BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

Docket No. UG-151663
Puget Sound Energy, Inc.'s
Petition for Approval of a Special Contract for Liquefied Natural Gas Fuel Service

PUBLIC COUNSEL DATA REQUEST NO. 002

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DR NO.	"CONFIDENTIAL" Material
002	Attachment A to PSE's Response to PUBLIC COUNSEL Data Request No. 002 is CONFIDENTIAL per Protective Order in WUTC Docket No. UG-151663.

ATTACHMENT A to PSE's Response to PUBLIC COUNSEL Data Request No. 002

LNG Strategy

PSE Board of Directors

PUGET SOUND ENERGY

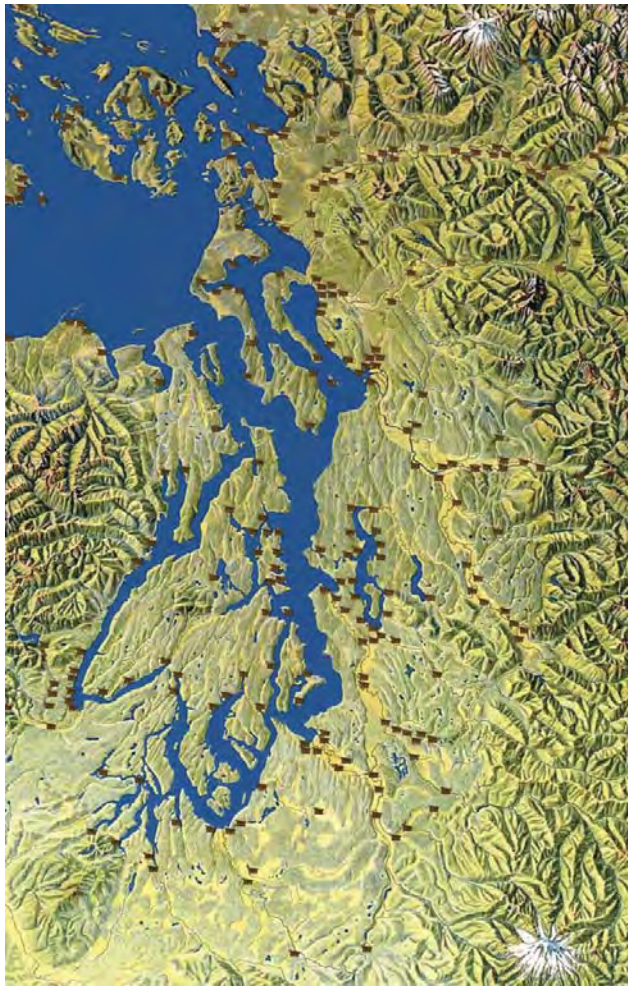
Roger Garratt

Director, Resource Acquisition & Emerging Technologies

May 9, 2012

PSE is an *Energy* Company with Regional Vision

- Energy is more than the electricity and natural gas a utility delivers to homes and businesses.
- Energy also moves people and products.
- PSE's vision is to promote energy projects on a regional scale that:
  - Take advantage of abundant, low-cost North American resources;
  - Stimulate economic growth;
  - Provide environmental benefits;
  - Enhance the reliability and security of the region's energy infrastructure.

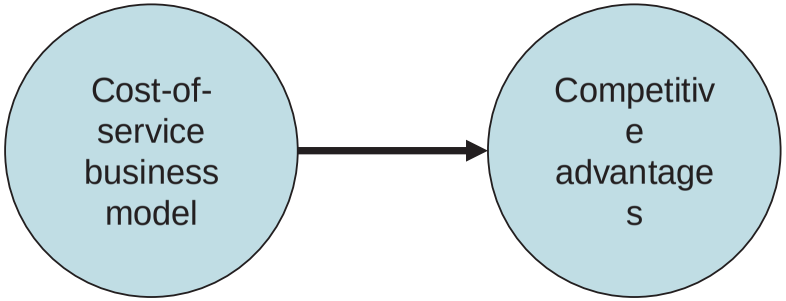


PSE's LNG Strategy

- Ownership of LNG facilities: liquefaction & storage
- LNG supply to anchor tenants
  - TOTE
  - Washington State Ferries
  - PSE peak-day use and system support
- Strategy to expand maritime and trucking markets via marketing partnerships
  - Gas supply companies
  - LNG providers
  - Maritime bunkering service providers
- LNG strategy consistent with PSE corporate strategy and risk management philosophy

	Current Status	Next Steps
LNG Strategy	▪ Identified preferred strategy	▪ Execute
Project Team	▪ Established project team and retained technology consultant ▪ Issued marketing consultant RFQ	▪ Identify and retain market consultant
Customers/marketing	▪ Targeted potential anchor customers ▪ Exploring potential marketing partners	▪ Continue working with TOTE and WSF to establish PSE as preferred supplier ▪ Develop relationship with marketing partners
Technology and bunkering	▪ Exploring LNG technology ▪ Obtain preliminary distribution system upgrade costs ▪ Exploring bunkering solutions	▪ Identify preferred provider and contracting approach ▪ Refine distribution system upgrade costs ▪ Further explore bunkering and potential providers
Siting	▪ Identified potential sites and surveyed permit requirements	▪ Site selection fatal flaw analysis
Regulatory, political, communications and community strategy	▪ Developing regulatory, political, communications and community strategy	▪ Refine and execute

Issue: PSE's Business Model



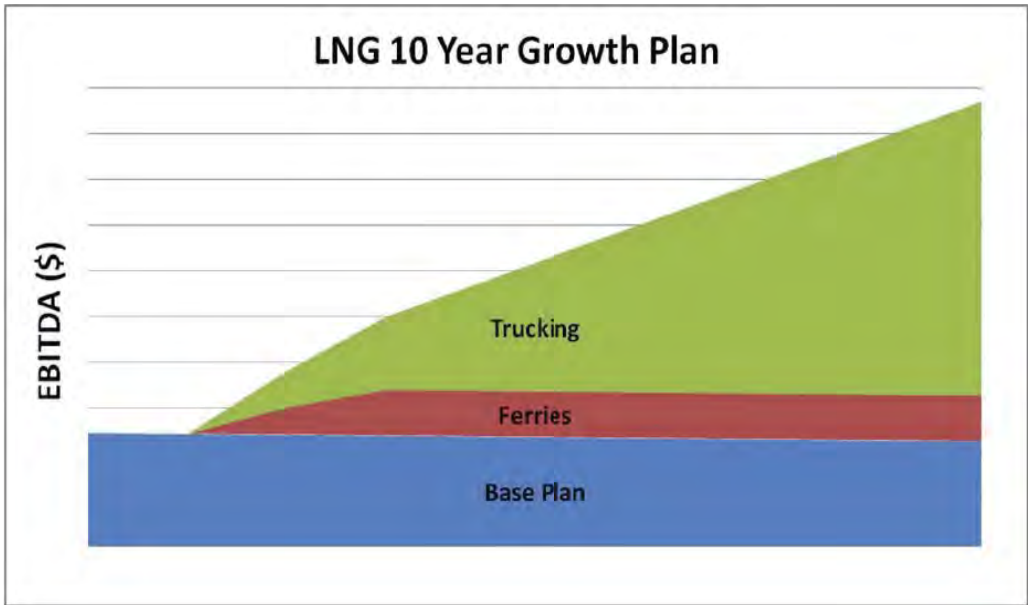
Cost-of-service business model:

- Earn a regulated rate of return on capital investments
- O&M expenses are passed through to the customer at cost
- No additional margin on commodity price

PSE offerings and competitive advantages:

- PSE would propose to levelize non-gas cost of service, and assist in exploring options to hedge gas-supply costs.
- PSE would market LNG service to additional customers and would spread the cost of facilities over the wider base, resulting in lower rates for all.
- PSE would utilize a portion of the LNG facility to improve reliability to its gas system, and would allocate a portion of the facility's costs, accordingly.

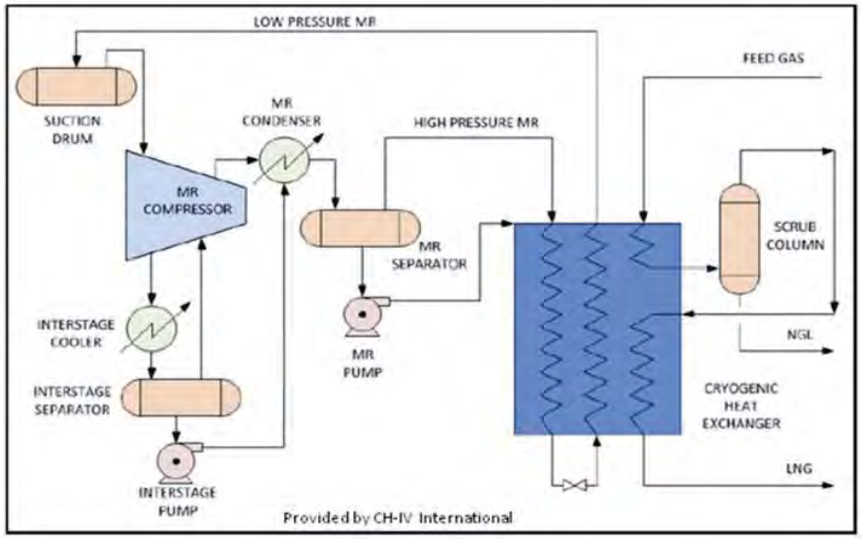
Issue: Growth Strategy

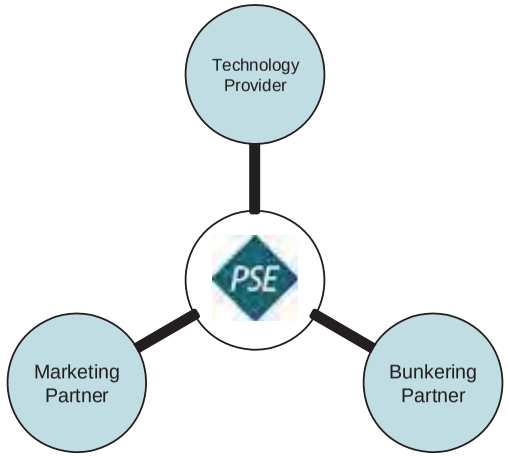


- Maritime markets
  - TOTE
  - Washington State Ferries
- PSE system uses
- Trucking markets

- PSE business model focused on measured development
  - Customer commitments
- Marketing partners/relationships
- Site and project expandability

Issue: Identifying Potential Project Partners





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Issue: Facility Siting

Port of Everett:

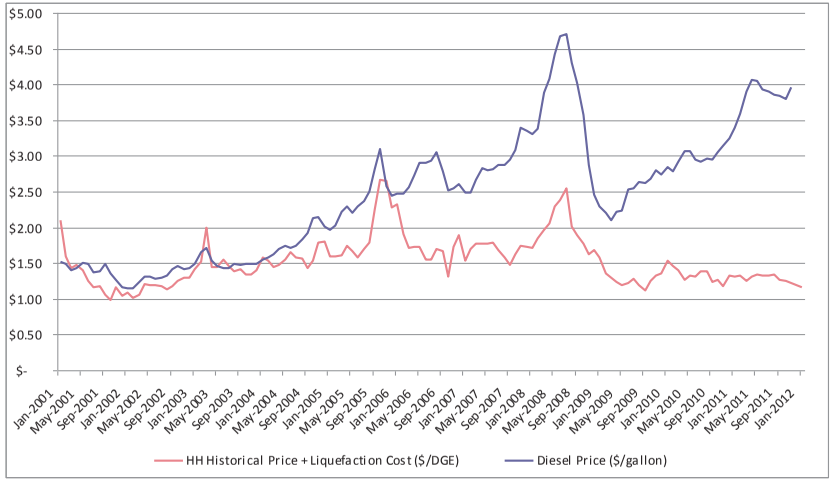
- Advantages:
  - ~$2-5 million in distribution upgrades
  - Potentially less expensive real estate
  - Development friendly municipality
  - Close proximity to I-5 for land-based markets
- Concerns:
  - Unknown draft clearance
  - ~60 miles to Tacoma market

Port of Tacoma:

- Advantages:
  - Immediate proximity to TOTE
  - ~30 miles to Seattle port
  - Development friendly municipality
- Concerns:
  - Real estate value
  - $30 - $40 million of distribution upgrades

Opportunity

- Abundant, low-cost North American natural gas offers strong economic advantages over diesel fuel
- Strengthened environmental regulations provide additional incentives for LNG conversions
- Capture of anchor tenants (TOTE, WSF) will provide strong competitive advantage for future market growth
- Opportunity to position PSE as part of regional solution focused on economic growth and environmental benefits



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PUGET SOUND ENERGY

Liquefied Natural Gas Strategic Assessment

Board of Directors Summary
May 2012

Executive Summary

The massive new growth in gas supply in North America has driven producers to seek opportunities to grow demand for their product in the transportation sector. All the players in the natural gas value chain are clamoring to get a piece of the action and help grow this nascent industry.

For PSE, energy is more than the electricity and natural gas we deliver to homes and businesses. Energy also moves people and products. PSE's vision is to promote energy projects on a regional scale that:

- Take advantage of abundant, low-cost North American resources:
- Stimulate economic growth;
- Provide environmental benefits; and
- Enhance the reliability and security of the region's energy infrastructure.

As a regulated distributor of natural gas, PSE and its customers benefit from growth in the transportation sector.

In its naturally occurring state, natural gas is not dense enough to be useful as a transportation fuel. Natural gas becomes most energy dense when chilled to form liquefied natural gas (LNG). In this state, it occupies 1/600th the volume that it does in its gaseous state. This density makes LNG capable to replace diesel fuel for long distance transportation applications.

This assessment presents the opportunity available to PSE in this sector. Supporting research and analysis focused on a gaining a deep understanding of commodity forecasts, liquefaction economics, end-user fuel conversion challenges, regulatory issues, market size and characteristics of the competitive landscape. The study is a result of the compilation of this diverse information into a view of how PSE should focus its efforts in the LNG space for the betterment of all stakeholders.

Market Drivers and Barriers

The market for LNG adoption in the transportation space is very new and still developing. While there are compelling market drivers in place, certain barriers exist that both the supply and demand side will have to overcome for LNG fueling to proliferate.

The most notable driver for LNG is simply the depressed price of natural gas and the apparent glut of reserves that are driving the pricing. This has the effect of spurring producers to find new buyers and has interested potential consumers with cost savings. Natural gas' favorable emissions profile relative to oil has also made it a potential fuel for industries facing tightening environmental regulations. Finally, the political world has installed or is considering installing assorted federal and state incentives to spur natural gas transportation growth.

Perhaps the biggest challenge facing widespread LNG adoption is the chicken and egg problem associated with fueling infrastructure. In short, the demand side is typically unwilling to invest in conversion of their fleet unless fuel is available, while the supply side is reticent to invest in liquefaction capacity without certain demand. Technology can also be an issue as LNG fueled transportation options are limited relative to oil fueled options, and in certain maritime applications, LNG fueling may not be physically feasible. Maintenance challenges are another barrier that is often not appropriately taken into account. This is not only a personnel expertise issue but also a facility issue. Maintenance facilities need to go through major renovations in order to safely accommodate maintenance on gas fueled vehicles. Finally, there are the expected challenges of securing the significant capital necessary to convert these fleets.

Markets

There are two transportation markets for LNG – maritime and trucking. In addition, an LNG facility will provide synergies for PSE peaking needs and other system uses. The maritime industry is a complex market for LNG as conversion requires very large capital investments and substantial engineering and design work for each vessel converted. However, it is of interest to PSE given our gas service to two major west coast ports. It is also important because a single maritime customer can offer the scale necessary to justify an entire small-scale liquefaction facility as an anchor tenant.

Within the maritime industry, the most promising sub-markets are regional ferry systems and shippers that operate entirely in the North American Emissions Control Area. The Washington State Ferries, for example, are publicly evaluating a switch to LNG. They are well suited to the fuel given their fixed routing and nightly return to base characteristics. Maritime shipping companies that operate within the North American Emissions Control Area are good candidates for LNG as they face tightening regulations that would require them to emit less sulfur per unit of fuel by 2015. Switching to LNG would allow them to more than comply with the regulation and do so more cost effectively than with low sulfur diesel.

The trucking industry is an enormous consumer of diesel, with over 28 billion gallons per year consumed in the US alone. Even a small percentage of this market converting to LNG would be significant for the natural gas industry. Equipment manufacturers are catching on and most major truck makers now offer LNG tractors. However, LNG tractors come at a cost premium and maintenance facility requirements represent an additional investment. Most important is the lack of fueling infrastructure. Until LNG is available along a truck fleet's hauling route, the fleet owner will not be interested in utilizing the new fuel.

PSE will also have use for a gas liquefaction and storage facility to meet peak needs and supply existing and potential future satellite LNG storage tanks. PSE is currently conducting an enterprise risk evaluation of its Swarr propane-air peak shaving facility. Should the facility require replacement, appropriate storage could be added on to a liquefaction facility built, for other purposes, to serve as replacement peaking capacity.

Recommended Business Model

PSE evaluated three potential LNG business models:

1) Provision of distribution and commodity to third-party LNG suppliers;
2) Ownership of LNG facilities supported by an anchor customer and with a strategy to grow the business over the longer term; and
3) Ownership of retail LNG fueling stations, in addition to LNG infrastructure.

Based on the financial and risk analysis completed on the three business models, we recommend that PSE pursue the second alternative: Ownership of LNG Facilities. Under this model, PSE would develop, own and operate a liquefaction and storage facility. This facility would supply a large anchor customer with LNG. At the same time, PSE would use the facility to serve other customers and markets and for peak-day supply and other system uses. The advantages and disadvantages are briefly summarized below:

Advantages	Disadvantages
Of the three business models evaluated, this one offers the highest financial return.	Initially, the bulk of the project would be for one or two customers, and therefore PSE would be exposed to their credit profiles.
This project would represent a noteworthy innovation in how we serve our customers and position us well for future growth in LNG.	LNG is a poorly understood fuel in the public domain making this a challenging permitting project.

This recommendation is based on five key findings:

1) This model offers the highest financial return to the company.
Ownership of LNG facilities provides more than twice the annual EBITDA as any other business model. It offers the best opportunity to invest capital to serve a customer's need while simultaneously providing system benefits.

2) It fits well with PSE's three-pronged strategy and core competencies.
PSE should be able to operate and maintain an LNG facility safely, efficiently and dependably just as it currently does with all of its electric generating facilities, LNG storage and underground gas storage facilities.

3) The risks presented are within PSE's capability to manage.
PSE's experience in development projects and safe operation of complex energy facilities make it well positioned to mitigate and control the risks that come with the siting and operation of an LNG facility.

4) It provides the best opportunity for future growth.

As owners of a liquefaction facility, PSE would be in the best position to capture additional market growth in LNG transportation usage. New maritime and trucking customers will inevitably look to the owner of existing supply as they consider switching to LNG.

5) *Based on PSE's cost of capital and regulated business model, we can offer the service at a very competitive price.*

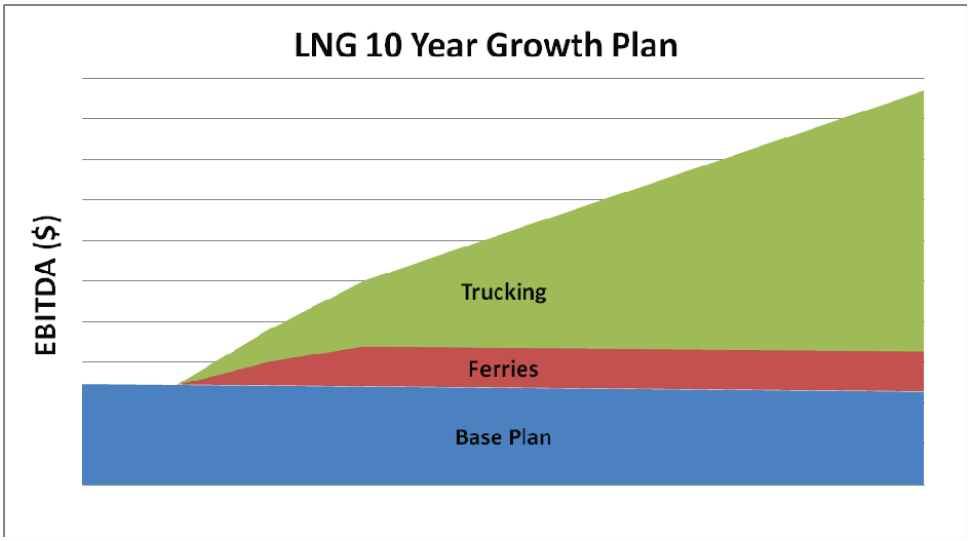
Most of the competitors in the marketplace price LNG on a diesel minus basis, where PSE would price it on a cost-of-service basis. This should make PSE the lowest cost provider. Counterparties may also be more confident in a local business that has been established for over 100 years.

The first business model, provision of distribution and commodity to third-party LNG suppliers, could also be pursued by PSE. In fact, if PSE fails to implement the second model, this will be our fallback option. Unfortunately this business model does not offer as attractive of a financial reward as ownership of LNG facilities. The risk of bypass also exists and a third party liquefier is likely to procure its own commodity and may construct its own interconnecting pipeline. Finally this business model removes PSE from the direct customer interface and leaves all the rewards of future growth to a third party.

PSE Growth Strategy

A viable LNG business plan must include sustainable growth. Supply arrangements with TOTE and Washington State Ferry System form the base of PSE's proposed strategy, but capturing an increasing share of the trucking market over time is a way to achieve sustained growth. This strategy is illustrated in Figure 8 below:

Figure 8: Growth in EBITDA Over 10 Years



To hone this growth strategy we have issued an RFQ to identify a marketing consultant to help better identify growth areas and help refine our marketing strategy. The RFQ has been sent to:

- Concentric Energy Advisors
- Navigant Consulting
- Pace Global

The selected consultant will assist PSE in determining current and future market sizes for LNG and CNG market segments in the Pacific Northwest, as well as, the anticipated growth and key drivers and risks for growth in each segment.
The outcome of this work will be a detailed bottom-up assessment of the LNG and CNG markets over the next 20 years for each market segment and associated risks of market development. Some key insights will be:

- For each market segment, what are the upper and lower bounds of the growth development timeline and market size?
- What is the likely timeline of adoption rates over the next 20 years?
- High level market strategy by segment. Can PSE partner with one or two key end users or is this a merchant or retail market?
- What can PSE do to help drive the market? (Support with tariffs, political pressure, work with key partners like other utilities, and UTC).
- What impact will uncontrollable market drivers have on key market segment development in terms of timeline and volume? (e.g., Federal and state incentives, environmental regulations, etc.)
- For each market segment what does the timing of consumption look like (e.g., Seasonal? One large delivery a year? Base load supply?)
- What impact will competitors have on our market size and timeline?
    - What is the reach of existing liquefaction supply from the north and the south?
    - Which competitive suppliers could complement PSE's efforts?
- What is the range of serviceable markets from an LNG facility?
- Who can PSE partner with to reach each market segment?

The KEY DELIVERABLE will be a forecast of potential sales volumes for all of the market segments in aggregate with associated forecast errors.

Important market segments to address include:

- Retail CNG/LNG:
    - Ground Transportation Fuel
        - Heavy-duty, long-haul trucking
        - Waste hauling
        - Drayage trucks
        - Return to base fleets

        - Off-road vehicles:
            - Locomotive
            - Factory and warehouse vehicles
    - Marine Transportation Fuel
        - Washington State Ferries
        - Cargo shipping
        - Tugboats/barges
        - Cruise ships
        - Other large recreational yachts
    - Industrial End Users
        - LNG used in manufacturing process
        - LNG as fuel in portable electric generation applications
        - LNG used for heat in industrial applications
        - LNG as fuel in off grid applications (development projects in the remote WA locations).
- LNG for Utilities and Power Generators:
    - Utility storage
        - For sale to other NW utilities for peaking
        - As support during pipe upgrade projects
    - Backup Power Generation Fuel—
        - Replace diesel as backup fuel at gas plants
        - Used as cheaper fuel than diesel or potentially pipeline gas on peak days

Marketing Partners

In parallel with identifying and retaining a market consultant, PSE has been having discussions with a variety of companies that have the potential of serving as a marketing partner, including:

- Air Products
- Linde
- Maxum

Air Products and Linde are both LNG technology providers, although Air Products appears to be focused on an "own and operate" business model rather than just a provider of technology. Hence, it is unclear to what extent Air Products is interested in a marketing partnership if they do not own a significant stake in the facility. Linde has thus far demonstrated much greater flexibility and has indicated that they would be willing to contract for a portion of the plant's capacity and fill that capacity by driving regional LNG growth. Maxum has been active in the regional maritime industry and could be an effective partner in the space, although they appear to have a more conservative strategy than Air Products or Linde, limiting their commitment to plant capacity only to the extent they can pre-arrange supply contracts with customers.

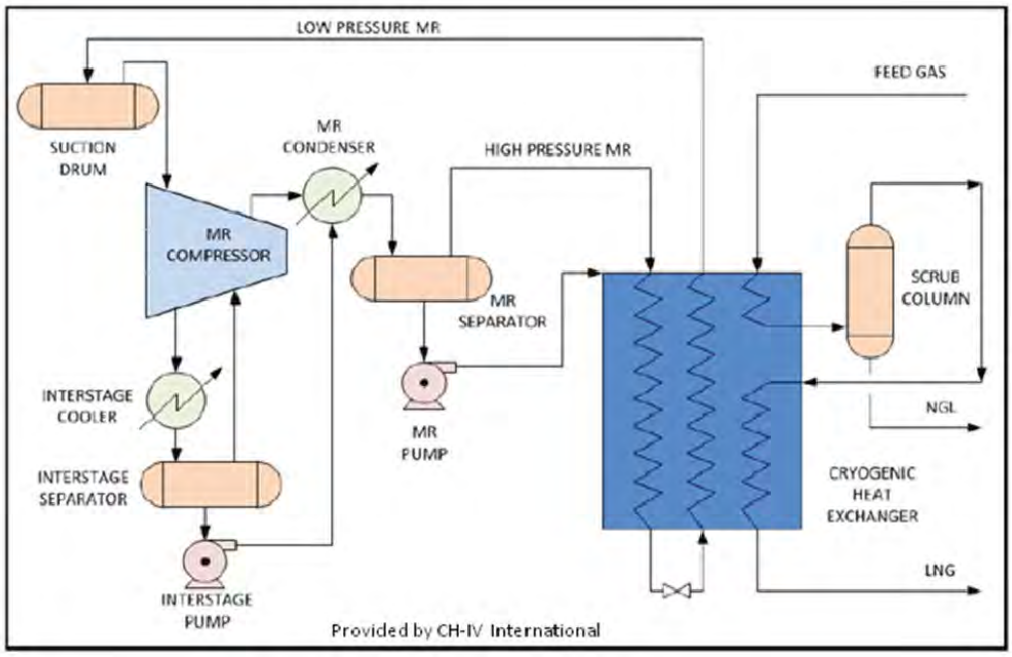
Liquefaction Technology

Natural gas liquefaction technology is well established and offered by several reputable and creditworthy companies, including:

- Air Products
- Black and Veatch
- Linde
- Kryopak

As mentioned previously, Air Products' business model may preclude them as a technology provider to a PSE-owned facility. All three providers offer liquefaction systems based on a single-mixed refrigerant process, which, generally speaking, is the most appropriate process for facilities in the size range being contemplated. This process is shown schematically in Figure 9.

Figure 9: Single Mixed Refrigerant Cycle



To assist in selecting a technology provider and, later, in providing owners engineering services under a design-build contract structure, we have selected CH-IV International, which has been providing engineering and consulting services in the LNG value chain since 1991. As part of our growth strategy, we envision a facility with expansion potential. Given the modular nature of these facilities, our approach should be feasible, provided it has been accommodated in the site selection and project layout. Figure 10 shows an LNG facility of comparable size located in Pinson, Alabama.

Figure 10: Single Mixed Refrigerant LNG Facility

LNG Bunkering

In the maritime sector, bunkering of LNG (i.e., transferring the LNG into the vessel) is a critical step. TOTE strongly desires a barge-based bunkering solution and such capability would allow for fueling of other regional maritime customers. This will enable them to continue to fuel their vessels at the same time they are off-loading and on-loading cargo; consistent with their current practice. Unfortunately, there is very little experience with LNG bunkering in the United States. There is limited experience in Norway and U.S. companies are attempting to learn from that knowledge base. Separate from the technology and infrastructure associated with bunkering are the applicable regulations. It is anticipated that the U.S. Coast Guard will be the lead agency with respect to these requirements, and efforts are underway to understand, work with, and shape Coast Guard regulations. At the present time, Maxum and Foss have been identified as potential bunkering partners, and the project team is working to expand this list.

Siting

PSE is presently considering two areas (Port of Tacoma and Port of Everett) that may be suitable for an LNG facility. Both have a deepwater harbor and available land zoned for heavy industry. Siting the LNG production plant near the source of natural gas and close to bunkering/barging facilities are important objectives. Tacoma is home to TOTE and has one or more potential sites but requires a significant investment to upgrade PSE's gas distribution system. Everett has suitable gas infrastructure but project development costs would be partially offset by higher operating costs associated with the longer barging service required to deliver fuel to TOTE and the core Tacoma and Seattle maritime markets.

An Environmental Impact Statement will be required, The EIS will likely address:

- Geology
- Soils and sediments

- Water resources
- Biological resources
- Land use, hazardous waste recreation and visual resources
- Socioeconomics
- Transportation
- Cultural resources
- Air quality
- Noise
- Reliability and safety
- Cumulative impacts

A significant work effort will address public safety including elements of plant safety, management/operational safety systems and risk assessments. Siting of this facility will require a risk-based verification including modeling for thermal radiation and flammable exclusion zones as well as flammable vapor dispersion analyses.

A fatal flaw analysis is important early in this process to determine if the sites are suitable for an LNG plant with respect to the aforementioned exclusion zones.

Next Steps

PSE's next steps encompass a range of activities across a broad array of disciplines, as follows:

Customer Identification

- Continue working with TOTE to establish PSE as preferred supplier.
  - Work with TOTE regarding technology providers.
  - Work with TOTE regarding bunkering solutions.
  - Work with TOTE regarding gas cost hedging.
  - Support TOTE's efforts for favorable EPA regulatory regime.
  - Support TOTE in community and communications strategy.
- Continue working with Washington State Ferries regarding LNG supply.
  - Reach out to the Washington State House and Senate transportation committee leaders to explore public/private partnership solutions.
  - Explore sources of conversion capital.
- Explore other maritime opportunities.
- Explore trucking market opportunities.

Potential Partners

- Indentify preferred technology provider and contracting approach.
- Further explore fuel bunkering solutions and economics.
- Identify and retain marketing consultant.
- Indentify marketing partners.
- Continue to work with gas planning and project management to hone scope and cost estimates for required distribution system upgrades.

Siting and Permitting

- Explore siting option in Tacoma area, including Puyallup tribal property.
- Explore potential siting issues at Port of Everett
- Understand permitting and setback requirements.

Community and Communications Strategy

- Flesh out comprehensive community and communications strategy to support siting and marketing efforts.

Regulatory Strategy

- Develop proposed structure for an LNG tariff and supporting special contracts, and regulatory filings, including necessary accounting petitions.

Introduction

The massive new growth in gas supply in North America has driven producers to seek opportunities to grow demand for their product in the transportation sector. Naturally all the players in the natural gas value chain are clamoring to get a piece of the action and help grow this nascent industry. As a regulated distributor of natural gas, PSE and its customers would benefit from growth in this sector.

In its naturally occurring state, natural gas is not dense enough to be useful as a transportation fuel. Natural gas becomes most energy dense when chilled to form liquefied natural gas (LNG). In this state, it occupies 1/600th the volume that it does in its gaseous state. This density makes LNG capable to replace diesel fuel for long distance transportation applications.

The following strategic evaluation is purposed to assess potential liquefied natural gas (LNG) business opportunities for PSE. This study is organized to outline the current market situation for LNG and how PSE might exploit opportunities in its own service territory. The report provides insight into the current drivers and barriers to LNG adoption, key competitive players, end use markets and potential PSE business models.

It is the recommendation of the strategic assessment team that PSE should pursue a business model that actively seeks a maritime based anchor customer as a long-term off-taker for a PSE owned liquefaction facility, combined with a strategy to grow the scale of this business over the longer term.

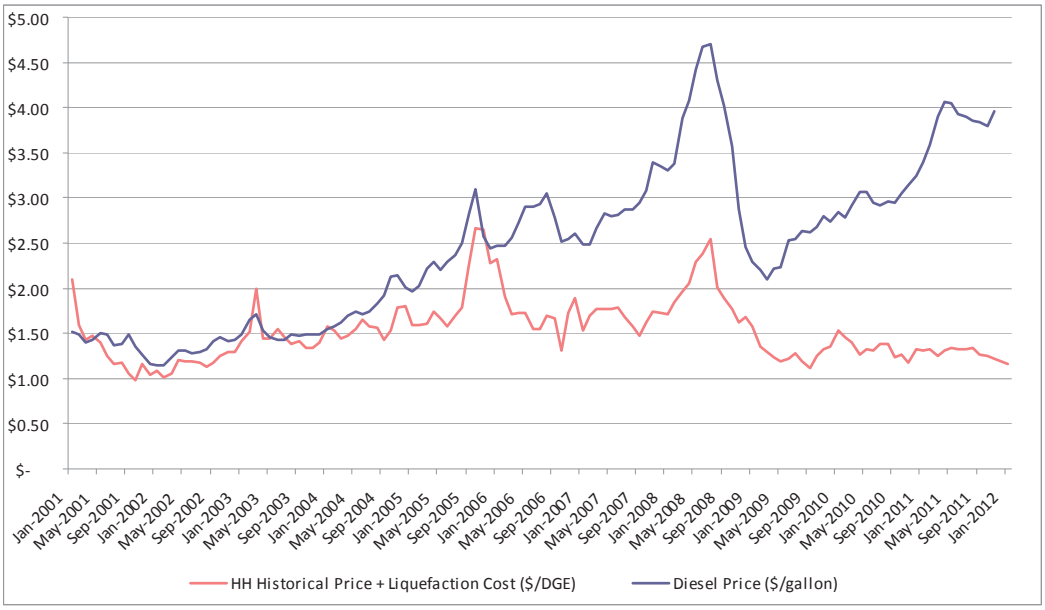
Key Drivers

Recent economic, environmental and political transitions have set the stage for a growth in the adoption of alternative transportation fuels, including LNG. While oil remains the undisputed king, LNG is making inroads in certain sectors due to the drivers discussed below.

Economic

The abundance of natural gas resulting from production of North American unconventional reserves, increased production of North American oil and associated natural gas, and persistent slow economic growth in the U.S. and globally have caused natural gas prices, in nominal and relative terms to oil, to be very low (see Figure 1 below). Natural gas prices are widely expected to remain stable for the foreseeable future. So abundant is North American natural gas, it is being actively evaluated as an export commodity as LNG and as a transportation fuel domestically as both compressed natural gas (CNG) and LNG. As a consequence of these developments, a number of transportation industries have begun assessing or have already switched to LNG or CNG as an alternative to petroleum based fuel. Early adopters have primarily been land-based transport companies, particularly waste hauling and other fleet-based industries.

Figure 1: Comparison of Historical Henry Hub Natural Gas Plus Liquefaction Cost and Diesel $/gallon



Regulatory/Environmental

Given the large contribution of transportation emissions to pollution levels both regionally and across the country, the EPA and other state environmental bodies have promulgated new emissions regulations for transportation vehicles that demand stricter emissions limits from diesel engines, and correspondingly higher cost or a switch to cleaner fuels like natural gas. EPA's recent tendency to propose regulations and then abandon them or slip regulation implementation dates has made some parties wonder if the same might happen here. It is not clear at this point if some or all of these regulations will experience a slip in either time or stringency. However, it is important to note that these aren't proposed, but rather are already promulgated so the debate has largely already taken place, thus lessening the likelihood of slip.

In the land-based heavy duty trucking industry, the EPA has progressively tightened emissions requirements on new engines. Most notable is the "2007 Heavy-Duty Highway Rule" which required heavy duty truck fleets to meet more stringent emissions standards for NO_x, particulate matter (PM) and other pollutants by 2010. The EPA allows fleets to meet these standards through engine and exhaust retrofits.

EPA: Control of Air Pollution from New Motor Vehicles: Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements, January 18, 2001 (40 CFR Parts 69, 80, and 86). Also known as the 2007 Highway Diesel Rule. Sulfur content in diesel fuel used by heavy-duty highway vehicles was reduced from 500 parts per million (low sulfur diesel, or LSD) to 15 ppm (ultra-low sulfur diesel, or ULSD). These standards were phased in starting in 2007 through 2010.

EPA Interim Final Rule on Nonconformance Penalties for On-Highway Heavy-Duty Diesel Engines, January 20, 2012. EPA is taking final action to make nonconformance penalties (NCPs) available to manufacturers of heavy-duty diesel engines in model years 2012 and 2013 for emissions of oxides of nitrogen (NO_x). In general, the availability of NCPs allows a manufacturer of heavy-duty engines whose engines fail to conform to specified applicable emission standards, but do not exceed a designated upper limit, to be issued a certificate of conformity upon payment of a monetary penalty to the United States Government. The upper limit associated with these NCPs is 0.50 grams of NO_x per horsepower-hour.

In December 2008 the California Air Resources Board (CARB) approved new regulations to reduce PM and NO_x from diesel trucks and buses. These regulations will be implemented in phases beginning in 2012 and ending in 2023. In 2012, the heaviest emitting trucks will need to buy costly exhaust filter retrofits to continue operating. Starting in 2015, the regulations call for a gradual phase out of trucks not meeting the 2010 standard such that, by 2023, all trucks (private and federally owned) that operate in California will need to meet 2010 engine standards. The result of these regulations will be a massive retirement of the older diesel fleet and the entrance of a new fleet of trucks that will either run on more expensive cleaner diesel engines or LNG. As an added incentive, fleets that switch to alternative fuels (like LNG) early in the process can delay retrofits or replacement of other fleet vehicles.

In the maritime sector, the most important driver of fuel is the recent promulgation by the EPA of new emissions rules for the marine industry. While these rules affect new marine engines to be built in the future more than existing engines, owners of existing engines will be forced to turn to lower emissions fuels, likely either a lower sulfur diesel or LNG.

EPA: Control of Emissions from New Marine Compression-Ignition Engines at or Above 30 Liters per Cylinder, April 30, 2010 Federal Register, Vol 75, No.83
Large vessels, meaning most large cargo ships, operating within the North American Emissions Control Area (ECA) must meet more stringent emissions and fuel requirements. The ECA for the U.S. and Canada is shown in Figure 2 below and includes all areas within 200 miles of the shore.

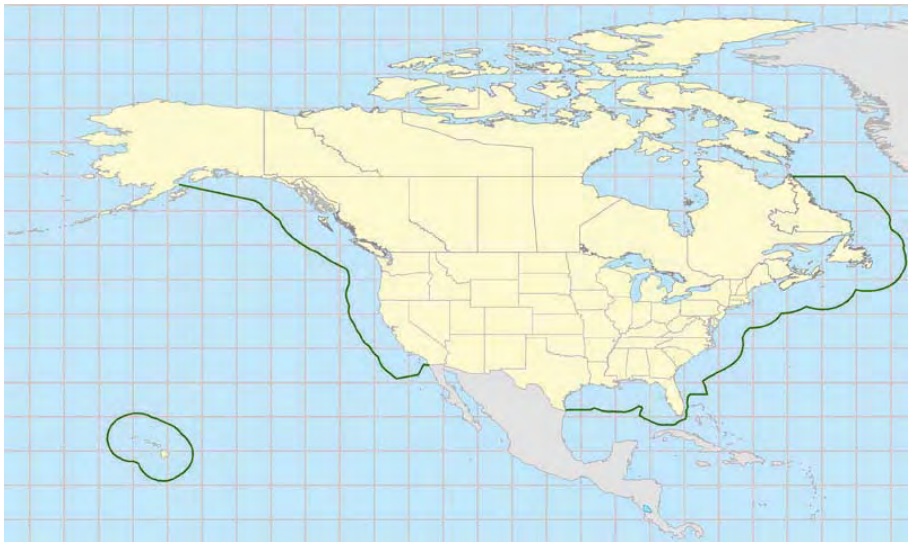
Sulfur Requirements: ECA marine fuel is subject to a maximum sulfur content of 1,000 ppm by January 1st 2015. (40 CFR 80.510)

NO_x Requirements: New large ships (with engines over 30 liters per cylinder) will need to meet more stringent NO_x requirements being phased in between 2004 and 2016. (40 CFR 1042.104) This means that new ships must choose between much more expensive diesel engines with scrubbers or a cleaner alternative fuel (e.g., LNG).

EPA: Control of Emission from Air Pollution from Locomotive Engines and Marine Compression-Ignition Engines Less than 30 Liters per Cylinder, May 6, 2008 (Federal Register Vol 73, No. 88.)

Class 2 vessels, which are the workhorses of the inland waterways are subject to a slightly different set of regulations than are the large vessels. The regulations for Class 2 vessels apply to newly built engines or remanufactured engines. As early as 2014 such engines will be subject to Tier 4 standards which require post-combustion emissions treatment or the use of a cleaner fuel such as LNG.

Figure 2: North American ECA



Political

The federal government has made alternative fuels a key component to reducing emissions from the transportation sector. Until the end of 2011, there were a number of federal incentives related to natural gas vehicles, fuel and infrastructure. Federal incentives included:

- A 30% tax credit on the cost of fueling equipment not to exceed $30,000;
- A $0.50 per gallon tax credit on the fuel itself;
- A fuel tax exemption when natural gas is used to fuel state vehicles;
- Tax credits for purchasing natural gas vehicles (LNG trucks have tax credits in the range of $25,000 to $32,000 per truck).

There is current legislation in Congress to expand incentives for natural gas vehicles. The 'New Alternative Transportation to Give Americans Solutions' Act (or NATGAS Act) is being championed by Clean Energy Fuels' Chairman T. Boone Pickens. The bi-partisan bill (with 181 cosponsors) dramatically increases the federal incentives for purchasing natural gas vehicles, fuel and infrastructure and should be voted on in early 2012.

Washington State appears to be committed to alternative fueled vehicles. Policy has focused on state goals around vehicles and emissions and one financial incentive is a sales tax exemption for light-duty, alternative-fueled vehicles. The state goal dictates that

at least 30% of vehicles purchased with state contracts must be clean fuel vehicles which include natural gas vehicles. In addition, the state has developed a comprehensive plan to lower green house gas emissions as follows:

- By 2020, reduce GHG emissions to 1990 levels;
- By 2035, reduce GHG emissions to 25% below 1990 levels;
- By 2050, reduce GHG emissions to 50% below 1990 levels.

The Washington Department of Ecology has put together a comprehensive plan to meet these goals which includes alternative vehicle fuels such as natural gas.

Barriers to Adoption

There are formidable drivers for the growth of LNG in the transportation sector but key barriers exist that hinder its proliferation.

Fuel availability

Perhaps the most important barrier to wider adoption of LNG as a transportation fuel is a lack of availability. This represents a chicken and egg dilemma in that demand and supply would each prefer the other to show up first. Natural gas liquefaction represents an investment level in the tens to hundreds of millions of dollars and requires a high level of complexity in operations and maintenance. Accordingly, development and construction of liquefaction is not done on a speculative basis but rather is typically based on a sizable long-term off-take agreement or a utility's system peaking need.

End Use Technology

Until very recently, there were few available options for natural gas fired engines for the automotive and trucking market. The early technologies that hit the markets in the 1990s suffered from reliability problems and few models were available. Recently a number of manufacturers have entered the market with heavy duty LNG trucks but fleet operators, for the reasons mentioned here, may not be quick to test them out. Fleet operators may have had bad experiences in the past with early natural gas vehicles and will want to tread carefully.

Furthermore, the models currently available don't yet include the higher horsepower models that many truckers need. However, Cummins Westport is planning to release an 11.9 liter engine soon to sate this demand.

Physical Feasibility

The density of natural gas as LNG, relative to conventional oil based fuels provides a challenge when it comes to onboard storage of the fuel in a vehicle. The densest phase of natural gas is as LNG, at which point it is 1/600th the density of its gaseous form. Unfortunately, LNG holds only about 58% the energy content of diesel fuel per gallon. Not only is it less energy dense than oil, but LNG also requires highly insulated storage in specially shaped containers. As a result, volume estimates for LNG on-board storage can be two to four times that of its diesel equivalent. This creates obvious challenges for

any form of transportation as more productive space is taken up by fuel containment. This can be particularly challenging in certain maritime conversions where below decks space is very confined.

Maintenance

Particularly for the trucking industry, maintenance of natural gas engines presents an obstacle because existing technicians are well trained in diesel mechanics but not natural gas. Smaller fleets without in-house mechanics are also going to want to feel secure that they can find a maintenance provider as easily as they can a diesel mechanic.

In addition to the mechanics themselves, the maintenance facilities will have to undergo substantial modifications. Because diesel is a liquid at ambient temperature, maintenance facilities are built to deal with floor spills of oils and diesel fuel. In contrast, a maintenance facility for natural gas vehicles must be built to deal with gas releases. Such modifications include gas sensors, ceiling exhaust fans and duct work, and spark-less electrical switches.

Capital Requirements

While in many cases, the present value economics may favor switching to LNG, the capital investment can be prohibitive. Existing gasoline/diesel vehicles will need to be modified or new natural gas fueled vehicles will need to be purchased. The owner may also need to invest in the fueling infrastructure or make long-term commitments to an LNG supplier, which is not necessary with conventional fuels. Consequently, sources of conversion capital may need to accompany a successful strategy. Furthermore, operators of vehicle fleets may only turn over a small percentage of their fleet every year which may not present enough fuel volume to make the initial investment in fueling infrastructure economic.

Competitors and Other Providers

Competition for LNG transportation customers comes in the form of competitive third parties. Many natural gas utilities have also become involved in LNG investments.

Third Party LNG Providers

The rise of interest in natural gas fueling in the transportation sector has spurred the creation of a handful of companies that are betting on proliferation of natural gas fueling. The following discussion highlights three of the most prominent players.

Clean Energy Fuels:
Clean Energy Fuels (chaired by T. Boone Pickens) is the leading provider of natural gas vehicle fuel and infrastructure in the United States and Canada. Clean Energy has developed 224 natural gas stations across the United States. Some stations are owned and operated by Clean Energy while others were developed as turnkey solutions for

private customers. Allied Waste, for example has two CNG stations designed and built by Clean Energy in Bellevue and Kent.

Clean Energy also operates both LNG production and fueling stations. Their two LNG production plants are located in Willis, TX and Boron, CA. Combined, their LNG production is 260,000 gallons per day, with a reported ability to scale to 340,000 gallons per day. Northstar, a wholly owned subsidiary of Clean Energy Fuels has built the majority of LNG fueling stations in North America. For the time being, Clean Energy's LNG fueling stations are located only in Southern California and East Texas. It is unclear whether or not they source 100% of their LNG from their own production.

Table 1: Summary of Clean Energy's Fueling Station (reproduced from CEF's 2010 Annual Report)

As of December 31, 2010:	CNG Stations	LNG Stations	Total Station
Operated, maintained with LNG supplied by Clean Energy	111	8	119
LNG Supplied by Clean Energy, operated and maintained by customer	-	28	28
Operated and maintained by Clean Energy, LNG supplied by customer	66	11	77
Total	**177**	**47**	**224**

Prometheus Energy:
Prometheus Energy, based out of Redmond WA, offers a variety of services related to LNG production and distribution. Prometheus is focused on extracting methane from sources such as landfills, coal beds and test wells, as well as converting and delivering that methane as LNG to end users. Prometheus targets the industrial end user market looking to convert from diesel or other heavy hydrocarbons and offers them services from supply to liquefaction and distribution. It is not clear how much attention Prometheus pays to the transportation market as they mostly target the industrial market. Prometheus Energy is privately held by Shell Technologies Venture Fund 1 B.V. and Black River Asset Management.

Applied Natural Gas Fuels:
Applied Natural Gas Fuels (Applied) owns a 35 million gallon per year liquefaction facility in Topock, AZ from which they serve various industrial and transportation markets primarily in California. They also own FleetStar, a business focused on owning and operating LNG and L/CNG retail fueling stations across the country. Applied appears focused on geographic expansion and could easily find a way into the Northwest if they find an appropriate customer base.

Complements

It is important to note that there are a few key market complements to those wishing to drive transportation conversion to alternative fuels in the Puget Sound Region. This mix of government and non-government organizations is actively attempting to change the market and PSE would be well served to work in unison with them.

Clean Cities

The U.S. Department of Energy started the Clean Cities program to help drive new local programs to reduce pollution in key U.S. cities. The Western Washington Clean Cities group, based in Seattle, is focused on promoting alternative fueled vehicles in the Puget Sound region. They generally have no funding to offer but rather work in the capacity of "information brokers" trying to connect key parties involved and provide supportive information to fleet owners. PSE is a sponsor of Western Washington Clean Cities and stays well connected with them. The Director, Stephanie Meyn reports that they are currently focused on providing appropriate vehicle conversion financial analysis templates to fleet owners and also in trying to develop financing programs.

Cascade Sierra Solutions

Cascade Sierra is a non-profit that provides unique financing programs to truckers to help them move to clean diesel or alternative fuels. Most of their work so far has concentrated on replacing aging, dirty diesel trucks with cleaner diesel engines. They have just become active in the Puget Sound region and PSE is working closely with them. Their focus here is likely to be in converting trucks to natural gas engines. Thus far they have received a grant from the Washington Department of Ecology to conduct a pilot program converting two trucks to natural gas at the Port of Seattle.

Gas Producers

Gas producers, such as Encana and BP have a strong financial interest in creating new markets for natural gas. Various drivers keep producers drilling, and selling, natural gas even in a low price environment, including but not limited to: leasehold provisions, associated liquids production and cash flow requirements. Cascade Sierra Solutions reports that they have been in conversations with some of the producers and they have expressed interest in providing low interest financing to truckers who will convert to natural gas.

Other Utilities and LNG

The involvement of regulated natural gas utilities in North America with LNG is variable. Some utilities have opted to seek opportunities for new revenue at the deep end of the value chain while others have found use for a shallower approach.

We have provided some examples of other utilities and their LNG businesses below. This list is by no means exhaustive and is only intended to provide examples of involvement at different points on the LNG value chain.

FortisBC Energy: Fortis serves areas throughout British Columbia and owns and operates LNG facilities at Tilbury, B.C and at Mt. Hayes, Vancouver Island as storage/peak shaving facilities. Fortis is actively marketing output from the Tilbury facility to transportation customers and has received interim approval from the British Columbia Utilities Commission to provide LNG fueling services to Vedder Transport in Abbotsford, BC. Vedder Transport is expected to have a fleet of 50 LNG powered trucks by early 2012. Fortis is working with Waste Management in an effort to supply their trucks with CNG. The BC Utility Commission is working with Fortis to determine an appropriate rate structure.

Pacific Gas and Electric: PG&E has pushed hard for NGV adoption and has a fleet of over 1000 natural gas cars, trucks and vans including five Class 8 Kenworth trucks that run on LNG. PG&E also teamed up with Idaho National Labs to build a small LNG plant outside of Sacramento. The LNG from the facility is used for system peaking and is also sold to end use customers.

AGL Resources: AGL owns and operates a number of LNG peaking facilities primarily in the southeast. The largest is capable of storing 31 million gallons in two separate tanks and can supply 400,000 Dth/day to the Atlanta gas system. AGL also own two mobile vaporization units. It uses these units along with an LNG tanker to supply gas anywhere throughout the system. AGL has created an unregulated subsidiary, Pivotal LNG which is attempting to further utilize the LNG peaking facilities, owned by AGL, to serve the transportation and industrial markets.

Questar: Through a subsidiary, the Utah gas utility Questar has partnered with Applied LNG technologies to begin exploring ways to expand LNG market opportunities in Utah. U.S. interstate I-15 which travels from Los Angeles through Las Vegas and into Salt Lake City is situated to be one of the nation's first LNG highways. Questar currently owns and operates public CNG fueling stations and it appears that their intention may be to do the same with LNG through Questar Transportation Services.

Integrys Energy: Integrys' regulated subsidiary, Peoples Gas, owns and operates an LNG facility used to store gas for peaking purposes. Their LNG storage facility can hold 24 million gallons of LNG in two storage containers and is located on top of their underground natural gas storage reservoir. Peoples Gas uses the facility to serve the Chicago area and reserves some peaking capacity for another Integrys owned gas utility, North Shore Gas.

Alagasco: Alagasco has two LNG facilities used for peak shaving. These facilities provide storage of over 20 million gallons and substantial liquefaction capacity. Alagasco has not yet committed output to the transportation sector but receives frequent inquiries for access to LNG product.

NYSEG: In 2003 NYSEG was awarded a $600,000 DOE grant to develop a small LNG plant that would serves as a peaking facility as well as an LNG fueling facility. As of 2009, NYSEG had completed a study of technologies but had not used any of the

$600,000 or purchased equipment for the facility, citing troubles in NY state legislation related to LNG as the cause of the delay.

Markets

The viable market in the Puget Sound region for LNG is comprised of three categories:

- **The maritime market** for fueling ocean and inter-coastal waterway vessels.
- **The heavy duty trucking market** servicing combination trucks serving interstate and intrastate routes.
- **Utility system peaking**

As a note, a fourth market may also be present – short-haul heavy duty trucking, including refuse and drayage vehicles. For the sake of this study, the team considered that market to fit better with CNG fueling. We made that decision because it appears that the conversions in that market have mostly been CNG.

Maritime Market

The maritime industry is in the early stages of adoption of LNG as a fuel and pockets of activity have begun to spring up. Worldwide, Norway appears to be leading the way. The country counts 22 LNG fueled ships including 14 ferries, four oil supply vessels, three coast guard patrol boats and one tug.

In the U.S., a grant of $2.34 million from the U.S. Department of Transportation's Ferry Boat Discretionary Program has been awarded to convert one Staten Island ferryboat from the use of ultra-low diesel fuel to clean-burning LNG. The Washington State Ferry system is also considering LNG. Beyond ferries, Harvey Gulf, a drilling platform service provider intends to launch two LNG fueled drilling platform service boats in the Gulf of Mexico in 2014.

Vehicle Types

Cargo Ships. These vessels haul large amounts of cargo either on long-haul international routes or shorter-haul domestic routes. The willingness of a cargo ship owner to convert its vessel(s) to LNG fuel depends entirely on the traveled route and physical feasibility of conversion.

Long-haul international carriers will be less interested in fuel conversion to natural gas as they only operate in the North American ECA for a small fraction of their total travel distance. It will likely be more economical for them to continue burning heavy fuel oil while sailing in the open ocean and switching to lower sulfur diesel once in the North American ECA.

Some ships may also be poorly configured to accommodate LNG bunkering. In some cases, a conversion would require major reconstruction below deck to accommodate the increased size and weight requirements of LNG fuel bunkering. This may result in either less attractive conversion economics or even be an impossible structure to convert.

Given the above characteristics, target marketing for LNG conversion should focus on domestic carriers.

Cruise Liners. Market intelligence gleaned by PSE has indicated that the main cruise lines that call on Seattle are very interested in conversion to LNG. The fact that these ships travel mostly in the North American ECA means that they could see significant savings by converting to LNG. The challenge for cruise lines is that they would need LNG available at all of their main ports of call. The vessels that call on Seattle typically only conduct Alaskan cruises during part of the year. During the remainder of the year the same boat may sail routes to Mexico or the Caribbean and would require LNG availability there as well.

Tug boats. The fact that many tug boat fleets tend to operate in a confined port area with short sailing distances makes them a good candidate for LNG fueling. Unfortunately the smaller physical structure of a tug boat makes LNG fueling difficult given the added space requirements of LNG bunkering.

So far, limited consideration has been given to LNG-fueled tugs. Wartsila has designed a conceptual LNG tug but has not yet sold one (**Figure 3**). Other tug operators have explored the potential of new LNG tugs but have had trouble with the economics. Crowley Maritime had an LNG-fueled tug designed and costed but has not constructed the vessel due to price issues. They believe it will cost 33% to 50% more than a conventional diesel tug. Worldwide there are three other LNG tugboats under construction or planned.

In the U.S., tugboats may be a longer term market conversion to LNG as the fuel becomes readily available in ports and tug companies cycle through their existing fleet. In the near term, tug boat fleets are not likely to be viable candidates for LNG conversion.

Figure 3: Wartsila Conceptual Tug Boat Design

Ferries. The short predictable routes of most ferries are ideal for LNG fueling since they can be re-fueled on a daily schedule. Currently there are at least 20 LNG-fueled ferries operating, under construction or planned, mostly in Europe. Washington State has the largest ferry fleet in the United States and is openly considering conversion of some of its vessels to LNG.

Market Size and Key Customers

The Ports of Tacoma and Seattle primarily service vessels on international routes that only operate for a fraction of their voyages within the North American ECA. Accordingly, they would likely be less interested in switching to LNG as they would economically prefer to burn heavy fuel oil during the non-ECA portion of their voyage and switch to lower sulfur diesel during the short duration that they steam inside the ECA. Accordingly, the target market for LNG fueling would be those shipping companies that serve domestic ports only.

The domestic carriers at both ports are shown in Table 2 below.

Table 2: Domestic shipping carriers in the Ports of Tacoma and Seattle.

Port of Tacoma			
Ship Owner	**Route**	**TEU/ship**	**Schedule**
TOTE	Tacoma – Anchorage	1200/2	2 X per week
Horizon	Tacoma – Anchorage – Kodiak	1582/2	2 X per week
Horizon	Tacoma – Oakland – Honolulu	1582/2	1 X per week
Port of Seattle			
Northland	Seattle – Alaska (various ports)	Unknown	2X per week

NOTE: TEU stands for Twenty-foot Equivalent Unit, a measure of cargo capacity and therefore ship size.

Of the listed companies in Table 2, TOTE has expressed specific interest in LNG conversion. TOTE consumes over 23 million gallons of diesel fuel per year (equating to about 40 million gallons of LNG or 3.2 million MMBtu) for its two vessels. Based on ship sizing and route, it would be reasonable to assume that Horizon and Northland consume a comparable amount or more on their Puget Sound to Alaska routes.

PSE has actively engaged TOTE in commercial and technical conversations about LNG supply. Preliminary discussions indicate that an LNG facility located adjacent to TOTE's base location at the Port of Tacoma might be the best solution. We understand that TOTE has spoken with the Port about their exploration of LNG fueling but it is unclear to what extent the Port understands the scope of the required LNG facility. More work will need to be done in educating the Port if this project is to become successful. Given the Port's distance from the interstate pipeline, it will also be important to acquire an

accurate view of the cost of PSE system upgrades necessary to deliver the proper volume and pressure of gas.

The Washington State Ferry System (WSF) is another potential LNG customer and is publicly exploring LNG fueling. The state has commissioned at least two studies to understand the feasibility of LNG conversion of certain ferries. The most recent study conducted by Cedar River Group in December 2011 concluded that the most economic option for WSF would be to make one of its planned new 144 car vessels as an LNG-fueled ferry and perhaps convert one or more of the existing Jumbo Mark II vessels as well. The consultant recommended that converting the existing Issaquah class vessels was not economically justifiable.

Even if the WSF chose to do either one or both of the recommended conversions, it would not be a large enough consumer of LNG to be an adequate anchor customer for a liquefaction facility. For example, if all the Jumbo Mark II vessels were converted at once, they would consume only 7.8 million gallons of LNG annually (Table 3). Conversion of one of the new 144 car vessels would be expected to consume a comparable amount of fuel as the current Super class, approximately 2 million LNG gallons per year. In total this would represent only about a quarter of the load from TOTE. If WSF does make any vessel conversions to LNG it may account for a meaningful amount of LNG consumption to be served from an existing liquefaction facility.

Table 3: Washington State Ferry System Fuel Consumption by Vessel Class

Vessel Type	# of Ferries	Annual ULSD Consumption (MMgal/year)	Equivalent LNG Consumption (MMgal/year)	Avg. Annual LNG Consumption per Vessel (MMgal/year)
Issaquah	6	3.7	6.29	1.05
Super	4	4.7	7.99	2.00
Jumbo Mark I	2	2.5	4.25	2.13
Jumbo Mark II	3	4.6	7.82	2.61

Because the WSF require state funding for any vessel conversions, their decision-making will be much longer than that of a private maritime owner. It will also be subject to unpredictable political machinations and state fiscal status. These political challenges as well as the necessary staggered timeline of LNG ferry deployment make the WSF a longer-term potential LNG off-taker. It would be financially challenging for a developer to build a liquefaction facility for the ferries, so WSF will need to rely upon existing capacity, at least for its initial supply. Should PSE have liquefaction capacity at that time, one would presume that, we would be the preferred supplier assuming our price is competitive.

Customer Economics

It is clear from PSE's research that both the ferries and TOTE have very different conversion costs, refueling logistical requirements and fuel consumption levels. Accordingly, it is impossible to generalize an analysis of customer economic feasibility. Based on conversations with TOTE, we do have a rough view of their capital requirements for conversion to LNG. Using this data, along with forecasts of crude oil, and PSE projections of natural gas and LNG pricing, we can construct an analysis to determine the financial viability of TOTE's investment in LNG.

To give a sense of LNG cost, Table 4 below shows PSE's anticipated conversion cost for LNG along with a view of the commodity cost at three different price levels. These numbers are based on preliminary estimates of liquefaction and storage equipment cost and distribution upgrade costs and are therefore subject to change. Given these economics, PSE can convert gas to LNG for about $0.44 per LNG gallon. Assuming three dollar gas, this equates to a total cost per LNG gallon of $0.72, equivalent to $1.21 per diesel gallon equivalent (DGE).

Table 4: PSE Project LNG Conversion Cost for a Liquefaction Facility at the Port of Tacoma

	$/LNG Gallon		
Natural Gas Price Level $/mmbtu	**$ 3.00**	**$ 4.00**	**$ 5.00**
Commodity $/LNG gallon (gas and transport)	$ 0.28	$ 0.36	$ 0.44
Conversion $/LNG gallon (liquefaction)	$ 0.44	$ 0.44	$ 0.44
Total $/LNG Gallon	**$ 0.72**	**$ 0.80**	**$ 0.88**
$/Diesel Gallon Equivalent of LNG	**$ 1.21**	**$ 1.35**	**$ 1.48**

We conducted a discounted cash flow analysis simulating an investment by TOTE in converting both of their ships to LNG-fueled combustion turbines. The analysis assumed that TOTE would convert both ships in 2015, one at a time through the course of the year (6 months each). The conversion would take place while the ship was still operating on oil. According to TOTE, the conversion of both vessels would require $120 million of capital investment. Given that the turbines would replace use of the current reciprocating engines, we assumed no net additional O&M. We do not know what TOTE's internal hurdle rate is but conversations with them revealed a preference for a 6-7 year payback which back-calculates to an approximately 15% hurdle rate.

TOTE currently uses IFO 380 (RMG-35), a form of bunker fuel. There are no projections of IFO 380 pricing but TOTE's experience suggests that IFO 380 trades at an average $18/barrel premium over West Slope Crude. We produced an analysis of a world in which they continue to use that fuel under three different U.S. Energy Information Administration oil forecasts. (Figure 4) We produced this assumption in order to gauge how cost effective TOTE's investment would be even if the maritime emission regulations were removed. We then produced separate analyses that assumed

the company made the investment to switch to LNG. For LNG, we assumed the three different natural gas price projections used in PSE's 2011 RFP.

Figure 4: Historical West Slope Crude Pricing and EIA projections

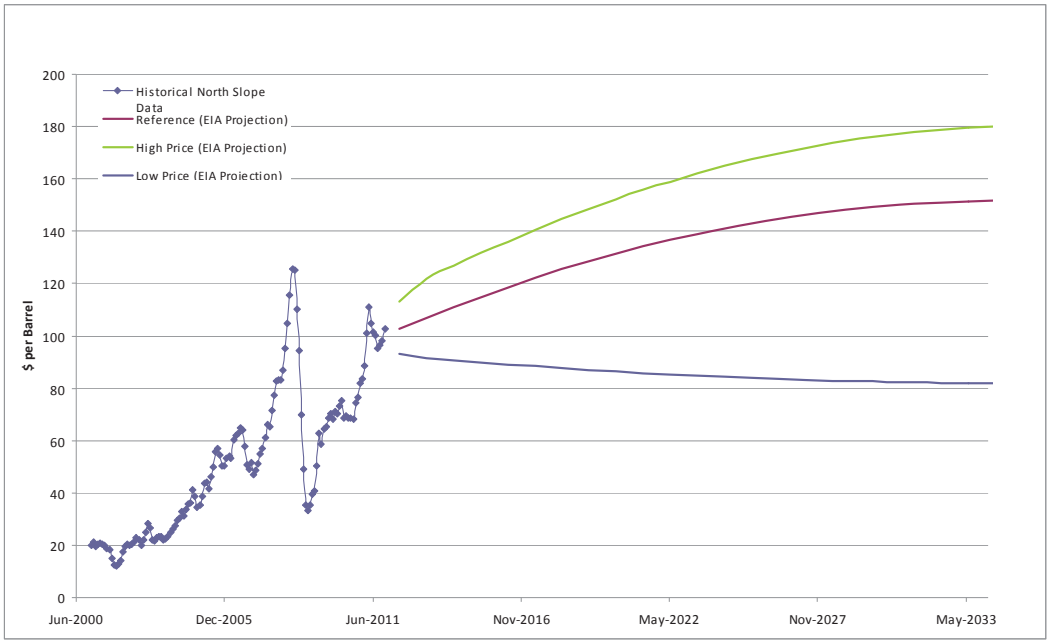


Table 5 below shows the present value differential from the three forecasts of IFO 380.

Table 5: Present Value Differential for TOTE at Different Gas and Oil Prices ($000s)

Oil Pricing	LNG Pricing: LNG Low	LNG Mid	LNG High
Oil Low	$ (12,929)	$ (35,548)	$ (56,103)
Oil Reference	$ 80,323	$ 57,704	$ 37,149
Oil High	$ 125,043	$ 102,424	$ 81,869

The cells in green indicate the scenario combinations where LNG conversion would have a positive NPV for TOTE relative to the corresponding fuel oil price. Most notable from the results is that the LNG conversion shows a financial benefit against all oil pricing forecasts except the low oil scenario. Should the emissions regulations hold and TOTE was required to burn a more expensive lower sulfur diesel, the LNG investment would most certainly be positive at any natural gas price forecast.

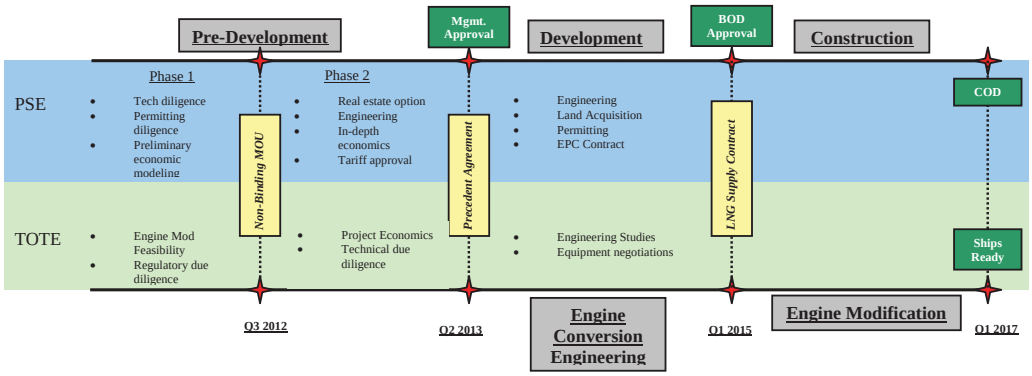
Conclusion

Any sales efforts in the maritime industry should focus on TOTE, Horizon and Northland in order to solidify an anchor customer. Of critical importance will be how PSE and a customer agree to move forward in a way that mitigates risk for both parties. This type of agreement requires multiple steps of increasing investment and risk for both parties. It

will be key to get the two parties to move together and incrementally reach milestones before moving on to additional expenditures.

Figure 5 below shows a potential set of milestones and bi-lateral agreements that the two parties could follow to get to an end-result. The point of this exercise is to make sure that no single party is required to risk more than the other at any given time.

Figure 5: Proposed Timeline and Milestones for a Liquefaction facility.



After conducting some initial predevelopment activity, PSE and TOTE would sign a non-binding MOU to signify that they intend to work together and to establish basic terms and guidelines. After MOU signing, both parties would have expenditures to conduct technical diligence and other pre-development activities. Should the parties come to further agreement, they would next sign a binding precedent agreement. This would have certain terms of recourse for both parties in the event of failure of the other. This would also set the stage for formal development work. Upon full project permitting and vessel engineering, the parties would sign a full LNG supply agreement and commence construction and vessel modification. We are currently exploring the option of an early-stage MOU which would give PSE a right of first offer or refusal to supply LNG. In exchange, we would provide support at the federal level related to the easing of timing of the applicable EPA regulations to allow time to fully implement the LNG solution.

Long-Haul Heavy Duty Trucking

Long haul trucking represents an enormous potential market for LNG in the U.S., given the amount of fuel consumed. In 2009, combination trucks, the work-horses of heavy duty trucking, consumed over 640 million barrels of diesel. As matter of comparison, total U.S. annual diesel consumption during that time was 1.2 billion barrels.

Unfortunately, long-haul trucking will not be a simple fuel conversion exercise because it would require a massive infrastructure build-out across the country. Long-haul trucking fleets can't effectively switch to LNG unless fuel supply is conveniently available on the entirety of their intended long-haul routes. According to a market assessment done by Clean Energy Fuels, this would require the installation of 2,000 to 5,000 LNG fueling stations nationwide representing $14 to $20 billion of investment. This is in addition to

an estimated $20 to $30 billion of investment in liquefaction facilities. Currently, LNG trucks run the I-5 corridor from San Diego to Sacramento. Plans for new LNG stations in Las Vegas, St. George and Salt Lake City will soon make the I-15 corridor from Los Angles to Salt Lake City available for LNG trucking.

Vehicle Types

Class 7 and 8 trucks are considered the heavy duty trucking category. Class 7 represents trucks with a Gross Vehicle Weight Rating (GVWR) of 26,001 – 33,000 pounds while Class 8 is anything above a GVWR of 33,000 pounds.

Vancouver, BC-based Westport Power Inc. could be credited with being the single biggest technology driver for natural gas based truck engines. The company has developed cutting edge engine technologies and partnered with key original equipment manufacturers (OEM) to help drive the availability of both CNG and LNG transportation products. The Westport HD line of engines is targeted at the heavy duty trucking market. Currently, three major truck OEMs have integrated Westport technology into new trucks.

Peterbilt, part of Bellevue-based Paccar, has developed the Model 386 LNG fueled class 8 truck, pictured below. This truck is available with different tank configurations ranging up to 240 LNG gallons with a maximum range of 614 miles.

Kirkland based Kenworth, also a Paccar company, has also produced the T-800 Class 8 LNG truck. Kenworth states that this vehicle is capable of storing over 200 gallons of LNG and boasts a 300 to 500 mile operating range.

Freightliner (owned by Daimler Trucks North America) has teamed up with engine manufacturer Cummins Westport to release an LNG version of their Business Class M2-112 trucks (pictured below). Freightliner, the largest heavy duty truck manufacturer in North America, has since added another LNG model truck and plans to offer a complete line in coming years

Market Size and Key Customers

LNG for the trucking industry represents an enormous opportunity for growth. The Puget Sound Region's robust ports make it a key origination and destination point for transportation of trucked goods.

Puget Sound is host to a few large trucking concerns including Interstate Distributor Inc. (1,756 tractors), Linden Inc. (693 tractors) and Gordon Trucking Inc. (1,460 tractors). None of these companies has converted trucks to LNG yet. This is relatively common as most industry observers don't expect a sudden dramatic shift in the trucking industry to LNG. Given the LNG truck cost premiums and concerns about fuel availability and maintenance, the first movers are likely to be large fleets with appropriate capital resources that already have fuel available in their area of operation. By example, Vedder Transport LTD, a large trucking company in British Columbia recently ordered 50 Peterbilt 386 LNG tractors to add to its current fleet of over 300 tractors. Vedder, will be supplied LNG from the existing Fortis BC Energy LNG facility at a refueling station owned by Terasen.

Using the Energy Information Administration *Annual Energy Outlook (AEO)*, we can begin to size the market potential for LNG in the state of Washington. Figure 6 below shows the AEO's forecast of trucking diesel consumption in Washington along with the equivalent volume of LNG. Current consumption is approximately 800 million gallons of diesel, equivalent to about 1.4 billion gallons of LNG.

Figure 6: Projected Washington State Trucking Diesel Consumption and Equivalent LNG

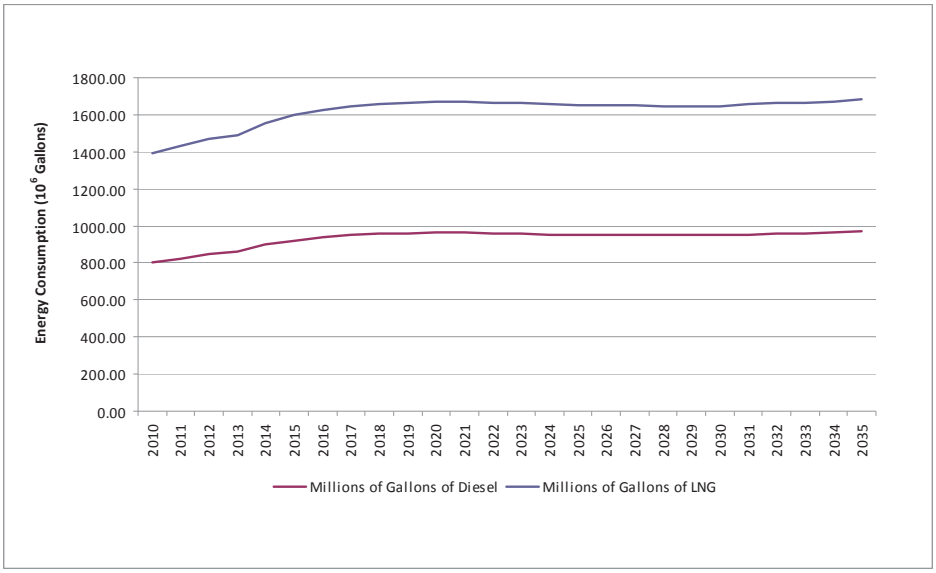
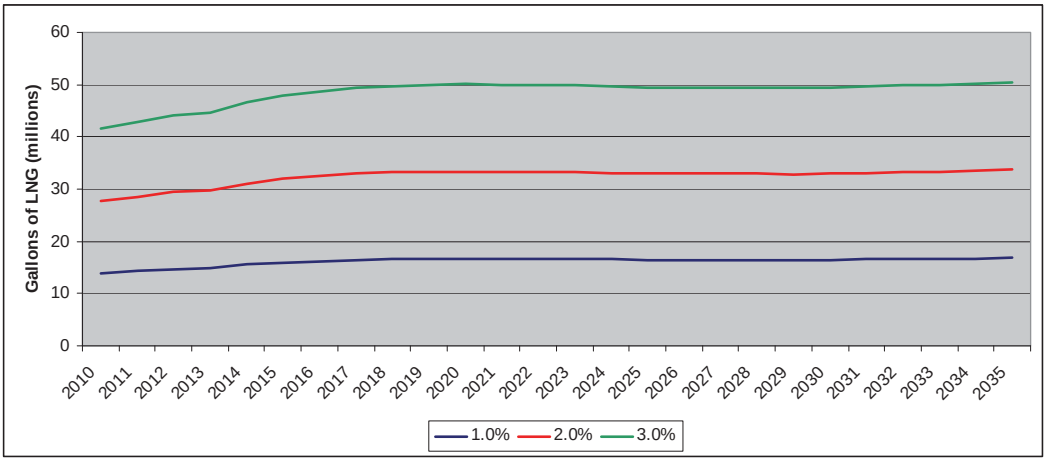


Figure 7 below uses the AEO outlook data to calculate the potential for gallons of LNG at 1%, 2% and 3% penetration of the diesel market in Washington. It is clear that even at the low levels of penetration, trucking could be a significant LNG consumer. It would take only a 3% penetration of diesel use to approximately match what TOTE would consume annually.

Figure 7: LNG Market Potential in Washington at 1, 2 and 3% Penetration



Customer Economics

The initial capital cost premium for LNG-fueled trucks over diesel trucks is approximately $40,000. Using known mile per gallon rates for modern diesel and LNG engines along with average annual miles traveled for combination trucks one can estimate the fuel cost savings that a single tractor could have by switching to LNG.

Table 6 below shows the present value of fuel cost savings from the analysis we undertook. For fuel costs, we evaluated savings based on LNG costs under PSE's three different gas price scenarios and also LNG pricing at a 25% discount per Diesel Gallon Equivalent. This fourth pricing level was meant to simulate a pricing that an unregulated fuel supplier might offer.

According to the Federal Highway Administrations (FHA) *Highway Statistics* publication, the average annual mileage for a combination truck is 64,000. Conversations with members of the long-haul trucking industry however suggest that long-haul truckers are operating at 100,000 to 200,000 miles per year and sometimes even higher. The FHA statistic may be heavily influenced by shorter haul trucks. Accordingly we evaluated fuel cost savings at 64,000 miles per year as well as 100,000 and 200,000. Present value of savings was calculated using a 4 year life and a 15% discount rate.

Table 6: Economic returns for an LNG vs. Diesel truck at Different LNG Price Levels

LNG Price	64,000 Miles	100,000 Miles	200,000 Miles
Low	$128,848	$201,325	$402,650
Medium	$116,964	$182,756	$365,512
High	$108,810	$170,015	$340,031
25% Diesel Discount	$57,467	$89,793	$179,586

The cost savings would easily cover the initial $40,000 premium for the LNG tractor. As well, a fleet owner could conceivably fund changes of their maintenance facility to meet natural gas maintenance requirements with the savings from several tractor conversions.

Conclusion

Long-haul trucking could represent a substantial growth prospect for LNG in the Puget Sound Region for an owner of liquefaction equipment. The economics for a long-haul customer are attractive and trucking companies have become interested in converting their vehicles. The barriers should not be overestimated however and the companies will need to see availability of fuel in their markets at a minimum before considering conversion.

PSE System LNG Use

PSE may have at least three different uses for LNG that would create efficiencies in its existing distribution system.

Gig Harbor Fill

Currently, PSE's Gig Harbor LNG storage facility is filled about 17 times per year. The source of the LNG is Northwest Natural Gas Company's LNG facility in Portland or Newport, Oregon. Having our own supply source, near the Gig Harbor facility would add value in lessening the risk of LNG availability. PSE has experienced problems in the past finding timely LNG fill for Gig Harbor on short notice. Without a reliable source of supply, the risk of running out of LNG at Gig Harbor exists. If PSE owned an LNG facility in Tacoma, there would be little risk of not being able to find supply due to weather concerns or lack of available fuel.

The volumes involved would not justify a liquefaction facility of their own accord but a facility built for an anchor customer could be sized to meet Gig Harbor requirements and add value to PSE's customers. The actual increase in size would be minimal.

System Peaking

PSE's existing Swarr propane air facility is currently off-line pending a decision to make certain safety, reliability and environmental compliance upgrades or to replace the resource all-together. Swarr's intended design capacity is 30,000 Dth per day of service. However, when it was operational, it was primarily designated as a super-peak facility, capable of providing 10,000 Dth per day. The current capital estimate for upgrades ranges from $2 to $3 million. In addition, to the cost of the upgrades, gas system planning is evaluating the enterprise risk associated with the facility. Should planning determine that the facility represents undue risk, an LNG liquefaction, storage and vaporization facility located at the Port of Tacoma may be able to provide comparable and necessary system peaking capability by offsetting gas needed for the North Tacoma distribution system.

Such a capability would require additional storage capacity at the liquefaction facility along with vaporization. This equipment is expected to cost in the range of $7 to $10

million. By contrast, 30,000 Dth per day of pipeline capacity would cost $4.5 million per year, before consideration of firm gas supply reservation fees. If Swarr is indeed retired, this could be a feasible replacement option. More extensive study is required by system planning to properly evaluate this as an option, but preliminary analysis finds it a feasible solution.

Kittitas County Supply

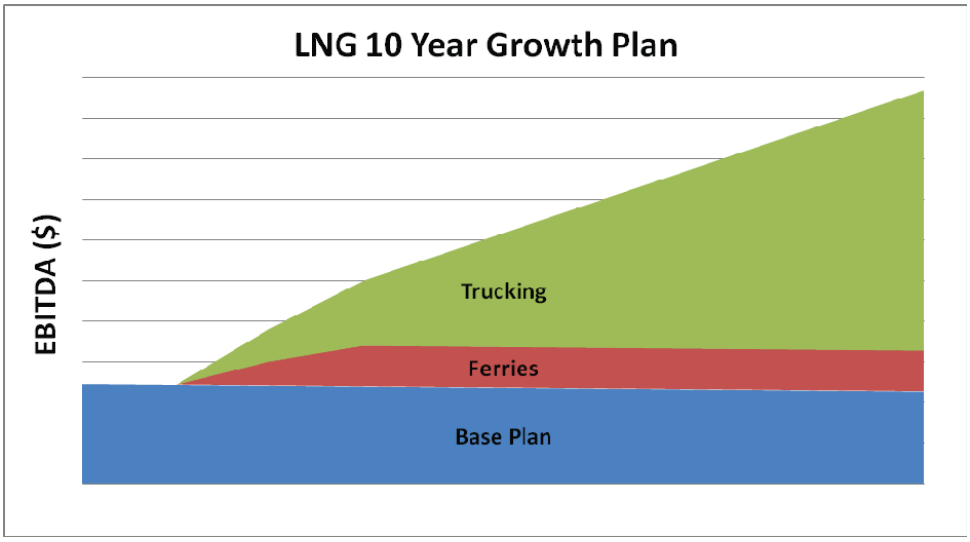
PSE has recently contracted with Cascade Natural Gas Co. (CNGC) for a permanent exchange of resources that would provide adequate firm pipeline capacity to PSE's Kittitas gas-service area through approximately 2016-17. The transaction is subject to acceptance by the FERC, but a favorable outcome is expected. Based on current long-term forecasts for growth in the Kittitas service area, additional firm resources will be required. Preliminary studies suggest that a facility similar to PSE's existing Gig Harbor LNG facility would be the least-cost resource. If future studies confirm this initial conclusion, LNG product would be required to supply a Kittitas LNG peaking facility.

The volumes involved would not justify an LNG facility of their own accord but a facility built for an anchor customer could be utilized to meet potential Kittitas LNG requirements (requiring little or no incremental capital cost) and add value to PSE's gas customers in the form of savings relative to alternative fill economics.

PSE Growth Strategy

A viable LNG business plan must include sustainable growth. Supply arrangements with TOTE and Washington State Ferry System form the base of PSE's proposed strategy, but capturing an increasing share of the trucking market over time is a way to achieve sustained growth. This strategy is illustrated in Figure 8 below:

Figure 8: Growth in EBITDA Over 10 Years



To hone this growth strategy we have issued an RFQ to identify a marketing consultant to help better identify growth areas and help refine our marketing strategy. The RFQ has been sent to:

- Concentric Energy Advisors
- Navigant Consulting
- Pace Global

The selected consultant will assist PSE in determining current and future market sizes for LNG and CNG market segments in the Pacific Northwest, as well as, the anticipated growth and key drivers and risks for growth in each segment.
The outcome of this work will be a detailed bottom-up assessment of the LNG and CNG markets over the next 20 years for each market segment and associated risks of market development. Some key insights will be:

- For each market segment, what are the upper and lower bounds of the growth development timeline and market size?
- What is the likely timeline of adoption rates over the next 20 years?
- High level market strategy by segment. Can PSE partner with one or two key end users or is this a merchant or retail market?
- What can PSE do to help drive the market? (Support with tariffs, political pressure, work with key partners like other utilities, and UTC).
- What impact will uncontrollable market drivers have on key market segment development in terms of timeline and volume? (e.g., Federal and state incentives, environmental regulations, etc.)
- For each market segment what does the timing of consumption look like (e.g., Seasonal? One large delivery a year? Base load supply?)
- What impact will competitors have on our market size and timeline?
    - What is the reach of existing liquefaction supply from the north and the south?
    - Which competitive suppliers could complement PSE's efforts?
- What is the range of serviceable markets from an LNG facility?
- Who can PSE partner with to reach each market segment?

The KEY DELIVERABLE will be a forecast of potential sales volumes for all of the market segments in aggregate with associated forecast errors.

Important market segments to address include:

- Retail CNG/LNG:
    - Ground Transportation Fuel
        - Heavy-duty, long-haul trucking
        - Waste hauling
        - Drayage trucks
        - Return to base fleets

        - Off-road vehicles:
            - Locomotive
            - Factory and warehouse vehicles
    - Marine Transportation Fuel
        - Washington State Ferries
        - Cargo shipping
        - Tugboats/barges
        - Cruise ships
        - Other large recreational yachts
    - Industrial End Users
        - LNG used in manufacturing process
        - LNG as fuel in portable electric generation applications
        - LNG used for heat in industrial applications
        - LNG as fuel in off grid applications (development projects in the remote WA locations).
- LNG for Utilities and Power Generators:
    - Utility storage
        - For sale to other NW utilities for peaking
        - As support during pipe upgrade projects
    - Backup Power Generation Fuel—
        - Replace diesel as backup fuel at gas plants
        - Used as cheaper fuel than diesel or potentially pipeline gas on peak days

Marketing Partners

In parallel with identifying and retaining a market consultant, PSE has been having discussions with a variety of companies that have the potential of serving as a marketing partner, including:

- Air Products
- Linde
- Maxum

Air Products and Linde are both LNG technology providers, although Air Products appears to be focused on an "own and operate" business model rather than just a provider of technology. Hence, it is unclear to what extent Air Products is interested in a marketing partnership if they do not own a significant stake in the facility. Linde has thus far demonstrated much greater flexibility and has indicated that they would be willing to contract for a portion of the plant's capacity and fill that capacity by driving regional LNG growth. Maxum has been active in the regional maritime industry and could be an effective partner in the space, although they appear to have a more conservative strategy than Air Products or Linde, limiting their commitment to plant capacity only to the extent they can pre-arrange supply contracts with customers.

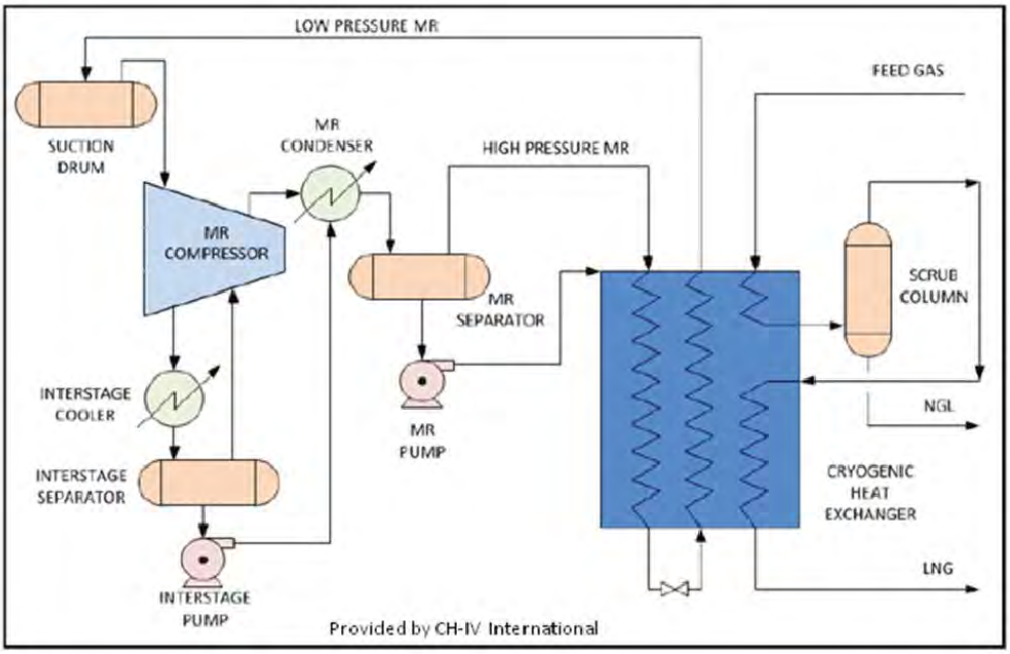
Liquefaction Technology

Natural gas liquefaction technology is well established and offered by several reputable and creditworthy companies, including:

- Air Products
- Black and Veatch
- Linde
- Kryopak

As mentioned previously, Air Products' business model may preclude them as a technology provider to a PSE-owned facility. All three providers offer liquefaction systems based on a single-mixed refrigerant process, which, generally speaking, is the most appropriate process for facilities in the size range being contemplated. This process is shown schematically in Figure 9.

Figure 9: Single Mixed Refrigerant Cycle



To assist in selecting a technology provider and, later, in providing owners engineering services under a design-build contract structure, we have selected CH-IV International, which has been providing engineering and consulting services in the LNG value chain since 1991. As part of our growth strategy, we envision a facility with expansion potential. Given the modular nature of these facilities, our approach should be feasible, provided it has been accommodated in the site selection and project layout. Figure 10 shows an LNG facility of comparable size located in Pinson, Alabama.

Figure 10: Single Mixed Refrigerant LNG Facility

LNG Bunkering

In the maritime sector, bunkering of LNG (i.e., transferring the LNG into the vessel) is a critical step. TOTE strongly desires a barge-based bunkering solution and such capability would allow for fueling of other regional maritime customers. This will enable them to continue to fuel their vessels at the same time they are off-loading and on-loading cargo; consistent with their current practice. Unfortunately, there is very little experience with LNG bunkering in the United States. There is limited experience in Norway and U.S. companies are attempting to learn from that knowledge base. Separate from the technology and infrastructure associated with bunkering are the applicable regulations. It is anticipated that the U.S. Coast Guard will be the lead agency with respect to these requirements, and efforts are underway to understand, work with, and shape Coast Guard regulations. At the present time, Maxum and Foss have been identified as potential bunkering partners, and the project team is working to expand this list.

Siting

PSE is presently considering two areas (Port of Tacoma and Port of Everett) that may be suitable for an LNG facility. Both have a deepwater harbor and available land zoned for heavy industry. Siting the LNG production plant near the source of natural gas and close to bunkering/barging facilities are important objectives. Tacoma is home to TOTE and has one or more potential sites but requires a significant investment to upgrade PSE's gas distribution system. Everett has suitable gas infrastructure but project development costs would be partially offset by higher operating costs associated with the longer barging service required to deliver fuel to TOTE and the core Tacoma and Seattle maritime markets.

An Environmental Impact Statement will be required, The EIS will likely address:

- Geology
- Soils and sediments
- Water resources
- Biological resources
- Land use, hazardous waste recreation and visual resources
- Socioeconomics
- Transportation
- Cultural resources
- Air quality
- Noise
- Reliability and safety
- Cumulative impacts

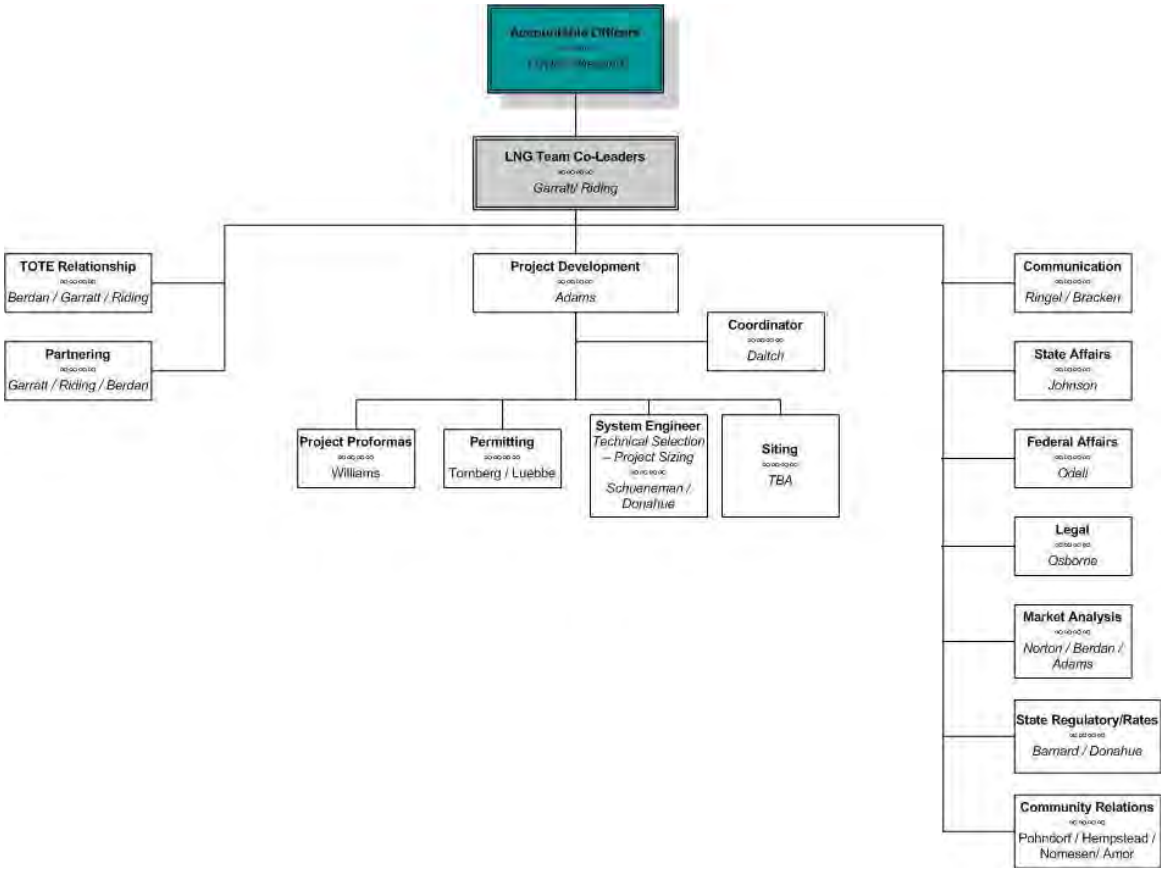
A significant work effort will address public safety including elements of plant safety, management/operational safety systems and risk assessments. Siting of this facility will require a risk-based verification including modeling for thermal radiation and flammable exclusion zones as well as flammable vapor dispersion analyses.

A fatal flaw analysis is important early in this process to determine if the sites are suitable for an LNG plant with respect to the aforementioned exclusion zones.

Project Team

In order to pursue this LNG strategy we have assembled a comprehensive PSE project team as shown on Figure 11. The project team will evolve as the project moves through various stages- from development to construction and into operation.

Figure 11: PSE Project Team Org Chart



Potential Business Models

PSE evaluated three potential LNG business models:

1. ***Provision of Distribution and Commodity to Third Party LNG Suppliers;***

2. ***Ownership of LNG facilities with an Anchor Customer, with a strategy to grow the business over the longer term; and***

3. ***Ownership of Retail LNG Fueling Stations, in addition to LNG infrastructure.***

All three of these business models contemplate PSE's involvement in the fuel supply portion of the value chain, as opposed to any consideration of involvement in the end-use part of the value chain. We opted to ignore this realm because PSE is clearly not suited to, and has no experience in the provision, maintenance or retail selling of transportation equipment.

In consideration of these business models, we take a view that any ultimate venture by PSE should fit within its core competencies and align with its strategic triumvirate of ***Efficiency, Dependability and Safety***.

With regard to core competencies, we have identified the following characteristics that we believe best define those applicable to PSE:

- ***Sourcing and distribution of electricity and natural gas to end-use customers***
- ***Safe and economic operation and ownership of major energy production and distribution infrastructure***
- ***Regulated business model operation***

1) Provision of Distribution and Commodity to Third Party LNG Suppliers

The most basic option for PSE would be to let a third party own and operate an LNG facility. In such a scenario, PSE would ideally supply the distribution service to the facility as well as the commodity. However, a third party could certainly opt to procure its own commodity and perhaps even bypass PSE's distribution system.

Financial Evaluation

Under this business model, PSE's financial growth would come in the form of additional EBITDA earned as a result of new distribution system upgrades that would occur to serve a liquefaction facility. For this analysis we assume that the facility would be located at the Port of Tacoma. This assumption is made given that the most likely anchor customer, at this point, would be TOTE which would require service at the Port.

Table 7 below shows the five year EBITDA forecast for PSE's investment in the expected $31 million distribution system infrastructure improvements as requested by Clean Energy. The modeling assumed that PSE would hold a special contract with the third party LNG supplier and there would be no lag.

Table 7: PSE EBITDA for distribution upgrades to the Port of Tacoma.

	Year 1	Year 2	Year 3	Year 4	Year 5
EBITDA	$ 4,262,000	$ 4,127,000	$ 3,976,000	$ 3,831,000	$ 3,692,000

Strategic Fit

Provision of distribution and commodity clearly fits within PSE's strategic framework and core competencies. Given that PSE has provided these services safely, dependably and efficiently for over 100 years, we have deemed it unnecessary to pontificate its strategic fit further

Risk Analysis

Risk	Description
System Bypass	A third party could decide to bypass PSE's distribution system with a lateral to the Port. While PSE has some inherent competitive advantage, Clean Energy is exploring this option with Northwest Pipeline.
Loss of Customer Contact	The strategy removes PSE from the involvement with the ultimate end-use customer and any other growth customers down the road.
Loss of System Benefits	If a third party owns the liquefaction facility, PSE may not be able to cost effectively use the facility for system uses including Gig Harbor, Kittitas County and a system peaking capability. At best, we would be able to source LNG from the facility for Gig Harbor or Kittitas County but at a market based price that will provide less savings for PSE's customers.

Regulatory and Political Issues

This business model would require little in the way of regulatory and political action by PSE. Most likely, there would be some effort required to negotiate a special contract (if PSE's distribution system is used) with the third party and the associated WUTC interaction to gain appropriate approvals.

2) Ownership of LNG Facilities with an Anchor Customer

The second business model under consideration is PSE ownership of gas liquefaction and storage facilities with a long-term anchor customer under a regulated tariff or special contract. In this model, PSE would secure a long term contract with a large LNG customer and then permit and construct the liquefaction facility and appropriate storage. Ideally there would be some excess capacity in the facilities that would allow for ancillary use in PSE's system and supply of other smaller customers that may appear.

Liquefaction facilities are available in a range of sizes from multiple millions of *tons* of production per year in a bulk LNG export facility to a small peaking facility that might produce 30 million *gallons* per year. Given the size requirements of a liquefaction facility, an anchor customer would have to be a very large user for the project to make economic sense. This requirement points any business opportunity to potential customers in the maritime market.

Financial Analysis

PSE has modeled the economics of an LNG facility installed at the Port of Tacoma sized to accommodate TOTE as an anchor customer with sufficient additional throughput and storage to accommodate PSE's ancillary needs along with a small amount of market growth. That analysis conveyed that such a project would add approximately $100 million to rate base and $12 million dollars of EBITDA. The table below shows the first

five years of expected EBITDA from the project. It should be noted that very little regulatory lag would be expected in this scenario as new rates designed to cover project costs, would become effective at COD.

Table 8: Projected five year EBITDA for a PSE owned liquefaction facility

	Year 1	Year 2	Year 3	Year 4	Year 5
EBITDA	12,277,086	12,148,812	12,017,616	11,883,429	11,746,184

Strategic fit

Ownership of an LNG facility fits well with PSE's three pronged strategy.

Strategy	Fit
Safety	PSE has a long history of safe operation of complex energy generation facilities including combined and simple cycle gas plants, hydro facilities, underground gas storage, LNG Storage and wind power plants. According to LNG expert Garry Hart, VP of Black & Veatch LNG, operation of an LNG facility requires the same skill set as one would find in power generation plant management. Specifically he noted that the successful skill-set typically includes a highly structured, procedures oriented view towards efficient operation and a priority on safety.
Dependability	As the certificated supplier of natural gas in our designated territory, our customers should be able to depend on us to provide their natural gas needs in whatever physical form is requested. By serving a large customer with LNG, we are solidifying our reputation as a reliable provider of energy commodities for our customer base
Efficiency	Ownership of an LNG facility would provide PSE with ancillary system benefits that would help lower costs for all PSE gas customers. As mentioned before, these include LNG supply for Gig Harbor and Kittitas County and potential use as a system peaking resource.

Ownership of LNG facilities also aligns well with PSE's second core competency: **Ownership and operation of major energy production and distribution infrastructure.**

LNG is, at its core, another form of energy conversion. As mentioned above, PSE is no stranger to the operation of complex energy facilities. PSE also operates an existing LNG storage facility. Liquefaction of gas would technically be a new process for PSE but its one that several other natural gas distribution utilities and pipelines have successfully mastered.

Regulatory and Political Strategy

Development and ownership of an LNG facility will require substantial effort on the political and regulatory front.

From a political standpoint we expect that PSE's formidable community and political relationships will be brought to bear to help facilitate the development effort. The development team will need to muster support for the project from key community stakeholders and local government bodies.

On the regulatory front, there will be work to gain appropriate regulatory treatment for the project. Specifically, a special contract or new tariff will need to be structured to meet customer and company needs and also be approved by the commission. In addition, the team will need to arrive at a fair allocation of the cost of distribution upgrades applicable to the project.

Risk Analysis

Risk	Description
Permitting	Permitting a liquefaction facility in Washington State would be a substantial undertaking for any firm. It is a little understood fuel and is likely to raise concern among the public. While PSE is well experienced and highly skilled in difficult permitting projects, this would require determined focus by the organization.
Customer Credit Exposure	The facility would depend heavily on off-take of a a few large customers. Accordingly, the project would always be highly exposed to those customers' credit. PSE will need to ensure that any anchor counterparty provides acceptable credit support.
Safety/Operation	Operation and maintenance of an LNG facility does present PSE with a new set of safety challenges. Just as with any of its complex energy production facilities, PSE will need to ensure that it employs best in class safety procedures.

3) Ownership of Retail LNG Fueling Stations

The final business model under consideration assumes that PSE could own retail LNG gas stations as an extension of its ownership of liquefaction and storage capacity. Given the regulatory environment that PSE operates under, it would be hard to imagine that PSE would be allowed to own LNG gas stations in a regulated framework. Accordingly, this would likely be structured as an unregulated subsidiary.

Financial Analysis

Estimating financial performance for an unregulated venture of this nature is inherently difficult. The station would be subject to competitive pressures and associated pricing variability. We can however make some basic assumptions to size the potential cash flows from a single station, under a good scenario. Sizing the cash flow would provide a sense of magnitude of the potential earnings against which one could weigh the risks of the venture.

For this exercise, we assumed that the initial cost of a gas station would be approximately $1 million dollars and would be fully funded by equity at an expected hurdle rate of 20%. To meet this hurdle rate, the enterprise would have to produce $210,000 per year of free cash flow.

This is basically a best case scenario and assumes that competition does not exist. Given the fact that neither PSE nor any of the parent organizations holds any existing capability to manage a retail fueling station venture, it seems unlikely that the company could really accomplish this financial result. Instead, an entire internal support organization would need to be created to manage the station(s), the fixed cost of which would overburden such a small venture. Other competitors are much better structured to do this efficiently.

Strategic Fit

This business model has a mixed fit within PSE's triumvirate of strategic focus.

Strategy	Fit
Safety	PSE could likely operate LNG fueling stations at a safety level that met its requirements. It would take some preparation, but we expect that PSE's theories around safe operation could be applied to a retail gas station.
Dependability	PSE could conceivably fail at managing a set of retail fueling stations in a dependable manner. Such a business requires an entirely additional support structure for retail operations that PSE does not currently hold. For example, PSE would have a whole new set of tax and other regulatory reporting obligations. As well there would need to be a retail product purchasing organization to stock the attached store.
Efficiency	Efficiency would likely be a struggle for PSE in this business model. It is likely that PSE could struggle through and eventually be able to manage a retail operation. However its lack of existing internal support structure for such a business would likely leave it in an uncompetitive cost position.

Ownership of retail fueling stations does not comport with PSE's core competencies. A retail gas station represents a step beyond what PSE would typically do in its distribution

business and an unregulated entity would be very difficult to establish. PSE is well positioned to provide commodity through its distribution system to fixed location homes and business. Playing the role of retail front-man for the sale of that commodity to a non-fixed and highly variable customer set, such as that found in a gas station, is a very different business.

Risk Analysis

Risk	Description
Unregulated Subsidiary	This would likely require the establishment of an unregulated subsidiary which would be difficult at best and impossible at worst.
Effective operation	PSE is simply not internally structured to efficiently operate a gas station. The company would have to create an entirely additional internal support structure to manage a retail operation and would not be cost competitive.

Regulatory and Political Strategy

If PSE were truly committed to going this route, it would require a Herculean political and regulatory effort to muster the required support to launch such an unregulated venture. The downside risk is simply too great in comparison to the opportunity to earn a few hundred thousand dollars of incremental cash flow.

Recommendation

Based on the full financial and risk analysis completed on the three business models, we recommend that PSE pursue business model number 2: **PSE Ownership of Liquefaction with an Anchor Customer**.

This recommendation is based on 5 key findings:

1) This model offers the highest financial return to the company.
Ownership of an LNG facility provides more than twice the annual EBITDA as any other business model. It offers the best opportunity to invest capital to serve a customer's need while simultaneously providing system benefits.

2) It fits well with PSE's three pronged strategy and core competencies.
PSE should be able to operate and maintain an LNG facility safely, efficiently and dependably just as it currently does with all of its electric generating facilities, LNG storage and underground gas storage facilities.

3) The risks presented are within PSE's capability to manage.
PSE's experience in development projects and safe operation of complex energy facilities make it well positioned to mitigate and control the risks that come with the siting and operation of an LNG facility.

4) *It provides the best opportunity for future growth.*
As owners of an LNG facility, PSE would be in the best position to capture additional market growth in LNG transportation usage. New maritime and trucking customers will inevitably look to the owner of existing supply as they consider switching to LNG.

5) *Based on PSE's cost of capital and regulated business model, we can offer the service at a very competitive price.*
Most of the competitors in the marketplace price LNG on a diesel minus basis, where PSE would price it on a cost-of-service basis. This should make PSE the lowest cost provider. A counterparty may also be more confident in a local business that has been established for over 100 years.

The first business model, Provision of Distribution and Commodity to a Third Party LNG Suppliers, could also be pursued by PSE. In fact, if PSE fails to procure an anchor customer for a liquefaction facility, this business model will be its fallback option. Unfortunately this business model does not offer as attractive a financial reward as ownership of LNG facilities. The risk of bypass also exists and a third party supplier is likely to procure its own commodity. Finally this business model removes PSE from the direct customer interface and leaves all the rewards of future growth to a third party.

The third business model provides little financial or strategic value to PSE and the added risks and complexity of retail fuel provision in a variable and competitive environment do not mesh well with PSE's core competencies.

Next Steps

PSE's next steps encompass a range of activities across a broad array of disciplines, as follows:

Customer Identification

- Continue working with TOTE to establish PSE as preferred supplier.
  - Work with TOTE regarding technology providers.
  - Work with TOTE regarding bunkering solutions.
  - Work with TOTE regarding gas cost hedging.
  - Support TOTE's efforts for favorable EPA regulatory regime.
  - Support TOTE in community and communications strategy.
- Continue working with Washington State Ferries regarding LNG supply.
  - Reach out to the Washington State House and Senate transportation committee leaders to explore public/private partnership solutions.
  - Explore sources of conversion capital.
- Explore other maritime opportunities.
- Explore trucking market opportunities.

Potential Partners

- Indentify preferred technology provider and contracting approach.
- Further explore fuel bunkering solutions and economics.
- Identify and retain marketing consultant.
- Indentify marketing partners.
- Continue to work with gas planning and project management to hone scope and cost estimates for required distribution system upgrades.

Siting and Permitting

- Explore siting option in Tacoma area, including Puyallup tribal property.
- Explore potential siting issues at Port of Everett
- Understand permitting and setback requirements.

Community and Communications Strategy

- Flesh out comprehensive community and communications strategy to support siting and marketing efforts.

Regulatory Strategy

- Develop proposed structure for an LNG tariff and supporting special contracts, and regulatory filings, including necessary accounting petitions.

PUGET SOUND ENERGY
The Energy To Do Great Things

DATE: January 16, 2013

TO: Board of Directors

FROM: Kimberly Harris

RE: Liquefied Natural Gas Development Strategy

A. OVERVIEW

Since late 2011, PSE has been studying the potential to develop and own a liquefied natural gas (LNG) facility in the Puget Sound region to serve marine and on-road transportation. This initiative also includes the potential to supply gas during peak periods to PSE's distribution customers.

B. PURPOSE OF THE DISCUSSION

At the January 23 Board meeting, management will present an update of its LNG development efforts and request the Board's feedback on next steps.

C. CURRENT STATUS

Since the last LNG update provided to the Board on May 9, 2012, management has completed the following action items:

1. Site evaluation to identify a preferred location for an LNG facility; the Port of Tacoma was selected, and long-term lease negotiations commenced in November of 2012;
2. Analysis of regulatory requirements including LNG exclusion zones and Coast Guard requirements;
3. Creation of a permitting strategy and initial meetings with key agencies;
4. Selection and engagement of supporting consulting firms for the project permitting process;
5. Began the selection process for firms to provide front-end engineering and design; and
6. Conducted preliminary commercial negotiations with potential anchor customers.

D. PRE-READING MATERIALS (attached)

1. Background materials on LNG prepared by management.
2. Concentric Energy Advisors' market research study on the potential for LNG in marine and transportation markets in the Puget Sound Region.
3. Management's presentation for discussion at the January 23 Board meeting. Topics include Risks and Opportunities, Site Details, Development Strategy and Financial Implications.

E. PSE TEAM

1. Paul Wiegand- Senior Vice President, Energy Operations
2. Clay Riding- Director, Natural Gas Resources
3. Nathan Adams- Manager, Development and Strategic Initiatives

Board Update:

Liquefied Natural Gas Development Strategy

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January 2013

PUGET SOUND ENERGY
The Energy To Do Great Things

Contents

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Introduction

The purpose of this document is to summarize the development efforts to date, and convey the planned activities for the future, on a PSE owned Liquefied Natural Gas (LNG) facility.

This facility is being developed for two purposes. The first is to serve transportation end users in the Puget Sound region. The plant will take natural gas from PSE's distribution system and cool it to a liquid state for consumption as a transportation fuel. The plant will have a marine loading system to fill LNG barges to serve marine LNG customers. It will also have truck loading facilities so that tanker trucks can transport the LNG to land based truck filling stations and end-users throughout the northwest.

The second use will be for system reliability with a portion of the plant being reserved to supply LNG for PSE's own peak-shaving needs. The facility will have LNG vaporization capabilities in order to provide supply to PSE's system during peak, cold weather conditions. PSE will reserve a small portion of the liquefaction capacity and a large portion of tank capacity in order to have LNG on hand to inject back into the distribution system during cold weather events or supply disruptions. This will provide increased reliability for PSE customers throughout the system.

This project will require certain upgrades to PSE's gas distribution system in order to support the plant; the upgrades will also reinforce the greater Tacoma system for other natural gas customers.

Current Status

The development team has spent the bulk of the past 12 months immersed in pre-development activities. The work initially focused on interaction with potential anchor customers, siting review, permitting considerations and technical due diligence.

PSE has met with several potential large customers for the facility and has advanced initial commercial negotiations with the more promising entities. More detail on specific customers and their status with the project is detailed below.

The team also conducted an exhaustive search for a suitable facility site while simultaneously conducting due diligence on LNG specific regulations and permitting options. Siting of an LNG facility is particularly challenging as such facilities are subject to Federal regulations governing certain exclusion zones around the plant. In short, this requires substantially more land to be controlled than the actual footprint of the installed equipment. Through guidance provided by LNG consulting firm CH-IV International, the project team has identified a preferred site at the Port of Tacoma and is finalizing a long-term lease with the Port.

PSE has also completed extensive due diligence on permitting options for LNG facilities. The team interviewed several legal and LNG consulting firms in consideration of both FERC and non-FERC permitting scenarios. Based on required time lines and jurisdictional issues, PSE has elected to permit the facility through local jurisdictions.

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Next Steps

In 2013, PSE will finalize contracts with one or more anchor customers and formally launch the permitting and engineering effort. On the commercial front, PSE believes that key potential anchor customers will be in a position to commit to LNG from a specific supplier by mid-year. We intend to pursue these key customers aggressively with a goal of having fully binding LNG supply agreements in place by year end. Management anticipates seeking board consent for any negotiated agreements, consistent with the board's delegated authority. The summary schedule is shown below.

PSE also expects to engage an engineering firm by the end of January to begin the front end engineering and design (FEED) which is expected to take 4 to 6 months. The engineering and design work is critical to developing accurate facility costs, as well as informing certain components of the permitting process.

PSE engaged CH-IV International to help with pre-development siting due diligence and preliminary plant design considerations. Permitting efforts for the facility have already begun with initial work focused on developing a thorough project description and assessing impacts. PSE has engaged CH2MHill as the primary permitting consultant. In addition, GeoEngineers has been contracted for geotechnical and contamination expertise, Moffatt & Nicholl for dock/pier design work and Stoel Rives as permitting consultants and legal support. The project team hopes to submit initial permit applications in the second quarter of 2013.

Summary Project Schedule

Date	Item
Jan – Mar 2013	Preparation of environmental studies and permit applications
Feb 2013	Signing of lease option
Feb 2013	Commencement of Front End Engineering and Design (FEED)
April 2013	Submittal of permit applications
Q3 2013	Finalization of FEED
Q2 2014	All permits received and construction start
Q3 2016	Plant commercial operation

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Customers

The facility is expected to have at least three direct customers – one or more large marine anchor customers, PSE's gas distribution system and at least one LNG marketing customer.

1. **One or more large marine anchor customers.** The two most likely opportunities include:
   - Totem Ocean Trailer Express (TOTE): An owner and operator of two roll-on/roll-off cargo ships that operate continuously between Tacoma and Anchorage.
   - Alaska Tanker Company, an owner operator of four oil tankers that operate from Alaska down the west coast of the U.S.
2. **PSE's gas distribution system.** The facility would provide incremental gas peaking supply to PSE as well as provide LNG for the satellite facility in Gig Harbor.
3. **At least one LNG marketing customer or other large LNG consumer.** PSE expects that an LNG marketing customer or customers will undertake direct sales and distribution to truck fleets, barges, and ferries in the regional LNG market.

Potential Large Marine Anchor Customers

PSE has identified two high potential marine anchor customers that would demand enough LNG to represent a viable anchor customer.

TOTE

TOTE operates two roll-on/roll-off cargo ships between Tacoma and Anchorage. Each ship operates almost continuously spending only 6-8 hours at each port and completing one roundtrip voyage per week.

TOTE has announced plans to convert its ships to gas fired capability in response to new maritime emissions regulations. In 2010 the International Marine Organization (IMO) approved the North American Emissions Control Area (ECA), establishing more stringent emissions standards within 200 miles of the U.S. and Canadian coast (see figure 1). Vessels operating in the ECA had to reduce their emissions to a level equivalent to burning a fuel with a sulfur content of 1% in August 2012 and must reduce it further to a 0.1% equivalent level by 2015. There are three options for compliance:

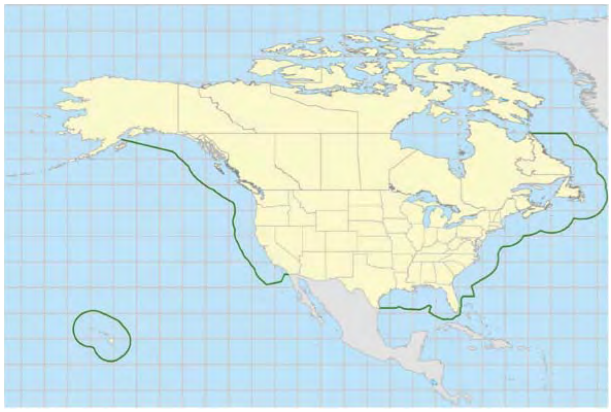

Figure 1. North American ECA

1. install stack scrubbers,
2. buy more expensive lower sulfur diesel, or
3. switch to a sulfur free fuel such as LNG.

Scrubber technology remains unproven and requires dealing with large amounts of waste product, so few vessels are expected to opt for this technology. Ocean going vessels operating trans-continental routes are only subject to ECA requirements while in the ECA waters, so most are expected to choose to burn the more expensive, lower sulfur diesel while in the ECA and switch to

heavier marine fuels for the rest of their voyage. Those ships that operate mostly or entirely within the ECA are the best candidates to switch to LNG.

TOTE's route from Tacoma to Anchorage takes place entirely inside the ECA. The decision to convert to LNG weighs a large upfront capital cost followed by significant fuel savings against increased cost for low sulfur petroleum fuels. The conversion of TOTE's ships to handle, store and burn LNG is expected to cost approximately $90 million.

In June 2012 TOTE entered into negotiations with the U.S. Environmental Protection Agency (EPA) which administers ECA in U.S. waters, and the U.S. Coast Guard which enforces ECA. TOTE sought a temporary exemption from having to comply with the lower sulfur fuel requirements while their ships are being converted to run on LNG. In an agreement dated July 31, 2012, TOTE was awarded a Regulation 3 permit, granting TOTE a temporary exemption through September 30, 2016.

Puget Sound Energy has been in conversations with TOTE since late 2011 and entered into a memorandum of understanding (MOU) signed July 27, 2012. The MOU provided that TOTE would work exclusively with PSE through the end of 2012 to set up the framework for a future agreement to be negotiated between PSE and TOTE that will make binding commitments to move the project forward. However, the MOU has expired without the framework agreement in place.

In December, TOTE's parent company, TOTE Inc., announced that they would be commissioning two new LNG capable container ships for its Jacksonville, FL to Puerto Rico operations. It has made an internal decision to revisit its strategy for LNG supply for all of its future LNG capable ships. There is a possibility that TOTE will elect to conduct a solicitation for potential providers in Q1 or Q2 2013.

Alaska Tanker Company (ATC)

ATC operates four oil tankers on the west coast of the United States. ATC's vessels transport all of BP's North Slope crude oil from Alaska to refineries on the west coast including those in the Puget Sound region. Like TOTE, ATC operates entirely within the ECA and would stand to benefit from the favorable economics of using LNG as fuel.

In late 2012, ATC approached the EPA to discuss an ECA waiver, similar to that granted to TOTE. According to ATC, EPA has tentatively agreed to issue the ECA waiver, once ATC makes the commitment to switch to LNG. ATC is currently working to secure internal approvals to commit to LNG and finalize the waiver with the EPA.

PSE has met with ATC several times to discuss potential deal structures and supply logistics. We expect to continue a dialogue with them as we progress through the development process.

PSE Gas Distribution System

PSE resource planning routinely considers various options to cost-effectively serve PSE customers' current and future needs. Due to the weather-sensitive demand of gas customers, the gas system can experience extreme demand for very brief periods of time, measured in hours and days for 5-10 days per year. Resources specifically designed to serve only this last increment of extreme demand are typically expensive on a per unit basis, but may be more cost-effective than a resource designed to be used every day, such as year-round pipeline capacity and the accompanying supply. An LNG-based peak-shaving resource, especially when included as part of a base-load liquefaction and storage facility, appears to be a cost-effective way to meet peak demand.

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Given the proposed plant location at the Port of Tacoma, PSE has determined that at least 30,000 Dth per day can be vaporized back into the distribution system and absorbed by customers in the Tacoma area. In order to provide this peaking resource, PSE's gas customers would subscribe to approximately 300,000 Dth (3.6 million LNG gallons) of storage capacity and enough liquefaction capacity to fill the tank annually (over a 260 day period); in addition, PSE gas customers would bear the cost of vaporization equipment required to deliver 30,000 Dth per day of supply.

Though substantial capital costs are involved, the annual cost to customers appears to be lower than if conventional year-round pipeline capacity and peak-day gas supply resources are acquired for the few days needed each year. Furthermore, having stored supply located on PSE's distribution system, as opposed to remotely located, provides an additional measure of supply security for PSE's customers in the event of extreme weather or supply disruptions.

A portion of the same gas distribution system upgrade required to deliver natural gas to the LNG plant on most days, would be available to take the vaporized LNG back out to customers. Thus, the location of the plant improves reliability of service in the Tacoma area for residential, commercial and industrial customers, and reduces the need for additional peak-day system upgrades to serve those traditional markets for many years.

In addition to the vaporization capacity of the proposed facility, the peak-shaving component could be increased to include a diversion of the natural gas for the other LNG customers, since liquefaction and vaporization would not occur simultaneously. On a peak day, PSE could choose to use its storage to provide service to LNG customers and redirect the natural gas to serve other distribution customers. Such use would reduce the number of days of available storage to 5 or 6 days, but increases the peaking component from 30,000 Dth per day to as much as 55,000 Dth per day under the current design assumptions.

PSE's Integrated Resource Plan analyses will be used to demonstrate the relative cost-effectiveness of the LNG peak-shaving resource.

Third Party LNG Marketer

In an effort to market the use of LNG as a transportation fuel to the region, PSE plans to toll part of the facility to a third-party LNG marketer and distributor. PSE has held commercial discussions with several entities interested in contracting for long-term tolling of a PSE-owned LNG facility. PSE proposed a model wherein the entities would sign a long-term contract with PSE to toll a specific amount of the plant capacity under cost-of-service based rates. The contracting entity would develop the greater transportation market for LNG in the Puget Sound region, and be responsible for selling and distributing to end-users.

PSE has discussed such an arrangement with:

- BP
- Shell
- Air Products
- Linde
- Maxum Petroleum
- Teekay LNG Partners
- Targa Resources
- Blu (Transfuels LLC)

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PSE has held numerous meetings and commercial discussions with the above listed parties in order to determine which one(s) would be the most suitable customer. Most of the companies fell away due to an inability to make a long-term commitment in a timely manner or were not interested in PSE's business model.

At this point, BP, Linde and Blu appear to be the remaining candidates willing to make a long-term commitment to toll the facility. PSE is currently negotiating term-sheets with all three that outline a long-term tolling of plant capacity and exclusivity or right-of-first-refusal provisions. In the case of Linde, the agreement could also include engineering, procurement and construction of the facility as well as operation and maintenance of the facility post-construction, with safeguards to ensure that they would be the lowest reasonable cost supplier.

The total capacity that these entities would toll from the plant has not yet been determined but preliminary indications are that they are confident that the Puget Sound LNG transportation market would support 75,000 – 150,000 gallons per day beyond the needs of a marine anchor customer, by 2017 and would grow from that point.

Other Potential Customers

Beyond the large potential customers described above, there are a few other entities that a Puget Sound region LNG plant could serve.

Washington State Ferries

The Washington Department of Transportation Ferries Division has been studying the benefits of converting part of its fleet to natural gas fired engines for several years. In September of 2012 it released a Request for Proposals for the provision of a full package of conversion of its six Issaquah class vessels. This includes installation of new natural gas capable engines, tanks and fueling systems, Coast Guard certification, fuel supply and financing of the entire package.

In response to the RFP, PSE is in discussions with both Rolls Royce and Wartsila who are independently packaging separate responses. Both companies are attempting to assemble a consortium that can provide all the services requested in the RFP.

Fuel consumption for the ferries is quite small relative to other large marine customers. The six Issaquah class vessels that are targets for conversion to natural gas fueling would only consume an average of 6 million gallons per year, growing to that level over several years as one vessel is converted each year. While this load is relatively small compared to TOTE's expected consumption of about 45 million gallons per year, the Washington State Ferries would be a natural partner for PSE in spreading awareness of the benefits of natural gas. There is also potential for the ferries to grow their LNG consumption over time if they convert additional ships.

Hawaii Gas

Hawaii Gas currently supplies synthetic natural gas (SNG) to about 70,000 customers throughout the Hawaiian Islands. Roughly half of these customers are served by a distribution system of about 1,000 miles of pipe and the other half are served by onsite or portable propane tanks.

Hawaii Gas currently sources its SNG by converting it from a petroleum refinery byproduct. As the feedstock is from imported oil, the cost per unit is quite high. Hawaii Gas is actively pursuing a three phase plan to supplement and eventually replace its SNG by importing LNG to Hawaii. The first phase of the plan, already under development, is to bring LNG in from the mainland U.S. in ISO containers for use as emergency backup fuel. The second phase may involve construction of storage

and receiving facilities in Hawaii and more ISO container shipments of LNG from the mainland to supplement its use of SNG. The third stage would require the construction of a large receiving tank and regular shipments of LNG for distribution customers, power generation and transportation customers.

At this point, it is not clear if Hawaii Gas could be served from a non-FERC facility. PSE has consulted several different law firms on the matter and has received conflicting guidance. It is also possible that given the expected demand in phase 3 of its plan, a second plant would have to be developed and built in addition to the Tacoma project currently contemplated by PSE.

Avista Utilities

Avista Utilities is a combined gas & electric utility providing service in Washington, Idaho and Oregon. Avista has expressed interest in LNG to provide natural gas service to remote locations in its service territory in residential, commercial and industrial applications. Preliminary discussions indicate potential demand of approximately 5,000 Dth per day.

Expected Contracting Process

Contracting with both anchor customers and third-party LNG marketers is expected to involve a two stage process. The first stage of the process consists of a “Framework Agreement.” This agreement sets the expectations and commitments for both parties through the permitting period. At some point during the permitting period, prior to construction, the parties will negotiate a definitive LNG supply agreement. This agreement would establish the pricing, terms and conditions for the supply and delivery of LNG.

Overall Market Potential

Increased environmental regulations combined with the large spread between oil and natural gas is spurring the development of the LNG transportation fuels market. In order to fully understand this market, PSE retained Concentric Energy Advisors to assess the market potential for LNG in trucking, maritime and industrial applications in the Puget Sound region. Concentric also provided a view of market drivers and insights into how the demand for LNG will develop. Concentric's full report can be found as an attachment to this document, but key results are summarized below:

Evolution of the Heavy Duty Truck Market

The on-highway trucking demand for LNG is being driven by the price spread between low-sulfur diesel and natural gas. Engine and truck OEM's have introduced LNG tractors and, as market interest in LNG increases, their demand will likely increase helping to drive down costs. Major new releases from Cummings-Westport, Navistar and Volvo are expected in 2013. The first adopters of LNG trucks have been large interstate fleets like UPS that can afford to convert their trucks and will realize savings at large economies of scale. As this market develops further, retailers like Clean Energy and Flying J will begin to offer LNG at some key stations along interstate corridors. These stations will open the market to smaller interstate and regional fleets who cannot afford the capital for LNG stations of their own.

Concentric modeled fleet characteristics for all heavy duty combination trucking fleets that operate in Washington. By modeling fleet fuel consumption, diesel and LNG price forecasts and conversion costs, Concentric projected when it would be economical for fleets to convert to LNG (with a 15% hurdle rate). Their forecast for LNG demand by truck fleets in the Puget Sound region is shown in Figure 2.

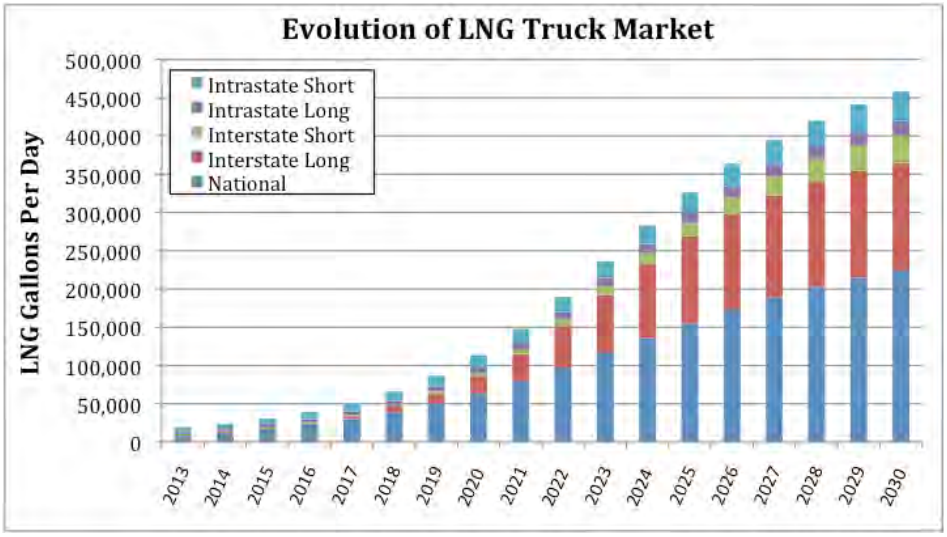

Figure 2. Demand for LNG by the trucking industry in PSE's market area. Provided by Concentric Energy Advisors.

Evolution of the Marine Market

Growth in the demand for LNG in the marine market is being driven by the ECA fuel requirements which are creating upward pressure on bunker fuel pricing. To assess growth in this market Concentric looked at all potential candidates for conversion. In this analysis, a vessel is only suitable if it burns a large amount of fuel and operates mostly or entirely in the ECA. Not included in the forecast is potential demand from the pleasure cruise industry. That industry has so far resisted LNG as a fuel. They could potentially convert in the future, however, as LNG infrastructure matures and they are able to get supply in all the markets that a given ship operates through the year. The results of Concentric's analysis are presented in Figure 3.

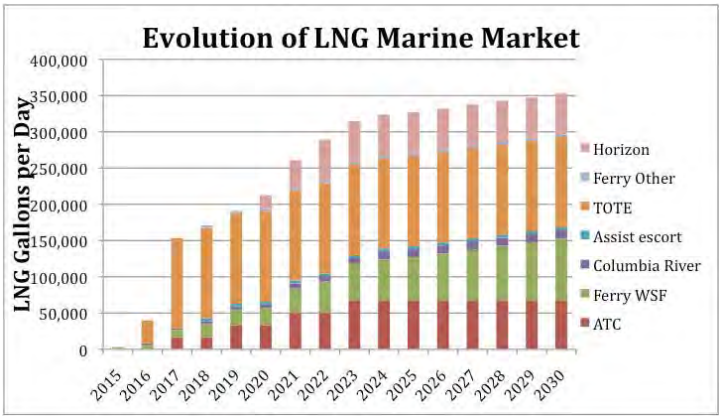

Figure 3. Demand for LNG by the marine industry in PSE's market area. Provided by Concentric Energy Advisors.

Competitive Landscape

There are three potential sources for LNG supply in the Puget Sound region: regional utilities selling excess capacity on existing peak shaving plants, large world scale export facilities and development of new greenfield LNG facilities in the Puget Sound region. With the exception of Fortis BC (discussed below), regional utilities do not have enough excess capacity to supply a growing LNG market and their plants are located far from the demand centers in the Seattle-Tacoma area. World scale export facilities are likely to only be built if they are backed by firm international supply contracts and are able to make it through the permitting process. Furthermore, these facilities will be targeting foreign markets and are unlikely to chase regional transportation markets. The development of a small scale LNG facility in the region (such as the one PSE is proposing) is perhaps the most serious competitive threat.

Key Players in the competitive landscape are:

Fortis: FortisBC has an existing LNG peak-shaving facility located on the Tillbury River just south of Vancouver, and has been selling relatively small quantities of excess LNG for trucking fuel with the approval of their regulators. Fortis is planning to expand this facility with another liquefaction train(s) to support a growing market. Fortis has partnered with Teekay LNG Partners who will be its sole distributor of LNG to marine markets. Through this partnership, Teekay will toll the capacity of the expanded plant and market LNG to maritime customers in Puget Sound and British Columbia.

Cheniere: Cheniere's Sabine Pass LNG facility, in Cameron Parish Louisiana, is the first world scale LNG export facility to be permitted in the U.S. Cheniere expects its first production trains to come online in late 2015. Although it is theoretically possible that they could transport LNG to Puget Sound as marine fuel, transportation costs would be prohibitively high.

Shell: Shell may present the greatest credible threat of developing a new small-scale LNG facility in the Puget Sound region. Shell has been actively chasing large LNG customers in the region and has approached the Port of Tacoma with plans to develop a facility there. The Port has since refused its proposal in favor of PSE's proposed project. Shell has been operating large LNG facilities for decades. Its purchase of Gasnor in Q3 2012 gave it access to LNG bunkering markets in Northern Europe. Shell has also announced plans to develop an LNG facility in Alberta dedicated to fueling regional truck fleets.

The market for transportation LNG is largely gravitating around two separate pricing regimes. In areas where excess capacity is present on existing utility-owned LNG peak shavers, the utilities are offering the service on a cost-of-service basis. Typically the utility will offer such service under a new tariff that requires a contract. In some cases, the utility will build additional capacity but requires long-term contracts to cover the cost. The other pricing regime is to price it on a diesel minus basis. This is the method expected to be proposed by Shell and Blu LNG.

Figure 4 below shows EIA's forecast for diesel along with PSE forecasts of key pricing regimes in the Puget Sound region, based on a TOTE-sized baseload customer. PSE's expected pricing is shown on both a 20-year contract basis and a 10-year contract basis. The pricing offered by FortisBC out of their facility in Tillbury, BC is also shown. Note however that this is the price of current excess demand delivered at the plant which is already under contract. In order to serve the marine market through Teekay, FortisBC will need to expand the plant, presumably at a higher cost of service.

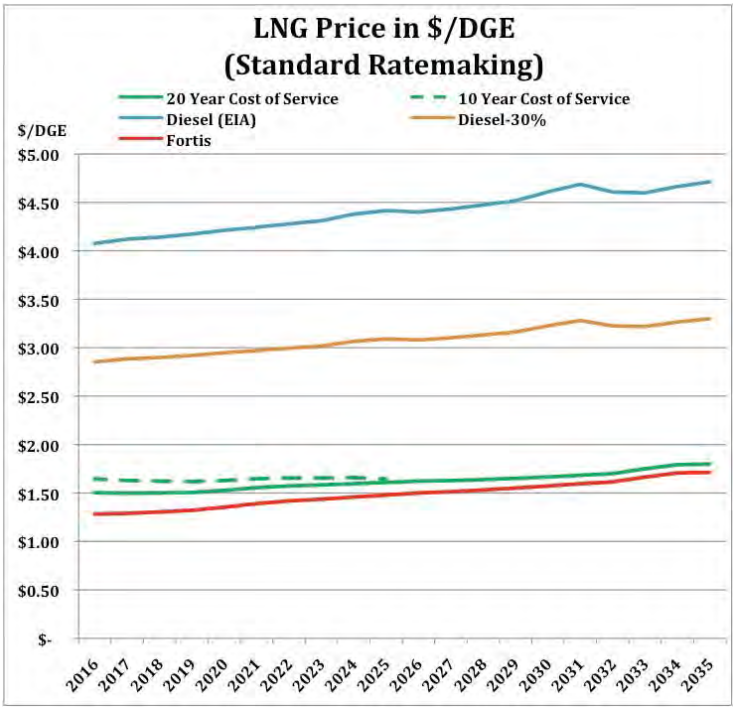

Figure 4: LNG pricing projections in Puget Sound region.

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Financial Impacts

PSE has conducted financial modeling based on order-of-magnitude plant cost estimates provided by LNG engineering firm CH-IV and several EPC contractors, and distribution upgrade cost estimates from PSE's gas planning group. However, until the FEED study is completed, actual plant costs will be subject to uncertainty.

Pro-forma financial information is presented in Appendix A that conveys the financial impacts under two different scenarios. The first scenario assumes the construction of a 250,000 gallon per day facility, enough to serve an anchor marine customer, PSE's gas system peaking needs and 100,000 gallons per day of additional capacity to serve other market demand. The other scenario starts with the same assumptions but then shows additional capital expenditures associated with adding liquefaction trains to meet the market growth described in Concentric's forecast.

Both scenarios share the following assumptions:

- 8 Million gallon storage tank
- Initial liquefaction capacity of 20 million scfd (mixed refrigerant technology)
- Gas distribution upgrades include a 500 psi uprate
- 20 year contract with full plant depreciation over 20 years
- Distribution system depreciated over its 33 year asset life
- Costs:
  - » Engineering, liquefaction and major equipment: $85 million
  - » Field erected, full containment storage tank: $42 million
  - » Balance of plant: $10 million
  - » Development costs: $15 million
  - » AFUDC: $17 million
- **TOTAL PLANT CLOSING COSTS: $169 million**

The first 5 year financial projections are summarized in Table 1.

Table 1: Five year financial summary.

($ millions)	2017	2018	2019	2020	2021
Revenue	49.2	48.4	47.6	46.8	46.1
EBITDA	29.1	28.1	27.0	26.0	25.0
Net Income	11.2	10.7	10.2	9.7	9.3

A more detailed 20-year view is shown in Appendix A. Note that additional trains are not added until 2022 under the expansion scenario, so the first five year financials are the same in both cases.

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Site and Permitting Overview

Siting any LNG plant can be challenging because of the public's perception of safety issues, as well as federal regulations requiring substantial exclusion zones around the facility and its components. Accordingly, a large enough parcel must be procured to accommodate the exclusion zones and must be properly zoned for such development. For this particular LNG project, a site must be geographically located to accommodate PSE system peaking needs and serve the marine fueling market. PSE conducted an exhaustive search of the Puget Sound region and has determined that all of those requirements are optimized on a waterfront parcel at the Port of Tacoma.

Selected Site

After exploring multiple locations the development team selected a 33 acre parcel at the Port of Tacoma as the most suitable site for this facility. The major siting considerations were:

1. The exclusion zones and associated size requirements required for an LNG facility;
2. Proximity to PSE's gas distribution system to effectively provide peaking services; and
3. Delivery of LNG to marine and other fueling markets.

The figure to the right shows an aerial photo of the Port of Tacoma with the selected site highlighted:

Figure 5. Preferred LNG facility site

The facility will be located across Taylor Way from TOTE's terminal. Locating the facility close to TOTE offers the potential for both land and barge based bunkering. Being able to bunker the ship two different ways helps to mitigate the regulatory risk surrounding LNG bunkering.

In addition to marine fleets, the Port of Tacoma is centrally located to the regional trucking demand which is concentrated around the Tacoma and Federal Way areas. Figure 6 shows the location of truck fleets in the region that are good candidates for LNG conversion. Clearly, a Tacoma facility will be well situated to serve LNG fleets and stations in this area. This site also has access to an existing rail spur that connects into Tacoma Public Rail's system. While LNG is currently not railed in the U.S., this option may prove a viable alternative for transporting large volumes of LNG in the future.

Figure 6. LNG Candidate Truck Fleets

Gas System Upgrades

PSE's gas distribution system will require upgrades to serve an LNG facility at the Port of Tacoma and accommodate vaporized supply. PSE's Gas System Planning group examined possible system expansion scenarios that include additional pipe and increased system operating pressures, and came up with two viable options.

Both options require installing about 4 miles of new 12 inch pipeline to connect the plant to PSE's high pressure system that currently runs along E. 20th Street (just south of I-5). This section of pipe presents construction challenges due to extensive soil contamination along the route. PSE's interconnect with Northwest Pipeline at the Fredrickson meter station will need to be expanded under both options.

The two options differ in how PSE's high pressure system between the Clover Creek Limit Station (current end of the existing 500 psig distribution system) and the Port of Tacoma will be reinforced. The preferred option has less total miles of new pipe and better utilizes the existing system. The two options are as follows:

1. *Uprate Option (preferred):*

This option includes uprating about 1.9 miles of existing high pressure pipe to a maximum allowable operating pressure (MAOP) of 500 psig. This pipe currently operates with an MAOP of 250 psig but was tested to 750 psig when commissioned, with the expectation that it may one day operate at a higher pressure. With this uprate, gas would be delivered from the Fredrickson meter station directly to a new limit station. From this location, one mile of new pipe is needed to connect to the Salishan lateral which extends north towards the Port. PSE currently operates a number of high pressure pipelines with an MAOP of 500 psig; however, the WUTC must approve any pipe that operates above 250 psig. PSE regularly makes uprate requests to the WUTC for certain sections of pipe, and therefore does not anticipate anything out of the ordinary with this request.

2. *Alternative Option:*

This second option does not require operating above 250 psig, but requires construction of 4.25 miles of new 16-inch diameter pipeline in Pierce County and 1.0 mile of new 16-inch pipeline in Sumner. This new construction is required to maintain existing system capacity, performance and reliability. This option is the more expensive alternative, but could be used if the WUTC does not approve the uprate discussed above.

Permitting strategy

PSE has prepared a permitting matrix (see Appendix B: Permitting Matrix) that enumerates the federal, state and local key agency stakeholders as well as the permits necessary for developing the LNG facility. The process of permitting an LNG facility will be complex, and the strategy will be continually refined taking into account risks, timing and options as the project moves forward.

Permitting Issues

Import/Export Terminals

LNG is not without controversy, most of which is associated with much larger import/export terminals. In the United States, LNG is most frequently associated with either deep-water import terminals proposed to receive LNG from ocean-going vessels from gas-rich nations or export terminals proposed to send gas from North America to gas-short countries[1]. Permitting and development of such facilities frequently requires significant in-water work to deepen and enhance port terminals, accompanied by the development of new natural gas transmission lines across long distances to reach major gas distribution systems. Such projects, especially in the Pacific Northwest have been lightning rods for environmental groups, and have faced many hurdles and opposition. PSE will differentiate this project from those much larger import/export terminals.

In-Water Work

PSE's LNG facility will not require dredging at the Port of Tacoma site. An existing timber pier will be replaced with a smaller steel or concrete finger pier to comply with U.S. Coast Guard requirements[2], in-water work will trigger Army Corps of Engineers involvement, Section 7 Endangered Species Act consultation with the U.S. Fish & Wildlife Service and review of essential fish habitat via the Magnuson-Stevens Fishery Management and Conservation Act with the National Marine Fisheries Service.

Public Safety

Public safety fears of gas explosions[3] at terminals and in pipelines have been exploited in the press, contributing to considerable public opposition to siting LNG import/export terminals across the country. The successful permitting of a liquefaction/storage/fueling facility by PSE will require a coordinated strategy in order to educate the public on the proven safety record of LNG, separating myth from reality and much smaller scale of a fueling facility. This strategy will have to be developed and implemented well in advance of submitting the first permit applications.

Agency and Public Outreach

There are numerous stakeholders to account for in the process of obtaining development approvals. Principally, these groups include administrative regulatory agencies (ports and local, state and federal agencies); elected officials (local, state and federal); industry organizations (labor, maritime shipping, industry associations); Native American tribes; and non-governmental organizations, most likely environmental groups, and possibly vicinity residents[4]. Each of these groups will have different interests and issues. Identifying and understanding their interests will inform the message and

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[1] LNG facilities unassociated with import terminals exist across the county, principally as peak shavers to serve local gas distribution companies. To date only one facility in the U.S. has received FERC approval to export LNG.
[2] 33 CFR Part 127.
[3] LNG in its liquid form does not burn; when released into the atmosphere, it forms a vapor cloud. Natural gas is lighter than air and is only flammable when in concentrations of 5 and 15 percent natural gas. See http://www.consumerenergycenter.org/transportation/afvs/lng.html

approach to be taken in publicly presenting the project and subsequently seeking permit approval. PSE is developing a communication plan to address these stakeholders and their issues.

Environmental Review: SEPA/NEPA

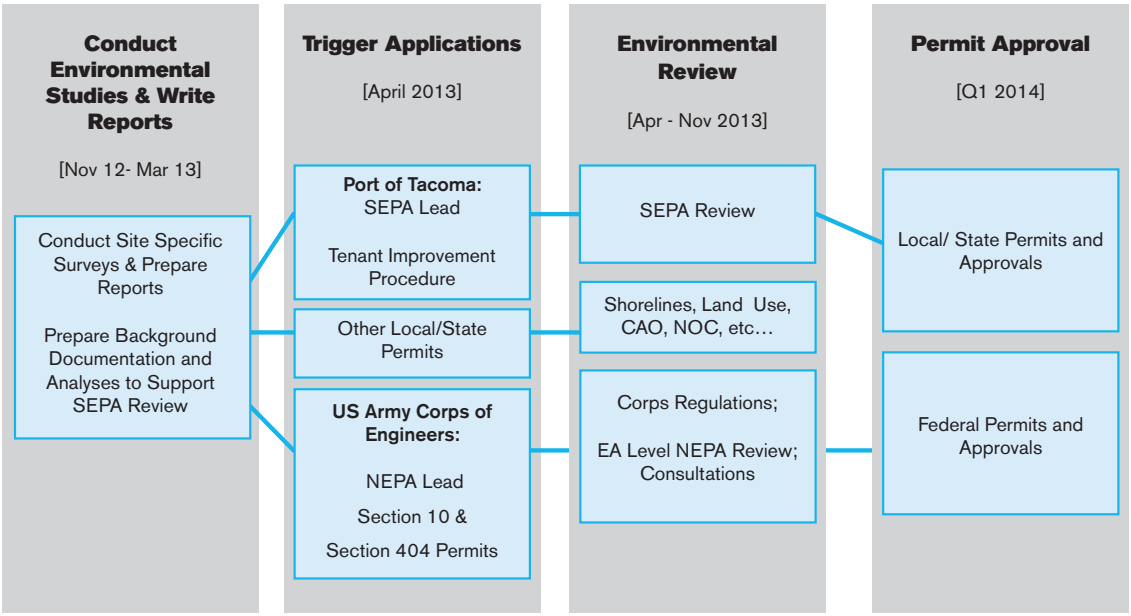
This project will require federal and state agency approvals, so environmental review under both the National Environmental Policy Act (NEPA) and the State Environmental Policy Act (SEPA) will be required. Review of the project's environmental impact must be conducted before agencies can issue approvals.

Our goal is to streamline this process by completing SEPA and NEPA reviews under one process with a state or local agency in the lead and a federal coordinating agency. This allows PSE to more effectively manage the environmental review process to ensure completeness and efficiency.

The Port of Tacoma prepared a Blair-Hylebos Terminal Redevelopment Project Environmental Impact Statement (EIS) in 2009 that addresses development of the same parcel now intended for our LNG fueling facility. This presents a unique opportunity to rely largely on this document along with a Supplemental EIS (SEIS) to meet environmental review requirements under SEPA and NEPA[5]. We anticipate that the Port of Tacoma will be the SEPA Lead Agency and the Army Corps of Engineers will be the federal coordinating NEPA agency.

The permitting strategy depicted on the following page describes the process and time line that best meets the objectives of the project. The ultimate permitting strategy may be adjusted if more agencies become involved and new issues develop, demanding a different level of complexity, time and cost.

Permitting Strategy



[4] The nearest residential area is located a third of a mile from the proposed facility.
[5] A supplemental EIS will be significantly smaller in scope because it can rely on the original EIS for much of the background property information and alternatives for development.

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Preliminary Schedule

Nov 2012 - Mar 2013	Prepare a draft Supplemental EIS to the Port of Tacoma's Blair Hylebos Terminal Redevelopment Project
Feb 2013 – Jun 2013	Front end engineering and design
Apr 2013	Submit SEPA/NEPA-triggering Permit Application(s) & Draft SEIS
Mar – Dec 2013	Preparation and Submittal of Accompanying Permit Applications
Dec 2013	SEPA/NEPA SEIS Issued and NEPA
Jan 2013 – Mar 2014	Public Hearings on Permits
Apr 2014	All Environmental, Land-Use and Construction Permits Received
May 2014	Start Construction
Sep 2016	Commercial Operation Date

Potential for litigation: Even with best efforts, a project of this magnitude and substance is unlikely to proceed without attracting opponents. In addition to planning up front before making a public announcement, scrupulous attention to the environmental review piece, careful adherence to permitting criteria, staying on message and making strategic adjustments as needed will contribute to a sound permitting process and a defensible decision record.

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EPC Strategy

The LNG industry predominately constructs plants using an EPC (Engineering, Procurement, and Construction) contracting methodology. PSE intends to use the "Open Book" variant of an EPC contract. This strategy allows PSE to participate in the design of the facility and direct decisions on all major equipment purchases (which are typically competitively bid by the EPC contractor). Upon completion of the plant design, the EPC contractor will then submit a fixed-price bid for the construction phase of the project.

PSE issued a Request for Proposals to major LNG EPC firms in November 2012. The team subsequently met with EPC firms including Matrix, Linde, Black & Veatch, CB&I, Chart/Bechtel, and Air Products and is reviewing written proposals from all but Chart/Bechtel and Air Products (who have not yet submitted proposals).

PSE will select an EPC firm based upon their experience, references, understanding of our project, and budgetary cost estimate. Upon selection and contract award, the EPC firm will begin design of the plant and provide information required for the permitting effort.

Table 2 summarizes the strengths and drawbacks of the potential EPC providers.

Table 2: EPC providers under consideration

Chicago Bridge and Iron (CB&I)	• Most U.S. LNG experience with design of several peak-shavers and LNG storage tanks across the U.S. • Extensive knowledge of DOT regulations that govern citing and design of LNG plants. • Competitive budgetary estimate. • In house construction services. • Designs and engineers LNG tanks so there would be no markup from a third party.
Black and Veatch	• Most experience with recent LNG peak-shavers in this size range (mainly in China). • Competitive budgetary estimate. • Long history of working with PSE on other infrastructure projects. • Would hire third-party construction contractor. • PSE would need to engage in a separate contract for the LNG storage tank.
Linde Process Plants	• LNG bunkering and fueling experience in Europe. • Marketing and distribution experience with LNG and other cryogenics. • Could operate the plant. • No U.S. LNG plants built to date and marginal understanding around U.S. regulations. • Would hire third-party construction contractor. • PSE would need to engage in a separate contract for the LNG storage tank. • Budgetary estimate was not competitive.
Chart/Bechtel Air Products Matrix Services	These providers are no longer under consideration due to: • Their focus on manufacturing individual plant components. • Lack of experience designing or constructing entire plants. • Unwillingness to use an open book structure. It is possible that PSE's plant will contain equipment from some or all of these providers and PSE may contract directly with Matrix for engineering and design of an LNG tank.

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Regulatory Strategy

PSE considered various structures, including regulated vs. unregulated, and state regulated vs. federally regulated.

Regulated versus Unregulated

LNG is a logical extension of PSE's natural gas service, since it is simply another form of natural gas. Further, regulated cost of capital provides competitive pricing and facilitates maximum market penetration. In addition, PSE believes the primary competition in this region will come from regulated utilities or pipelines deploying a similar regulated business model (FortisBC, Northwest Natural Gas, Williams-Northwest Pipeline, etc.). Finally, establishment of an unregulated subsidiary would require WUTC approval, if at the PSE or Puget Energy level.

State versus Federal

One of PSE's primary drivers on this project is meeting TOTE's required deadline. Project development time lines would likely not be able to accommodate a FERC permitting schedule, when combined with the lengthy construction schedule. Further, the project does not clearly have a federal nexus, without an interstate component.

State Regulatory Strategy

PSE has briefed WUTC commissioners and staff on a state regulated concept. PSE is considering a state regulatory strategy under which LNG service would be a separate regulated line of business, distinct from existing electric and natural gas distribution business lines; however, the distribution upgrades necessary to serve the plant would remain part of the natural gas distribution business. The gas distribution business line would become a customer of the plant and contract for peaking services at published tariff rates.

The new LNG business line will file a separate WUTC tariff (and possibly special contracts) for the LNG services, with separate rates for liquefaction, storage and vaporization services. In addition to these services, LNG customers will separately contract to purchase gas, pipeline capacity and PSE transportation services. PSE is also considering an alternate strategy where PSE would provide delivered gas to the LNG plant as a bundled service; in this case the LNG business line would contract for the distribution service; this approach is dependent on individual customer needs and regulatory acceptance. Bundling these services could complicate the regulatory process by creating a separate and distinct gas portfolio which could result in a lower weighted average cost of gas (no storage costs, not heavily weighted with winter gas, etc.). By establishing LNG as a new line of business PSE will minimize challenges related to allocation of costs among business lines.

Under GAAP Accounting rules, the LNG Plant must be depreciated on the books over its estimated useful life (30-40 years depending on component); however, PSE intends to design rates to recover all or nearly all of the LNG plant investment over a shorter contract term with individual customers (10 to 20 years). Potential customers have expressed interest in levelized rates for LNG services and PSE may work with the WUTC to develop rates that strike a balance between providing a levelized annual (non-gas) cost to the customers over the life of contract and achieving a favorable return for PSE. Revenues will commence when service commences, significantly reducing regulatory lag in cost recovery.

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Benefits of the Project

Growth through a New Line of Business in PSE's Core Competency

One of PSE's core competencies is the ownership and operation of major energy infrastructure. This project represents an opportunity for PSE to expand into a new line of business that focuses on this competency. The LNG business would add growth to PSE's EBITDA by providing a service to new customers.

Regional Environmental Benefits

The project will be a fuel source for at least one major user of distillate fuels and is expected to provide LNG for many other oil consumers in both the marine and land-based transportation sectors. Given the emissions reductions that natural gas offers relative to diesel, the regional air quality benefits could be substantial.

System Gas Security Benefits

The facility is expected to help fulfill future needs for expected gas system peaking capacity. In addition to this service, the added on-system gas storage capability provides supply security benefits beyond peak weather conditions. For example, the storage would be available in the event of interstate pipeline disruptions to help maintain service for PSE customers in the Tacoma area.

PSE Customer Benefits

The project will prove to be beneficial to other PSE customers since the project will attract an allocated amount of existing fixed overhead cost from Puget Sound Energy, based on investment and other allocable measures, and provide additional revenue for the gas distribution line of business. Accordingly, all of PSE's existing customers will see a commensurate reduction in such allocated overhead costs.

Meeting a Regional Market Need

The facility will produce an ECA compliant fuel that will offer the maritime industry an economical way to meet new regulations. LNG can serve as the low cost fuel for end-users who power trucks, small scale generation and other machinery that operates in remote locations. By filling these market needs, PSE expands its roles as a regional energy services provider.

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Risk Analysis

The proposed LNG development project is subject to certain risks that, generally speaking, vary in nature and or extent based on the phase of development.

Risk	Possible Cause	Mitigation
Permitting		
Permitting Delay	• Appeal from third party interveners • Agency decision delay	• Given the tight time frame, permit delay is entirely possible. In order to mitigate, PSE is planning the following: • Project introduction meetings with all involved agencies to give them advance notice of the project and educate them about time frame • Regular project meetings with the agencies during permitting • Potential use of an independent coordinator to help facilitate decision-making among agencies • Reimbursement of key agencies for dedicated time to this project
Permits Not Granted	• Project impacts judged to be too severe	• PSE has already begun to gain support for the project from key community, business and government organizations to ensure its success. We will continue to educate others in the federal, state and local government about the substantial public benefits of the project.
Community Resistance	• Concern of LNG being located in the community	• PSE is planning to undertake an extensive community education and outreach campaign complete with open houses, community meetings and presentations, web sites and other forms of communication to help address any concerns the communities may have.
Site Issues	• Exclusion zones do not fit on-site • Contamination from prior industrial operations on-site	• PSE has engaged Gexcon to conduct preliminary, worst-case scenario exclusion zone modeling. Based on those results, PSE is confident that the site can accommodate the planned facilities. Some risk remains on the exclusion zone around the marine loading boom. PSE will also explore political solutions. • PSE is working closely with EPA, Washington State Department of Ecology and Port of Tacoma to minimize development limitations based on ongoing remediation efforts. Coring and sampling will be completed very early in development to ascertain issues.
Coast Guard Regulations	• Coast Guard regulations for LNG bunkering not expected until summer of 2013	• PSE is meeting with the Coast Guard about twice a month to continuously update them on project direction, suggest regulation changes and solicit feedback on plans.

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Commercial		
No Third-Party Marketer	• Interested marketers unwilling to make a long-term commitment to purchase LNG	• Should PSE find no parties willing to commit to purchase LNG, it will have the option to build the plant to serve TOTE and PSE's peaking needs, and market directly to additional end-use customers.
No Additional Customers	• Plant size remains uncertain	• The project team is soliciting interest from at least one other large marine entity and two potential marketing customers. PSE could establish an unregulated affiliate to market excess LNG. Improving cost certainty will improve marketing position.
Land Lease	• PSE does not have a signed land lease with the Port of Tacoma • Upon signing option, Port still maintains ability to deny full lease if project produces undue risk to Port	• Basic terms of the lease have been agreed upon by both parties; PSE expects to execute the lease in Q1 2013.
Credit	• TOTE (Saltchuk is unrated) is a B+ to BB- entity • ATC, Hawai'i, BP & Linde – no known credit issues • BLU – Appears to have substantive backing from a large Chinese energy company ENN)	

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Appendix A: Summary Financial Results

Baseline Plant to Meet 2016 Market

($ millions)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Revenue		49.2	48.4	47.6	46.8	46.1	45.4	44.8	44.2	43.6	43.0
EBITDA		29.1	28.1	27.0	26.0	25.0	24.0	23.1	22.2	21.3	20.4
Net Income		11.2	10.7	10.2	9.7	9.3	8.8	8.4	8.0	7.5	7.1
Capex Schedule*	200										

($ millions)	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Revenue	42.5	41.9	41.4	40.9	40.4	40.0	39.8	39.7	39.7	39.6
EBITDA	19.5	18.6	17.7	16.8	15.8	15.0	14.4	13.8	13.3	12.7
Net Income	6.7	6.2	5.8	5.4	4.9	4.5	4.2	3.9	3.6	3.3
Capex Schedule*	200									

*Closing Plant 169 *Closing Dist System 31.3

Plant with Expansion to Meet Market Growth

($ millions)	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Revenue		49.2	48.4	47.6	46.8	46.1	55.5	57.5	56.6	56.1	64.0
EBITDA		29.1	28.1	27.0	26.0	25.0	28.8	30.0	28.8	27.6	30.5
Net Income		11.2	10.7	10.2	9.7	9.3	10.5	11.1	10.5	9.9	10.8
Capex Schedule	200						47.6				41.7

($ millions)	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Revenue	65.5	64.6	63.7	63.1	72.1	74.0	73.3	72.8	72.3	71.8
EBITDA	31.2	29.8	28.3	26.9	30.2	31.0	29.6	28.2	26.9	25.6
Net Income	11.1	10.4	9.7	9.0	10.1	10.4	9.6	9.0	8.3	7.6
					47.2					

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Appendix B: Permitting Matrix

Federal Permitting Matrix

Agency	Permit/Approvals	Agency Action
U.S. Department of Transportation (DOT)	Petition for Approval (49 CFR Part 193) Federal Safety Standards	Must demonstrate that new LNG facility meets standards governing siting, design, installation, personnel qualifications and training. Incorporates requirements of NFPA 59A.
U.S. Department of the Army Corps of Engineers, Seattle District (USACE)	Section 10 (Rivers and Harbors Act) Likely NEPA Lead	Permit for placement of structures in, or affecting, navigable waters (e.g., LNG loading facility).
	Section 404 (Clean Water Act)	In water work at the pier/LNG loading facility.
U.S. Coast Guard (USCG)	Letter of Intent (33 CFR Part 127)	Captain of the Port issues Letter of Recommendation to operator and develops OPLAN at sea ports.
	Waterway Suitability Analysis (NVIC 01-2011)	Addresses requirements of 33 CFR Part 127: Coast Guard assessment of LNG Marine Operations
	Permission to establish Aids to Navigation required under 33 CFR Part 66	USCG must be notified and give permission to establish any navigational aids (buoys) associated with the LNG unloading facility.
	Spill Prevention and Spill Response Plan (CWA, 33 U.S.C.§1321(j))	Plan for responding to spills from ships.
U.S. Fish & Wildlife Service (FWS)	Section 7 of Endangered Species Act	Provide biological concurrence on marine species of wildlife that are federally listed as threatened or endangered, and on managed fisheries. Oversight of activities associated with marine facilities construction and EFH. Underwater noise could trigger consultation due to potential impacts to listed species of salmon.
National Marine Fisheries Service (NOAA Fisheries)	Essential Fish Habitat (EFH), Magnuson-Stevens Fishery Management and Conservation Act	
	Marine Mammal Protection Act. Level B harassment authorization	Underwater noise associated with pile driving for dolphin installation.
Federal Aviation Administration	Federal Aviation Act (14 U.S.C. Section 44718) 14 CFR park 77. FAA Form 7460-1, Notice of Proposed Construction or Alteration	Any construction or alteration of more than 200 feet in height above the ground level at its site.

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State Permitting Matrix

Agency	Permit/Approvals	Agency Action
Department of Ecology (Ecology)	NPDES – Construction Stormwater General Permit	Permit for all soil disturbing activities where one or more acres will be disturbed and have a discharge of stormwater to a receiving water and/or storm drains that discharge to a receiving water.
	NPDES Industrial Stormwater General Permit	Permit for public or private operation of an industrial facility with a stormwater discharge to surface waters or a storm sewer.
	NPDES Individual Permit or State Waste Discharge Permit	NPDES Individual Permit - Any discharge of wastewater directly into surface waters through a conveyance system. State Waste Discharge Permit - For a planned discharge of wastewater to the ground or discharge of wastewater to municipal treatment plant.
	Coastal Zone Consistency Determination	Determination for federal activity and development in coastal counties. Federal – State partnership: Ecology reviews projects to determine that the activities are compliant with six laws: Shoreline Management Act, SEPA, Clean Water Act, Clean Air Act, EFSEC, and Ocean Resource Management Act.
	401 Water Quality Certification	Certification to conduct any activity that requires excavation in or might result in a discharge of dredge or fill material into water or non-isolated wetlands.
	Hazardous Chemical Inventory Reporting Requirements	Facilities that have hazardous substances on-site are required to provide information on the type, quantities, and storage locations for those substances.
Utilities and Transportation Commission (UTC) Office of Pipeline Safety	Review and Project Compliance with 49 CFR Part 192 (Pipeline Safety) and 193 (LNG Siting and Development)	Through partnership, PHMSA and WUTC Office of Pipeline Safety oversee pipelines in Washington State and LNG facilities.
Department of Fish and Wildlife (DFW)	Hydraulic Project Approval	Permit for work that uses, diverts, obstructs, or changes the natural flow or bed of any of the salt or fresh waters of the state.
Department of Natural Resources (DNR)	Aquatic Use Authorization	Permit to use state owned aquatic lands (includes harbors, state tidelands, shorelands, and beds of navigable waters).

Department of Transportation (DOT)	State Highway Crossing Permit	Permit for the occupancy of highway rights-of-way.
Department of Archaeology and Historic Preservation (DAHP)	Section 106 Review (for projects requiring federal permit, license, or funds)	Review for excavation altering or removing archaeological resources or Native Indian grave sites.
	Archaeological Excavation Permit	Permit for excavation altering or removing archaeological resources or Native Indian grave sites.

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Local Permitting Matrix

Agency	Permit/Approvals	Agency Action
Port of Tacoma	SEPA Lead Agency; Tenant Improvement Procedure	Supplemental Environmental Impact Statement; Tenant Improvement Procedure defines how the Port and its Tenants will interact with regard to improvements accomplished by the Tenant. Port policy and Port's standard lease language allow for tenants to make changes, alterations and improvements to Port property if approved by the Port.
Puget Sound Clean Air Agency	Notice of Construction Approval	Approval to release contaminants to the air from a new or modified source. The approval requires that the source use the best available control technology for all pollutants, including greenhouse gases, and that the new source does not adversely impact air quality.
Cities of Tacoma and Fife/Pierce County	Shoreline Substantial Development Permit (part of a state-local partnership with the WA Department of Ecology)	Permit issued by local government for development on shorelines
	Right of Way Permit; Street vacation of a section of Alexander Ave in City of Tacoma in a controlled access area/LNG fuel line crossing of a public road.	If the pipeline crosses a road maintained by municipality, a right-of-way permit must be obtained. ROW Permits also needed to cross any lands owned by the county.
	Wetlands and Critical Areas Review	Ensure compliance with state and local policies and regulations
	Land Use Approval/Permit	If the zoning for the facility site or areas where new pipeline is proposed require a land use approval such as a Conditional Use Permit.
	Building/Construction Permit	Ensure compliance with cities policies and regulations
	Floodplain Development Permit	Local governments participating in the National Flood Insurance Program (NFIP) are required to review proposed development projects to determine if they are in identified floodplains as shown on the NFIP maps. If a project is located in a mapped floodplain, the local government must require that a permit be obtained prior to development.

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Appendix C: Development Budget

	2012 (Act.)	2013	2014
CAPITAL BUDGET			
Engineering/EPC	$ 305	$ 1,095	
Permitting/Legal	$ 104	$ 3,045	$ 1,500
Site/Real Estate	$ 37	$ 500	$ 300
Distribution System	$ 81	$ 1,715	$ 200
PSE Labor	$ 45	$ 636	$ 300
Communication & Outreach		$ 141	$ 50
TOTAL	**$ 609**	**$ 7,132**	**$ 2,350**

O&M BUDGET	2012	2013	2014
Commercial Legal	$ 68	$ 350	$ 18
Market Study	$ 164	$ -	$ -
TOTAL	**$ 232**	**$ 350**	**$ 18**

Budget Assumptions:

- Includes all costs except plant items and construction
- Plant construction begins spring 2014
- Plant COD is September 2016

MARKET ASSESSMENT OF LIQUEFIED NATURAL GAS AS A DISTRIBUTED FUEL IN WASHINGTON STATE

DRAFT

Prepared for

Puget Sound Energy

September 19, 2012

I. EXECUTIVE SUMMARY

Puget Sound Energy ("PSE") is evaluating liquefied natural gas ("LNG") as a fuel option for certain markets in the Pacific Northwest, specifically the state of Washington and the western Columbia River Port ("market area"). PSE retained Concentric Energy Advisors, Inc. ("Concentric") to provide a market assessment for several potential LNG markets including heavy duty on-road transportation, marine, rail, and industrial conversion markets.[1] In addition, PSE requested that Concentric assess the market for LNG to compressed natural gas ("CNG") in on-road and off-road fleet applications. Last, Concentric considered PSE's strategic advantages and the roles of potential competitors and/or partners to PSE in serving these markets.

Concentric provides this report to supplement PSE's decision criteria regarding LNG market demand and strategic positioning. Major price and supply assumptions and certain of Concentric's findings are summarized as follows:

- Basing oil prices on the Energy Information Administration ("EIA") Long Term Energy Outlook ("AEO") dated June 2012, Reference Case oil prices, the resulting Ultra Low Sulfur Diesel ("ULSD") prices in the market area will remain significantly above the expected cost of LNG from PSE's proposed greenfield LNG facility to allow customers to payback investments for conversion of engines and related equipment. The EIA's Reference Case Long Term Energy Outlook, August 2012 forecasts crude oil prices to rise to 170 USD per barrel by 2025. ULSD, which sells at a premium to crude prices, is currently used in the heavy duty trucking market, and its price will drive economic considerations for future industry conversions. Beginning in 2015, marine vessels operating in the North American Emission Control Area or ECA [2] must use marine oil that contains only 0.1% sulfur. For purposes of this report, the forecast assumes on-road ULSD and 0.1% sulfur marine fuel are equal in price.

- While there is LNG production in Washington and northern Oregon, this LNG supply is generally part of the integrated resource portfolio of the local distribution companies serving the region, including PSE. These LNG facilities could be used to provide bridging supply for the new, distributed LNG markets that develop until a new LNG facility is built. PSE has collaborated with potential bridge suppliers of LNG, notably Fortis BC in Vancouver, BC, as sources of LNG supply in the event demand for LNG from new markets precedes the availability of LNG from a new liquefaction facility in the market area.

- Only two markets, marine and heavy duty trucking, will contribute measurably to distributed LNG demand in PSE's market area:

[1] Initially, Concentric was retained to consider electric and gas peak shaving markets, microgrid markets and LNG supply context and alternatives associated with serving potential markets. Through mutual agreement with PSE, in early July 2012, PSE and Concentric reduced the work scope to consider only the stated markets.

[2] The ECA is any area within 200 nautical miles of the North American coastline.

- Marine customers in the market area that must comply with ECA regulations are numerous. Excluding ocean traffic (vessels that operate internationally and largely outside the ECA), Concentric estimates that the ECA-compliant shipping market could consume as much as 1,000,000 LNG gallons per day[3] of fuel if 100% of the vessels operating in the market area converted to LNG. PSE is advantaged to possibly serve marine LNG markets that are significantly more active than elsewhere in the United States. Specifically, LNG as a marine fuel has been publically endorsed by two major marine customers in PSE's market area, Washington State Ferries ("WSF") and Totem Ocean Trailers Express ("TOTE"). Both potential customers have implementation plans and, to a large degree, have regulatory support to convert a portion of all of their marine-based fleets to LNG over the next few years. In addition, several other large marine customers could convert to LNG based on LNG's availability in the Puget Sound area, emulating conversion activities of WSF and TOTE. By 2020, Concentric forecasts demand in the marine market to exceed 170,000 LNG gallons per day or a market penetration level of about 20%.[4]

- Based on Concentric's analysis, demand for LNG in the heavy duty truck (Class 7&8) transportation market could to grow over the next several years from its current level to over 100,000 LNG gallons per day by 2020. The majority of demand comes from national and interstate long-haul fleets and assumes an adaption rate of between 5-8% in these two segments. Overall, Concentric forecasts a 2020 market area adoption rate in the Class 7&8 segment of approximately 7%.

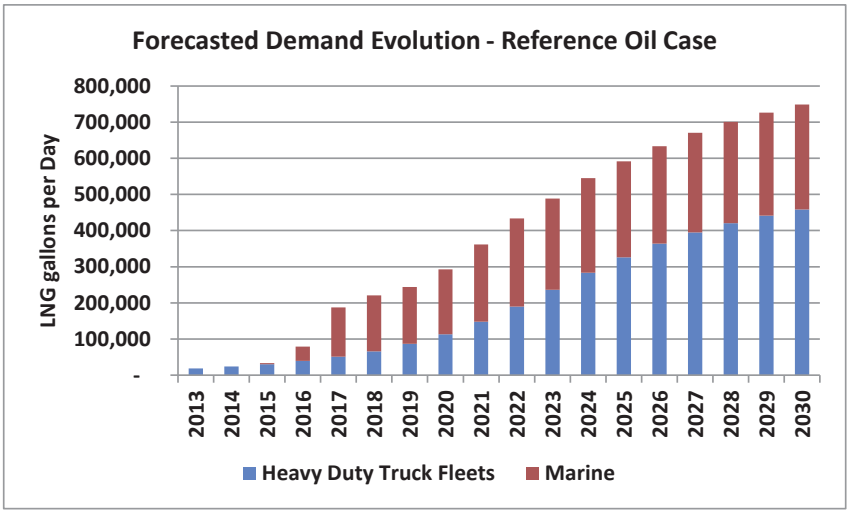
	LNG gallons per day	
EIA on-highway diesel use - 2010	2,838,873	
Est. diesel use in western Washington	2,129,155	
Class 7&8 use in western Washington	1,596,866	
Concentric forecasted market penetration by 2020	113,399	7.1%

- The trucking market demand, when combined with marine demand, could total 300,000 LNG gallons per day by 2020 and provide PSE with enough market demand to construct and operate a LNG production facility with a capacity of up to 300,000 LNG gallons per day.

[3] This includes the summer-only cruise ship market of approximately 500,000 LNG gallons per day.

[4] Since cruise ships provide summer-only demand, average daily demand on a 365-day basis is about 750,000 LNG gallons per day.

Figure 1



- Demand for LNG in the thermal conversion market is extremely limited. Most industrial customers in the market area currently use gas or, if not gas, then self-provided biomass. Only 1-2 larger industrial customers in the market area could be targets for on-site LNG as a fuel option.

- Demand for LNG in the rail segment could be viable in later years (2025+) but will not be developed in the short or medium term due to slower developing dual fuel (gas and diesel) locomotive engine technology. The rail industry needs high horsepower engines and LNG fueling along major rail routes in order to become a significant market for PSE's LNG.

- There is demand for CNG in the market area consisting of lighter duty vehicle applications and return to base/slow fill heavier duty applications (transit buses, garbage trucks). LNG to CNG does not appear to compete favorably against pipeline CNG and therefore does not contribute significantly to LNG demand unless CNG is produced at an existing LNG fueling stations (the LNG is already on-site; CNG is produced from the on-site LNG). In addition, if fleets commit to CNG under medium to long term contracts prior to the in-service date of PSE's LNG facility, it will be difficult for PSE to capture market share. Concentric has not included CNG demand from LNG in its LNG demand evolution.

- Regulatory oversight and permitting of LNG are critical factors in the success of LNG as a distributed fuel. Regulations for LNG use as a vehicle fuel are developed and known; National Fire Protection Association ("NFPA") 57 and 59A are currently used by the industry and its regulators. Rules and procedures for LNG as a marine fuel are still being developed. It is in PSE's interest to understand existing regulations for LNG as well as participate in the development of any new requirements.

- Federal, state and local tax and other incentives that encourage the use of LNG as a distributed fuel are currently very limited with the majority of federal tax incentives for fueling infrastructure and fuel tax having expired at the end of 2011. Of note, LNG as a transportation fuel currently suffers from two tax *penalties* – a) a penalty associated with the lower energy content of an LNG gallon versus a diesel gallon yet both are taxed equally on a volumetric basis ("gallon tax penalty") and b) a second penalty associated with the excise taxes on the higher gross cost of LNG engines versus diesel engines ("excise tax penalty"). While Concentric believes that the gallon tax penalty will be resolved in early 2013, it believes the excise tax penalty will remain. In summary, tax and funding incentives could materialize but currently do not play a significant role in expected LNG demand evolution.

II. RESEARCH AND ANALYSIS

Purpose of the Report

PSE retained Concentric to assist PSE with the evaluation of certain distributed LNG and LNG to CNG markets. The report contains the following five sections:

1. **Market Context –** This section identifies the relative competitiveness of LNG and LNG to CNG as a competing fuel against diesel and ULSD in the market area.
2. **Evolution of demand –** This section will quantify the demand forecast and certain scenarios for each of the following markets:
    a. **LNG as a transportation fuel in the marine segment**
    b. **LNG as a transportation fuel in the heavy duty truck segment**
    c. **LNG in the rail segment**
    d. **LNG industrial thermal conversion segment**
    e. **LNG to CNG for use as a transportation fuel primarily in lighter duty fleets**

    Each market analysis will contain methodology for establishing the fleet inventories, expected annual fuel use of vessels/vehicles in the fleet, and projected evolution for LNG to capture market share under three price scenarios. In addition, factors that PSE can successfully influence in this demand evolution will be discussed.
3. **Competition and partners –** This section provides a high level summary of major competitors or partners for PSE to consider to profitably capture market share for LNG in the market area.
4. **Conclusion** – This section provides a summary of conclusions and findings based upon the research and market analysis conducted for this assignment.
5. **Appendix A-E** – This section provides price scenarios and information regarding the data and models that underlie the analysis. All data and models will be provided to PSE.

III. MARKET CONTEXT

There are two major factors driving expected demand for LNG as an alternative to oil-based fuels such as on-highway diesel oil, marine diesel and residual oil, and propane.

Economic

Demand for LNG as a distributed fuel in the market area is largely being driven by the price spread between natural gas products including LNG and CNG and refined oil products including marine fuels and on-road diesel.

Concentric and PSE collaborated in determining the long range price forecast for ULSD, the expected primary fuel used in the heavy duty transportation market and a proxy for marine fuel after 2015. The process was as follows:

- To forecast crude oil prices, for the period from 2012 and 2013, Concentric used the July 2012 EIA Short Term Energy Outlook oil price forecast; for 2014, Concentric extrapolated the oil price between EIA's short and long term outlooks. For 2015 and beyond, Concentric relied on the AEO 2012 Reference forecast for Low Sulfur Light Crude Oil ("LSLCO").

    - In order to approximate a forecast for the Washington state wholesale price for ULSD, Concentric reviewed historical spreads between EIA-reported historical LSLCO prices and North Slope Crude Oil prices. North Slope Crude is the feedstock for refiners in the market area that produce ULSD. Historical data shows little spread between LSLCO and North Slope Crude. As such, Concentric adopted the EIA short and long term forecasts for LSLCO as a proxy for North Slope Crude.

    - Based on market intelligence provided by PSE, given existing refining capacity in the Seattle-Tacoma area combined with higher demand from marine markets beginning in 2012 and tightening again in 2015, ULSD prices were set at 25% above North Slope Crude prices (red line in Figure 2 below). This price is at, or close to, the forecast for US transportation diesel fuel published by the EIA[5] (green line in Figure 2 below). Concentric and PSE also considered i) ULSD price forecasts produced by WSF in their late 2011 analysis of fleet conversion to LNG,[6] ii) TOTE's assumed ULSD price forecasts (not explicitly provided to PSE) which are much higher than the WSF forecast and iii) the potential for increased ULSD refining capacity in the Puget Sound area[7] which could decrease the relative ULSD price premium versus LSLCO. After considering several alternatives, Concentric and PSE agreed to use LSLCO AEO 2012 Reference prices at the 25% premium as the basis for the market

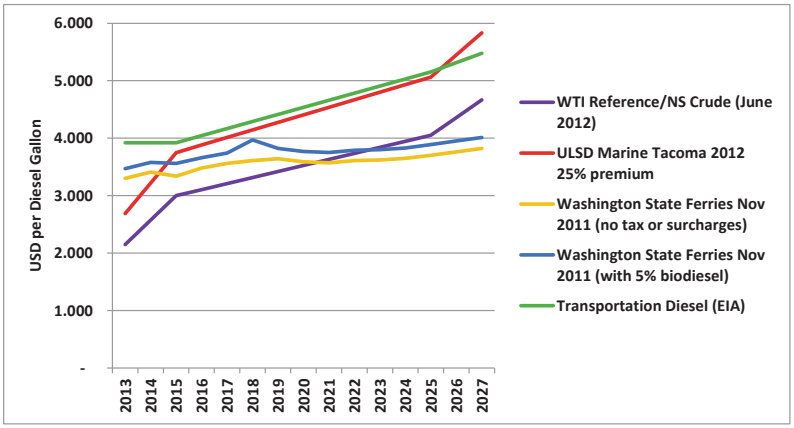
5 AEO 2012

6 Evaluating the Use of Liquefied Natural Gas in Washington State Ferries, Washington Joint Transportation Committee, January 2012, Exhibit 7

7 Incremental ULSD refining capacity is very expensive to build and very complex to operate. This adds significant risk to refiners who may be considering increasing ULSD capacity in the Puget Sound area. Refiners will try to recover these large investments through increased margins but there is no guarantee of investment recovery.

area ULSD price forecast ("ULSD Reference"). This forecast is shown in red in Figure 2 below.

Figure 2

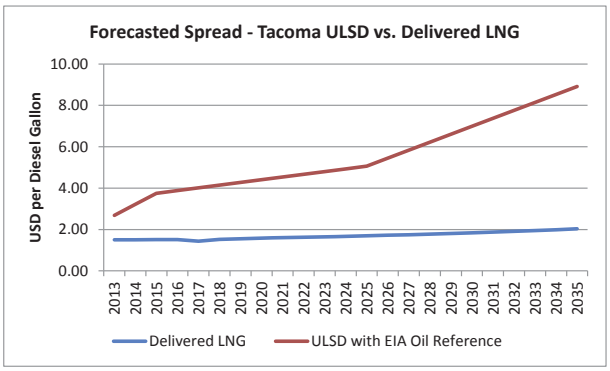


- Natural gas and LNG price forecasts were provided by PSE.

- The forecast used by Concentric also assumes that distributed LNG customer will be able to purchase LNG from existing LNG sources at a price of 10.00 USD per MMBtu for the period 2013 through Q3 2016, prior to the expected start date for new proposed liquefaction facility.

Figure 3

The forecasted spread between ULSD Reference and PSE LNG ("Reference Case Spread"), as expressed in USD per diesel gallon equivalent ("DGE"), is significant and can support investment in engine conversion and LNG fueling infrastructure in the heavy duty trucking, and as explained below, the marine markets.



- The marine market currently uses slightly heavier and therefore slightly less expensive grades of marine fuel oil than ULSD. This is expected to change in 2015 when local and coastal marine fleets must use fuels that emit <0.1% sulfur content when burned. Beginning in 2015, the forecast assumes that the price of 0.1% marine fuel equals the price of ULSD Reference. The spread between marine fuel and LNG and ULSD Reference and LNG will be significant enough to support conversion of vessels to LNG.[8]

- Forecasted price spreads between LNG and ULSD under the AEO2012 EIA "High Oil" and "Low Oil" cases are shown in Appendix A.

Environmental

- In the marine and heavy duty trucking markets, in addition to economic advantages of natural gas as a fuel, environmental regulations are also driving the move towards cleaner fuels such as natural gas.

- For the marine market, the US Environmental Protection Agency ("EPA") sets air emission standards under MARPOL Annex VI rules. These rules provide for limits for emissions of sulfur oxides ("SOx"), nitrogen oxides ("NOx") and particulate matter ("PM") applicable to US-flagged ships and foreign-flagged ships operating in US waters.[9]

- For the trucking market, as of December 2010, all heavy duty tractors are required by the EPA to use ULSD in order to comply with EPA standards. Some states further restrict air emissions, requiring national and interstate fleets to comply with the most restrictive standards in their operating area.[10]

- The reliance on higher grade fuels in these two markets puts upward pressure on cleaner diesel, such as ULSD. While crude oil and natural gas have strong price spreads, refined oil products, particularly ULSD command an additional premium above the crude price as refining costs are factored into the price and demand for ultra-light diesel grows. As such, stricter environmental regulations further expand the price spread between oil and natural gas-based transportation fuels.

- Both the marine and trucking market must rely on cleaner fuels such as natural gas to meet future sulfur and nitrogen oxide emission standards or they must rely on add-on technology, such as exhaust gas scrubbers, along with lighter grades of diesel fuel, to comply with the standards. These clean air standards, combined with the price spread between oil based fuels and natural gas based fuels, make conversion to LNG and CNG (for lighter transportation vehicles such as cars and light duty trucks) very attractive to reduce emissions and costs as compared to other alternatives to meet emissions requirements.

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8 See Figure 4 and Figure 6 below

9 As of August 1, 2012, the maximum sulfur content of fuel oil used within the Emissions Control Area ("ECA") around North America (generally 200 miles from the coast) will be limited to 1%. As of January 1, 2015, this falls to 0.1%. NOx emissions will be further restricted as of January 1, 2016.

10 For example, trucks operating in California must comply with California standards for reduction in particulate matter that are slightly more restrictive than in other states. Given that the major transportation corridor leaving the market area is interstate highway I-5, heavy duty long-haul trucks leaving the market area will likely have to comply with California air emissions standards.

IV. EVOLUTION OF DEMAND

a. Marine market

Factors influencing evolution

The evolution of demand for LNG in the marine sector is driven by several factors including:

- The forecasted sustainable price spread between oil-based clean marine fuel and LNG.
    - This includes a pricing structure between buyer (fleet owner) and seller (PSE) that allows, under multiple oil and gas price scenarios, recovery of invested capital costs of both parties over a reasonable payback period.
- PSE's willingness and ability to produce LNG for use in the market area.
    - The partnership and risk balance that is evolving between PSE, in contemplating the construction of LNG production capacity, and the potential marine customer base is a key driver in this sector's market evolution. The marine market is relatively concentrated, with few major players dominating the potential LNG conversion market (as compared to trucking fleet markets which are disaggregated). Both parties (PSE and the marine customer) must invest significant capital in infrastructure – PSE in liquefaction and storage, the customer in delivery methods, on-board engine retrofit and storage – for LNG to be considered a reliable, available alternative to oil-based marine fuel.
- The implementation of more restrictive EPA emissions requirements
    - Fleets will have several choices to make regarding compliance including the cost of installing emissions reducing equipment on-board the vessel. Maritime Executive recently reported that emission reduction equipment has technological and other challenges (deck space, increased fuel consumption) that may make LNG a better compliance alternative.
    - PSE's LNG plan is important to marine vessel owners to provide evidence to EPA and United States Coast Guard ("USCG") that implementation of LNG fueling is a viable option for compliance. In TOTE's case, an LNG implementation plan was an important factor for TOTE to gain approval from the EPA and USCG for a small but important delay in ECA compliance. This delay could give vessel owners the necessary permitting, engineering, design and construction window to convert to LNG versus install emissions reduction equipment.

- PSE's support of vessel owners in any EPA or USCG regulatory review of LNG conversion plans will help PSE gain market share in this sector.

- The ability for the converted fleet to find sources of LNG in expected trade routes and in the aftermarket.

    - Similar to truck fleets that travel outside the market area, marine fleets must have refueling options in the expected trade where fleet is or may be deployed. If LNG is not widely available in North America and around the world, vessels reliant on LNG fueling may have lower portfolio value[11] and resale value than vessels relying on traditional oil-based marine fuels. The development or lack of development of LNG fueling in other global markets will also affect the re-sale value of LNG ships.

- Marine fleet owners must account for the incremental cost of conversion including the capital cost of LNG engine and on-board fueling system and/or the incremental cost of new builds

Fleet owners must take into account all expected capital and expense-related costs associated with conversion to LNG and weigh those against fuel and technology costs associated with burning an oil-based fuel. Costs for LNG conversion include i) capital costs for LNG storage and fuel systems, ii) expense costs associated with any reduction in ship commercial space resulting from on board storage, fuel and environmental compliance systems, iii) the commercial time lost during the conversion process (either loss of incremental sailing time during conversion or time spent in a shipyard), iv) training time for mariners and fuel handlers, and v) incremental costs associated with regulatory oversight of new fueling or compliance systems. In looking at fleet conversion costs, Concentric has not estimated costs for items (ii) through (v) as there is little or no publically available information associated with such costs and each fleet and vessel will consider these costs differently[12] and review them against similar costs they will alternatively incur to install and operate exhaust gas scrubbers and Selective Catalytic Reduction ("SCR") on-board the vessels. As such, Concentric does not believe these other factors will substantially diminish forecasted LNG demand in this sector.

11 Fleet owners rely on the flexibility within their fleet to meet financial goals. If parts of the fleet cannot be used in multiple locations due to fuel availability restrictions, the overall value of the fleet is reduced.

12 This will be information that PSE will likely gather in conversations with its customers.

PSE's Role

- The demand for LNG as a marine fuel resides in a very concentrated set of customers. It is therefore important for PSE to understand the unique needs and wants of each potential customer.

- Capital investment by the customer and by PSE must be tightly coordinated. Given the demand from individual vessels once converted to LNG and the impact this demand can have on PSE's expected return from the proposed LNG facility, PSE and its potential marine customer must work in tandem to ensure LNG supply and LNG demand are as closely coordinated as possible.

- PSE should take an active role in the operational requirements associated with fueling marine vessels. Rules and regulations regarding marine fueling using LNG are under review with formal and informal stakeholders such as USCG, classification societies such as DNV and ABS, the International Maritime Organization ("IMO"), ship owners, fuel providers, LNG suppliers, equipment manufacturers, and consultants. Although PSE may ultimately play the role of LNG supplier and leave others technically, operationally and legally responsible for the custody transfer of LNG onto vessels, during this stage of LNG adoption, PSE must understand the requirements of LNG fueling and on-board storage of LNG. This is important in the timing of a customer's requirements for LNG; such timing will affect the demand growth served and economics of PSE's proposed LNG production facility.

- PSE can also work with other regional and national LNG suppliers that may provide LNG outside PSE's market area. Certain fleets need assurance that LNG will be available to vessels at multiple locations in their forecasted trade. For example, Horizon operates its fleet out of multiple locations along the Pacific coastline including Tacoma, Oakland, and Los Angeles as well as in Alaska and Hawaii. PSE can work with other utilities and LNG marine fuel providers to promote the development of marine fuel infrastructure in major ports within the ECA of the western US, Alaska and Hawaii. In addition, cruise ships operating within the ECA on the US west coast are also interested in converting to LNG but cannot do so unless LNG as a port fuel is developed in both the PSE market area (for Seattle/Vancouver to Alaska voyages in the winter) and the Southern California and Mexico markets (for winter voyages).

Determining inventory and expected fuel use of potential conversion fleets

Concentric relied on multiple sources to determine an inventory of marine fleets and vessels in the market area[13] including:

[13] Detailed marine fleet inventories, characteristics, owners, annual mileage estimates and evolution calculations will be provided to PSE in an Excel workbook. Data is summarized in Appendix C.

- Puget Sound Maritime Emissions Survey, 2007
- Washington Legislature Joint Transportation Committee report, 2012
- Washington State Ferries – Glosten Associates reports and presentations dated 2010, 2011 and 2012
- US Army Corps of Engineers Waterborne Statistics
- American Association of Port Authorities – Port Industry Statistics
- Northwest Ports Association
- Company websites

Vessels were then cross-referenced via United States Coast Guard (USCG) Vessel Documentation Database and Marine Traffic Database

Concentric then determined annual fuel requirement of certain vessels operating in the market area using multiple forecast methodologies and references including:

- Horsepower and annual mileage of vessel[14]
- Estimates from various industry reports including American Clean Skies Natural Gas for Marine Vessels, April 2012
- Route and schedule of vessel
- Multiple industry websites and presentations

Concentric then assumed that that any net incremental investments[15] in on-board LNG engine and fuel systems equipment would be recovered over a ten year period at a discount rate of 15% based on the annual estimated mileage for the vessel. Based on forecasted Reference Case Spread, [16]annual diesel use should be at or above the breakeven annual DGE threshold in order for the investment to make economic sense.

Figure 4 shows the approximate annual diesel gallon equivalent ("DGE") consumption that is necessary to break even on the conversion investment. Investment period is assumed to be ten years with IRR of 15%. This assumed IRR represents a relatively conservative assumption with regard to the break-even analysis.

Figure 4

		Reference Oil Case	
	Investment	Breakeven Annual DGEs	Breakeven Annual LNG Gallons
Tugs	$7.2M	239,679	402,660
Ferries	$12M	399,464	671,100
Ships	$20M	665,774	1,118,500
	$30M	998,661	1,677,751
	$40M	1,331,548	2,237,001

14 Information provided in the Puget Sound Maritimes Inventory report is based on 2005 reported figures. An updated report and inventory should be available in late 2012 but was not yet available for this assessment.

15 Investment estimates based on industry sources including American Clean Skies Foundation, Natural Gas for Marine Vessels, April 2012

16 Since marine vessels in North America must comply with a 0.1% sulfur cap starting in January 2015, the analysis assumes that 0.1% marine fuel and ULSD have the same commodity price in the market area for the period 2015 forward.

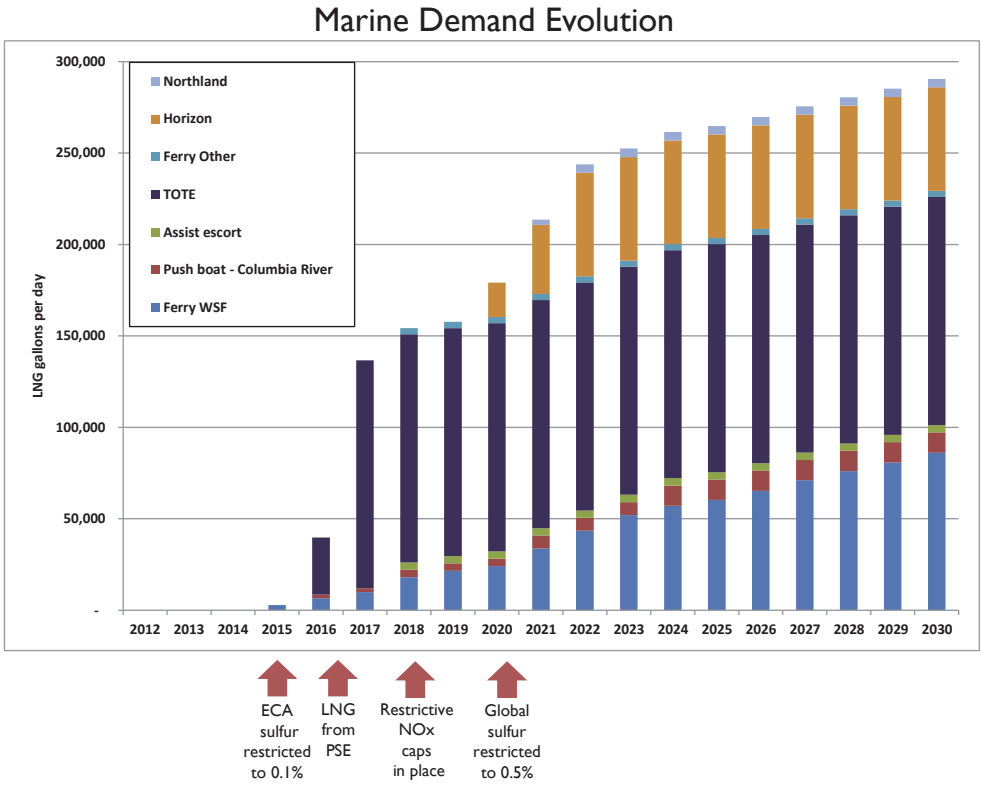
Of the vessels meeting annual estimated mileage needed to cover conversion investment costs, conversion dates for fleets and vessels are then estimated based on:

- Public information regarding intent to convert (WSF and TOTE)
- Environmental regulation drivers
- Regulatory or technical considerations associated with the use of LNG
- Availability of LNG from PSE or other market sources in vessel's anticipated trade route

Reference Case Evolution - Marine

- As shown in Figure 5 below, the LNG marine fuel market could exceed 170,000 LNG gallons per day by 2020.
- Cruise, ocean going, and other vessel conversions (designated "not active" below) may take place after 2020, but the location of LNG fueling alternatives in North America and around the world is currently the limiting factor.

Figure 5



b. Heavy duty trucking market

Factors influencing evolution

The evolution of demand for LNG in the heavy duty trucking sector is driven by the following primary factors:

- The forecasted sustainable price spread between ULSD and LNG
    - This includes a pricing structure between buyer (fleet or fueling station owner) and seller that allows, under multiple oil and gas price scenarios, recovery of invested capital costs of both parties over a reasonable payback period.
- In addition to the availability of LNG for use as a distributed fuel in the market area, the development of LNG fueling infrastructure outside the market area to support conversion of national and interstate fleets.
    - There is a certain amount of risk sharing that must take place among the LNG producer, the LNG distributor, and the LNG customer for the LNG truck transportation market to develop in the market area. The availability of LNG along major transportation routes outside the market area will have strong influence on demand evolution.
    - As shown later in this document, national fleets show the highest initial and overall potential for conversion to LNG. This is largely because of their ability to absorb financial and operating risks associated with LNG conversion, technology and training synergies among national operating fleets, and cost benefits of large scale conversion to a more economic fuel supply. In order to serve the needs of the national fleets, PSE should consider becoming part of a larger network of LNG suppliers to the market. Cooperation among LNG suppliers and distributors is necessary to build up the regional infrastructure that will support demand for LNG. This may result in PSE's role in the LNG fueling supply chain to be either more or less than originally expected.[17]
- The incremental cost of LNG engines/vehicles and LNG fueling station
    - LNG tractors currently cost approximately 30% more, or approximately $75,000 (including excise tax), than diesel tractors.
        - The analysis assumes that the incremental cost (and excise tax) of the LNG tractors is borne entirely by the customer

[17] PSE could simply play the role of LNG supplier or, in order to stimulate market adoption, PSE may have to work with partners or the customers themselves to develop fueling infrastructure to serve potential marine and transportation customers.

- The analysis also assumes that the tax "penalty" (LNG engines/fuel systems cost more than diesel; excise tax is paid on the total cost of the LNG system) continues throughout the forecast period.

- The analysis projects that there is no "salvage penalty" for the LNG tractor aftermarket. Given the LNG tractor market is in the early stages of development, there is the risk that the aftermarket for LNG tractors (primarily resale to overseas trucking companies) does not develop. Concentric believes that this aftermarket issue is offset by the industry expectation that LNG tractors will have a longer useful fleet life in North America.[18]

- As shown in Figure 6 below, using ULSD Reference prices, fleet owners could recoup their incremental investment (IRR would be greater than 0%) if the tractor averaged between 20,000 and 40,000 miles annually over a five-year period.

Figure 6

IRR	Annual Mileage					
	20,000	40,000	60,000	80,000	100,000	120,000
Low Case	(49.27%)	(36.43%)	(26.62%)	(18.13%)	(10.35%)	(2.98%)
Reference Case	(1.41%)	46.74%	113.38%	241.55%	679.17%	NA
High Case	40.73%	215.18%	NA	NA	NA	NA

- Assumes public fueling station charges minimum of $0.10 per LNG gallon[19] to recover the investment of the public fueling facility
- Low Case Breakeven at 170,000 miles

- A private, single fleet LNG fueling station can cost as much as 1-2 MUSD.
  - A fleet customer absorbing this cost must have significant centralized diesel requirements (either multiple trucks or multiples of miles per truck (as shown above in Figure 6) or combinations of the two as shown in Figure 7) in order to pay off the cost of the fueling station.
  - Figure 7 below provides indicative IRR on investment to gauge whether fleets can support the cost of private, centralized fueling

[18] In August 2011, Chuck Gordon, President and Chief Operating Officer of Heckmann Resources, stated that their expectation is that an LNG tractor purchased by Heckmann Resources in 2011 will have a useful life of over seven years versus a diesel tractor that has a useful life of only five years.

[19] The 2012 NACS Retail Fuels Report stated that retail fuel distributors have a 5-year average mark-up of 15.8 cents per gallon. This equates to approximately 10 cents per LNG gallon.

Figure 7

IRR	Annual Mileage					
Number of Trucks in Fleet	30,000	55,000	80,000	105,000	130,000	155,000
5	(42.64%)	(29.30%)	(18.42%)	(8.56%)	0.86%	10.15%
10	(30.80%)	(12.41%)	3.91%	20.07%	37.07%	55.73%
15	(23.27%)	(0.83%)	20.48%	43.28%	69.53%	101.73%
20	(17.81%)	8.06%	34.09%	63.92%	101.43%	153.12%
25	(13.60%)	15.27%	45.77%	83.00%	133.98%	213.57%
30	(10.22%)	21.28%	56.05%	100.98%	167.88%	287.41%
35	(7.43%)	26.42%	65.22%	118.12%	203.61%	380.82%
40	(5.09%)	30.87%	73.51%	134.57%	241.60%	503.65%
45	(3.09%)	34.78%	81.06%	150.45%	282.24%	673.16%
50	(1.35%)	38.24%	87.98%	165.82%	325.96%	922.86%

Based on fueling station cost of $1.5 M, payback period of 5 years, Reference Case Oil

- Availability of public LNG fueling stations

  - Availability of LNG along high-traffic trucking routes is essential to the development of the heavy-duty trucking market. LNG tractors can currently travel approximately 200-600 miles per LNG fill-up using currently available LNG tractor equipment. Most national and long haul fleets will want a network of LNG refueling stations every 100-200 miles in order to ensure adequate refueling capability.

- Availability of Original Equipment Manufacturer ("OEM") heavy duty LNG truck engines

  - The analysis assumes that demand in the LNG trucking market will be stimulated by the availability of high performance, mass-produced LNG OEM engines beginning in late 2013 and early 2014 from Westport, Cummins, Navistar and Volvo.

  - Mass production of LNG engines and tractors should serve to drive down incremental costs of LNG tractors. Concentric has not assumed such a benefit in this analysis.

- Cost and availability of compliance options regarding EPA clean fuel requirements

  - Concentric does not explicitly quantify the implementation of tighter clean air standards as they relate to the demand evolution for heavy duty trucking. However, the impact of the clean air standards is accounted for in the ULSD Reference price premium expectation and therefore, a larger spread between ULSD and LNG.

- DGE tax penalty for LNG

  - Since an LNG gallon has energy density 40% lower than diesel yet is taxed on a per volumetric gallon basis, LNG currently has an effective federal tax penalty as compared to diesel.

- The analysis assumes this will be resolved in 2013 making the tax applicable to both diesel and LNG on an energy (versus volumetric gallon) equivalent basis. This serves to slightly increase the spread between ULSD and LNG.

While a sustained price advantage of LNG over ULSD is the most important determining factor in the evolution of demand in the trucking sector, Concentric also identified other key events that will influence the timing and magnitude of demand growth. PSE requested Concentric estimate the evolution of demand over the ten year period starting in 2015 (beginning with demand prior to the in-service date of a proposed liquefaction facility in late 2016 and including demand during the first 8-10 years of the investment cycle), Concentric focused on short and medium term key events that will influence market growth.

2012:	National fleets (UPS, Ryder, FedEx) start adopting LNG technology creating more public and fleet awareness of price benefits, technology advancements and LNG availability
2013:	The elimination of the LNG gallon tax penalty creates more economic incentive for fleets to convert
2014:	New widely mass-produced engines and technology improvements in performance could make the switch to LNG more realistic for longer haul trucking fleets
2015:	New emission regulations will increase the demand and consequently the cost of ULSD in the Puget Sound area, making LNG more economical for many fleets
2017:	Supply from a proposed new LNG facility could be available (the analysis assumes LNG is available from existing sources of supply prior to 2017). This stimulates growth in all segments but, in particular, local fleets
2018:	The dispersion and spacing of on-highway LNG refueling stations will encourage more fleets to consider LNG (dissipating fear of running out of fuel while on a run). This can also eliminate fueling facility capital costs for smaller customers interested in converting.

PSE's Role

By developing local LNG production capacity, PSE could facilitate the market development of fleet use of LNG. Since fleet owners identified "lack of LNG infrastructure" as the most critical factor they consider in conversion to LNG, providing LNG to the market and/or supplying LNG to fuel distributors sends a critical positive signal.

Effort put forth by PSE to support LNG as a vehicle and marine fuel infrastructure in the market area as well as on a regional and national basis is a key factor in helping develop LNG as a transportation fuel. This support can take the form of:

1) coordination among utilities in Washington, Oregon, Northern California and southern British Columbia to supply LNG and/or build LNG fueling infrastructure,

2) providing LNG supply to developers of LNG fueling infrastructure such as Shell, Clean Energy, Linde and others.[20]

Supporting federal, state and local economic and environmental incentives for fleet owners and infrastructure providers is also an important role for PSE.

1) On a national level, PSE can establish and maintain contacts with industry organizations that promote the use of natural gas as a transportation fuel such as NGVAmerica, American Clean Skies Foundation, and the National Petroleum Council.

2) On a state and local level, PSE can work with governmental and environmental organizations such as Washington's Joint Transportation Committee and other industry organizations to promote market adoption of LNG.

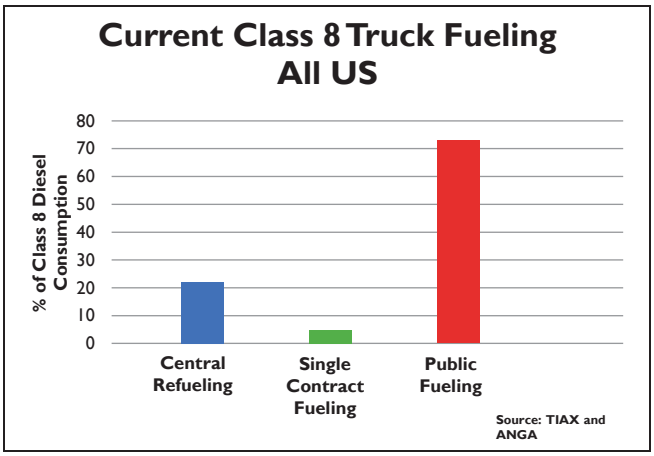
PSE can also work to ensure LNG safety and security is a perceived benefit, not a deterrent, to large scale adoption of the fuel. LNG has low market penetration and is widely perceived by the general public as a dangerous fuel. Large scale LNG import and export facilities proposed in the Pacific Northwest have received significant negative publicity, with safety and security driving local opposition to these facilities. PSE and its customers and partners must work jointly to ensure the public is well informed about LNG safety and security.

Last, the existing diesel fuel supply distribution chain is important in understanding customer behavior and preferences. The majority of heavy duty fleets refuel at public diesel fueling stations. While private fueling may be PSE's preferred distribution method – return to based fleets with on-site private LNG fueling infrastructure – the market's existing preferences for public fueling will likely drive demand.

[20] Clean Energy is developing "America's Natural Gas Highway" and plans to install up to 150 LNG fueling stations in the United States by the end of 2013. Shell has developed a partnership to provide LNG fueling at Pilot Flying J facilities across Canada.

Figure 8

PSE must consider existing fleet refueling habits in order to understand potential demand. As shown in Figure 8, most fleets refuel at public stations. As such, PSE may consider partnerships with current fuel distributors, national gasoline companies, and natural gas and diesel distributors like Shell and Clean Energy.



Determining inventory and expected fuel use of potential conversion fleets

Concentric relied on various local and national fleet databases, government references and industry sources to compile an inventory of fleets in PSE's market area. Included in this information is source data from.

- U.S. Department of Transportation, Federal Motor Carrier Safety Administration
- Department of Transportation, Washington State
- Washington Trucking Association
- EIA
- TIAX report for America's Natural Gas Alliance, "Liquefied Natural Gas Infrastructure"
- Clean Energy Fuels 2011 Annual Report; Clean Energy website information on America's Natural Gas Highway ("ANGH")
- CenterPoint Energy, "Building a Business Case for NGV's"
- National Petroleum Council, "Advancing Technology for America's Transportation Future." August 2012
- PLS Logistic Service, "Use of LNG-Powered Vehicles for Industrial Freight"
- National Energy Policy Institute, "What set of Conditions Would Make the Business Case to Convert Heavy Trucks to Natural Gas? – A Case Study", November 2010
- University of Chicago, "Natural Gas and the Transformation of the U.S. Class 8 Trucking Fleet." May 2012

The summary data provides fleet name, location and estimated or actual size of fleets doing business in the market area based. Size of national fleets doing business in the market area is based on per capita income of Washington versus other US states. In addition, interstate and intrastate fleet data

is used to estimate market growth based on location, number of tractors per company,[21] estimated annual miles driven per tractor,[22] percentage of fleet owned versus leased, the type of cargo carried,[23]

Concentric divided the fleet data into the five categories below and assessed the evolution of demand in each of the categories separately.

Figure 9

Fleet	Characteristics	Impact on Demand Evolution
National	Overall size determined for national fleets, fleet size per state estimated/researched	More total tractors, could rely on internal network of fueling stations for long range trips/not necessarily reliant on NGHW, converting to LNG has marketing appeal
Interstate long range	Interstate fleets with majority of trips greater than 100 miles, DOT	Needs NGHW to convert, but will convert quickly once it is established because of economics/ # of tractors
Interstate short range	Interstate fleets with majority of trips less than 100 miles, DOT	Needs NGHW to convert, not as economical as long range fleets due to lower mileage, slower adoption rate
Intrastate long range	Intrastate fleets with majority of trips greater than 100 miles, DOT	Hesitant without NGHW, but higher mileage makes converting more economical
Intrastate short range	Intrastate fleets with majority of trips less than 100 miles, DOT	No broad scale LNG infrastructure required, but less mileage and generally smaller fleets make adoption less economical and therefore much slower

Reference Case Evolution – Heavy Duty Trucking

Based on the economics of conversion (total cost, miles driven) combined with the key milestones shown in Figure 9 Concentric estimated market demand for LNG from the heavy duty transportation market to reach over 100,000 LNG gallons per day by 2020 and over 520,000 LNG

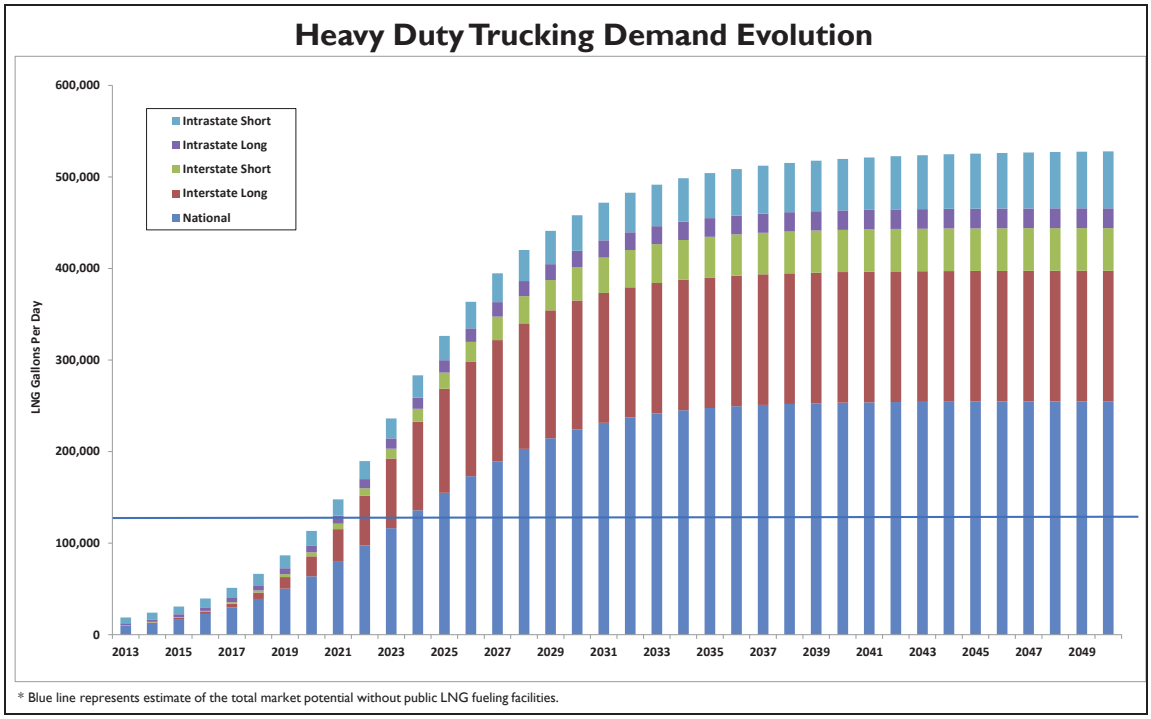
21 Tractors per company location is an important metric to determine the financial viability of on-site LNG fueling. Since the cost of an LNG fueling station is between 1-2 MUSD, there must be sufficient fleet size (and miles per tractor) to pay for the cost of the fueling station. The analysis assumes the fueling station capital investment must be paid back over 5 years to coincide with the life of the LNG tractor(s).

22 Miles driven per tractor is also an important metric to determine the financial viability of the higher cost of LNG tractor.

23 Type of cargo carried can help PSE determine whether the fleet is return-to-base and/or has fueling characteristics that may allow for overnight refill such as CNG slow fill.

gallons per day by 2050. The majority of this demand occurs in the national and interstate long haul fleet categories.

Figure 10

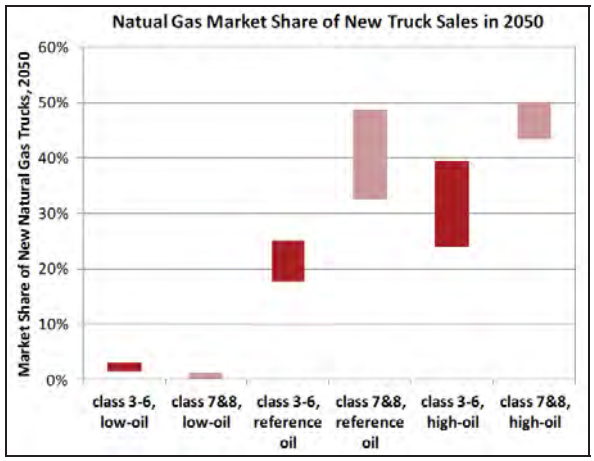


Concentric believes that the establishment of regional and national fueling infrastructure is a key element for successful adoption of LNG by the trucking industry. If demand were limited to fleets dependent **only** on on-site fueling, demand growth is probably limited to approximately 120,000 LNG gallons per day as shown by the blue line in Figure 10 above.

In its recent study,[24] the National Petroleum Council ("NPC") estimates that natural gas (mostly in the form of LNG) will capture between 32 and 49% of the heavy duty truck transportation new truck sales by 2050.[25]

24 Advancing Technology for America's Transportation Future dated August 1, 2012
25 Using EIA Reference Price Scenario oil prices

Figure 11



Source: National Petroleum Council

Based on current diesel use for on-road transportation in Washington State of 1.7 million diesel gallons per day[26] or 2.8 million LNG gallons per day, and assuming 65% of this consumption occurs in PSE's market area, Concentric's projection for 2050 of approximately 520,000 LNG gallons per day of demand (approximately 28% of the 2010 consumption) falls under the low end of the NPC Reference Case forecast.[27]

26 EIA Independent Statistics and Analysis, On-Highway Diesel Use 2010

27 The analysis assumes that increases in heavy duty truck miles driven in the market area through 2050 are offset by fuel efficiency improvements

c. Rail market

Factors influencing evolution

The evolution of demand for LNG in the rail sector is driven by several factors including:

- The forecasted sustainable price spread between ULSD and LNG (see above)
- Available LNG in the market area but also along major rail routes serving the Pacific Northwest and to the east and south
- Stricter EPA rules regulating air emissions for rail locomotives
- Development of rail engine technology
    - Advancements in LNG locomotive engine technology remain in the pilot stage. A good example of this is in eastern Canada where GazMetro and Canadian National Railroad will develop a prototype hybrid locomotive (diesel and LNG) that *could* begin operation in 2013. The project proponents believe pilot testing is far in advance of commercial use of LNG as a locomotive fuel.
    - GE and Shell have also formed a research project to develop dual-fuel rail locomotives but no commercial development timelines have been publically announced
    - No commercially available dedicated LNG or dual fuel engines are at commercial stages of development at this time

Determining inventory and expected fuel use of potential conversion fleets

Concentric assessed the railroad demand for diesel use in Washington. BNSF is the primary rail service provider in western Washington; Union Pacific operates mostly in the eastern half of the state.

Concentric estimates demand for LNG in the market area could be as high as 50,000 LNG gallons per day[28] if LNG replaced diesel fuel on major rail routes.[29]

Figure 12

Rail service provider	Route	Miles	Freight train frequency	Passenger train frequency	Total Miles	High Level Estimate LNG Gallons per Day	Per Train
BNSF	Seattle-Everett	30	40	8	1,440	4,608	96
BNSF	Everett-Spokane	300	25		7,500	24,000	960
BNSF	Seattle-Portland	177	50		8,850	28,320	566

Rail demand has not been included as part of the demand evolution for PSE. Current technology limitations cannot be overcome in the short term. Demand could start to develop after 2020 but in limited form.

Last, rail transportation of goods competes directly with over-the-road trucking. To the extent LNG is widely adopted as a transportation fuel in the heavy duty trucking market, any development of LNG use in rail could indirectly reduce demand for LNG as a trucking fuel.

[28] Based on an average mile per gallon of diesel at 0.5.

[29] Major rail routes in western Washington are Seattle to Everett, Everett to Spokane and Seattle to Portland. BNSF is the operator of all conversion routes studied.

d. Industrial thermal conversion market

Factors influencing evolution

The evolution of demand for LNG in the industrial thermal conversion sector is driven by several factors including:

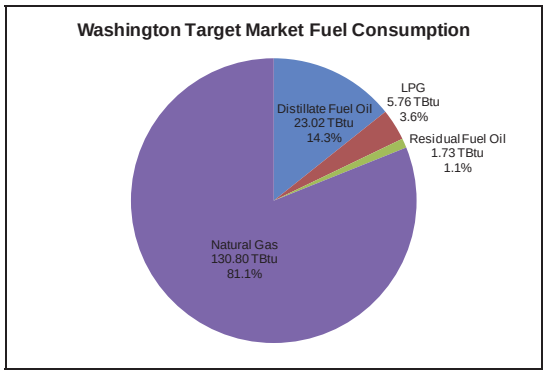
- The forecasted sustainable price spread between oil based stationary fuels such as distillate oil and propane, and natural gas. Natural gas can take the form of pipeline gas, distributed LNG or distributed CNG depending on the customers distance from the natural gas source and the annual load of the customer.
- Ability of customer or fuel supplier to change out on site equipment and provide site space for LNG or CNG equipment.

Determining inventory and expected fuel use of industrial conversion customers

Concentric assessed the industrial thermal conversion demand by reviewing PSE's market area. In that effort, Concentric:

Figure 13

- Assessed natural gas market share relative to other fuels consumed in Washington. Natural gas consumption is relatively high as a total percentage compared to other US states.



Source: EIA

- Gathered a comprehensive list of fuel burning facilities in the PSE market area based on air emissions

- Eliminated certain facilities based on pre-determined filters:
  - Companies located in an existing LDC service territory
  - Companies located within 10 miles of the LDC territory or a natural gas pipeline
  - Low energy intensive industries such as financial services, retail
  - Companies using self-provided biomass to generate energy (paper, lumber)

- Inventory remaining consisted of only two potential customers - Nippon Paper Industries in Port Angeles and TransAlta Centralia Mining in Centralia (currently not operating)

- Industrial conversion does not present a viable LNG demand source for PSE at this time

e. LNG to CNG

Factors influencing evolution

In the light duty vehicle market, there is demand for CNG in the PSE market area. Lighter duty trucks (Class 3-6), car fleets, and small vehicles such as forklifts and other operating equipment do not need the range or density of LNG in order to use natural gas as a fuel

CNG made from LNG saves power costs associated with compression. However, producing LNG at a central location, trucking it to an off-site fueling facility, then converting the LNG back to CNG is not economical as compared to producing CNG from pipeline gas.

Determining inventory and expected fuel use of potential conversion fleets

Concentric considered potential CNG demand for trucking. Certain short range truck and bus fleets could find CNG to be an acceptable transportation fuel as compared to LNG if the vehicles make short trips, return to base each day, and spend off-hours at slow-fill CNG fueling stations. As stated above, CNG from LNG may not initially compete with CNG from pipeline gas. Concentric has not included demand from this segment in forecasted LNG demand growth.

Concentric also surveyed yard vehicles in ports – forklifts, yard tractors, and cranes – as potential CNG conversion targets. Currently, there is only one commercially available CNG forklift available in the market. However, to the extent LNG and CNG become more readily available in ports, manufacturers may look at this market for potential development. Most port vehicles have long lives (over 10 years); as such, Concentric does not believe this market provides for growth opportunity for at least 10-15 years.

Other considerations

Clean Energy operates five public CNG fueling facilities in the Seattle-Tacoma area, with current delivered prices between 1.80 and 2.25 per CNG gallon

Although the CNG produced on-site at an LNG fueling facility could be competitive as compared to CNG produced from pipeline gas, Clean Energy and other CNG providers have already established contractual and locational relationships with existing and potential CNG fleet customers

There is opportunity to provide LNG to CNG as an additional on-site fuel to the extent PSE or its downstream partners are successful in capturing fleet markets served via on-site LNG fueling infrastructure; however, this on-site market is very limited.

While there may be some LNG to CNG demand that evolves over time, Concentric conservatively assumes that LNG to CNG is not a source of incremental LNG demand in the demand evolution projections.

V. COMPETITION AND PARTNERS

PSE is working to provide a source of LNG for use in the market area. Given the potential demand for LNG and the public announcements of both TOTE and Washington State Ferries regarding their intention to convert to LNG, PSE should expect significant competitive and cooperative interests from LNG and other fuel suppliers both regionally and nationally. Below is a summary of potential parties:

Shell
Shell is very active in distributed LNG applications, forming partnerships with potential LNG supply chain participants to develop and market the necessary equipment and infrastructure that supports LNG market growth. Shell recently acquired Gasnor, a provider of LNG and related services to the marine and trucking markets in Europe. Additionally, Shell announced a partnership with Pilot Flying J to develop LNG fueling infrastructure in Canada. Additionally, Shell has formed infrastructure partnerships with Westport Cummins for LNG truck engines, Wartsila for LNG marine applications and GE for LNG locomotive applications.

Shell owns and operates the Puget Sound Refinery in Anacortes, Washington and supplies refined oil products, including ULSD, to the region.

Shell could be a major competitor to PSE in the event Shell develops LNG production infrastructure in the market area. In the alternative, Shell could be a customer of PSE in the development of public LNG fueling stations in southern British Columbia and/or Western Washington.

BP
Although BP has not yet publically announced plans for distributed LNG demand and infrastructure development, BP is internally studying distributed LNG markets. BP owns the Cherry Point refinery located in Whatcom County. BP provides the majority of marine fuel to customers in the Puget Sound area.

BP has a long history in large scale LNG projects. Given the potential for BP to give up marine and trucking diesel market share to PSE's LNG, BP might attempt to develop LNG capabilities themselves. BP may also contract for PSE's plant capacity and distribute the LNG to end users in the area.

Both BP and Shell have large international energy portfolios and are both actively pursuing LNG export opportunities in Canada and Alaska. In order for PSE and its customers to ensure the spread between LNG and ULSD/low sulfur marine oil is sufficient, companies like BP and Shell may be able to take the risk of spread maintenance into these large financial portfolios. Smaller companies like PSE, Clean Energy, LNG customers and motor fuel distributors may not have the creditworthiness or risk tolerance to take such positions.

Clean Energy
Clean Energy is the US's largest developer of LNG and CNG infrastructure. Clean Energy owns multiple public CNG fueling stations in the market area and is considering developing at least two LNG fueling stations as part of the ANGH effort.

Clean Energy should be considered both a competitor (Clean Energy owns and operates LNG liquefaction capacity in Boron, California) and a partner/customer. It is likely that Clean Energy will not develop LNG production capacity in the PSE market area. Instead, it is likely that Clean Energy could develop on-highway LNG fueling infrastructure and rely on PSE for LNG supply.

As of 2011, Clean Energy received and continues to receive significant funding from Chesapeake Energy to develop natural gas demand. As such, most of Clean Energy's recent LNG fueling station investments have been in gas producing regions in the Marcellus, Utica, Eagle Ford and Haynesville.

Motor fuels providers in the market area

There are multiple diesel providers operating the market area including Love's Truck Stops, Union 76, Chevron, and Texaco, as well as petroleum distributors such as Associated Petroleum and SC Fuels. It is possible that any of these current motor fuels providers could finance LNG fuelling infrastructure and distribute LNG to fleets.

Given the reliance by heavy duty truck fleets on the availability of fuel from public fueling stations (see Figure 8 above), PSE's ability to reach the on-highway trucking market via distributors is important to consider. Developing relationships with current motor fuels distributors could be important to PSE in accelerating the rate of market evolution in the heavy duty trucking markets.

Marine fuel distributors

Although marine fueling infrastructure could remain between PSE and the handful of potential LNG customers in the market area, marine fuel distributors such as ChemOil could be interested in playing a role in the marine LNG distribution chain.

VI. CONCLUSIONS

As stated above, projected costs of LNG versus oil-based fuels like ULSD and low-sulfur marine fuel, environmental initiatives, and LNG engine and storage technology advancements, all contribute to the potential for significant market growth of distributed LNG in PSE's market area.

Since availability of LNG infrastructure is viewed by the market as the largest factor preventing wide scale adoption of LNG as a distributed fuel, especially as it relates to the marine and heavy duty trucking market, PSE's proposed LNG production facility could provide the market with the promise of future regional LNG supply.

The timing of the in-service date of PSE's proposed LNG facility is critical since

1) the spread between oil and gas-based fuels is currently at a high level; interest in natural gas as a transportation fuel is building rapidly,

2) large marine customers interested in converting to comply with ECA emission requirements must begin permitting, capital allocation, engineering, design and fleet planning to begin using LNG three to five years from now, and

3) distributors interested in investing in LNG fueling infrastructure for the on-road transportation market can be assured of a local source of LNG supply in a little over four years.

PSE's coordination efforts with other regional LNG suppliers can provide a network of LNG supply, adding to the reliability of the fuel and reducing risks for both customers and suppliers.

The demand for LNG in PSE's market area should be sufficient by 2020 to absorb the LNG production capacity contemplated by PSE.

Although not part of Concentric's scope of work, Concentric makes additional observations as follows:

- Regulatory jurisdiction of the LNG facility is an important consideration for PSE given the accelerated market expectations for development and commercial operations. This must be weighed against the future flexibility PSE may want in supplying LNG to markets that may require the proposed LNG facility to fall under FERC jurisdiction.

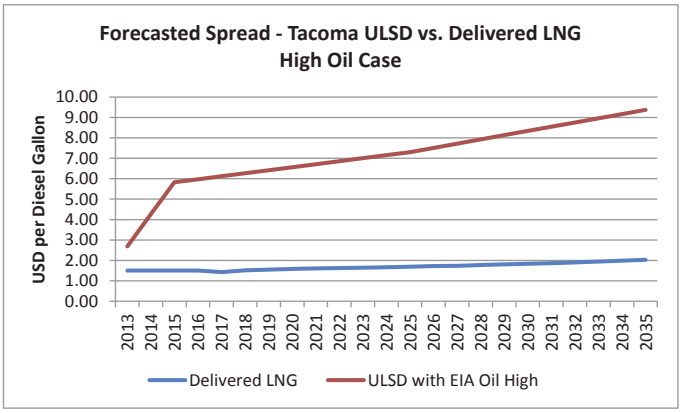
- Community outreach on a local and state level is important with regard to the siting of any energy facility. Given the history of LNG siting and past perception of the fuel as a safety and security threat, PSE may consider a comprehensive strategy to inform the public and government stakeholders that could support or oppose construction of the LNG production facility.

Appendix A – Alternative Price Scenarios

EIA High Oil

The high oil scenario shows a rapidly increasing the spread between gas and oil, especially during the period 2013 to 2015. In EIA high oil scenario, domestic natural gas prices remain decoupled from global oil prices. This is primarily due to North American supply dynamics - associated gas is abundantly available due to high levels of domestic oil drilling activity.

Figure 14

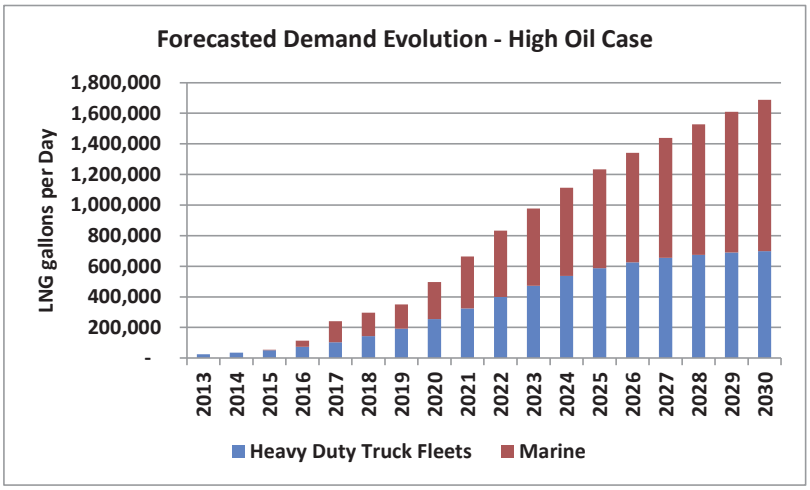


The increased spread leads to accelerated marine and heavy duty trucking adoption rates.

The forecast assumes the cruise sector begins conversion of fleets in 2020 as LNG as a marine fuel becomes available across North America. Global fleet conversion to LNG still lags as *global oil*, not *US natural gas*, drives LNG prices abroad.

The forecast also assumes trucking demand accelerates and increases as LNG becomes more available nationally and the spread widens.

Figure 15



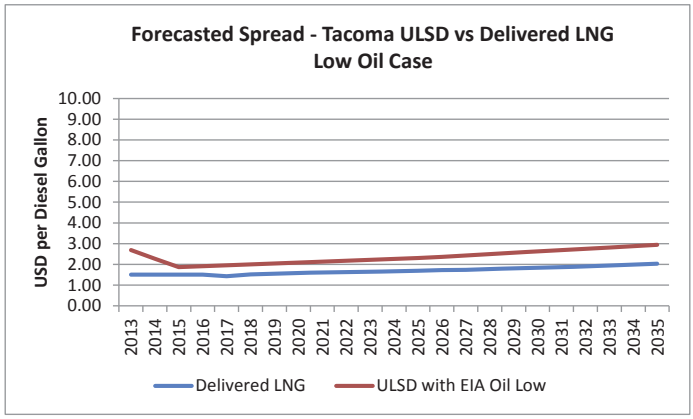
Appendix A – Alternative Price Scenarios (continued)

EIA Low Oil

The low oil scenario assumes the price of oil stabilizes at or below current levels and the spread between oil and gas remains at only an 8 USD per MMBtu level.

This spread slows significantly the wide adoption of LNG as a fuel as, in the trucking sector, the payback periods for incremental tractor costs are extended beyond the useful life of the tractor (5-7 years).

Figure 16



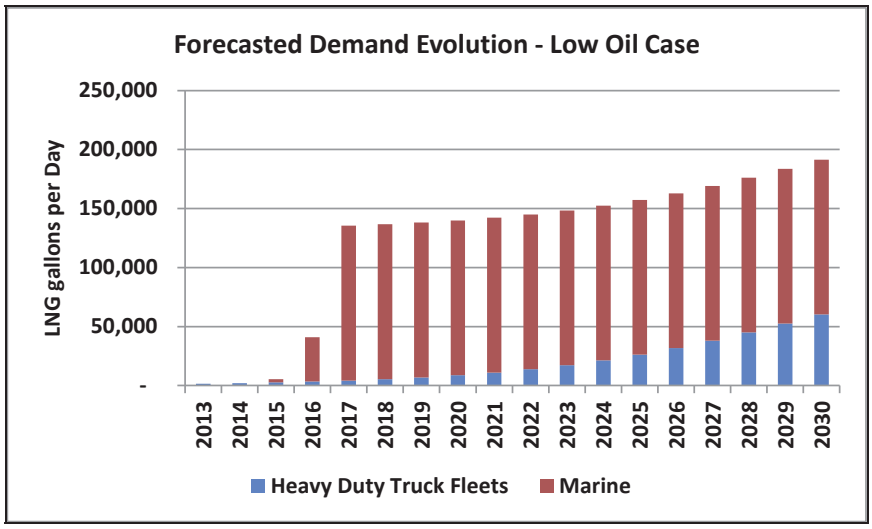
The decreased spread leads to very low marine and heavy duty trucking adoption rates.

The forecast assumes conversion of certain national fleets will continue but it is limited to 3-4 fleets in PSE's market area.

The forecast assumes TOTE completes its conversion to LNG and WSF converts two ferries. No additional marine demand transpires as options to meet clean air requirements can more economically be met by scrubbers and other technologies.

In this scenario, PSE's proposed LNG facility could be significantly underutilized.

Figure 17



Appendix B – Summary of Trucking Fleet Database

This database has multiple uses for PSE. First, the model includes all potential local and national fleets expected to do business in the market area. Expected demand from customers along with assumptions about market penetration of LNG, creates a market evolution forecasts for PSE. The evolution model can easily be adjusted if specific segments (national, interstate long haul etc) grow more rapidly or more slowly based on market information PSE is able to gather or scenarios PSE wishes to consider.

The tool also provides a comprehensive list of potential conversion customers including:

- Fleet size
- Location of fleet including relative to existing CNG infrastructure
- Cargo carried (trash, lumber etc)
- Estimated annual miles per tractor in the fleet
- Interstate or intrastate use of the fleet
- Number of tractors, buses/vans and other power units on site
- Lease or ownership of the equipment

The fleet model allows for sorting of the data - size, location, and type of goods, determination of IRR metrics for fleets, payback periods, and the impact of ULSD-LNG spread on conversion economics.

The fleet model provides the PSE sales team with specific information on each potential customer and can allow for scenario testing on each market segment or each fleet.

Inventory example

Legal Name	IRR	Tractors	Trucks, Vans, Buses	Total Power Units	Owned	Leased	% Leased	Miles/Tract	Miles/Van	Diesel Gallons	LNG Per Day	Miles/Vehicle
PACCAR INC		66	23	89	89	0	0.0%	50,000	50,000	733,333	3,375	10,494
RALPH'S CONCRETE PUMPING INC		64	11	75	75	0	0.0%	50,000	50,000	711,111	3,273	10,667
WASHINGTON TRUCKING INC		57	0	57	57	0	0.0%	130,000	50,000	1,140,000	5,247	58,683
TRIPLE B CORPORATION		56	88	144	144	0	0.0%	50,000	50,000	622,222	2,864	28,115
KING COUNTY SOLID WASTE DIVISION		55	10	67	65	0	0.0%	50,000	40,000	611,111	2,813	55,522
GARY MERLINO CONSTRUCTION CO INC		52	92	144	144	0	0.0%	50,000	50,000	577,778	2,659	10,861
M & M TRANSPORT INC		50	0	59	50	9	15.3%	80,000	50,000	727,273	3,347	76,446

Cargo	D&B #	Country	Street	City	County	State	Service Area?	ZIP	Shipper Type
General Freight	48341267	US	777 106TH AVE NE	BELLEVUE	33	WA	YES	98004	Carrier Interstate
Machinery, Large Objects	9504499	US	1529 RAINIER AVE SOUTH	SEATTLE	33	WA	YES	98144	Carrier Interstate
General Freight		US	2810 34TH ST	EVERETT	61	WA	YES	98201	Carrier Interstate
General Freight	173823147	US	4103 2ND AVE S	SEATTLE	33	WA	YES	98134	Carrier Interstate
Building Material	47848122	US	201 SOUTH JACKSON STREET SUITE 701	SEATTLE	33	WA	YES	98104	Carrier Intra/HazMat
General Freight	27452689	US	9125 10TH AVE SOUTH	SEATTLE	33	WA	YES	98108	Carrier Interstate
Logs, Poles, Beams		US	170 STATE HIGHWAY 508	CHEHALIS	41	WA	YES	98532	Carrier Interstate

Appendix B – Summary of Trucking Fleet Database (continued)

Scenario testing example

	Min # of Tractors	*Probability of Converison* 2013	2015	2016	2018	2020
Intrastate SR	11	10%	15%	20%	25%	30%
Interstate SR	8	0%	0%	0%	10%	15%
Intrastate LR	6	0%	10%	15%	20%	25%
Interstate LR	5	0%	0%	0%	0%	15%

Out of Top 200 National Fleets (# of Fleets Converting)					
Top Percentile (#)	0	0	0	0	1
Avg National (#)	5	10	15	50	75

	Tax Penalty Ends ISR Begin to Convert	Tech Improves ILR Convert	New Regs	Rough NGHW XSR Convert	Better NGHW XLR Convert

Appendix C – Summary of Marine Fleet Database

The information provided can be useful to PSE in determining overall market demand for marine LNG. In addition, when talking to companies who are considering conversion to marine LNG, PSE has a good understanding of fleet size, characteristics, and requirements for fuel.

Types and Companies

- Assist and Escort Vessels
- Harbor Tugs
- Pilot Boats
- Ocean Tugs
- Columbia River Ports – Tidewater Pushboats
- Columbia River Ports – Sause Brothers Shipping
- Washington State Ferries, other Puget Sound area ferries
- Cruise Vessels calling on Seattle
- Horizon Shipping
- TOTEM Shipping
- Northland Shipping

Information

- Name, vessel type, and USCG Vessel ID
- Owner
- Horsepower
- Hours in service per year
- Estimated diesel and LNG gallons per year
- Equipment age

Example

Vessel ID	Type	Hours	Age	HP	EPA Category	Propulsion Engines	Pounds of fuel per year	Diesel gallons of fuel per year	LNG gallons of fuel per year	With Engine Load Factor of 68%	Conversion Liklihood	Owner
559404	Ocean Tug	1500	1976	3500	1	2	2,625,000	330,189	554,717	377,208		Crowley
PSOTS	Ocean Tug	1423	1981	3070	1	2	2,184,305	274,755	461,589	313,881	*working on identifying owner*	
256829	Ocean Tug	5000	1974	850	1	2	2,125,000	267,296	449,057	305,358		Dunlap
567630	Ocean Tug	1620	1975	2150	1	2	1,741,500	219,057	368,015	250,250		Kirby
500126	Ocean Tug	3325	1980	900	1	2	1,496,250	188,208	316,189	215,008		Kirby
569517	Ocean Tug	1041	1986	1710	1	2	890,055	111,957	188,087	127,899		Dunlap
566082	Ocean Tug	1331	1975	1125	1	2	748,688	94,175	158,213	107,585		Dunlap

Appendix D – Summary of Rail and Industrial Database

The rail database summarizes the owner, routes traveled, and frequency of trips in order to estimate potential market demand for LNG. Although this market is not likely to generate measurable LNG demand in the market area in the immediate future, if engine technology advances and LNG fueling is more readily available along rail routes, there is potential for rail use of LNG in the next decade.

Example

Rail service provider	Route	Miles	Freight train frequency	Passenger train frequency	Total Miles	High Level Estimate LNG Gallons per Day	Per Train
BNSF	Seattle-Everett	30	40	8	1,440	4,608	96
BNSF	Everett-Spokane	300	25		7,500	24,000	960
BNSF	Seattle-Portland	177	50		8,850	28,320	566
BNSF	Portland-Pasco	233	31		7,223	23,114	
BNSF	Auburn-Pasco	227	6		1,362	4,358	
BNSF	Pasco-Spokane	147	33		4,851	15,523	
BNSF	Spokane-Sandpoint	69	46		3,174	10,157	
BNSF	Everett-Vancouver	155	24	4	4,340	13,888	
UP	Hinkle-Spokane	171	11		1,881	6,019	
UP	Spokane-Sandpoint	74	7		518	1,658	
					41,139		
			Diesel Gallons of Fuel per Day		82,278		
			LNG Gallons of Fuel per Day		131,645		

The industrial database provides customer listings, primary fuels and estimated load. Although this market is not likely to generate measurable LNG demand in the market area, the data is available for PSE's other research efforts.

Example

							EU1		
Facility Name	**Location**	**Industry**	**SIC**	**NAICS**	**Issuing Body**	**Permit**	**Primary Fuel**	**Secondary Fuels**	**MMBtu/HR**
Nippon Paper Industries	Port Angeles	Paper Products	2621		ORCAA	http://www.orcaa.org/	#6		236
TransAlta Centralia Mining, LLC	Centralia	Coal Mining Operations	1221	212111	SWCAA	http://www.swcleanai	Fuel Oil		NA
City of Spokane - Northside Landfill	Spokane	Landfill	4953		SRCAA	http://www.spokanecl	Landfill Gas	Propane	NA
City of Spokane - Spokane Regional Solid Wa	Spokane	Solid Waste Combustion	4953		SRCAA	http://www.spokanecl	Solid Waste	Natural Gas	183.33
KC Natl Resources Wastewater Treatment	Seattle	Municipal Wastewater Treatment	4952		PSCAA	http://www.pscleanair	Digester Gas	Propane	25.7

Appendix E – Summary of Port Vehicles Database

The port vehicle database provides information related to the potential for CNG to be used in various lighter duty equipment and vehicles that are part of port operations. Concentric relied on the Puget Sound Maritimes Emissions Survey 2007 to compile the data. Currently, CNG port vehicles are very limited in availability; only Toyota manufacturers an OEM natural gas forklift. Concentric does not yet consider the port vehicle market as immediately impacting the demand for LNG in the market area.

Example

Port	Terminal Number	High Use Vehicle	High Use Number in Port	Gallons per hour	Average annual hours	Average Annual Diesel Consumption per Vehicle (in gallons)	Annual CNG Consumption (in therms)	Annual CNG Consumption per Vehicle (in therms)	Annual CNG Consumption per Day in Port (in therms)
Everett	PSE020	Wheelloader	6			5,083	41,172	6,862	
	PSE020	Log Shovel	2			3,750	10,125	5,063	
									140.54
Tacoma									
	PST010	Forklift	2			1,900	5,130	2,565	
	PST010	Straddle carrier	4			2,130	11,502	2,876	
	PST010	Straddle carrier	13			10,749	188,645	14,511	
	PST020	Forklift	8	2.2	880	1,936	20,909	2,614	
	PST020	SidePick	5	2.8	1,850	5,180	34,965	6,993	
	PST020	Straddle Carrier	59	6.0	1,850	11,100	884,115	14,985	
	PST020	Yard Tractor	3	2.4	1,500	3,600	14,580	4,860	

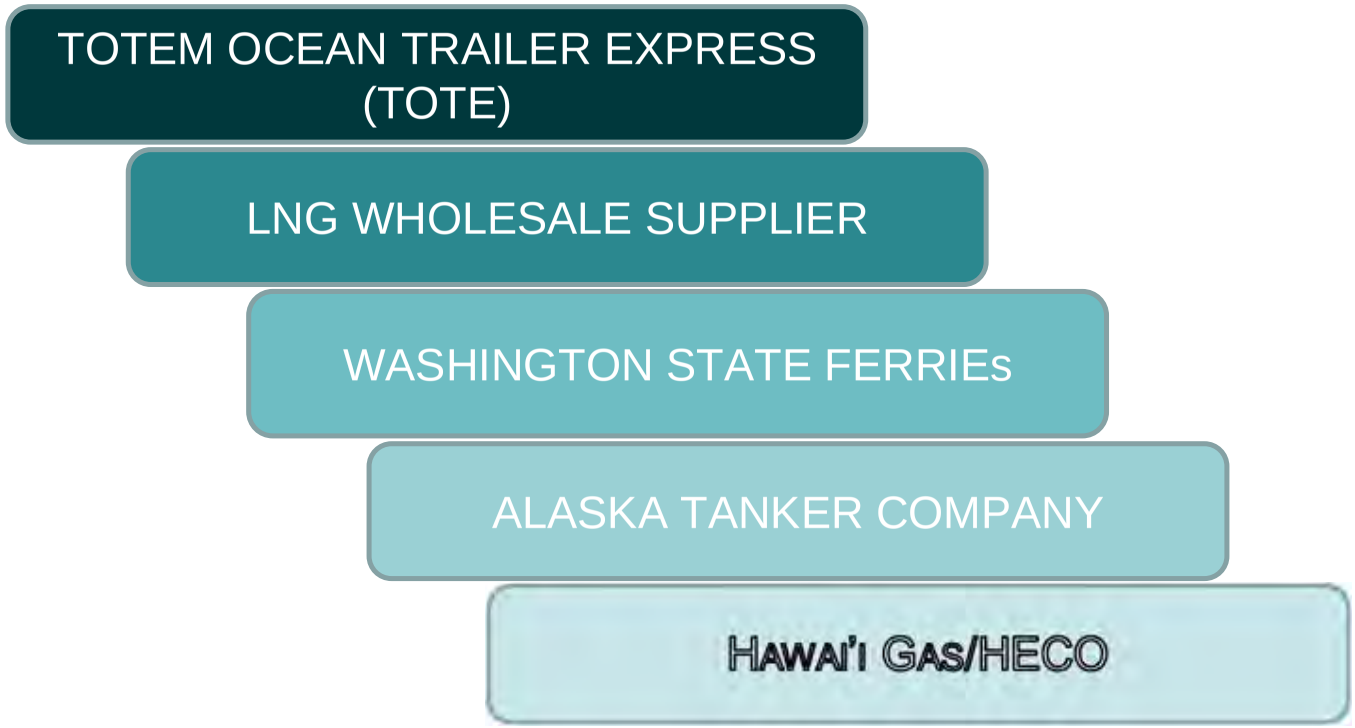
Liquefied Natural Gas Development Strategy

Kimberly Harris
Chief Executive Officer

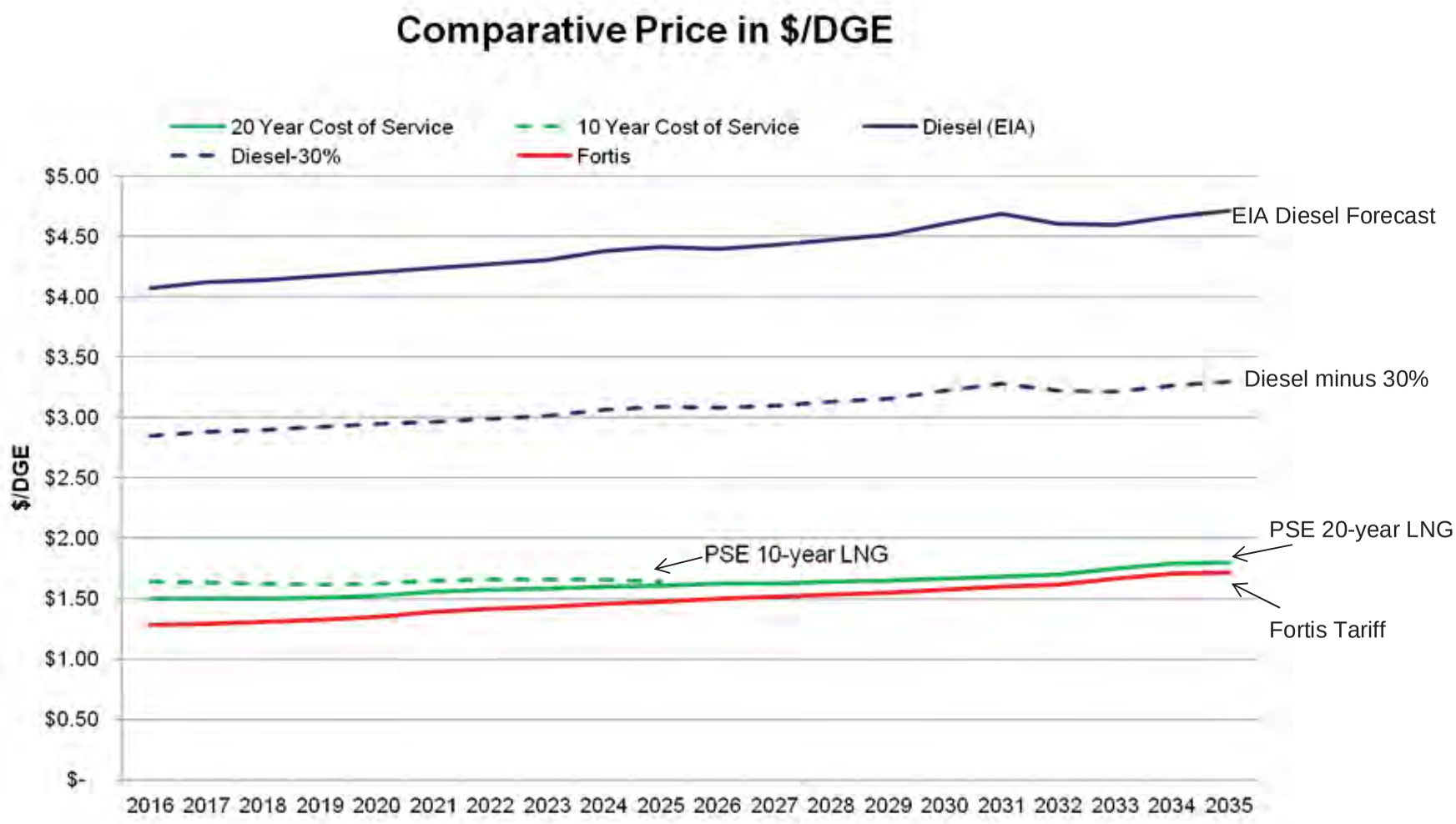
January 23, 2013

PUGET SOUND ENERGY
The Energy To Do Great Things

The Opportunity



Competitive Landscape



PUGET SOUND ENERGY
The Energy To Do Great Things

Facilities

Tacoma Facility

- Serve Tacoma-Seattle-based marine and land transportation markets
- 250,000 gpd to start
- Growth potential to 750,000 gpd

Potential Facility #2

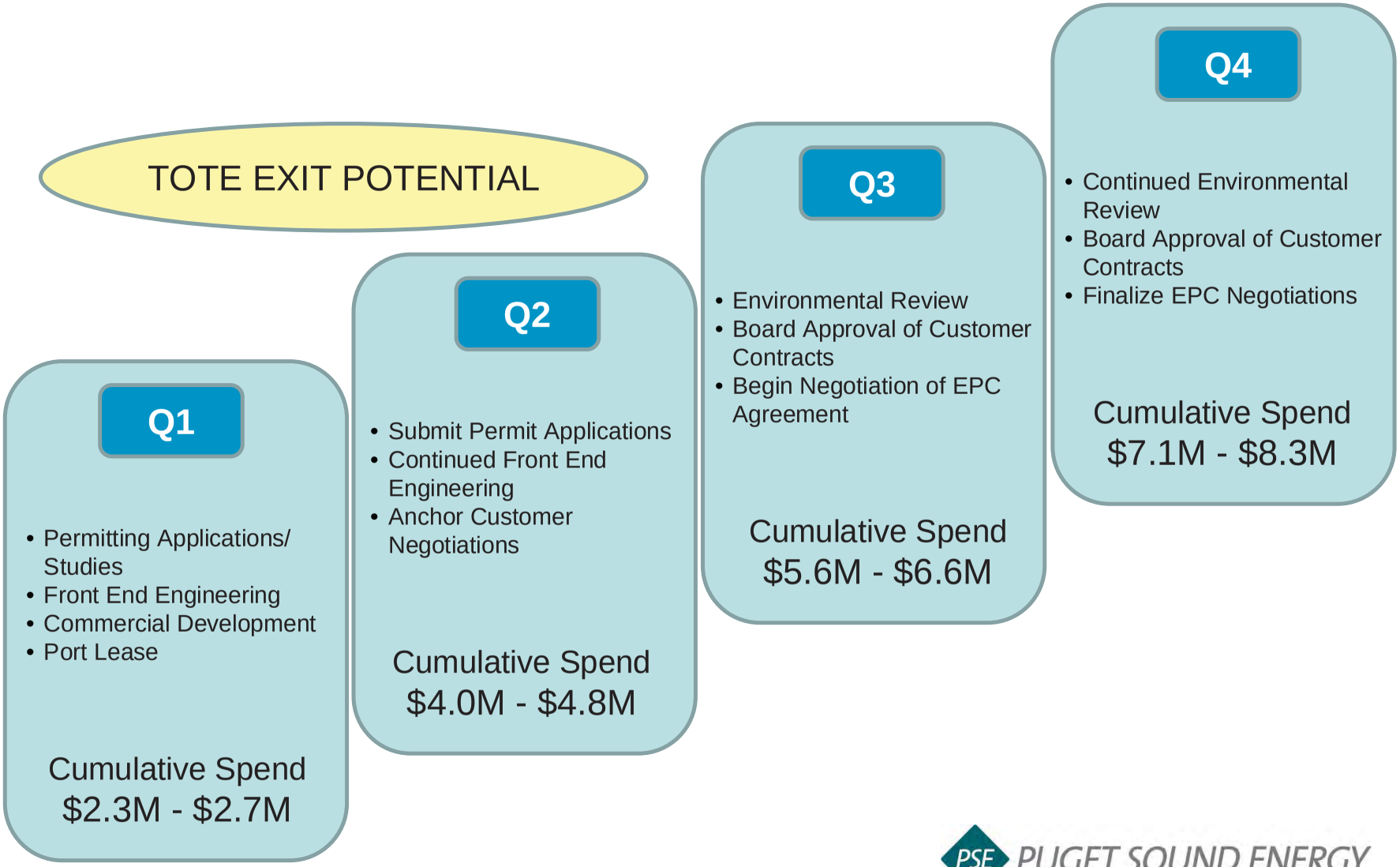
- Serve Hawaiian utilities (Phase 3)
- ~500,000 – 600,000 gpd to start
- Growth to well over 1,000,000 gpd depending on electric generation load

HAWAIIGAS
THE CLEAN ENERGY COMPANY

Hawaiian Electric Company

PSE PUGET SOUND ENERGY
The Energy To Do Great Things

2013 Timeline/Budget/Risk



PSE PUGET SOUND ENERGY
The Energy To Do Great Things

Management Recommendation

Pursue LNG business strategy by:

- Continuing permitting and other development activities at the Tacoma site to ensure suitability and refine cost information
- Further developing a business plan for the Hawaiian market and pursuing commercial arrangements with Hawai'i Gas and Hawaiian Electric
- Finalizing commercial/contractual arrangements with TOTE and further pursuing arrangements with Alaska Tanker Company and BP (and/or other marketers)

Liquefied Natural Gas Development Strategy

Kimberly Harris
Chief Executive Officer

January 23, 2013

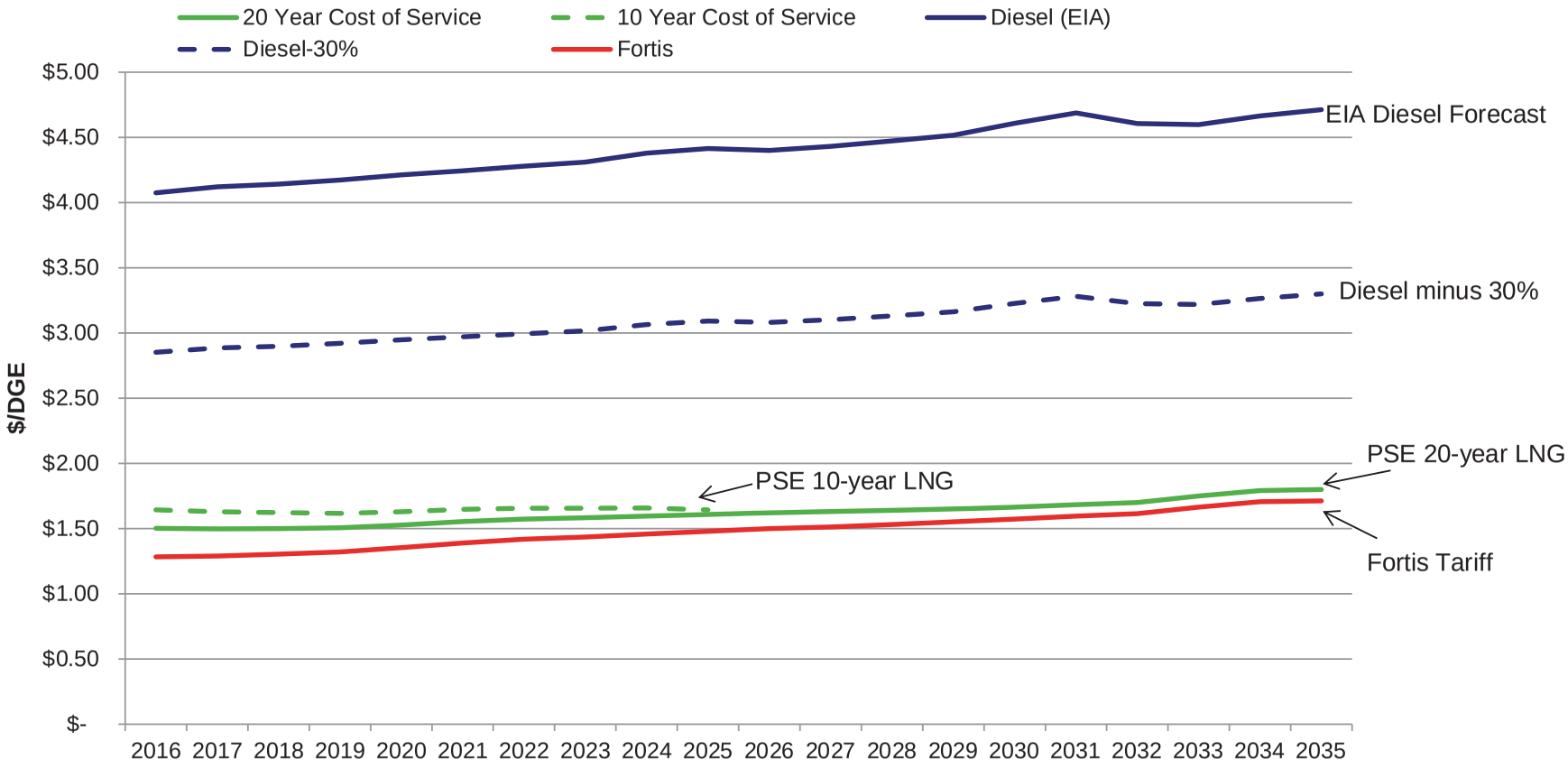
PUGET SOUND ENERGY
The Energy To Do Great Things

The Opportunity

PUGET SOUND ENERGY
The Energy To Do Great Things

Competitive Landscape

Comparative Price in $/DGE



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Facilities

Tacoma Facility

- Serve Tacoma-Seattle-based marine and land transportation markets
- 250,000 gpd to start
- Growth potential to 750,000 gpd

Potential Facility #2

- Serve Hawaiian utilities
- ~500,000 – 600,000 gpd to start
- Growth to well over 1,000,000 gpd depending on electric generation load

HAWAIʻIGAS
THE CLEAN ENERGY COMPANY

Hawaiian Electric Company

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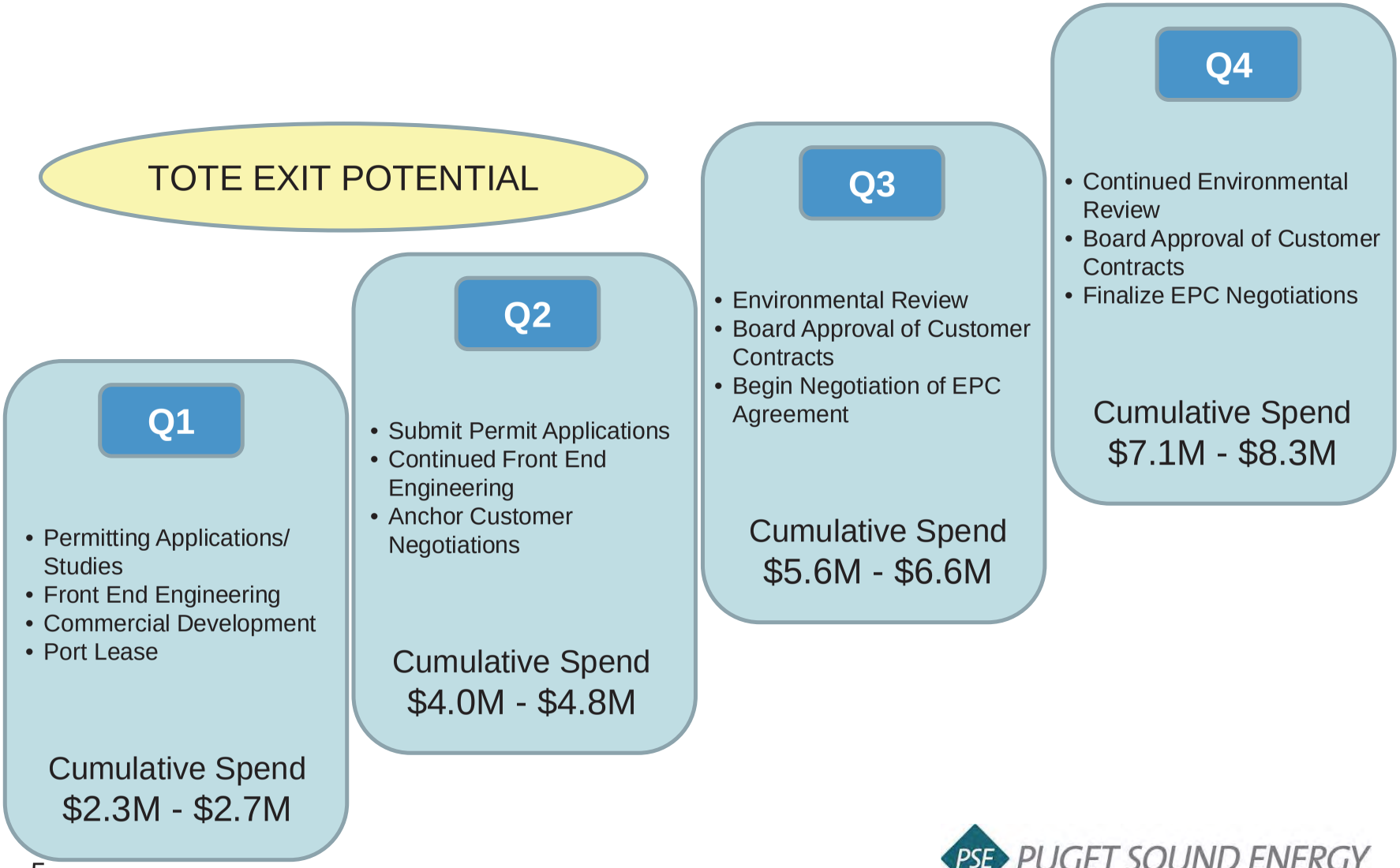
2013 Timeline/Budget/Risk



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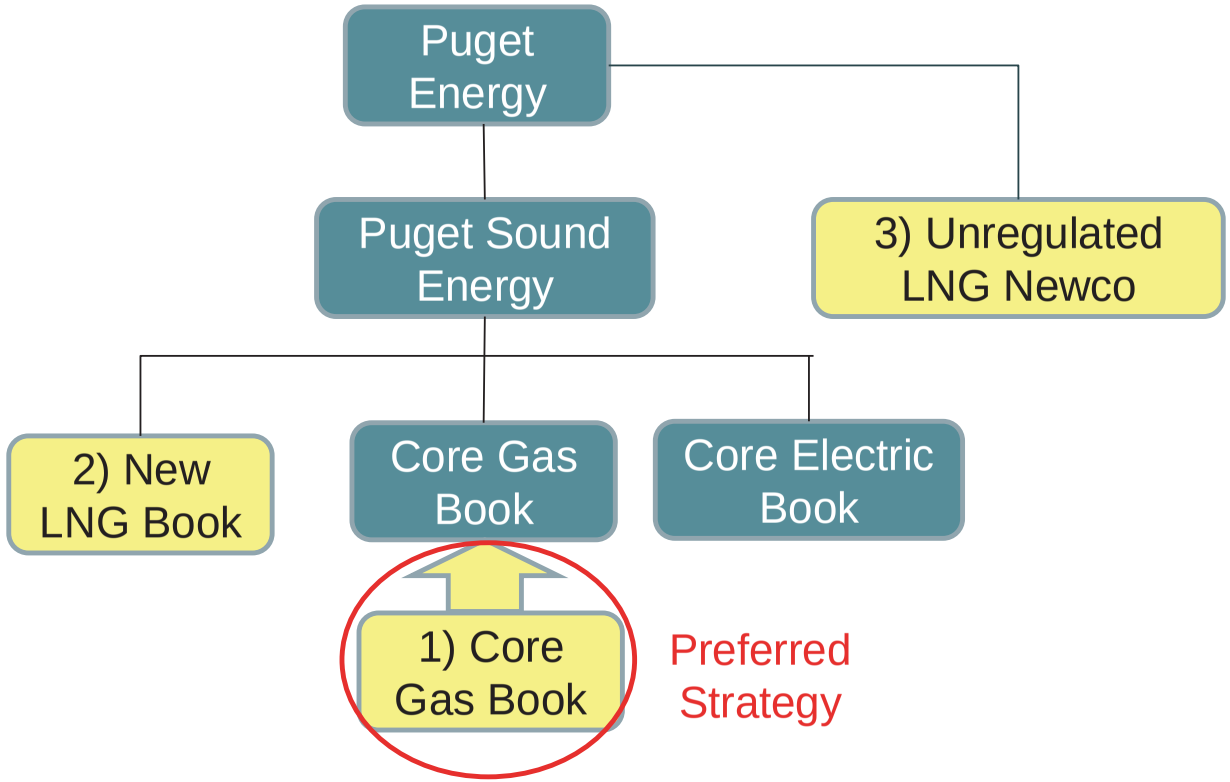
Liquefied Natural Gas Development Strategy

Kimberly Harris
Chief Executive Officer

February 28, 2013

PUGET SOUND ENERGY
The Energy To Do Great Things

Potential Business Structures



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Preferred Model: Core Gas Book

Advantages

- Best position to provide customer/societal benefits
- Does not require creation of any new affiliate or entity
- Relatively simple to administer
- No implication of merger commitments

Disadvantages

- Requires prudence demonstration or legislative mandate
- Rate of return established by WUTC rather than market

Legislation Scope

- LNG facility will provide customer and societal benefits
- Pre-approved prudency determination of LNG facility with customer contracts
- No option for WUTC to re-evaluate at later date

2013 Timeline/Budget/Risk

Cumulative Spend To-Date - $1M

TOTE Exposure

Q1

- Permitting Strategy
- Front End Engineering
- Commercial Development
- Port Lease negotiations

Cumulative Spend
$1.3M - $1.5M

Q2

- Continued Front End Engineering
- Anchor Customer Negotiations (Expected contracts by June 30)

Cumulative Spend
$2.1M - $2.4M

Q3

- Submit Permit Applications
- Environmental Review
- Board Approval of Customer Contracts

Cumulative Spend
$3.9M - $4.6M

Q4

- Continued Environmental Review
- Finalize EPC Negotiations

Cumulative Spend
$6.0M - $7.1M

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Impact to Plan

5-Year Plan

	2013	2014	2015	2016	2017	Total
Capex	7	29	51	52	0	**139**
Revenue					38	**38**
EBITDA					21	**21**

Current View

	2013	2014	2015	2016	2017	Total
Capex	7	36	74	80		**197**
Revenue					47	**47**
EBITDA					26	**26**

- Major impact on Capex due to increase in assumed plant size
- Ultimate Capex will vary with market and plant cost

Next Steps

- Internal strategy development for legislative requirements
- Lobby key legislators and governor for support and introduce bill
- Continue commercial development with potential anchor customers; develop markets with existing regional supply
- Continue engineering design and critical site evaluation (coring for soil condition and site contamination)
- Evaluate FERC permitting options (opens interstate markets)

LNG Development Strategy Update

February 28, 2013

Table of Contents

Executive Summary

Since the January Board meeting, the team has advanced the LNG project on a number of fronts while simultaneously slowing spend to better align project development with key customer decision points.

TOTE has indicated that it will likely not make a decision on its preferred LNG counterparties until the May–June timeframe and contract negotiations are likely to extend through June. Accordingly, PSE has dramatically reduced spending on permitting focused activities. We have continued to advance the front end engineering work with CB&I in order to gain better understanding of project cost and site capability.

Additionally, we have conducted a deeper dive and evaluation of potential business models and have developed a preferred regulated construct that best mitigates project risk and provides the most value to customers. We believe that the project is best situated as an integrated component of PSE's regulated gas distribution business. In such a format, it will provide system benefits to PSE customers as well as societal benefits to the state of Washington.

Included in this update is an insight into the competitive atmosphere for LNG supply in the Pacific Northwest as well as credit characterizations for key potential counterparties. PSE's proposed LNG facility at the Port of Tacoma would be well positioned to supply LNG to transportation customers as well as provide peak-day support to PSE gas system customers. By locating at the Port of Tacoma, PSE is able to provide fuel to large marine anchor customers like TOTE, which makes the entire project possible. The Port of Tacoma project is also in the heart of PSE's gas distribution system, which provides system benefits for PSE's core gas customers. The Port of Tacoma location may hold a slight cost disadvantage for land-based transportation (higher land costs, PSE distribution charges and lower delivered gas pressure); however, those markets are expected develop more slowly and do not represent any one large anchor customer.

Status Update and Next Steps

The project team has continued efforts in a number of work areas. Summarized below is the status and next steps for key components of the project.

Commercial

PSE met with the newly appointed TOTE project team on February 7th in order to familiarize them with PSE's project and discuss potential terms. The TOTE team expressed that they were in learning mode with regard to LNG and were meeting with only credible suppliers. Their timeline for choosing an LNG supplier is three to six months. Accordingly, we don't expect to have a contract with TOTE until the June/July timeframe.

We have also continued development work with other customers. Regarding Washington State Ferries, PSE has held meetings with both Rolls Royce and Clean Marine Energy/Mitsui Bank/Wartsila who are each seeking an LNG fuel supply partner for their responses to the Ferries RFP. The project team has also held multiple conversations with Hawai'i Gas to present our capabilities and better understand its schedule.

Permitting

In light of TOTE's expected timeline for choosing an LNG supplier, the project team has reduced spending on permitting activities. As of early February, we have halted all work by our chief permitting consultant, CH2MHill. In addition, only

limited work will continue with other consultants. We do not expect to restart permitting unless we are able to secure TOTE or another anchor customer. Internal PSE staff will continue to advance the permitting strategy and prepare documents. This is expected to delay project delivery on a day-for-day basis.

Engineering

PSE has chosen CB&I to provide the front end engineering and design (FEED) work for the project. The project team held a kick-off meeting with CB&I on February 25th to get the engineering started. The FEED work is expected to take 5 to 6 months. The output of the FEED study will provide a much more accurate cost estimate for the project and will make permitting documents more informative and exact. The FEED work must continue so that we can provide more definitive pricing to prospective customers.

Siting

Lease negotiations have continued with the Port of Tacoma and we are nearing agreement on the term sheet. We will continue to negotiate the lease so that we are ready to sign as soon as we are able to reach commercial certainty with TOTE.

Competitive Atmosphere

PSE believes that our proposed Port of Tacoma project will be competitively situated both in the near term and the outer years of the project's life. Because of its location in the center of the Puget Sound marine market, it will likely be one of only two facilities operating in the Sound (the other being FortisBC's facility at Tilbury), and perhaps the whole U.S. west coast, capable of providing bulk bunkering supply to large ocean going vessels. It will also be well situated to supply the truck fleets in the major trucking centers of Tacoma and the Kent Valley.

In order to provide context to the competitive atmosphere, outlined below are key considerations regarding the development of an LNG supply project, the likely competitors and the competitive advantages and disadvantages held by the planned PSE LNG facility at the Port of Tacoma.

Key Considerations

- **Marine LNG facilities are difficult to site.**
  PSE's siting work found viable marine access areas only at the Port of Tacoma and March Point where Shell currently holds excess land. PSE also evaluated Everett but found the parcels small, and the proximity to the naval base could present permitting or operating hurdles. Although projects with direct access to the water are difficult to site, such access is necessary to serve large marine vessels and barges since the time required to load directly from trucks and/or rail cars is impractical. By example, it would take 40-50 hours to load each TOTE ship directly from trucks.

- **Inland site options may not be as difficult to develop as marine sites and may hold a cost advantage for land-based transportation customers.**
  There will be more land and site options for development of an inland LNG facility and they will likely be less difficult to site. Such sites may also hold certain cost advantages since the land is likely to cost less and have direct access to the pipeline, eliminating the need for lateral construction or distribution charges. As noted above, while some smaller marine operations such as the Washington State Ferries can be served by truck, larger operations such as TOTE and Hawai'i Gas will need to be served by a shore-side facility.

- **Financing construction without longer-term customer commitments will be challenging for most established players.**
  Most of the key competitors will require a large anchor customer in order to justify construction of an LNG facility, especially on the west coast, where there is little in the way of existing LNG infrastructure.

Potential Competitors

There are currently three potential competitors attempting to develop markets and supply LNG for transportation fuel in the Puget Sound region.

Shell

Shell has been actively attempting to secure land at the Port of Tacoma for the development of an LNG facility. The parcel that it desired has since been leased to another party but representatives of the company are still present in the region. It is possible that it may try to develop a facility adjacent to its refinery in March Point.

Teekay

Teekay entered the LNG shipping market in 2004 and currently has one of the world's largest independently owned LNG fleets. Teekay is the exclusive LNG marine marketing partner of FortisBC. Teekay will contract with FortisBC under a long-term tolling agreement for liquefaction services from FortisBC's Tilbury, BC LNG facility. Teekay plans to market LNG to marine customers and distribute it by LNG bunkering ship or barge in the Puget Sound region.

Blu

Blu is reportedly exploring the development of an LNG facility in the Lewis County area that would be purposed to provide LNG to the trucking market through Blu owned fueling stations. The company is a startup but is wholly-owned by ENN Energy Holdings, a Chinese energy company. An LNG facility in Lewis County built near the interstate pipeline may have a cost advantage over a PSE facility at the Port of Tacoma when it comes to serving land-based transportation. Blu does not appear to be interested in the marine market.

PSE's Competitive Position

Advantages	Disadvantages
Location: Location at the Port of Tacoma provides direct access to marine markets and close proximity to major trucking markets.	**Distribution costs:** The plant is not adjacent to the pipeline and is burdened with the cost of gas distribution, which adds at least $0.097 per diesel gallon equivalent, and lower plant inlet pressures, which drive up compression costs (both capital and O&M).
Proximity to TOTE: Being adjacent to TOTE's operations ensures a cost advantage over other potential suppliers which is critical given TOTE's role as an anchor customer.	**Land costs:** Waterfront land comes with a premium cost. PSE expects that similar land inland, adjacent to the pipeline would be approximately half the cost of the parcel at the Port of Tacoma.
Proximity to Marine Markets: In addition to TOTE, the core Puget Sound marine markets of Port of Tacoma and Port of Seattle are closer than they are to other potential competitors.	
Scalability: The facility site holds ample footprint to accommodate growth in liquefaction capacity to meet growing market demand. Early feasibility studies suggest it could accommodate as much as 1,400,000 gallons per day of liquefaction.	
Shared Resource: PSE's ability to use the resource for both peaking and transportation fuel provides cost benefit to all parties.	

Potential Business Models

PSE evaluated three potential business models to house the LNG initiative. The first one assumes the project would be regulated and included as part of PSE's core gas book like any other system addition. The second also assumes a regulated business but it would become a separate LNG book. The third assumes the project would become an unregulated affiliate under Puget Energy. PSE believes that the first option is the optimal choice of the three in that it provides the most value to all customers. The table below includes a description of each structure, along with advantages, disadvantages and potential risk mitigations.

	Option 1: PSE Core Gas Book	Option 2: New PSE "LNG Book"	Option 3: Unregulated Affiliate
Structure	• PSE would construct the LNG facilities • PSE would include such facilities in PSE's regulated core gas book in its next rate proceeding • The LNG facilities would be treated in a manner similar to any other regulated gas plant in PSE's core gas book • Services from the LNG facilities would be subject to a schedule on file with the Washington Utilities and Transportation Commission (WUTC) • The services provided by the LNG facilities cannot be cross-subsidized by other customers	• PSE would construct the LNG facilities • PSE would include the LNG facilities in a new regulated LNG book in PSE's next rate proceeding • This structure is identical to Option 1, except that the costs associated with the LNG facilities would be separate from costs associated with the core gas book • Services from the LNG facilities would be subject to a schedule on file with the WUTC	• PSE would construct the LNG facilities, using the existing PSE financing arrangements • PSE would then sell some or all of its interest in the LNG facilities to an unregulated affiliate o PSE could sell all of its interest in the LNG facilities to an unregulated affiliate and retain no interests in its core gas book o PSE could sell some of its interest in the LNG facilities to an unregulated affiliate and retain the remainder in its core gas book for regulated services, such as peak shaving • PSE asset sale would require WUTC approval
Potential Advantages	• Merger commitments would not be implicated because the services of the LNG facilities would be regulated • Relatively simple to administer; no sales or affiliated interest arrangements to navigate • Plant costs associated with the LNG facilities would be included with core gas assets • Does not require the creation of a new entity or affiliate of PSE	• Merger commitments would not be implicated because the activities of the LNG facilities would be regulated • Relatively simple to administer; no sales or affiliated interest arrangements to navigate • Does not require the creation of any new entity or affiliate of PSE	• No rate proceeding; no need to demonstrate prudence of development of LNG facilities (other than peaking component) • The unregulated affiliate would be free to negotiate price and terms of service with its customers • Potential higher rate of return • Relatively simple administrative process based on a reasonableness standard • Merger Commitment 26(a) would not be implicated; PSE customers would be held harmless from liabilities of the unregulated subsidiary
Potential Disadvantages	• PSE would need to demonstrate that development of an LNG facility is prudent for inclusion in Core gas plant o Prudency may be contentious and focus on the potential for cross-subsidization of LNG services o Parties to the rate proceeding would likely argue that the LNG facilities should not be placed in the core gas book • WUTC may disallow some or all of the costs associated with the LNG facilities • Rate of return would be established by the WUTC rather than the market • Timing of the prudency determination may be problematic o Potential LNG customers may be reluctant to commit to taking services without a known rate o PSE may not be able to establish a known rate until after the facilities are built and placed into rate base	• PSE would need to demonstrate that development of an LNG facility is prudent for inclusion in rates for the new PSE LNG book o WUTC may disallow some or all of the costs associated with the LNG facilities • Rate of return would be established by the WUTC rather than the market • Costs associated with the LNG facilities would not be included with core gas assets • Timing of the prudency determination may be problematic o Potential LNG customers may be reluctant to commit to taking services without a known rate o PSE cannot establish a known rate until after the facilities are built and placed into rate base	• Merger Commitment 56 prevents Puget Energy from operating or owning any business other than PSE • Amending the Merger Order to modify Merger Commitment 56 requires WUTC approval o Modification request requires notice to all parties to the Merger proceeding o Parties may object and the WUTC may require a hearing • Use of the LNG facilities to provide service to PSE may render the "gas plant" subject to WUTC jurisdiction • Requires allocation of costs between PSE and the unregulated subsidiary that has the potential to be controversial at the WUTC • Unclear whether credit facilities at Puget Energy may be used by a subsidiary other than PSE
Potential Mitigation	• PSE may want to consider legislation that would require the WUTC to deem any LNG facilities prudent if the utility secures long-term customers with projected revenues in excess of a certain percentage of projected annual revenue requirement associated with the LNG facilities • PSE could enter into special contracts with customers that could be approved by the WUTC priority to their effective date and prior to the initial rate proceeding to include the facilities in rates	• PSE may want to consider legislation that would require the WUTC to deem any LNG facilities prudent if the utility secures long-term customers with projected revenues in excess of a certain percentage of projected annual revenue requirement associated with the LNG facilities • PSE could enter into special contracts with customers that could be approved by the WUTC priority to their effective date and prior to the initial rate proceeding to include the facilities in rates	• PSE could seek to modify Merger Commitment 56 • The LNG facilities could be placed in an unregulated subsidiary of Puget Intermediate Holdings and avoid the need to modify Merger Commitment 56 • PSE would need to enter into an Intercompany Administrative Services Agreement with the unregulated affiliate that requires WUTC approval o Specify the allocation of costs that are common between PSE and the affiliate, e.g., common facilities, employee salaries and overhead

Proposed Commercial Structure and Financial Pro-Forma

As noted above, there are three business structures under consideration, two regulated and one non-regulated. Provided below are pro-forma financial results for each structure (there are only two pro-formas as the regulated version is the same in either of the two regulated business models).

Regardless of business structure, the contractual structure between PSE and the customers is assumed to be the same. This is because the pricing concept we propose entails the use of term differentiated rates. The shorter the term, the higher the price required to compensate the facility owner for risk. TOTE by example, is assumed to have a 10-year contract and would thus have a higher price than the marketer who is assumed to have a 20-year contract. We believe that this pricing strategy should exist in both a regulated or unregulated structure. The tables below describe the key assumptions used in the modeling.

Model Targets and Terms

The table below shows the assumptions used in modeling each of three potential anchor customer classes. TOTE is expected to provide a higher return for its share of the plant to compensate for its shorter contract term. The Wholesale Marketer is assumed to sign a longer term contract as it will desire a lower tolling rate in order to allow for more competitive pricing as it resells LNG to other transportation customers. In each case, the hurdle rate is applicable to the customer's share of plant. The entire project will have a blended IRR.

TOTE	
Contract Term:	Initial firm contract period of 10-years, levelized.
Hurdle Rate:	9% unlevered over 15 year period
Post Contract Treatment:	• Years 11-15 are priced to produce the 9% unlevered return over 15 years. • Years 16-25 priced in levelized 5 year increments based on regulated rate of return
Wholesale Marketer	
Contract Term:	20 years, levelized
Hurdle Rate:	6.71% unlevered over 20 year period
Post Contract Treatment:	Marketer pays tariff based on regulated rate of return.
PSE Peaking Contract	
Contract Term:	25 years
Hurdle Rate:	6.71% unlevered over 25 year period

Plant Assumptions

Item	Cost	Notes
Liquefaction & Plant	$86 million	250,000 gallons per day
Storage	$30 million	8 million gallon tank
Balance of Plant	$18 million	Control room, site work, etc.
Development	$10 million	Costs prior to permits received
Distribution System Upgrades	$33 million	PSE internal estimate
AFUDC	$20 million	
TOTAL PLANT AT CLOSE	**$197 million**	

NOTE: All plant assumptions are based on preliminary cost estimates only, subject to +/-50% differential.

Returns Summary

Returns Analysis - Regulated		Returns Analysis - Unregulated	
Unlevered Pre-Tax IRR	9%	Unlevered Pre-Tax IRR	11%
Unlevered Post-Tax IRR	7%	Unlevered Post-Tax IRR	8%
Post Tax Payback Period	10X	Post Tax Payback Period	10X
Avg PT Unlevered Cash Yield (1-5)	11%	Avg PT Unlevered Cash Yield (1-5)	12%
Avg PT Unlevered Cash Yield (1-10)	10%	Avg PT Unlevered Cash Yield (1-10)	11%

Unregulated Financial Pro-Forma Results

Income Statement		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
($Millions)	Closing to Plant	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Revenue																										
TOTE		$ 19.8	$ 19.8	$ 19.8	$ 19.8	$ 19.8	$ 19.8	$ 19.8	$ 19.8	$ 19.8	$ 19.8	$ 16.9	$ 16.9	$ 16.9	$ 16.9	$ 16.9	$ 15.2	$ 15.2	$ 15.2	$ 15.2	$ 15.2	$ 15.5	$ 15.5	$ 15.5	$ 15.5	$ 15.5
Wholesale Marketer		$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 12.8	$ 12.8	$ 12.8	$ 12.8	$ 12.8
PSE		$ 8.8	$ 8.7	$ 8.5	$ 8.3	$ 8.2	$ 8.0	$ 7.9	$ 7.7	$ 7.6	$ 7.5	$ 7.4	$ 7.2	$ 7.1	$ 7.0	$ 6.9	$ 6.8	$ 6.8	$ 6.7	$ 6.7	$ 6.7	$ 6.7	$ 6.7	$ 6.7	$ 6.7	$ 6.8
Distribution Tariff		$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9
Total Revenue		**$ 47.2**	**$ 47.0**	**$ 46.8**	**$ 46.7**	**$ 46.5**	**$ 46.4**	**$ 46.2**	**$ 46.1**	**$ 46.0**	**$ 45.9**	**$ 42.8**	**$ 42.7**	**$ 42.6**	**$ 42.5**	**$ 42.4**	**$ 40.5**	**$ 40.5**	**$ 40.5**	**$ 40.5**	**$ 40.5**	**$ 39.9**	**$ 39.9**	**$ 39.9**	**$ 39.9**	**$ 39.9**
Expenses																										
Variable O&M																										
Utilities/Consumables		$ 3.8	$ 3.9	$ 4.0	$ 4.1	$ 4.2	$ 4.3	$ 4.4	$ 4.5	$ 4.6	$ 4.8	$ 4.9	$ 5.0	$ 5.1	$ 5.2	$ 5.4	$ 5.5	$ 5.6	$ 5.8	$ 5.9	$ 6.1	$ 6.2	$ 6.4	$ 6.6	$ 6.7	$ 6.9
Dockage		$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.5	$ 0.5	$ 0.5	$ 0.5	$ 0.5	$ 0.5	$ 0.5	$ 0.5	$ 0.6
Fixed O&M																										
Maintenance		$ 0.7	$ 0.7	$ 0.8	$ 0.8	$ 0.8	$ 0.8	$ 0.8	$ 0.8	$ 0.9	$ 0.9	$ 0.9	$ 0.9	$ 1.0	$ 1.0	$ 1.0	$ 1.0	$ 1.1	$ 1.1	$ 1.1	$ 1.1	$ 1.2	$ 1.2	$ 1.2	$ 1.3	$ 1.3
Operations Staff		$ 2.5	$ 2.6	$ 2.6	$ 2.7	$ 2.8	$ 2.8	$ 2.9	$ 3.0	$ 3.1	$ 3.1	$ 3.2	$ 3.3	$ 3.4	$ 3.5	$ 3.6	$ 3.6	$ 3.7	$ 3.8	$ 3.9	$ 4.0	$ 4.1	$ 4.2	$ 4.3	$ 4.4	$ 4.5
Security Staff		$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.5	$ 0.5
Corporate Overhead		$ 2.8	$ 2.9	$ 3.0	$ 3.0	$ 3.1	$ 3.2	$ 3.3	$ 3.4	$ 3.4	$ 3.5	$ 3.6	$ 3.7	$ 3.8	$ 3.9	$ 4.0	$ 4.1	$ 4.2	$ 4.3	$ 4.4	$ 4.5	$ 4.6	$ 4.8	$ 4.9	$ 5.0	$ 5.1
Lease		$ 2.8	$ 2.9	$ 3.0	$ 3.1	$ 3.1	$ 3.2	$ 3.3	$ 3.4	$ 3.5	$ 3.5	$ 3.6	$ 3.7	$ 3.8	$ 3.9	$ 4.0	$ 4.1	$ 4.2	$ 4.3	$ 4.4	$ 4.5	$ 4.6	$ 4.8	$ 4.9	$ 5.0	$ 5.1
Wharfage		$ 0.2	$ 0.2	$ 0.2	$ 0.2	$ 0.2	$ 0.2	$ 0.2	$ 0.2	$ 0.2	$ 0.2	$ 0.2	$ 0.2	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3
Distribution System		$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0
Property Tax		$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4
Sales Tax		$ 5.1	$ 5.0	$ 5.0	$ 5.0	$ 5.0	$ 5.0	$ 5.0	$ 4.9	$ 4.9	$ 4.9	$ 4.6	$ 4.6	$ 4.6	$ 4.6	$ 4.5	$ 4.3	$ 4.3	$ 4.3	$ 4.3	$ 4.3	$ 4.3	$ 4.3	$ 4.3	$ 4.3	$ 4.3
Total Expenses		**$ 19.9**	**$ 20.2**	**$ 20.6**	**$ 20.9**	**$ 21.2**	**$ 21.6**	**$ 22.0**	**$ 22.3**	**$ 22.7**	**$ 23.1**	**$ 23.2**	**$ 23.6**	**$ 24.1**	**$ 24.5**	**$ 25.0**	**$ 25.2**	**$ 25.7**	**$ 26.2**	**$ 26.7**	**$ 27.2**	**$ 27.7**	**$ 28.3**	**$ 28.8**	**$ 29.4**	**$ 30.0**
EBITDA		**$ 27.3**	**$ 26.8**	**$ 26.3**	**$ 25.8**	**$ 25.3**	**$ 24.8**	**$ 24.3**	**$ 23.8**	**$ 23.3**	**$ 22.7**	**$ 19.6**	**$ 19.1**	**$ 18.5**	**$ 18.0**	**$ 17.4**	**$ 15.3**	**$ 14.8**	**$ 14.3**	**$ 13.7**	**$ 13.2**	**$ 12.2**	**$ 11.6**	**$ 11.0**	**$ 10.4**	**$ 9.9**
Plant Depreciation		$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6
Distribution System Depreciation		$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2
Income Tax		$ 4.7	$ 4.7	$ 4.6	$ 4.5	$ 4.5	$ 4.4	$ 4.3	$ 4.3	$ 4.2	$ 4.1	$ 3.1	$ 3.0	$ 2.9	$ 2.8	$ 2.7	$ 2.1	$ 2.0	$ 1.8	$ 1.7	$ 1.6	$ 1.3	$ 1.1	$ 1.0	$ 0.8	$ 0.7
Operating Income		**$ 14.7**	**$ 14.3**	**$ 13.9**	**$ 13.4**	**$ 13.0**	**$ 12.5**	**$ 12.1**	**$ 11.7**	**$ 11.3**	**$ 10.8**	**$ 8.7**	**$ 8.3**	**$ 7.8**	**$ 7.3**	**$ 6.9**	**$ 5.4**	**$ 5.0**	**$ 4.6**	**$ 4.2**	**$ 3.8**	**$ 3.1**	**$ 2.7**	**$ 2.2**	**$ 1.8**	**$ 1.4**
Interest		$ 6.0	$ 5.7	$ 5.3	$ 5.0	$ 4.7	$ 4.4	$ 4.1	$ 3.8	$ 3.5	$ 3.2	$ 2.9	$ 2.7	$ 2.4	$ 2.1	$ 1.8	$ 1.6	$ 1.4	$ 1.2	$ 1.1	$ 0.9	$ 0.7	$ 0.6	$ 0.4	$ 0.3	$ 0.2
Net Income		**$ 8.7**	**$ 8.6**	**$ 8.5**	**$ 8.4**	**$ 8.3**	**$ 8.2**	**$ 8.0**	**$ 7.9**	**$ 7.8**	**$ 7.6**	**$ 5.8**	**$ 5.6**	**$ 5.4**	**$ 5.2**	**$ 5.1**	**$ 3.9**	**$ 3.6**	**$ 3.4**	**$ 3.2**	**$ 2.9**	**$ 2.3**	**$ 2.1**	**$ 1.8**	**$ 1.5**	**$ 1.2**
Cash Flows																										
Operating Income		$ 14.7	$ 14.3	$ 13.9	$ 13.4	$ 13.0	$ 12.5	$ 12.1	$ 11.7	$ 11.3	$ 10.8	$ 8.7	$ 8.3	$ 7.8	$ 7.3	$ 6.9	$ 5.4	$ 5.0	$ 4.6	$ 4.2	$ 3.8	$ 3.1	$ 2.7	$ 2.2	$ 1.8	$ 1.4
Add Depreciation		$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8
Add Deferred Taxes		$ 0.7	$ 3.8	$ 3.2	$ 2.6	$ 2.0	$ 1.6	$ 1.3	$ 1.3	$ 1.3	$ 1.3	$ 1.3	$ 1.3	$ 1.3	$ 1.3	$ 1.3	$ (0.7)	$ (2.7)	$ (2.7)	$ (2.7)	$ (2.7)	$ (2.7)	$ (2.7)	$ (2.7)	$ (2.7)	$ 0.0
Tax Benefit of Interest		$ (2.1)	$ (2.0)	$ (1.9)	$ (1.7)	$ (1.6)	$ (1.5)	$ (1.4)	$ (1.3)	$ (1.2)	$ (1.1)	$ (1.0)	$ (0.9)	$ (0.8)	$ (0.7)	$ (0.6)	$ (0.5)	$ (0.5)	$ (0.4)	$ (0.4)	$ (0.3)	$ (0.3)	$ (0.2)	$ (0.1)	$ (0.1)	$ (0.1)
Decommissioning																									$ (7.9)	
Cash Flow (Post Tax)*	**$ (190.6)**	**$ 21.2**	**$ 24.0**	**$ 23.0**	**$ 22.1**	**$ 21.2**	**$ 20.4**	**$ 19.8**	**$ 19.5**	**$ 19.2**	**$ 18.8**	**$ 16.8**	**$ 16.5**	**$ 16.1**	**$ 15.8**	**$ 15.4**	**$ 12.0**	**$ 9.6**	**$ 9.3**	**$ 8.9**	**$ 8.6**	**$ 7.9**	**$ 7.5**	**$ 7.2**	**$ 6.8**	**$ 1.3**
IRR (Post-Tax)	*8.0%*																									
Income Tax		$ 4.7	$ 4.7	$ 4.6	$ 4.5	$ 4.5	$ 4.4	$ 4.3	$ 4.3	$ 4.2	$ 4.1	$ 3.1	$ 3.0	$ 2.9	$ 2.8	$ 2.7	$ 2.1	$ 2.0	$ 1.8	$ 1.7	$ 1.6	$ 1.3	$ 1.1	$ 1.0	$ 0.8	$ 0.7
Cash Flow (Pre-Tax)*	**$ (190.6)**	**$ 25.9**	**$ 28.6**	**$ 27.6**	**$ 26.6**	**$ 25.7**	**$ 24.8**	**$ 24.2**	**$ 23.8**	**$ 23.4**	**$ 22.9**	**$ 19.9**	**$ 19.5**	**$ 19.0**	**$ 18.6**	**$ 18.1**	**$ 14.0**	**$ 11.6**	**$ 11.1**	**$ 10.6**	**$ 10.2**	**$ 9.2**	**$ 8.7**	**$ 8.1**	**$ 7.6**	**$ 2.0**
IRR (Pre-Tax)	*10.9%*																									

**Closing plant values are shifted back .5 years using PSE after tax WACC to line up with cashflow midyear convention.*

Balance Sheet Plant																										
Gross Plant	$ 158.2	$ 158.2	$ 158.2	$ 158.2	$ 158.2	$ 158.2	$ 158.2	$ 158.2	$ 158.2	$ 158.2	$ 158.2	$ 158.2	$ 158.2	$ 158.2	$ 158.2	$ 158.2	$ 158.2	$ 158.2	$ 158.2	$ 158.2	$ 158.2	$ 158.2	$ 158.2	$ 158.2	$ 158.2	$ 158.2
Accumulated Depreciation		$ 6.6	$ 13.3	$ 19.9	$ 26.6	$ 33.2	$ 39.9	$ 46.5	$ 53.2	$ 59.8	$ 66.4	$ 73.1	$ 79.7	$ 86.4	$ 93.0	$ 99.7	$ 106.3	$ 113.0	$ 119.6	$ 126.2	$ 132.9	$ 139.5	$ 146.2	$ 152.8	$ 159.5	$ 166.1
Depreciation		$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6
Net Plant Balance		**$ 151.6**	**$ 144.9**	**$ 138.3**	**$ 131.6**	**$ 125.0**	**$ 118.3**	**$ 111.7**	**$ 105.0**	**$ 98.4**	**$ 91.8**	**$ 85.1**	**$ 78.5**	**$ 71.8**	**$ 65.2**	**$ 58.5**	**$ 51.9**	**$ 45.2**	**$ 38.6**	**$ 32.0**	**$ 25.3**	**$ 18.7**	**$ 12.0**	**$ 5.4**	**$ (1.3)**	**$ (7.9)**
Tax Depreciation		$ 7.9	$ 15.0	$ 13.5	$ 12.2	$ 10.9	$ 9.9	$ 9.3	$ 9.3	$ 9.3	$ 9.3	$ 9.3	$ 9.3	$ 9.3	$ 9.3	$ 9.3	$ 4.6	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 7.9
Tax- Book Difference		$ 1.27	$ 8.38	$ 6.88	$ 5.54	$ 4.30	$ 3.21	$ 2.71	$ 2.71	$ 2.7	$ 2.7	$ 2.7	$ 2.7	$ 2.7	$ 2.7	$ 2.7	$ (2.0)	$ (6.6)	$ (6.6)	$ (6.6)	$ (6.6)	$ (6.6)	$ (6.6)	$ (6.6)	$ (6.6)	$ 1.3
Deferred Tax		$ 0.44	$ 2.93	$ 2.41	$ 1.94	$ 1.51	$ 1.12	$ 0.95	$ 0.95	$ 0.9	$ 0.9	$ 0.9	$ 0.9	$ 0.9	$ 0.9	$ 0.9	$ (0.7)	$ (2.3)	$ (2.3)	$ (2.3)	$ (2.3)	$ (2.3)	$ (2.3)	$ (2.3)	$ (2.3)	$ 0.4
Accumulated Deferred Tax		$ 0.44	$ 3.38	$ 5.79	$ 7.72	$ 9.23	$ 10.35	$ 11.30	$ 12.25	$ 13.2	$ 14.1	$ 15.1	$ 16.0	$ 17.0	$ 17.9	$ 18.9	$ 18.2	$ 15.8	$ 13.5	$ 11.2	$ 8.9	$ 6.5	$ 4.2	$ 1.9	$ (0.4)	$ (0.0)

Balance Sheet Dist System																										
Gross Plant	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7
Accumulated Depreciation		$ 1.2	$ 2.3	$ 3.5	$ 4.7	$ 5.9	$ 7.0	$ 8.2	$ 9.4	$ 10.5	$ 11.7	$ 12.9	$ 14.1	$ 15.2	$ 16.4	$ 17.6	$ 18.8	$ 19.9	$ 21.1	$ 22.3	$ 23.4	$ 24.6	$ 25.8	$ 27.0	$ 28.1	$ 29.3
Depreciation		$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2
Net Plant Balance		**$ 37.5**	**$ 36.3**	**$ 35.2**	**$ 34.0**	**$ 32.8**	**$ 31.6**	**$ 30.5**	**$ 29.3**	**$ 28.1**	**$ 27.0**	**$ 25.8**	**$ 24.6**	**$ 23.4**	**$ 22.3**	**$ 21.1**	**$ 19.9**	**$ 18.8**	**$ 17.6**	**$ 16.4**	**$ 15.2**	**$ 14.1**	**$ 12.9**	**$ 11.7**	**$ 10.5**	**$ 9.4**
Tax Depreciation		$ 1.9	$ 3.7	$ 3.3	$ 3.0	$ 2.7	$ 2.4	$ 2.3	$ 2.3	$ 2.3	$ 2.3	$ 2.3	$ 2.3	$ 2.3	$ 2.3	$ 2.3	$ 1.1	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Tax- Book Difference		$ 0.76	$ 2.50	$ 2.14	$ 1.81	$ 1.51	$ 1.24	$ 1.11	$ 1.11	$ 1.1	$ 1.1	$ 1.1	$ 1.1	$ 1.1	$ 1.1	$ 1.1	$ (0.0)	$ (1.2)	$ (1.2)	$ (1.2)	$ (1.2)	$ (1.2)	$ (1.2)	$ (1.2)	$ (1.2)	$ (1.2)
Deferred Tax		$ 0.27	$ 0.88	$ 0.75	$ 0.63	$ 0.53	$ 0.43	$ 0.39	$ 0.39	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ (0.0)	$ (0.4)	$ (0.4)	$ (0.4)	$ (0.4)	$ (0.4)	$ (0.4)	$ (0.4)	$ (0.4)	$ (0.4)
Accumulated Deferred Tax		$ 0.27	$ 1.14	$ 1.89	$ 2.52	$ 3.05	$ 3.48	$ 3.87	$ 4.26	$ 4.6	$ 5.0	$ 5.4	$ 5.8	$ 6.2	$ 6.6	$ 7.0	$ 7.0	$ 6.6	$ 6.2	$ 5.7	$ 5.3	$ 4.9	$ 4.5	$ 4.1	$ 3.7	$ 3.3

CONFIDENTIAL per Protective Order in WUTC Docket No. UG-151663

Regulated Financial Pro-forma Results

Income Statement		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
($Millions)	Closing to Plant	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Revenue																										
Revenue Requirement		$ 46.2	$ 45.6	$ 44.9	$ 44.3	$ 43.7	$ 43.2	$ 42.8	$ 42.3	$ 41.9	$ 41.5	$ 41.1	$ 40.7	$ 40.3	$ 39.9	$ 39.6	$ 39.3	$ 39.3	$ 39.3	$ 39.4	$ 39.5	$ 39.6	$ 39.7	$ 39.8	$ 40.0	$ 40.4
Customer Revenues																										
TOTE (elevated)		$ 19.8	$ 19.8	$ 19.8	$ 19.8	$ 19.8	$ 19.8	$ 19.8	$ 19.8	$ 19.8	$ 19.8	$ 16.9	$ 16.9	$ 16.9	$ 16.9	$ 16.9	$ 15.2	$ 15.2	$ 15.2	$ 15.2	$ 15.2	$ 15.5	$ 15.5	$ 15.5	$ 15.5	$ 15.5
Wholesale Marketer		$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 13.7	$ 12.8	$ 12.8	$ 12.8	$ 12.8	$ 12.8
PSE		$ 8.8	$ 8.7	$ 8.5	$ 8.3	$ 8.2	$ 8.0	$ 7.9	$ 7.7	$ 7.6	$ 7.5	$ 7.4	$ 7.2	$ 7.1	$ 7.0	$ 6.9	$ 6.8	$ 6.8	$ 6.7	$ 6.7	$ 6.7	$ 6.7	$ 6.7	$ 6.7	$ 6.7	$ 6.8
Distribution Tariff		$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9	$ 4.9
Total Revenue		**$ 47.2**	**$ 47.0**	**$ 46.8**	**$ 46.7**	**$ 46.5**	**$ 46.4**	**$ 46.2**	**$ 46.1**	**$ 46.0**	**$ 45.9**	**$ 42.8**	**$ 42.7**	**$ 42.6**	**$ 42.5**	**$ 42.4**	**$ 40.5**	**$ 40.5**	**$ 40.5**	**$ 40.5**	**$ 40.5**	**$ 39.9**	**$ 39.9**	**$ 39.9**	**$ 39.9**	**$ 39.9**
*Revenues Back to Ratepayers**		*$ 0.9*	*$ 1.3*	*$ 1.7*	*$ 2.1*	*$ 2.5*	*$ 2.8*	*$ 3.1*	*$ 3.4*	*$ 3.7*	*$ 3.9*	*$ 1.6*	*$ 1.8*	*$ 2.1*	*$ 2.3*	*$ 2.5*	*$ 1.1*	*$ 1.1*	*$ 1.1*	*$ 1.0*	*$ 0.9*	*$ 0.3*	*$ 0.2*	*$ 0.0*	*$ (0.1)*	*$ (0.5)*
Expenses																										
Variable O&M																										
Utilities/Consumables		$ 3.8	$ 3.9	$ 4.0	$ 4.1	$ 4.2	$ 4.3	$ 4.4	$ 4.5	$ 4.6	$ 4.8	$ 4.9	$ 5.0	$ 5.1	$ 5.2	$ 5.4	$ 5.5	$ 5.6	$ 5.8	$ 5.9	$ 6.1	$ 6.2	$ 6.4	$ 6.6	$ 6.7	$ 6.9
Dockage		$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.5	$ 0.5	$ 0.5	$ 0.5	$ 0.5	$ 0.5	$ 0.5	$ 0.6
Fixed O&M																										
Maintenance		$ 0.7	$ 0.7	$ 0.8	$ 0.8	$ 0.8	$ 0.8	$ 0.8	$ 0.8	$ 0.9	$ 0.9	$ 0.9	$ 0.9	$ 1.0	$ 1.0	$ 1.0	$ 1.0	$ 1.1	$ 1.1	$ 1.1	$ 1.1	$ 1.2	$ 1.2	$ 1.2	$ 1.3	$ 1.3
Operations Staff		$ 2.5	$ 2.6	$ 2.6	$ 2.7	$ 2.8	$ 2.8	$ 2.9	$ 3.0	$ 3.1	$ 3.1	$ 3.2	$ 3.3	$ 3.4	$ 3.5	$ 3.6	$ 3.6	$ 3.7	$ 3.8	$ 3.9	$ 4.0	$ 4.1	$ 4.2	$ 4.3	$ 4.4	$ 4.5
Security Staff		$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.5	$ 0.5
Corporate Overhead		$ 2.8	$ 2.9	$ 3.0	$ 3.0	$ 3.1	$ 3.2	$ 3.3	$ 3.4	$ 3.4	$ 3.5	$ 3.6	$ 3.7	$ 3.8	$ 3.9	$ 4.0	$ 4.1	$ 4.2	$ 4.3	$ 4.4	$ 4.5	$ 4.6	$ 4.8	$ 4.9	$ 5.0	$ 5.1
Lease		$ 2.8	$ 2.9	$ 3.0	$ 3.1	$ 3.1	$ 3.2	$ 3.3	$ 3.4	$ 3.5	$ 3.5	$ 3.6	$ 3.7	$ 3.8	$ 3.9	$ 4.0	$ 4.1	$ 4.2	$ 4.3	$ 4.4	$ 4.5	$ 4.6	$ 4.8	$ 4.9	$ 5.0	$ 5.1
Wharfage		$ 0.2	$ 0.2	$ 0.2	$ 0.2	$ 0.2	$ 0.2	$ 0.2	$ 0.2	$ 0.2	$ 0.2	$ 0.2	$ 0.2	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3	$ 0.3
Distribution System		$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0
Property Tax		$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4	$ 1.4
Sales Tax		$ 5.0	$ 4.9	$ 4.8	$ 4.8	$ 4.7	$ 4.6	$ 4.6	$ 4.5	$ 4.5	$ 4.4	$ 4.4	$ 4.4	$ 4.3	$ 4.3	$ 4.2	$ 4.2	$ 4.2	$ 4.2	$ 4.2	$ 4.2	$ 4.2	$ 4.3	$ 4.3	$ 4.3	$ 4.3
Total Expenses		**$ 19.8**	**$ 20.1**	**$ 20.4**	**$ 20.6**	**$ 20.9**	**$ 21.3**	**$ 21.6**	**$ 21.9**	**$ 22.3**	**$ 22.6**	**$ 23.0**	**$ 23.4**	**$ 23.8**	**$ 24.2**	**$ 24.7**	**$ 25.1**	**$ 25.6**	**$ 26.2**	**$ 26.6**	**$ 27.1**	**$ 27.7**	**$ 28.3**	**$ 28.8**	**$ 29.4**	**$ 30.1**
EBITDA		**$ 26.4**	**$ 25.5**	**$ 24.6**	**$ 23.7**	**$ 22.8**	**$ 22.0**	**$ 21.2**	**$ 20.4**	**$ 19.6**	**$ 18.8**	**$ 18.0**	**$ 17.3**	**$ 16.5**	**$ 15.7**	**$ 14.9**	**$ 14.2**	**$ 13.7**	**$ 13.2**	**$ 12.8**	**$ 12.3**	**$ 11.9**	**$ 11.4**	**$ 11.0**	**$ 10.5**	**$ 10.4**
Plant Depreciation		$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6
Distribution System Depreciation		$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2
Income Tax		$ 4.4	$ 4.2	$ 4.0	$ 3.8	$ 3.6	$ 3.4	$ 3.2	$ 3.1	$ 2.9	$ 2.7	$ 2.5	$ 2.4	$ 2.2	$ 2.0	$ 1.8	$ 1.7	$ 1.6	$ 1.5	$ 1.4	$ 1.3	$ 1.2	$ 1.1	$ 1.0	$ 0.9	$ 0.8
Operating Income		**$ 14.2**	**$ 13.5**	**$ 12.7**	**$ 12.0**	**$ 11.4**	**$ 10.7**	**$ 10.1**	**$ 9.5**	**$ 8.9**	**$ 8.3**	**$ 7.7**	**$ 7.1**	**$ 6.5**	**$ 5.8**	**$ 5.2**	**$ 4.7**	**$ 4.3**	**$ 3.9**	**$ 3.6**	**$ 3.3**	**$ 2.9**	**$ 2.6**	**$ 2.2**	**$ 1.9**	**$ 1.7**
Interest		$ 6.0	$ 5.7	$ 5.3	$ 5.0	$ 4.7	$ 4.4	$ 4.1	$ 3.8	$ 3.5	$ 3.2	$ 2.9	$ 2.7	$ 2.4	$ 2.1	$ 1.8	$ 1.6	$ 1.4	$ 1.2	$ 1.1	$ 0.9	$ 0.7	$ 0.6	$ 0.4	$ 0.3	$ 0.2
Net Income		**$ 8.2**	**$ 7.8**	**$ 7.4**	**$ 7.1**	**$ 6.7**	**$ 6.4**	**$ 6.0**	**$ 5.7**	**$ 5.4**	**$ 5.1**	**$ 4.7**	**$ 4.4**	**$ 4.1**	**$ 3.8**	**$ 3.4**	**$ 3.1**	**$ 2.9**	**$ 2.7**	**$ 2.5**	**$ 2.4**	**$ 2.2**	**$ 2.0**	**$ 1.8**	**$ 1.6**	**$ 1.5**
Cash Flows																										
Operating Income		$ 14.2	$ 13.5	$ 12.7	$ 12.0	$ 11.4	$ 10.7	$ 10.1	$ 9.5	$ 8.9	$ 8.3	$ 7.7	$ 7.1	$ 6.5	$ 5.8	$ 5.2	$ 4.7	$ 4.3	$ 3.9	$ 3.6	$ 3.3	$ 2.9	$ 2.6	$ 2.2	$ 1.9	$ 1.7
Add Depreciation		$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8	$ 7.8
Add Deferred Taxes		$ 0.7	$ 3.8	$ 3.2	$ 2.6	$ 2.0	$ 1.6	$ 1.3	$ 1.3	$ 1.3	$ 1.3	$ 1.3	$ 1.3	$ 1.3	$ 1.3	$ 1.3	$ (0.7)	$ (2.7)	$ (2.7)	$ (2.7)	$ (2.7)	$ (2.7)	$ (2.7)	$ (2.7)	$ (2.7)	$ 0.0
Tax Benefit of Interest		$ (2.1)	$ (2.0)	$ (1.9)	$ (1.7)	$ (1.6)	$ (1.5)	$ (1.4)	$ (1.3)	$ (1.2)	$ (1.1)	$ (1.0)	$ (0.9)	$ (0.8)	$ (0.7)	$ (0.6)	$ (0.5)	$ (0.5)	$ (0.4)	$ (0.4)	$ (0.3)	$ (0.3)	$ (0.2)	$ (0.1)	$ (0.1)	$ (0.1)
Decommissioning																										$ (7.9)
Cash Flow (Post Tax)**	**$ (190.6)**	**$ 20.6**	**$ 23.1**	**$ 21.9**	**$ 20.7**	**$ 19.6**	**$ 18.6**	**$ 17.8**	**$ 17.3**	**$ 16.8**	**$ 16.3**	**$ 15.8**	**$ 15.3**	**$ 14.8**	**$ 14.3**	**$ 13.8**	**$ 11.2**	**$ 8.9**	**$ 8.6**	**$ 8.3**	**$ 8.0**	**$ 7.7**	**$ 7.4**	**$ 7.1**	**$ 6.9**	**$ 1.6**
IRR (Post-Tax)	*6.9%*																									
Income Tax		$ 4.4	$ 4.2	$ 4.0	$ 3.8	$ 3.6	$ 3.4	$ 3.2	$ 3.1	$ 2.9	$ 2.7	$ 2.5	$ 2.4	$ 2.2	$ 2.0	$ 1.8	$ 1.7	$ 1.6	$ 1.5	$ 1.4	$ 1.3	$ 1.2	$ 1.1	$ 1.0	$ 0.9	$ 0.8
Cash Flow (Pre-Tax)**	**$ (190.6)**	**$ 25.0**	**$ 27.4**	**$ 25.9**	**$ 24.5**	**$ 23.2**	**$ 22.0**	**$ 21.1**	**$ 20.4**	**$ 19.7**	**$ 19.0**	**$ 18.3**	**$ 17.7**	**$ 17.0**	**$ 16.3**	**$ 15.6**	**$ 12.9**	**$ 10.5**	**$ 10.1**	**$ 9.7**	**$ 9.3**	**$ 8.9**	**$ 8.5**	**$ 8.1**	**$ 7.7**	**$ 2.4**
IRR (Pre-Tax)	*9.4%*																									

*Revenues back to Ratepayers represents dollars collected from TOTE above regulated rate of return that would be returned to other Core Gas book customers, net of sales tax

***Closing plant values are shifted back .5 years using PSE after tax WACC to line up with cashflow midyear convention.*

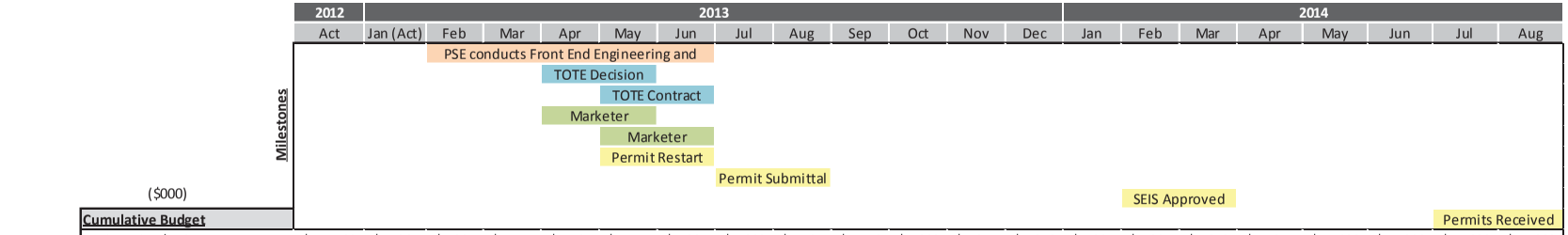
Balance Sheet Plant																										
Gross Plant	$ 158.2	$158.2	$158.2	$158.2	$158.2	$158.2	$158.2	$158.2	$158.2	$158.2	$158.2	$158.2	$158.2	$158.2	$158.2	$158.2	$158.2	$158.2	$158.2	$158.2	$158.2	$158.2	$158.2	$158.2	$158.2	$158.2
Accumulated Depreciation		$ 6.6	$ 13.3	$ 19.9	$ 26.6	$ 33.2	$ 39.9	$ 46.5	$ 53.2	$ 59.8	$ 66.4	$ 73.1	$ 79.7	$ 86.4	$ 93.0	$ 99.7	$106.3	$113.0	$119.6	$126.2	$132.9	$139.5	$146.2	$152.8	$159.5	$166.1
Depreciation		$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6	$ 6.6
Net Plant Balance		**$151.6**	**$144.9**	**$138.3**	**$131.6**	**$125.0**	**$118.3**	**$111.7**	**$105.0**	**$ 98.4**	**$ 91.8**	**$ 85.1**	**$ 78.5**	**$ 71.8**	**$ 65.2**	**$ 58.5**	**$ 51.9**	**$ 45.2**	**$ 38.6**	**$ 32.0**	**$ 25.3**	**$ 18.7**	**$ 12.0**	**$ 5.4**	**$ (1.3)**	**$ (7.9)**
Tax Depreciation		$ 7.9	$ 15.0	$ 13.5	$ 12.2	$ 10.9	$ 9.9	$ 9.3	$ 9.3	$ 9.3	$ 9.3	$ 9.3	$ 9.3	$ 9.3	$ 9.3	$ 9.3	$ 4.6	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 7.9
Tax- Book Difference		$ 1.3	$ 8.4	$ 6.9	$ 5.5	$ 4.3	$ 3.2	$ 2.7	$ 2.7	$ 2.7	$ 2.7	$ 2.7	$ 2.7	$ 2.7	$ 2.7	$ 2.7	$ (2.0)	$ (6.6)	$ (6.6)	$ (6.6)	$ (6.6)	$ (6.6)	$ (6.6)	$ (6.6)	$ (6.6)	$ 1.3
Deferred Tax		$ 0.4	$ 2.9	$ 2.4	$ 1.9	$ 1.5	$ 1.1	$ 0.9	$ 0.9	$ 0.9	$ 0.9	$ 0.9	$ 0.9	$ 0.9	$ 0.9	$ 0.9	$ (0.7)	$ (2.3)	$ (2.3)	$ (2.3)	$ (2.3)	$ (2.3)	$ (2.3)	$ (2.3)	$ (2.3)	$ 0.4
Accumulated Deferred Tax		$ 0.4	$ 3.4	$ 5.8	$ 7.7	$ 9.2	$ 10.4	$ 11.3	$ 12.2	$ 13.2	$ 14.1	$ 15.1	$ 16.0	$ 17.0	$ 17.9	$ 18.9	$ 18.2	$ 15.8	$ 13.5	$ 11.2	$ 8.9	$ 6.5	$ 4.2	$ 1.9	$ (0.4)	$ (0.0)

Balance Sheet Dist System																										
Gross Plant	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7	$ 38.7
Accumulated Depreciation		$ 1.2	$ 2.3	$ 3.5	$ 4.7	$ 5.9	$ 7.0	$ 8.2	$ 9.4	$ 10.5	$ 11.7	$ 12.9	$ 14.1	$ 15.2	$ 16.4	$ 17.6	$ 18.8	$ 19.9	$ 21.1	$ 22.3	$ 23.4	$ 24.6	$ 25.8	$ 27.0	$ 28.1	$ 29.3
Depreciation		$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2	$ 1.2
Net Plant Balance		**$ 37.5**	**$ 36.3**	**$ 35.2**	**$ 34.0**	**$ 32.8**	**$ 31.6**	**$ 30.5**	**$ 29.3**	**$ 28.1**	**$ 27.0**	**$ 25.8**	**$ 24.6**	**$ 23.4**	**$ 22.3**	**$ 21.1**	**$ 19.9**	**$ 18.8**	**$ 17.6**	**$ 16.4**	**$ 15.2**	**$ 14.1**	**$ 12.9**	**$ 11.7**	**$ 10.5**	**$ 9.4**
Tax Depreciation		$ 1.9	$ 3.7	$ 3.3	$ 3.0	$ 2.7	$ 2.4	$ 2.3	$ 2.3	$ 2.3	$ 2.3	$ 2.3	$ 2.3	$ 2.3	$ 2.3	$ 2.3	$ 1.1	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Tax- Book Difference		$ 0.8	$ 2.5	$ 2.1	$ 1.8	$ 1.5	$ 1.2	$ 1.1	$ 1.1	$ 1.1	$ 1.1	$ 1.1	$ 1.1	$ 1.1	$ 1.1	$ 1.1	$ (0.0)	$ (1.2)	$ (1.2)	$ (1.2)	$ (1.2)	$ (1.2)	$ (1.2)	$ (1.2)	$ (1.2)	$ (1.2)
Deferred Tax		$ 0.3	$ 0.9	$ 0.7	$ 0.6	$ 0.5	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ 0.4	$ (0.0)	$ (0.4)	$ (0.4)	$ (0.4)	$ (0.4)	$ (0.4)	$ (0.4)	$ (0.4)	$ (0.4)	$ (0.4)
Accumulated Deferred Tax		$ 0.3	$ 1.1	$ 1.9	$ 2.5	$ 3.0	$ 3.5	$ 3.9	$ 4.3	$ 4.6	$ 5.0	$ 5.4	$ 5.8	$ 6.2	$ 6.6	$ 7.0	$ 7.0	$ 6.6	$ 6.2	$ 5.7	$ 5.3	$ 4.9	$ 4.5	$ 4.1	$ 3.7	$ 3.3

CONFIDENTIAL per Protective Order in WUTC Docket No. UG-151663

Development Budget Forecast and Key Milestones

PSE has adjusted development work by dramatically reducing permitting-related spend. This has the effect of putting fewer dollars at risk prior to TOTE's supplier selection and other customer contracts. The latest development budget forecast along with key milestone events is shown below. The milestones below are mostly point-in-time events but are shown to occur over a multiple month time period due to uncertainty of exact timing.



($000) Cumulative Budget	Act	Jan (Act)	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Engineering/EPC	$ 199	$ 264	$ 284	$ 444	$ 594	$ 744	$ 894	$1,089	$1,134	$1,179	$1,229	$1,254	$1,279	$1,304	$1,324	$1,349	$ 1,374	$ 1,399	$ 1,399	$ 1,399	$ 1,399
Permitting/Legal	$ 195	$ 306	$ 351	$ 406	$ 431	$ 446	$ 461	$ 771	$1,064	$1,534	$1,994	$2,454	$2,919	$3,329	$3,729	$4,009	$ 4,139	$ 4,269	$ 4,399	$ 4,529	$ 4,529
Site/Real Estate	$ 37	$ 40	$ 50	$ 75	$ 100	$ 100	$ 110	$ 165	$ 219	$ 273	$ 327	$ 381	$ 436	$ 490	$ 544	$ 598	$ 653	$ 707	$ 761	$ 815	$ 815
Distribution System	$ 43	$ 107	$ 107	$ 107	$ 107	$ 107	$ 107	$ 107	$ 292	$ 477	$ 662	$ 847	$1,032	$1,217	$1,402	$1,587	$ 1,682	$ 1,778	$ 1,873	$ 1,969	$ 1,969
PSE Labor	$ 81	$ 105	$ 151	$ 192	$ 233	$ 276	$ 319	$ 380	$ 441	$ 502	$ 563	$ 624	$ 685	$ 746	$ 807	$ 868	$ 899	$ 930	$ 960	$ 990	$ 990
Communications & Outreach	$ 8	$ 16	$ 16	$ 16	$ 16	$ 16	$ 31	$ 46	$ 66	$ 86	$ 106	$ 126	$ 145	$ 155	$ 165	$ 170	$ 175	$ 180	$ 185	$ 190	$ 190
Total Capital Cumulative Spend	**$ 563**	**$ 838**	**$ 959**	**$1,240**	**$1,481**	**$1,689**	**$1,922**	**$2,557**	**$3,215**	**$4,050**	**$4,881**	**$5,686**	**$6,495**	**$7,240**	**$7,971**	**$8,581**	**$ 8,922**	**$ 9,262**	**$ 9,577**	**$ 9,892**	**$ 9,892**
O&M Legal	$ 232	$ 232	$ 232	$ 232	$ 232	$ 352	$ 472	$ 582	$ 582	$ 582	$ 582	$ 582	$ 582	$ 582	$ 582	$ 588	$ 594	$ 600	$ 600	$ 600	$ 600
Total Cumulative Spend	**$ 795**	**$ 1,070**	**$1,191**	**$1,472**	**$1,713**	**$2,041**	**$2,394**	**$3,139**	**$3,797**	**$4,632**	**$5,463**	**$6,268**	**$7,077**	**$7,822**	**$8,553**	**$9,169**	**$ 9,516**	**$ 9,862**	**$10,177**	**$10,492**	**$10,492**

Potential Counterparty Credit Evaluation

PSE is actively negotiating with a number of potential counterparties for LNG supply. Some of them could be LNG end-users while others would serve as a market wholesaler.

Counterparty	Credit Rating
Linde AG	A/Stable
BP	A/Stable
Saltchuk (TOTE)	B+ (Saltchuk is not rated by S&P. This rating is the product of an internal PSE credit analysis.
ENN Energy Holdings (Blu)	BBB-/Stable
Hawaiian Electric	BBB-/Stable

Next Steps

Moving forward PSE intends to focus on the following key project drivers:

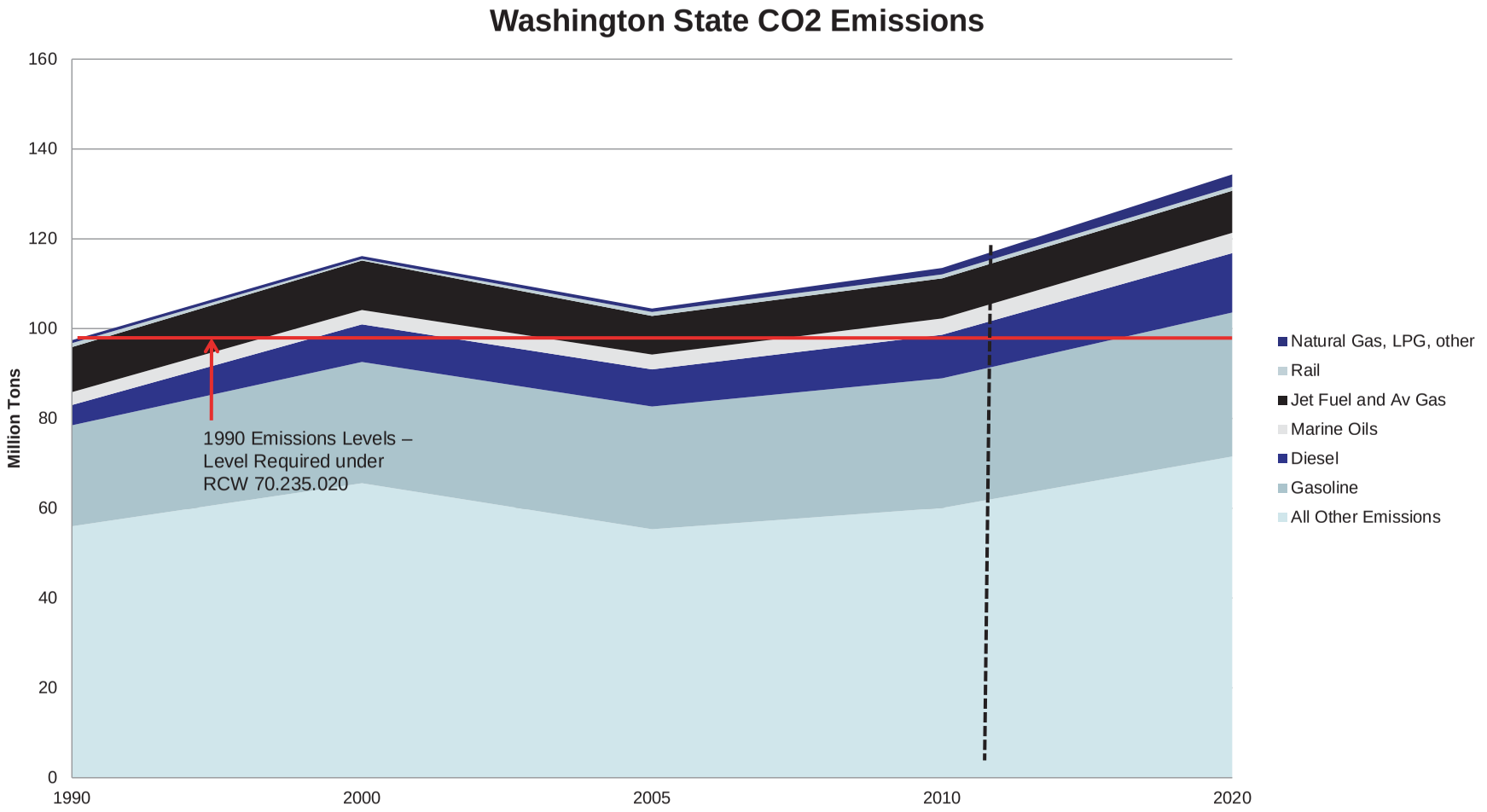
- Internal strategy development for legislative requirements for the preferred business model of including the project in PSE's core gas book. This will include lobbying key legislators and the governor's office for support as well as legislation design.
- Continue commercial development with potential anchor customers and work towards developing markets with existing regional supply sources in the near term.
- Continue engineering design and critical site evaluation for contamination and seismic issues.
- Evaluate FERC permitting options if required for interstate markets.

Transportation Strategy

May 8, 2013

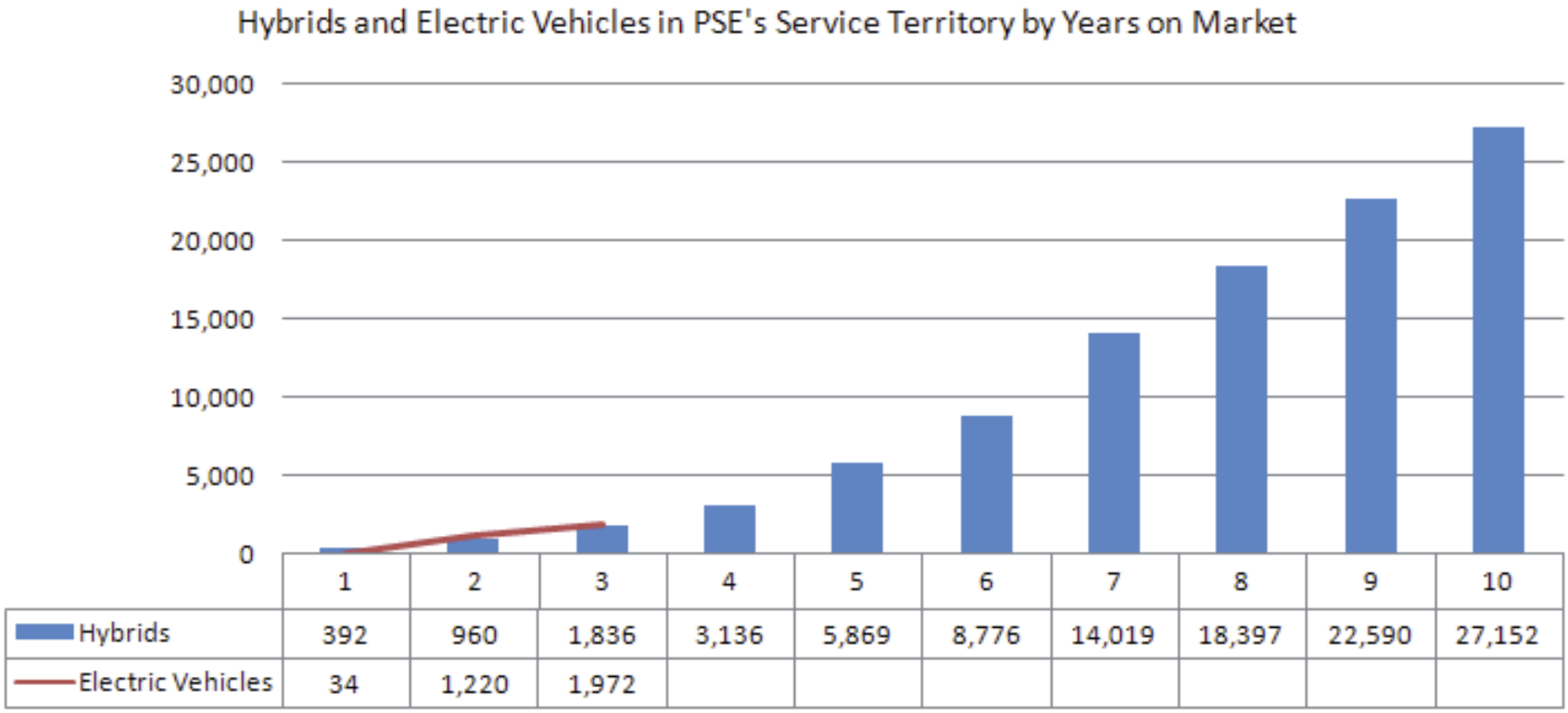
PUGET SOUND ENERGY
The Energy To Do Great Things

State Emission Challenges Ahead



PUGET SOUND ENERGY
The Energy To Do Great Things

Markets PSE Will Serve - Electric



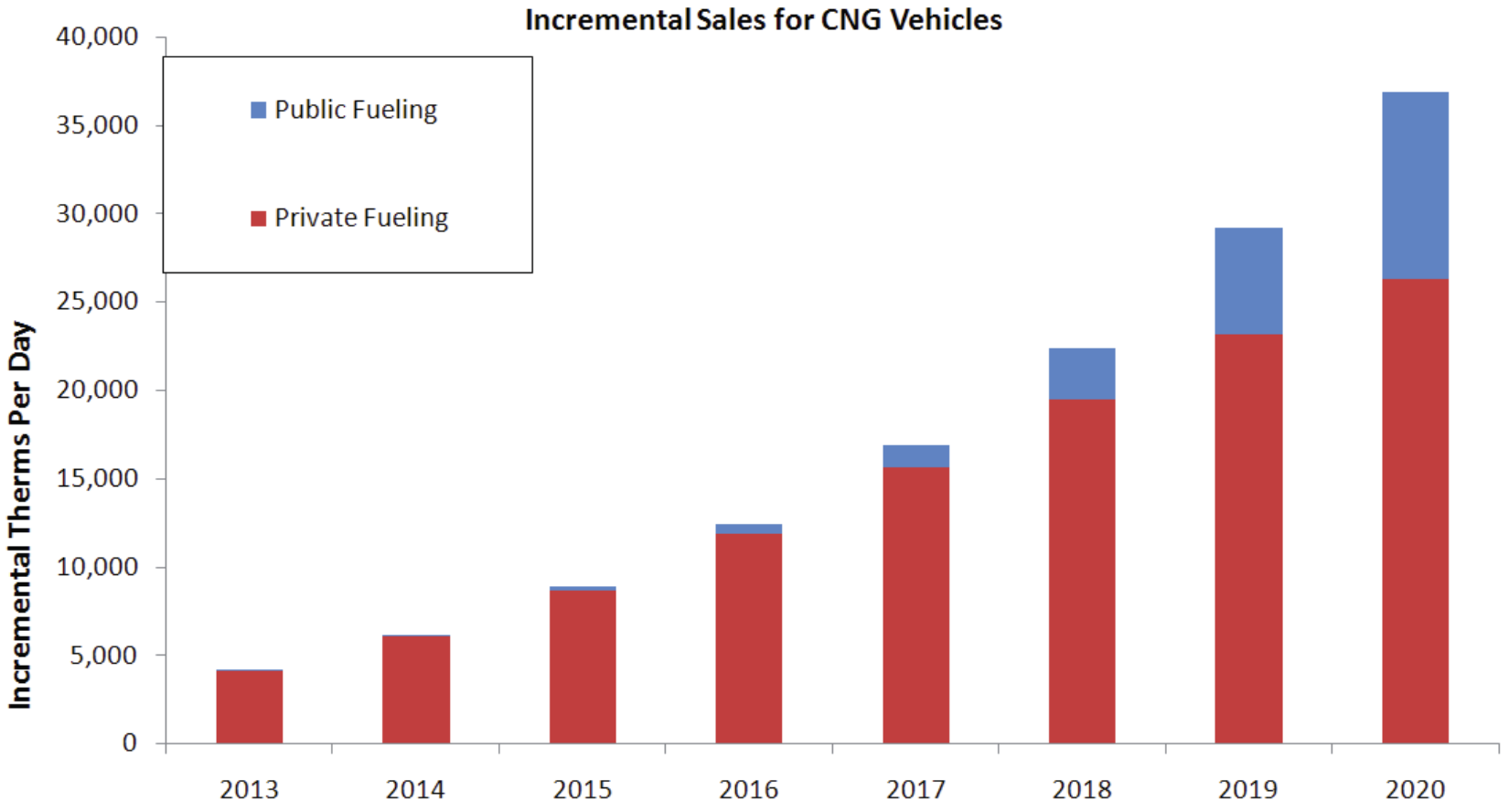
	1	2	3	4	5	6	7	8	9	10
Hybrids	392	960	1,836	3,136	5,869	8,776	14,019	18,397	22,590	27,152
Electric Vehicles	34	1,220	1,972							

Electric Vehicles - Home Charging Station Rebate

- Assist customers with offsetting initial cost
- Voluntary market enhancement
- Revenue neutral to all stakeholders

PSE PUGET SOUND ENERGY
The Energy To Do Great Things

Markets PSE Will Serve - CNG



- Assists customers with offsetting initial cost, design and sourcing challenges
- Voluntary market enhancement
- Self-funding, meets regulated ROR

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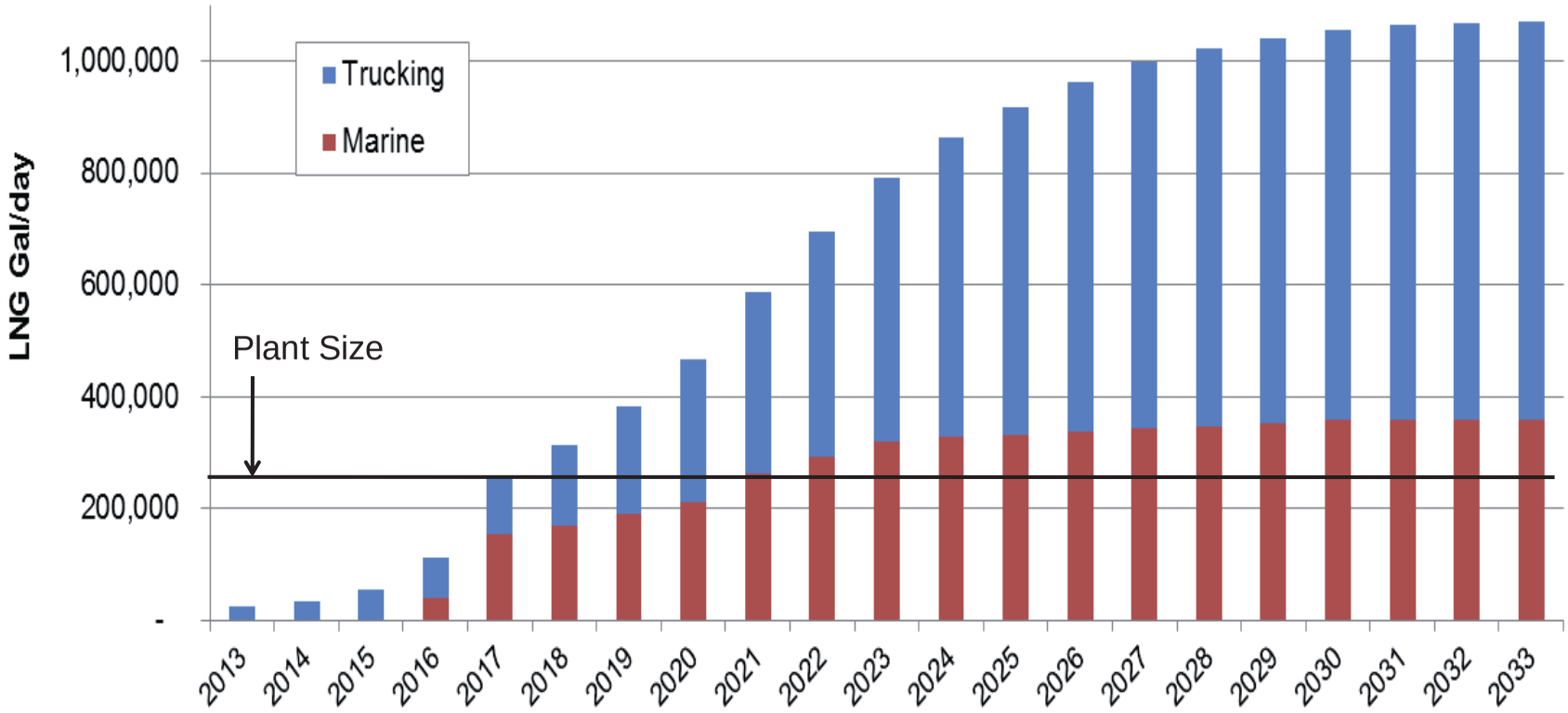
The Energy To Do Great Things

Markets PSE Will Serve - LNG

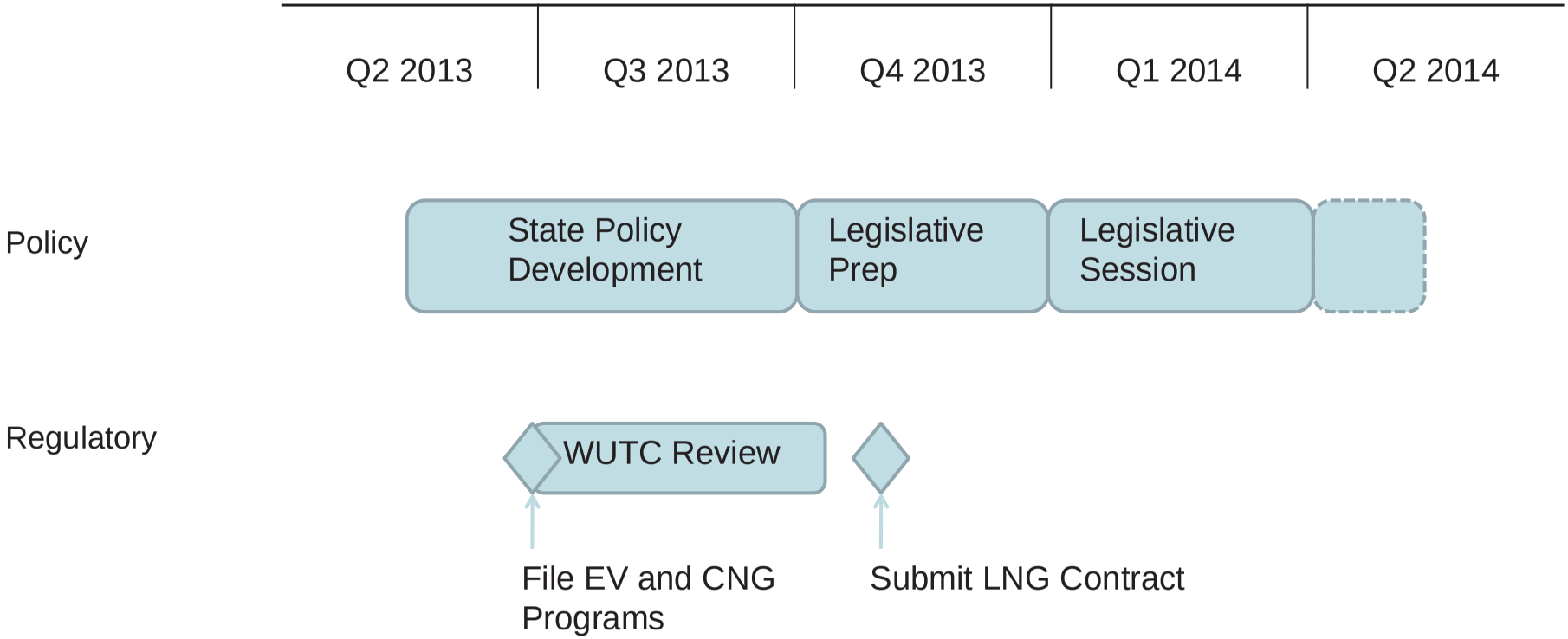


LNG Transportation - Develop LNG plant

- Assists customers with meeting emissions requirements
- Provides NG system benefits to PSE
- Self-funding, meets regulated ROR
- Fully regulated & contracted

PSE PUGET SOUND ENERGY
The Energy To Do Great Things

Timeline



LNG Update

- TOTE RFP for LNG expected to be released in June
  - A 45-day response period is anticipated, following a review period and presentation meeting
- Discussions continue with BP as a project partner. Potential structures include:
  - BP as tolling customer
  - BP as a joint venture partner, but also a tolling customer
- Other potential partners include Avista Utilities and Linde North America
- Project development work focused on engineering and site suitability
- Current pricing projections:

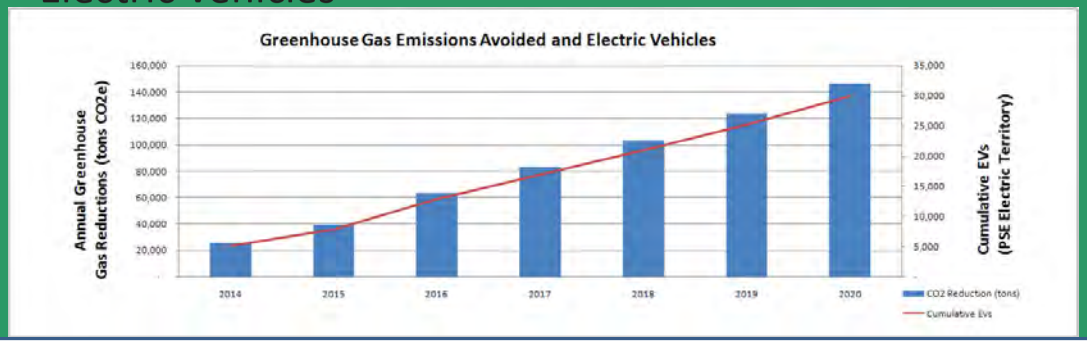
Transportation Markets and Plan

Electric Vehicles

Passenger Vehicles

PSE Plan

- Offer charging station rebate to customers who purchase an electric vehicle and home charging station in PSE's electric service territory.

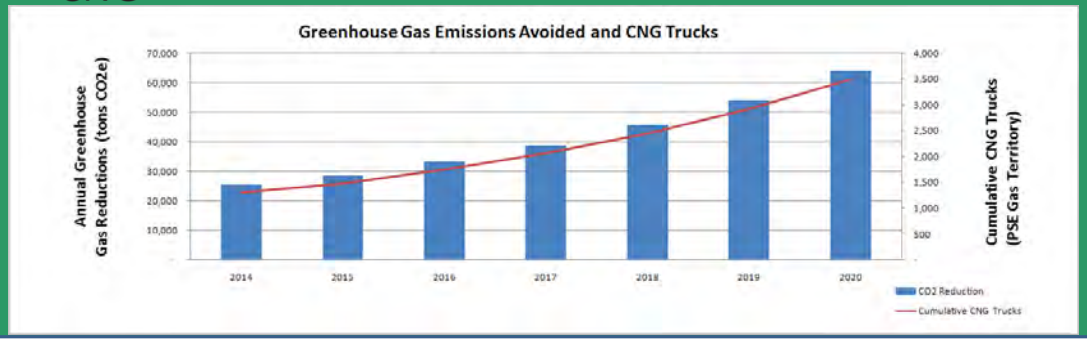


CNG

Return to Base Fleets

PSE Plan

- Offer turnkey tariff service for design, build, own, and maintain compression equipment sited on customer's property.

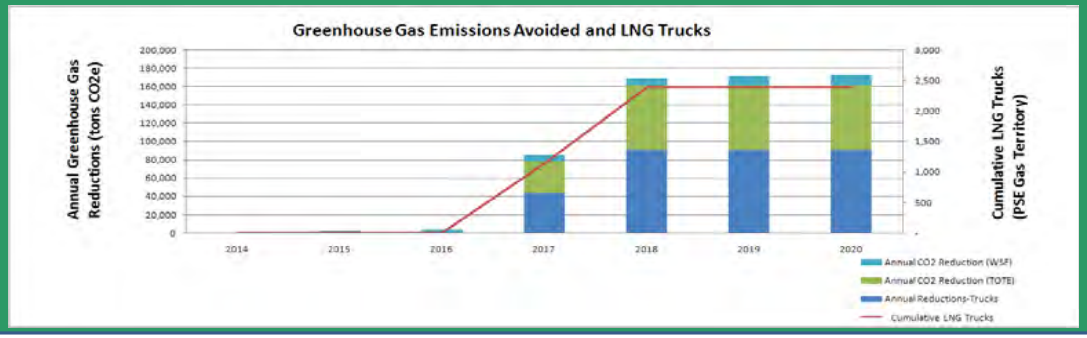


LNG

Marine, Long Haul Trucking

PSE Plan

- Develop LNG plant to provide liquefaction under tariff to direct users or downstream marketers.



LNG Strategic Initiative Board Update

Paul Wiegand

November 8, 2013

PUGET SOUND ENERGY
The Energy To Do Great Things

Total Plant

Total Capex

- High: $312M
- 2014 Plan: $266M
- Low: $243M

**High/Low estimates represent a +20%/-10% adjustment on plant capital*

Annual Capital Summary	2013	2014	2015	2016	2017	TOTAL
LNG Plant Capital	$5	$12	$85	$75	$54	$231
Gas System Upgrades	$0	$4	$12	$15	$3	$35
TOTAL	$5	$16	$97	$90	$58	**$266**

Plant Assumptions:

- 250,000 gallon per day liquefaction
- 7.7 million gallon storage tank
- Projected in-service date late 2017
- AFUDC estimated to be $40M for a total cost of $306M

Business Segments

	Peaking	TOTE	Marketer
LNG Plant Capital (million $)	$95	$73	$63
LNG Plant Capital %	41%	32%	27%
Liquefaction Capacity %	10%	44%	46%
Storage Capacity %	78%	16%	6%
2019 Revenues (million $)*	$24	$23	$22
2019 EBITDA (million $)*	$16	$14	$13

**First year of peaking revenues begin in 2019 with planned rate case*

- Excludes capital ($35 million) and Revenues/EBITDA ($7 million/$5 million) from distribution system upgrades

Gas System Upgrades

Gas System Upgrades Capex[1]	$35

[1]*Excludes AFUDC*

	2019	2020	2021	2022	2023
Revenues	$7	$7	$6	$6	$6
EBITDA	$6	$5	$5	$5	$5

- Gas distribution system upgrades wholly integrated for rate making purposes.
- Assumes plant added to rate base in 2019 rate case.
- However, TOTE and Marketer-related distribution revenues would commence in 2018.

Peaking Facility

Peaking Allocated Capex[1]	$95
Liquefaction Capacity (Gal/day)	23,817
Storage Capacity (million Gal)	6.0
Vaporization Capacity (Dth/Day)[2]	66,000

[1]*Excludes AFUDC*

[2]*Vaporization Capacity for 6 Days. Does not include 19,000 Dth/day of diverted gas.*

	2019	2020	2021	2022	2023
Revenues[3]	$24	$23	$22	$22	$21
EBITDA	$16	$15	$15	$14	$13

[3]*Revenues for the peaking facility begin in 2019 with next rate case.*

IRP Least Cost Analysis

- 2013 Integrated Resource Plan (IRP) shows peaking need starts in 2017/18 and grows to 141,000 Dth per day of need by 2022/23.
- IRP identifies the LNG facility as least-cost.
- Peaking revenue requirement will raise rates by approximately 2.4% in year 1.

TOTE

Allocated Capex[1]	$73
Liquefaction Capacity (Gal/day)	110,736
Storage Capacity (million Gal)	1.2

[1]Excludes AFUDC; includes plant capital only

	2018	2019	2020	2021	2022
Revenues[2]	$23	$23	$23	$22	$22
EBITDA[2] [3]	$11	$14	$14	$13	$13

[2]Includes revenues/expenses from LNG plant and gas system upgrades

[3]EBITDA in 2018 includes peaking expenses (prior to the peaking facility's inclusion in rates)

- TOTE expects LNG supply contract by year-end

- Remaining Competitor – Clean Energy/GE/Ferus Natural Gas Fuels
  - Site immediately south of PSE's site
  - Potential for direct-service LNG pipeline
  - Not located on waterway

Marketer – Clean Energy

Allocated Capex[1]	$63
Liquefaction Capacity (Gal/day)	115,447
Storage Capacity (million Gal)	0.5

[1]Excludes AFUDC; includes plant capital only

	2018	2019	2020	2021	2022
Revenues[2]	$22	$21	$21	$21	$20
EBITDA[2] [3]	$9	$13	$12	$12	$12

[2]Includes revenues/expenses from LNG plant and gas system upgrades

[3]EBITDA in 2018 includes peaking expenses (prior to the peaking facility's inclusion in rates)

Clean Energy (CE)

- TOTE has suggested that PSE & CE join forces
- NDA in place; MOU being discussed
- CE is proposing GE equipment and may have access to equipment that is already in the works
- CE interested in taking on merchant position for the balance of the plant, but also likely wants the contractual interface with TOTE
- CE in JV with GE and Ferus Natural Gas Fuels –
  - Likely wants an equity position in the plant

LNG Strategic Initiative Board Update

Paul Wiegand

January 22, 2014

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Requested Board Action

November 8, 2013 Board authorization:

- Continue efforts to implement management's near-term LNG development strategy

Current Request: Continued support for the execution of the LNG Strategy

- Continue negotiating LOI with TOTE for fuel supply
- Partner with third-party marketer – Blu
- Re-start plant development and permitting activities

Previous Board Interaction

The LNG initiative was discussed at the following board meetings:

Board meeting on May 9, 2012

- Evaluated the LNG Strategy

Board meeting on January 23, 2013

- Discussed the Tacoma LNG project development strategy

Board meeting on February 28, 2013

- Reviewed the LNG development structure and regulatory strategy

Board meeting on May 8, 2013

- Discussed the transportation initiative

Board meeting on November 8, 2013

- Reviewed the project costs, structure and commercial plan

Background

PSE is developing an LNG facility to serve as a peaking resource for its core natural gas customers and to provide fuel to marine and on-road transportation markets

Plant Assumptions:

- 250,000 gallon per day liquefaction capacity
- 7.7 million gallon storage tank
- Projected in-service date late 2017

LNG Facility Cost Assumptions*

- High: $312M
- 2014 Plan: $266M
- Low: $243M

**High/Low estimates represent a +20%/-10% adjustment on plant capital.*

Commercial Updates - TOTE

PSE provided a draft LOI to TOTE on January 7 detailing key negotiating points that include:

- Target execution of a fuel supply agreement by March 31, 2014
- PSE would be TOTE's sole LNG supplier for a 10-year term
- Contract pricing based on (i) a 250,000 gallon/day plant and (ii) cost-of-service pricing, with allocations as discussed
- Extension of contract terms for additional TOTE load or to affiliates
- Create a mechanism to balance (i) TOTE's risk that the oil market could decline to the extent that it's no longer economical to purchase LNG and (ii) PSE's risk of recovering the undepreciated plant value, in the event that TOTE terminates the contract. We refer to such a mechanism as a price trigger.

TOTE Price Triggers

Price Triggers

- PSE is seeking a one- and two-year written notice of termination for ULSD and IFO 380, respectively
- PSE will have the right, but not the obligation, to lower pricing in order to match fuel oil
- Price triggers consider PSE's costs of liquefaction, forward curves for natural gas, ULSD and IFO 380 Marine Fuel Oil and TOTE's cost to burn the alternate fuels
- PSE has proposed the following termination payments. The first five years represent the undepreciated plant value (on a contract basis) associated with TOTE's allocated share of the LNG facility

Termination Fee (millions)*										
FSA terminates in Year:	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Contract Termination Fee:	$65	$59	$54	$48	$42	$20	$17	$14	$10	$7

* Termination fees assume termination at the beginning of each contract year

Commercial Updates – Blu

Clean Energy elected not to participate in the Tacoma plant under conditions acceptable to PSE & TOTE. Consequently, PSE re-engaged with Blu (a joint venture of Transfuels, a Utah-based LNG fuels company and ENN, a large Chinese utility). PSE and Blu are negotiating an LOI that is expected to be finalized by the end of January. The LOI contains the following key negotiating points:

- **PSE**
  - Owns, at a minimum, the plant allocated to the PSE peaking resource and TOTE
  - Is responsible for the TOTE contract and serving TOTE
  - Manages site permitting, plant design, construction, and operates the LNG facility
  - PSE has the right to participate as an equity owner in subsequent expansions, even if all LNG will be marketed by Blu

Blu

- Owns or contracts for the non-peaking, non-TOTE portion of the plant and is responsible for marketing the associated supply
- May have an equity stake in some or all of the marketing-related portion of the plant as a way to mitigate PSE's credit exposure to Blu
- If necessary, Blu acquires a barge and installs loading facilities to facilitate interim TOTE supply before the Tacoma LNG facility is in service
- Blu controls all marketing rights to LNG beyond TOTE and peaking-related supply; provided, however, that if PSE's Washington State Ferries supply proposal is successful, PSE would also serve the Washington State Ferries

Risks/Opportunities Matrix

Risk	What	Probability	Magnitude	Mitigation Plan
Financial	TOTE credit	Low	Medium	Saltchuk parental guaranty/letter of credit; plant will be in rate base.
	Blu credit	Low	Low	If adequate/acceptable credit can't be provided, Blu will invest equity.
	Project costs	Medium	Low	Contract pricing will be established with EPC guaranteed pricing.
	Fuel oil price trigger	Low	Low	Termination fees will recover TOTE's remaining allocated plant cost in the first five years.
Political (Opportunity)	Help Governor Inslee meet transportation emission/clean energy goals	Medium	High	Working with the governor and staff to promote benefits of natural gas.
Regulatory	WUTC could deny regulated rate-base treatment	Medium	High	Working with WUTC commissioners and staff (and Governor's office) to promote peaking resource benefit and espouse clean energy and economic regional benefits. Considering legislation.

Risks/Opportunities Matrix

Risk	What	Probability	Magnitude	Mitigation Plan
Permitting	Permits are appealed; delays ensue	Low	High	Supplementing an existing Port of Tacoma EIS to mitigate environmental challenges. Talk early and often to stakeholders.
Competition (Opportunity)	Project scale provides lower cost peaking resource	High	Low	Find complimentary markets (TOTE/others) to optimize LNG facility pricing.
Reputational	LNG facilities attract NIMBYs and environmental activists	Medium	Low	Develop public outreach programs. PSE builds and operates many NIMBY-attracting facilities.

Financial Analysis

Annual Capital Summary[1]	2013	2014	2015	2016	2017	TOTAL
LNG Plant Capital (millions)	$4	$12	$87	$73	$55	$231
Gas System Upgrades (millions)	$0	$4	$12	$15	$3	$35
TOTAL	**$4**	**$16**	**$99**	**$88**	**$58**	**$266**

[1]Excludes AFUDC

Annual EBITDA Summary	2018[2]	2019	2020	2021	2022
LNG Facility (millions)	$15	$39	$37	$36	$34
Gas System Upgrades (millions)	$6	$5	$5	$5	$5
TOTAL	**$20**	**$45**	**$43**	**$41**	**$39**

[2]EBITDA in 2018 includes peaking expenses but no revenues (prior to the peaking share being ratebased)

Customer Allocation Summary[3]	PSE Peaking	TOTE	Marketer
LNG Plant Capital (million $)	$110	$57	**$64**
LNG Plant Capital %	48%	25%	28%
Liquefaction Capacity %	9%	44%	46%
Storage Capacity %	78%	6%	16%
2019 Revenues (million $) [4]	$26	$17	$18
2019 EBITDA Plant Only (million $) [4]	$19	$10	$11

[3]Excludes capital ($35 million) and revenues/EBITDA ($7 million/$5 million) from distribution system upgrades.

[4]First year of peaking revenues begin in 2019 with planned rate case

Blu may invest equity and reduce PSE investment by as much as $64 million, mitigating credit exposure and revenue and EBITDA risks

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Impacts to Customers - Ratepayer Benefits

2013 IRP

- Gas peaking resource need starts in 2017-2018, growing to 141,000 Dth/day by 2022-2023
- IRP analyses have chosen the LNG facility as a least-cost resource
  - The peaking resource may raise rates by approximately 2.4% in the first year the plant is included in rates
- An LNG facility within PSE's distribution system eliminates the need for long-haul interstate pipeline capacity

Other Regional Benefits

- Air quality improvement benefits regional customers
- The project provides local jobs and economic development

Strategy

- **Commercial**: Ensure that the LNG facility is fully contracted by PSE customers, TOTE and a third-party marketer (i.e., Blu)

- **Regulatory**: Obtain full prudency for LNG facility by validating resource need and regional resource benefits (e.g., economic, environmental)

- **Project Development:** Develop a holistic "playbook" that incorporates all aspects of permitting, engineering, construction, advocacy and community outreach to ensure successful project development

- **Community Outreach**: Engage community and political leaders to garner support for the LNG project by emphasizing project benefits to customers and the region

Next Steps

TOTE

- Negotiate LOI and the fuel supply agreement with TOTE

Blu

- Negotiate an LOI and joint venture agreement with Blu
- Negotiate a service or supply agreement with Blu and/or WesPac for interim supply

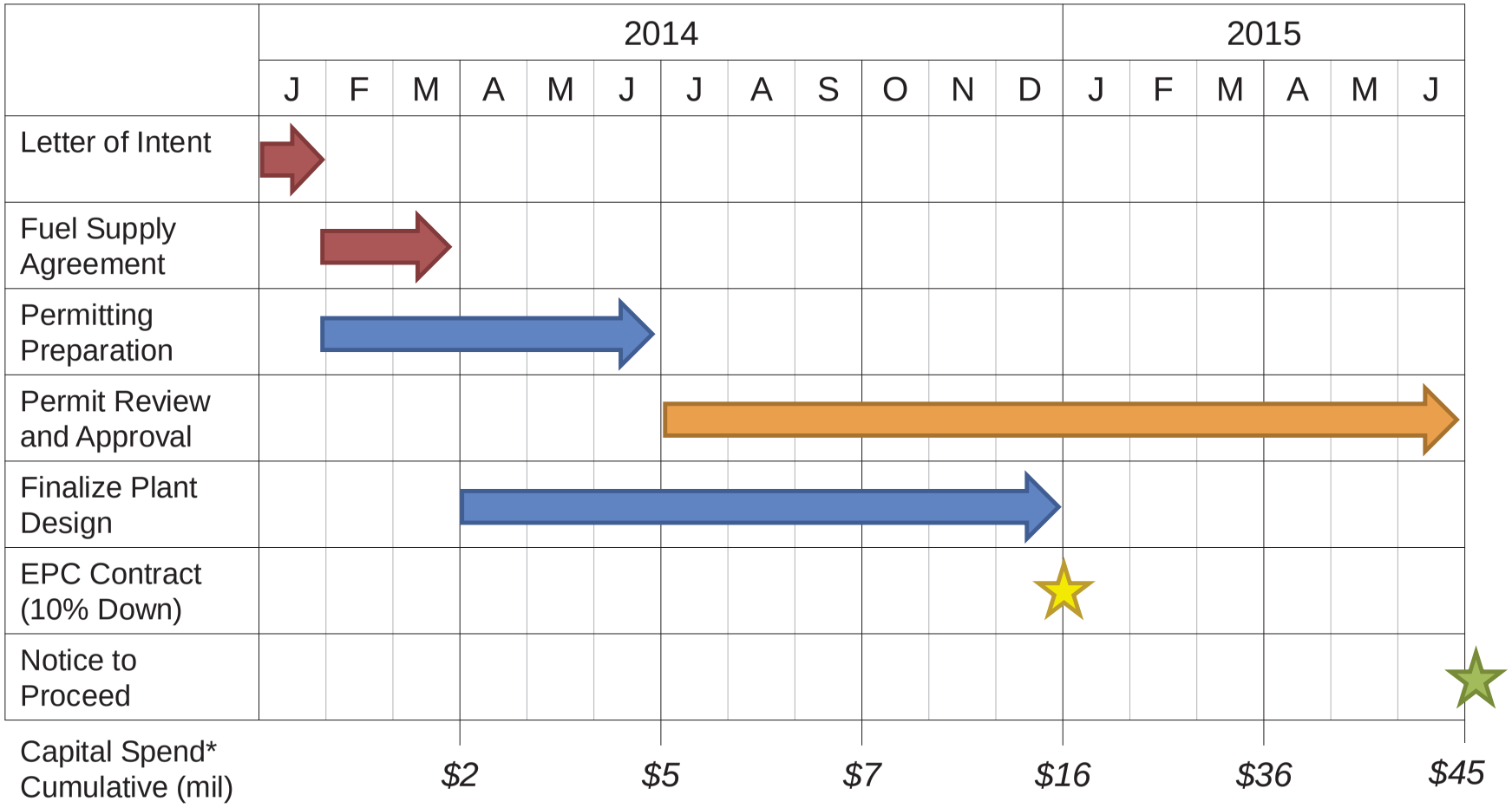
Plant Development

- Negotiate the lease with Port of Tacoma
- Re-start permitting studies and application preparation
- Re-start geotech investigation and soil stabilization engineering
- Ramp-up gas system upgrade engineering work
- Revisit and finalize design considering GE liquefaction and pretreatment equipment

Regulatory

- Finalize the LNG tariff, and file the tariff and special contracts with the WUTC

Next Steps - Timeline



** Capital spend shown above is in addition to the $3.5 million spent on the project through 1/1/2014*

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Requested Board Action

Continued support for the execution of the LNG Strategy

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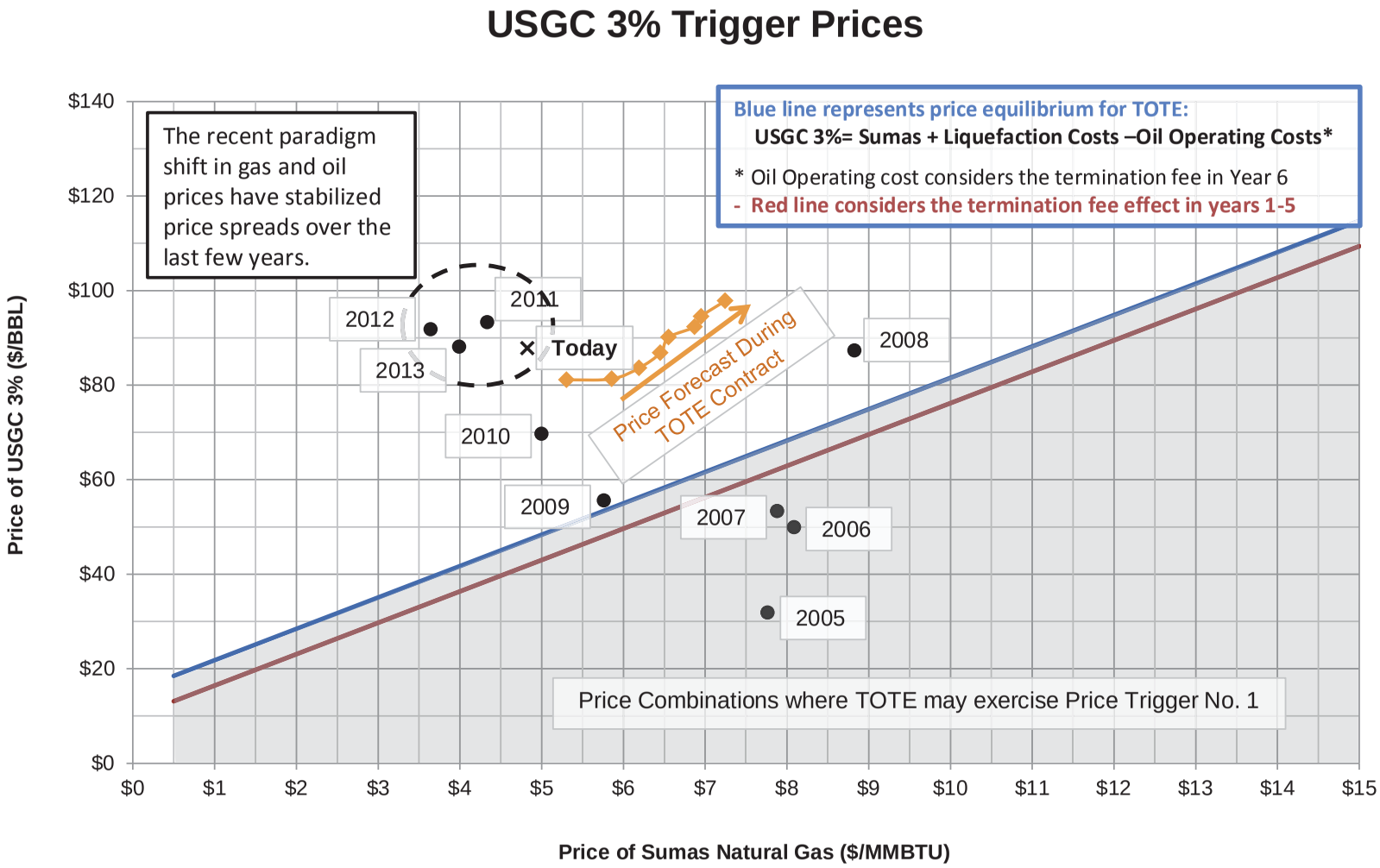
Appendix

TOTE Price Triggers



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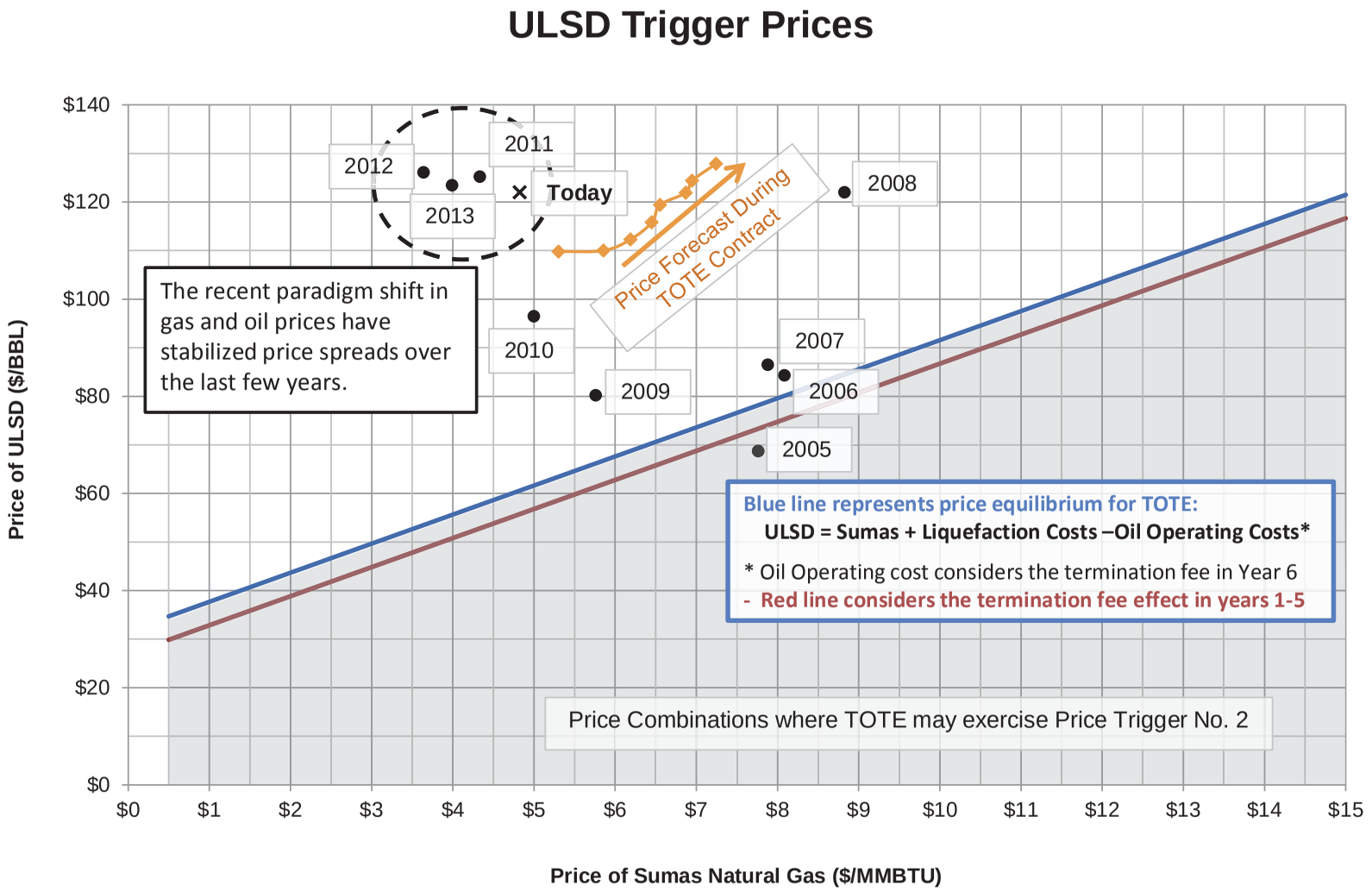

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LNG Strategic Initiative Board Update

Paul Wiegand
Senior Vice President Energy Operations

Clay Riding
Director Natural Gas Resources

January 22, 2014

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Report to the Board of Directors:

Tacoma LNG Facility

[Draft Preview June 19, 2014]

July 2, 2014

Table of Contents

List of Exhibits

1. Executive Summary

The purpose of this Report to the Board of Directors ("Report") is to recommend approval to continue development of the Tacoma LNG Project (the "Project"), in accordance with the resolutions set forth in ***Exhibit A***. Specifically, approval will authorize PSE to enter into a long-term Fuel Supply Agreement ("FSA") to sell to Totem Ocean Trailers Express ("TOTE") liquefied natural gas ("LNG") supplied from the Tacoma LNG Facility (the "Facility"). Approval will also authorize PSE to enter into an agreement to sell to TOTE LNG procured by the Company from third parties until completion of the Tacoma LNG Facility (the "Interim Supply Agreement").

This Report, and this request for certain approvals, is anticipated to be the first of multiple decision-points for the Board. Due to the timing of the development process, management currently seeks approval of the contracts with TOTE, and the interim fuel supplier. The Company will return to the Board (later in 2014 and in 2015) to seek its approval of other aspects of the Project. Upon completion of a marketing or co-ownership agreement with a third party LNG fuel marketer, management will bring such agreement to the Board for its consideration. Also, after issuance by the relevant agencies of final permits authorizing construction of the Facility, management will seek the Board's approval of the construction of the Facility and authority to execute the requisite engineering, procurement and construction ("EPC") agreement with the lead contractor. In the event that construction of the Facility does not proceed, for whatever reason, the contracts put forth for approval at this time are terminable by the Company, and in such event would leave the Company with relatively limited exposures, as detailed elsewhere in this Report. This Report describes the Project, which includes development, construction and operations of the Facility and associated upgrades to PSE's natural gas distribution system (see ***Section 2*** for additional details). Details include the commercial aspects of the Project, the development plan, anticipated financial performance, risks and mitigation plans, and an analysis of Project costs and benefits as conducted by PSE's Natural Gas Resource, Strategic Initiatives and Project Management teams. The report concludes with a recommendation to authorize PSE to enter into fuel supply agreements under which PSE will be obligated, subject to conditions precedent, to provide LNG to TOTE on a long-term basis.

PSE anticipates that all regulatory and permitting approvals will be received by Q3 2015 and the Project will be in-service in Q4 2018, assuming there are no appeals or other legal action during the permitting and development phase. The estimated cost of the development phase is [$14 million] and the total project cost is estimated to be [$319 million].

2. Project Description

The Project will enable PSE to liquefy natural gas and to store and dispense LNG. The Project will be an integral part of the PSE gas business by providing additional peaking capability. Additionally, PSE will secure long-term commercial contracts to sell LNG to customers who will use or market the LNG as a fuel. Project components include development, construction and operations of the LNG Facility, and associated upgrades to PSE's gas distribution system.

What is meant by Tacoma LNG Facility vs. Tacoma LNG Project?

Tacoma LNG Facility (the "Facility")

- Buildings, gas processing, storage and support equipment, and foundations located on PSE's leased site at the Port of Tacoma
- Underground LNG fuel line connecting the LNG tank to TOTE's berthing area, marine fueling system and in-water platform at TOTE's site
- LNG tanker truck loading racks
- Ground lease from the Port of Tacoma

Tacoma LNG Project (the "Project")

- Development, construction and operations of the Facility
- Improvements to PSE's gas distribution system needed to support the Facility
- Commercial contracts to sell LNG to customers
- Regulatory approvals to operate the Facility and sell LNG as part of a regulated service

The Facility

The Facility will be located at the Port of Tacoma, adjacent to the Hylebos waterway, on the corner of East 11th Street and Alexander Avenue East (see ***Figure 1*** on page 3). It will be capable of liquefying 250,000 gallons of LNG per day and storing approximately 8 million gallons of LNG on site. The Facility will be capable of injecting 66,000 Dth/day of vaporized gas and diverting 19,000 Dth/day of gas into PSE's distribution system to provide 85,000 Dth/day of peak-day supply. The Facility will also dispense LNG to other end-use customers via a tanker truck loading system and marine loading facilities located on the water.

Northwest Pipeline's ("NWP") interstate system will deliver natural gas to PSE's distribution system, which will in turn deliver the gas to the Facility. PSE's distribution system will require improvements to support the Facility, including a pressure increase on an existing section of pipe, constructing a new limit station, modifying an existing gate station and adding approximately five miles of new higher pressure pipe. The increase in operating pressure on the existing pipeline (from 250 psig to 500 psig) is a planned system upgrade to be implemented in

2017. The upgrade process begins in 2014 with a Pressure Authorization Request to the WUTC. Electricity for the Facility will be procured at Mid-C based market prices and will be wheeled through Tacoma Power's 115 kV transmission system. The main energy consumer at the Facility will be the liquefaction compressor, which will draw approximately 14 MW of electricity.

See ***Exhibit C*** for a more detailed description of the Project.

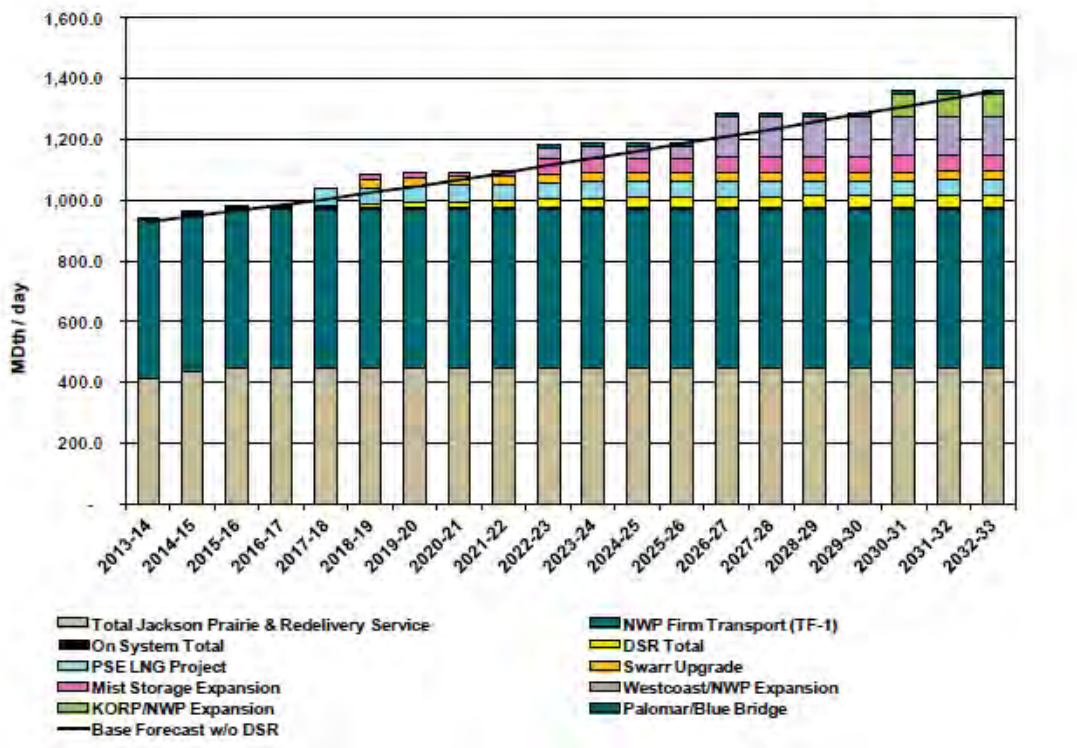
Figure 1. Tacoma LNG Facility Plot Plan

3. Determination of Need

PSE Resource Need

PSE's need for new peak-day resources to serve its retail natural gas customers is set forth in the 2013 Integrated Resource Plan (IRP). The IRP considered expected customer loads, including the effect of demand-side resource programs, based on expected regional economic growth. The 2013 IRP demonstrates a need for peaking resources beginning in 2017 that is expected to grow to a deficit of approximately 150,000 Dth per day by 2022, and 200,000 Dth per day by 2026, as shown in ***Figure 2*** below.

Figure 2. PSE's Peak Gas Resource Need (Tacoma LNG Project shown in light blue)



PSE will meet the resource needs with (i) additional Jackson Prairie storage (50,000 Dth/day) purchased from Avista Utilities and Williams-Northwest Pipeline redelivery transportation service; (ii) the Tacoma LNG Facility (85,000 Dth/day); and (iii) upgrading the SWARR propane-air facility (30,000 Dth/day; refurbishment is currently under evaluation).

PSE evaluates various resource alternatives available to reliably meet customer demand and determines which resource, or set of resources, most cost effectively meets such customer demand. PSE evaluated the Tacoma LNG Facility in comparison with long-haul interstate pipeline capacity as well as regional underground natural gas storage service and interstate pipeline storage redelivery service. Since interstate pipeline capacity in PSE's service territory is generally fully subscribed, especially considering the level of PSE's resource needs, the resource alternatives analysis evaluated expansion of the regional pipeline grid. Due to the significant revenue contribution from marine and large scale truck fuel markets, the Tacoma LNG Facility is selected as a least-cost resource in PSE's analyses of resource alternatives.

A more detailed summary of the analysis of peak-day resource alternatives can be found in ***Exhibit N***.

Other LNG Customers

While the primary purpose of the Tacoma LNG Facility is to provide peak-day supply for PSE's retail natural gas customers, the Project's benefits are significantly enhanced by serving additional markets. LNG facilities are capital intensive and, therefore, costs for all customers are reduced when facilities are fully deployed. The peak-shaving component of the plant requires significant storage and relatively small liquefaction capacity, while the marine, heavy-duty trucking and other fuel markets require significant, steady liquefaction and minimal storage. By combining these complementary load profiles, PSE can optimize the Facility and minimize peaking-resource costs for PSE's retail natural gas customers.

Totem Ocean Trailers Express (TOTE)

A fuel supply agreement has been negotiated with TOTE and will be executed upon Board approval (see ***Exhibit E***). TOTE is a shipping company that transports approximately 30 percent of all consumer goods shipped to Alaska. It operates two Orca class ships between the Port of Tacoma and Anchorage on a regimented schedule of sailings departing from Tacoma every Wednesday and Friday evening. TOTE will consume more than 39 million gallons of LNG annually, which is approximately 44 percent of the LNG produced at the Tacoma LNG Facility. TOTE is fully owned by Saltchuk Resources Inc., a privately held investment group based in Seattle. TOTE's decision to use LNG (as opposed to a petroleum based fuel) has been driven by regulatory and economic factors. The following section, 'Market Drivers' discusses these factors in further detail.

LNG Marketing Partner

PSE intends to have a marketing partner under contract prior to seeking board approval for the construction of the Facility, such that all or nearly all of the Facility is contracted. Much of the demand for LNG fuel is likely to come from markets unaccustomed or unwilling to enter into long-term contracts for fuel. This creates a need for an aggregator, or Marketer, to take on a long-term contract with PSE to resell and distribute the LNG at smaller volumes through shorter contracts. PSE has had discussions with several parties who could fulfill this role and has targeted BP and Shell. These companies bring strong balance sheets, an existing marketing presence in transportation fuels, natural gas resources, and strategic value. With either company as a marketing partner, it is likely they will want to invest equity in the Facility, which would mitigate some of PSE's marketing and regulatory risks. In getting to this point, PSE has considered other potential partners including: Blu, Tenaska, Noble and LNG America.

A long-term contract with a marketing partner may take one of several forms, including:

- ***Joint Ownership Agreement.*** If a marketing company desires an equity investment in the Tacoma LNG Facility, or must invest equity to mitigate their lack of credit, a joint ownership agreement will be negotiated, detailing the obligations of each party. PSE envisions that ownership would be structured as a tenancy-in-common, whereby each owner owns an undivided but specified percentage of the plant, broken down by its functional areas (i.e. liquefaction, storage, bunkering, truck loading, vaporization, and common). The ownership agreement would also set forth the role of each owner during the development, construction, and operational phases of the Facility (e.g., PSE develops, constructs and operates the plant; the counterparty invests equity, assumes a pro rata share of development and operating costs). Finally, the ownership agreement would set forth the allocation of output from the Facility and the payments required for future capital infusions and ongoing O&M.

- ***Tolling Agreement (TA).*** A tolling agreement will be similar to the FSA, but the customer would be responsible for delivering natural gas to PSE's distribution system. A TA customer would be required to make its gas available during peak periods to serve PSE's peak-day needs. The Facility will have adequate on-site storage to serve the tolling customer's needs during such peak periods.

- ***Fuel Supply Agreement (FSA).*** An FSA agreement provides for PSE to sell LNG to the customer as it's delivered into the customer's vessel. PSE procures and transports the natural gas to the Tacoma LNG Facility. Title and associated risks pass at the point of sale.

It is assumed that the provisions of any FSA or TA will be generally the same. Customer pricing will be based on standard cost-of-service principles, with capital costs generally recovered over the initial primary term (for project development purposes, PSE is seeking a minimum 10-year primary term). Customers will pay demand charges for fixed-priced components (capital recovery and fixed O&M) and volumetric charges for underlying natural gas costs, electricity and consumables. Natural gas and electricity costs will be recovered at market-sensitive rates (e.g., Sumas index for natural gas and Mid-C index for electricity). Pricing will vary by contract term, with shorter-term contracts carrying a higher premium. Any contract shorter than 25 years (the depreciable life of the Facility as determined by the Port of Tacoma), will include a short-term contract premium.

As a fallback to a marketing partner, PSE would seek to contract with one or more large end-use customers in order to subscribe the Facility. PSE has been in discussion with other entities interested in entering into long-term LNG supply contracts and able to serve as an additional anchor customer. These parties are either shipping or marine customers, or utilities that cannot be served by interstate pipelines. They include Horizon, Matson and Hawaiian gas and electric utilities. In the supporting analyses found in the exhibits of this report, plant volumes and revenues for these customers have been combined under the caption of "Marketer."

Market Drivers

The success of marketing partner or other end-use contracts and the potential for plant expansion depends on the success of the LNG market as a whole. There are three factors driving the market for LNG as fuel:

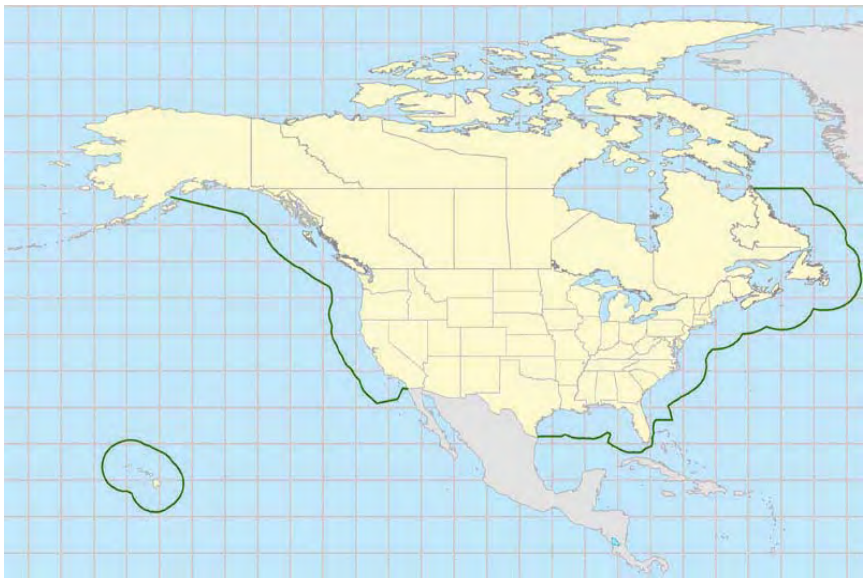
- ***Economic.*** Recent development of unconventional gas resources has stabilized the cost of natural gas. At the same time, increasing global demand has increased the cost of diesel and other petroleum-based fuels. Wood Mackenzie (an energy sector consultant commissioned by PSE) studied these market factors and determined that the wide price spread between natural gas and oil (approximately $15/MMBtu) is sustainable. In fact, Wood Mackenzie concluded that it would be difficult to imagine a scenario where a significant spread was ***not*** sustained on a long-term basis over the study period (see ***Exhibit T***).

- ***Regulatory.*** Regulators have increasingly looked to natural gas to replace petroleum-based fuels in order to reduce pollution and increase air quality. The California Air Resource Board (CARB) recently passed rules on Low Carbon Fuel Standards (LCFS) which require fuel consumers to transition to lower carbon fuel alternatives including natural gas.

In 2010, the International Maritime Organization (IMO) approved the North American Emissions Control Area (ECA), establishing more stringent emissions standards within 200 miles of the US and Canadian coast (see ***Figure 3*** on page 13). The Environmental Protection Agency (EPA) is responsible for administering vessels operating in the ECA. Ships operating within the ECA were required to reduce the sulfur content of their fuel to one percent in August 2012 and must further reduce it to 0.1 percent by 2015. Vessel operators can meet the new standard by switching to lower sulfur diesel fuels, installing scrubbers or transitioning to a cleaner fuel, such as LNG. Many operators, including TOTE, are finding that LNG is the preferred alternative.

- ***Environmental.*** When compared to diesel or marine fuel oil, LNG has significant environmental benefits. Emissions from natural gas do not contain particulates or SO_x. LNG has been embraced by the American Lung Association as a "Clean Air Choice". Carbon dioxide emissions are also greatly reduced. Using LNG in long-haul trucking operations can result in a 25 percent reduction of CO_2 emissions.

Figure 3. North American Emissions Control Area

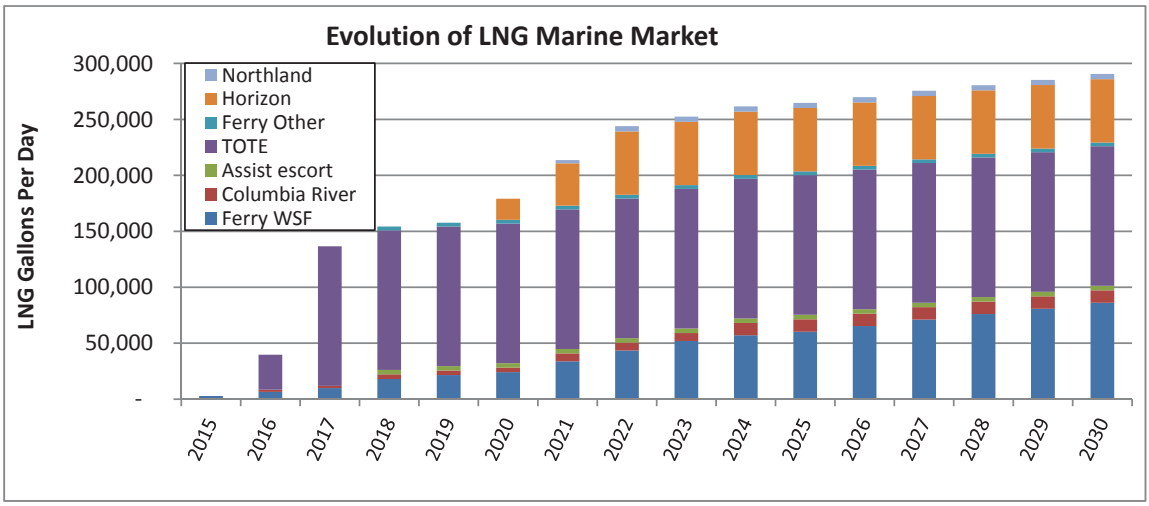


In order to fully understand this market, PSE retained Concentric Energy Advisors to assess the regional market potential for LNG in trucking, maritime and industrial applications. Concentric also provided a view of market drivers and insights into how the demand for LNG will develop over time. Concentric's full report can be found in ***Exhibit R***.

Evolution of the Marine Market

Growth in the demand for LNG in the marine market will be driven by ECA and IMO requirements, which phase in over the next several years, resulting in higher fuel costs to the maritime industry. To assess growth in this market, Concentric looked at all potential candidates for conversion. Concentric's analysis in the marine market was relatively conservative, considering only vessels that burn a large amount of fuel and operate mostly or entirely within the North American ECA (200 miles from the coast of the US and Canada). The cruise industry could also represent substantial demand; however, at this time, the industry has not embraced LNG as an alternative. The results of Concentric's analysis of the maritime market are shown in ***Figure 5***.

Figure 4. Demand for LNG by the marine vehicles industry in PSE's market area[1]



It is important to note that the study specifically excluded shipping companies in the Hawaii trade, such as Matson and Horizon (the Horizon volumes above are for its Alaska trade), two entities that have subsequently announced they are purchasing LNG-ready ships or converting existing vessels. Both Matson's and Horizon's Hawaii trade consumption is similar to TOTE's volumes.

Evolution of the Heavy Duty Truck Market

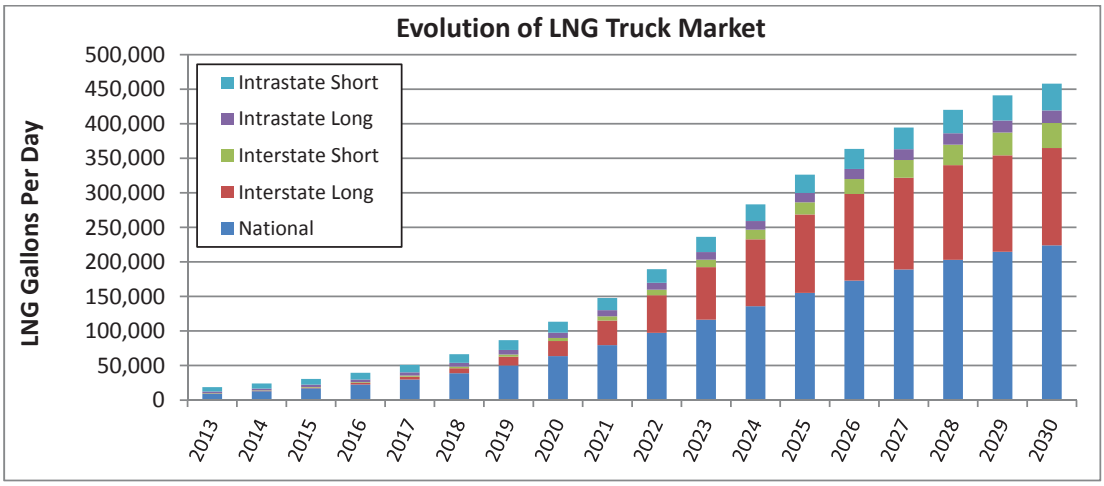
The heavy-duty trucking demand for LNG will be driven by the price spread between low-sulfur diesel and natural gas. As market interest in LNG increases, engine and truck manufacturers will begin to roll out more LNG tractors and engines, which will help drive down costs. The first

[1] Source: Concentric Energy Advisors

adopters of LNG trucks in the region are likely to be large interstate fleets (such as UPS) that can afford to convert their trucks and will realize savings due to high consumption. As this market develops, retailers like Clean Energy and Flying J, will begin to offer LNG at some key stations along interstate corridors. Blu LNG opened a station in Sumner, WA in Q4 2013. These stations will expand the market to smaller interstate and regional fleets that cannot afford the capital for a dedicated LNG station.

Concentric modeled fleet characteristics for all heavy duty combination trucking fleets that operate in Washington. By modeling fleet fuel consumption, diesel and LNG price forecasts, and conversion costs, Concentric projected when it would be economical for fleets to convert to LNG (assuming a 15 percent hurdle rate).

Figure 5. Demand for LNG by the trucking industry in PSE's market area[2]



[2] Source: Concentric Energy Advisors

4. Project Development

This section of the report summarizes PSE's past, current and future development work including siting, permitting, community outreach, plant engineering and financial modeling. To date, PSE has negotiated a ground lease for the Facility at the Port of Tacoma; completed a full front-end engineering and design ("FEED") study with Chicago Bridge and Iron ("CBI"), a leading firm in the design and construction of LNG facilities; and assembled an engineering team of consultants in the geotechnical, marine, and LNG sectors. (See ***Engineering and Construction*** on page 18 for more information.) PSE has also garnered support from local and state elected officials and has successfully supported legislation that achieved tax parity between natural gas and diesel as a transportation fuel. Permitting studies are being prepared by CH2MHill and permit applications will be submitted in Q3 2014. In addition to developing the Facility at the Port of Tacoma, the Project requires upgrades and improvements to PSE's gas distribution system.

Siting

PSE conducted an exhaustive site review of locations throughout Puget Sound. There were three primary siting criteria considered in the analysis:

1. Appropriate placement on PSE's gas distribution system to effectively provide peaking services;
2. A parcel large enough to support regulatory and other siting requirements;
3. Proximity to marine and other fuel markets.

Selected Site

After exploring multiple locations, the development team selected a 33-acre parcel at the Port of Tacoma as the most suitable site for the Facility. The site is located on the Hylebos waterway, on the corner of East 11th Street and East Alexander Avenue. The site will be connected to PSE's North Tacoma high pressure system with approximately four miles of new 16-inch pipe, allowing the plant to inject gas directly into PSE's distribution system.

The Pipeline and Hazardous Materials Safety Administration ("PHMSA") is a branch of the U.S. Department of Transportation that is responsible for regulating LNG facilities. PHMSA defines siting requirements based on two criteria. The first criterion is that in the event of a spill, all vapor must be contained on the property and cannot drift onto neighboring property. The

second criterion is that in the event of a fire, heat from the fire at the property line must be below a prescribed level. To satisfy these PHMSA requirements, the parcel must be appropriately sized. There are few parcels in areas zoned for industrial use that are both large enough to satisfy these regulations and capable of supporting PSE's resource needs.

The selected site at the Port of Tacoma is ideally situated for serving LNG fuel markets. Providing service to these LNG fuel customers optimizes use of the Facility and generates revenues that significantly lower the cost of the peaking resource for PSE's gas customers. The site is located across Alexander Avenue from the TOTE terminal. This location will allow PSE to meet TOTE's needs directly and at an inherent cost advantage over a network of LNG barges and bunker stations, which may be available in the future. PSE will also be able to serve other marine customers from this location.

The Port of Tacoma is also centrally located to serve regional trucking demand concentrated in the Tacoma, Federal Way and Kent areas. The selected site has access to an existing rail spur that connects to Tacoma Public Rail's system. While LNG is not currently railed in the U.S., this may prove a viable option for transporting large volumes of LNG in the future.

The siting analysis and characteristics of the selected site are discussed in detail in ***Exhibit I***.

Port of Tacoma Lease

PSE will lease the 33-acre project site from the Port of Tacoma under a 25-year lease with extension rights for a second 25-year term, provided certain conditions are met. Details of the lease can be found in ***Exhibit I***.

Permitting

For a discussion of the permits and approvals required for the Tacoma LNG Project, refer to the confidential attorney-client privileged memo from Steve Secrist to the Board of Directors, dated July 2, 2014.

Community and Government Outreach

A coordinated communications and outreach strategy has been developed for local and state government, the Tacoma community, special interest groups, commercial partners, regulators and PSE customers. The plan, which includes a discussion of potential risks and mitigations, is designed to maintain and grow public support for the Project by educating stakeholders about the regional benefits of LNG and the Project. Plan details are summarized in ***Exhibit K***.

Engineering and Construction

The project will be engineered and constructed using a combination of two execution methodologies to obtain the best value for PSE. The Facility (including pre-treatment, liquefaction, storage tank, truck rack, vaporization system, and balance of plant) will be performed in accordance with an engineering, procurement and construction ("EPC") contracting methodology. Site preparation (including demolition, ground improvement, and underground utilities) and marine facilities construction will be performed by PSE using a design-bid-build contracting methodology.

PSE considered several methodologies for engineering and constructing the Facility before selecting a strategy. Ultimately, PSE relied upon input from national engineering firm CH-IV and on market research in its determination of the preferred option.

Engineering, Procurement and Construction

An EPC contract is a firm, fixed price contract with performance guarantees and liquidated damages. In exchange for control of all elements of the project (engineering, procurement, and construction), the EPC contractor retains cost and schedule risks during project delivery. Because a single entity is responsible for both design and construction, a more active consideration of constructability and construction efficiency in the design of the Project is more likely than it would be with alternative contracting methodologies, such as design-bid-build, or even design-build.

PSE considered a pool of seven candidate firms and selected Chicago Bridge & Iron ("CBI") to perform an initial Front End Engineering Design ("FEED") study that developed the Facility to a conceptual level and provided budgetary pricing. CBI completed this work, which culminated in an open book price review and firm bid price in fall 2013. This design and pricing has been used to support commercial, permitting and regulatory efforts. In the coming months, remaining design uncertainties will be resolved and the design of the plant will be frozen to allow CBI to re-bid all material and sub-contract elements of the project, in order to present a final bid for open book review prior to signing an EPC contract.

CBI is an international leader in LNG plant and tank engineering and construction and has four decades of experience. CBI has designed and built peak-shaving LNG plants around the world. Projects have included complete peak shaving facilities—including pre-treatment, liquefaction, storage and send-out systems; stand-alone liquefaction systems; plant revamps; retrofits; and expansions. In addition, CBI has extensive experience with the key processes and equipment that are utilized in baseload natural gas liquefaction plants, including gas metering, CO_2

removal, dehydration, liquefaction, boil-off/flash gas recovery, gas vaporization, truck loading and unloading and fire protection. CBI is one of the leading contractors for LNG storage and loading systems. This experience includes the design and construction of approximately 220 LNG storage tanks, the majority were double-wall single containment storage tanks up to 200,000 cubic meters. In addition to the LNG sector, CBI provides engineering and construction solutions in the petrochemical, wastewater treatment, mining, nuclear power, and heavy infrastructure sectors with nearly 50,000 employees worldwide.

In order to ensure a competitive bid for the EPC contract, PSE is engaging Black & Veatch to perform a parallel FEED study. This FEED will be based upon the same design criteria used for the proposed CBI plant and will provide another price point for the Facility. Black & Veatch was a top contender for the original FEED contract and has experience designing and building LNG facilities globally. The value of having competitive options for the EPC contract is significant, particularly when compared with the relatively low cost of a second FEED study (approximately 0.5 percent of the plant cost).

CBI presented a proposed contract format as part of their FEED study deliverables in fall 2013. Black & Veatch will provide a competing contract proposal at the end of their FEED study. PSE will have an open book review of the EPC contractor's pricing package prior to contract signing. This gives PSE the ability to review all material and subcontractor bids, EPC contractor contingency (and methodology for determining it), and markup.

After selecting the winning EPC proposal, the EPC contract will be executed and Notice to Proceed will be issued once permitting is complete and the Board approves a subsequent request. This is expected to occur in Q3 2015. ***Exhibit L*** summarizes the contract features indicative of CBI's proposed contract form. These features may be amended during contract negotiations with either potential EPC contractor.

PSE will select an EPC contractor prior to final Board approval of the EPC contract. Details about the selection decision and negotiated contract terms will be included in a Board package at that time.

Work Performed by PSE

PSE will perform all design and construction work necessary to ready the plant for the EPC contractor (site demolition, soil improvement, and underground utilities), as well as all marine work (TOTE loading platform). PSE is choosing to perform these project elements because they are outside the value-added capability of an EPC contractor and can be more cost effectively managed by PSE using local resources.

The list below summarizes the team PSE will use to complete its design and construction work, as well as each firm's scope of work. Many of the firms have experience with LNG facility development and several have experience working with the Port of Tacoma and/or other engineering and consulting firms retained by PSE for the Project. The qualifications and benefits of each firm are discussed in detail in ***Exhibit L.***

- ***GeoEngineers (Geotechnical Design).*** Develop ground improvement strategies to meet federal and local seismic design requirements, coordinate structural and foundation requirements with the EPC firm and provide contracting and quality assurance support for the execution of the ground improvement program.

- ***Moffatt & Nichol (Marine Design).*** Develop a demolition plan for the existing timber pier and design a new concrete pier on the Hylebos Waterway, design a new loading platform on the Blair Waterway, and marine construction oversight as necessary.

- ***Sanborn Head & Associates (Owner's Engineer).*** Review EPC design work product, perform a peer review of GeoEngineers work product, assist with EPC contract preparation, and provide support on permitting and community outreach efforts, as needed.

- ***Jim Lewis LNG Expertise, LLC (LNG Consultant).*** Work on select engineering tasks and regulatory discussions.

- ***Tacoma Power (Substation Design/Construction).*** Design and construct the utility substation located on the site. Tacoma Power has already completed an initial preliminary power supply study and will be further engaged as the Project moves forward.

- ***Proposed Firms – Site Civil Design.*** PSE has received proposals from four local civil engineering firms to work on the design of the site storm water management system, as well as modifications to the fire water and sanitary sewer systems. The contract will be awarded as the Project progresses.

Construction work performed by PSE has not yet been contracted. This includes site soil improvement work, which can only be performed by a limited number of specialized contractors, and site demolition and underground utility work, which can be performed by a number of general contractors in the Seattle-Tacoma area. See ***Exhibit L*** for additional details about the bid and selection process for the construction work.

Gas Distribution Upgrades

The PSE distribution system will require improvements to support the Tacoma LNG Facility, including approximately five miles of new pipeline in the cities of Fife/Tacoma and Pierce County, a new limit station and existing gate station modifications. A detailed discussion of the gas distribution upgrades can be found in ***Exhibit M***.

The design, engineering and execution of this work will be managed by PSE's Project Management and Gas Engineering organizations. The work is expected to be completed by the end of 2017 to support plant startup and commissioning in 2018. The cost of the upgrades, estimated to be $47 million, will be incorporated into PSE's gas ratebase and recovered through rates, including rates charged to LNG fuel customers for gas transportation service across the PSE distribution system. PSE included the cost of the distribution upgrades, which will be significantly offset by incremental revenue recovered from LNG fuel customers, as part of the analysis of the prudence of the Facility. The results of this analysis are discussed in detail in ***Exhibit N***.

Natural Gas Supply

PSE will provide natural gas supply for liquefaction services, unless a customer selects a tolling arrangement. The natural gas required for the initial design capacity of the plant is relatively modest—approximately 21,000 Dth per day[3], which is approximately two percent of PSE's current peak-day requirement and approximately five percent of PSE's annual daily average demand. Natural gas supply for turn-key customers will be provided under a market-sensitive pricing mechanism, tied to the monthly Sumas index (with "Sumas" being the interconnection point between Spectra Energy's BC pipeline system and the NWP interstate system, near Sumas, Washington). With this structure, PSE will carry no natural gas supply price risk.

Sufficient firm NWP interstate pipeline service will be procured to transport the natural gas to PSE's system. Customers will pay the transportation costs, except when PSE diverts the gas to serve retail customers during peak periods. The natural gas will generally be managed as a part of PSE's portfolio, but will not utilize PSE's underground storage resources because the Facility will have storage onsite.

[3] The Tacoma LNG Facility will require 21,000 Dth per day to meet the 250,000 LNG gal per day output. The capacity of the Facility to divert natural gas typically used during liquefaction is 19,000 Dth per day. This difference is attributed to the fact that PSE will not hold firm, year round, pipeline capacity for the gas needed for peak shaving (approximately 10 percent of the liquefaction capacity).

Budget and Schedule

The Project will be completed in two distinct phases: development and construction. The development phase is underway and will be considered complete upon receipt of all permits and approvals necessary to build the Facility, and upon successful negotiation of all construction contracts, including the EPC contract. Barring any appeals or legal action during the permitting process, PSE anticipates completing this phase of the project in Q3 2015 at a cost of $14 million. Upon completion of the development phase, PSE will seek board approval to construct the Facility and gas distribution upgrades, and to execute an EPC contract with the lead contractor. The majority of the development phase costs are associated with preliminary engineering, permitting studies and permit application preparation.

The construction phase of the Project will begin with execution of the EPC contract and consist of detailed engineering, procurement, construction and commissioning of the Facility and the gas system upgrades. Construction costs for the Project are estimated to be $305 million ($258 million for the Facility and $47 million for the gas system upgrades). The majority of the Facility costs will be covered under a fixed price EPC contract. Other significant components include demolition and soil work. Furthermore, projected Project costs include a construction contingency which is determined by the level of engineering design and based off of industry standards. PSE anticipates construction will be complete in mid-2018, with plant commissioning to follow. The in-service date for the Project is expected to be January 1, 2019.

The figure on the following page shows a high level summary of the Tacoma LNG Project budget. A detailed Project budget by quarter and a Project schedule can be found in ***Exhibit F.*** Project costs are described in detail in ***Exhibit O***.

Figure 6: Tacoma LNG Project Budget (1,000s)

Development Budget		
PSE Labor and OH	$	2,179
Engineering and Analysis	$	4,404
Permitting & Legal Support	$	3,333
Communications/Outreach	$	390
Distribution Upgrades	$	1,637
Commercial and Regulatory[1]	$	719
Real Estate and Lease	$	767
Contingency	$	445
Project Development Sub-Total	**$**	**13,873**

[1]Commerical and Regulatory expenses are not capitalized

Project Budget		
Development	$	13,873
PSE Labor and OH	$	5,801
Engineering & Legal	$	1,400
Real Estate and Lease	$	6,132
Geotechnical and Demolition	$	13,000
In Water Work	$	4,000
EPC Scope	$	181,793
Miscellaneous	$	6,900
Contingency	$	22,650
PSE Construction OH	$	3,113
Sales Tax	$	12,954
Tacoma LNG Facility Sub-Total	$	257,742
Gas Distribution Upgrades	$	47,339
Project Sub-Total	**$**	**318,954**
AFUDC	$	46,303
GROSS PLANT	**$**	**365,257**

Pro Forma Financial Statements

The Project pro forma models the 25-year revenue requirement to recover all capital investment made during development and construction of the Tacoma LNG Project, and the subsequent 25 years of O&M expenses to operate the Facility and associated distribution upgrades. The pro forma considers revenue contributions from other plant customers that purchase LNG as a fuel. These revenue contributions are calculated based on the percentage of plant facilities that will be charged to these customers. In addition to contributing revenue needed to pay for the incremental cost of the plant, LNG fuel customers will also contribute revenues to cover PSE administrative and general costs, and to pay a short-term contract premium if the initial contract term is less than 25 years. The costs for Project construction and operation, as well as projected revenue contributions, are discussed in detail in ***Exhibit O***.

The pro forma for the Tacoma LNG Facility assumes that the entire plant has a depreciable life of 25 years. This assumption is based on the primary lease term that PSE will execute with the Port of Tacoma in July 2014.[4] PSE's unilateral right to extend the lease will be conditional as discussed in ***Exhibit I***. By assuming a 25-year life, the plant will fully depreciate by the time the lease expires. The engineering life of certain plant components (control systems, IT systems, etc.) may be less than 25 years; however, to simplify the analysis, the shorter life of these items is included in the pro forma as a more conservative O&M estimate, rather than a calculation of depreciation expenses on a more granular basis. The natural gas distribution system upgrades are depreciated over 50 years, which is typical for PSE distribution system facilities.

The pro forma assumes the gas distribution system upgrades go into service in January 2018 and the Facility goes into service in January 2019. The gas system upgrades must be in place to support plant startup and commissioning. The pro forma assumes perfect ratemaking. The LNG Facility and gas system distribution upgrades will be placed in ratebase at the conclusion of a general rate case timed to coincide with the in-service date of the LNG Facility. Revenues from LNG service customers will commence upon plant start-up for both LNG and distribution service.

[4] The 25-year depreciable life of the Tacoma LNG Facility will begin with the plant goes into operation (not in July 2014).

5. Regulatory Process

The regulatory process regarding the Tacoma LNG Facility will occur in two phases that will take place over several years. In the first phase, PSE will seek approval from the Washington Utilities and Transportation Commission ("WUTC") for the delivery of LNG to customers for use as fuel for marine vessels, motor vehicles, and industrial end uses (the "LNG Fuel Supply Service"). In the second phase, PSE will seek a prudence determination and rate recovery of the facility.

Phase 1: Approval of the LNG Fuel Supply Service Tariff Schedule and Agreements

The first phase of the regulatory process will commence in 2014 with the filing of an LNG Tariff Schedule pursuant to which PSE will provide a service consisting of the delivery of LNG to any customer for use as fuel for marine vessels, motor vehicles, and industrial end uses (the "LNG Fuel Supply Service"). The draft rate schedule will provide the details for the LNG Fuel Supply Service and outline the minimum terms for LNG Services Agreements pursuant to which customers will take such service. Concurrent with the filing of the draft rate schedule, PSE will file LNG Services Agreements that will provide the specific terms, conditions, and rates associated with the LNG Fuel Supply Service that PSE will provide to these customers.

During the LNG Fuel Supply Service and LNG Services Agreements approval process, PSE will need to demonstrate:

1. the rates charged under the LNG Services Agreements recover all costs resulting from providing the LNG Fuel Supply Service and contribute to PSE's other fixed costs associated with the Tacoma LNG Facility;

2. the need for and nature of the Tacoma LNG Facility, including, but not limited to, a discussion of the economies of scale provided by the provision of the LNG Fuel Supply Service and the resulting benefits to the peak day gas supply service;

3. satisfactory commercial terms and conditions of the LNG Fuel Supply Service, including but not limited to an explanation of the basis and derivation of the proposed rates charged for such service; and

4. The LNG Services Agreements do not provide an unreasonable preference for, or rate discrimination with respect to, the counterparties.

Phase 1 will not be the process by which PSE will seek a prudence determination of or rate recovery for the Tacoma LNG Facility. Those issues will be addressed in Phase 2.

Phase 2: Prudence Determination and Rate Recovery of the Tacoma LNG Facility

PSE will seek a prudence determination and rate recovery for the Tacoma LNG Facility in General Rate Case ("GRC") filed with the WUTC in the second or third quarter of 2018. Construction is estimated to be completed in January 2019. The filings may occur before all construction costs are known with certainty. If necessary, cost estimates may be updated during the filing. The figure below lists the major milestones associated with the second phase.

Figure 7. Projected Rate Recovery Milestone Dates Based on Current Permitting and Construction Timelines

Projected Date	Milestone
Q2/Q3 2018	PSE files GRC with rate recovery for Tacoma LNG Facility
Q2/Q3 2019	WUTC order with new rates

The GRC would seek a prudence determination for the Tacoma LNG Facility (as well as other potential resource acquisitions or contract restructurings for unrelated resources). In order to demonstrate the prudence of the Tacoma LNG Facility, PSE will need to address:

1. the necessity of the Tacoma LNG Facility;
2. the cost-effectiveness of the Tacoma LNG Facility;
3. the resource alternatives considered by PSE to meet its need, including consideration of factors such as end effects, capital costs, impact on the utility's credit quality, dispatchability, transportation costs, and other need-specific analysis at the time of the acquisition decision;
4. the contemporaneous information provided to and used by the board of directors in making the acquisition decision and its costs;
5. the contemporaneous records of PSE to allow the WUTC to evaluate PSE's actions with respect to the decision process.

Concurrent with the rate filing, PSE may also file an accounting petition with the WUTC to request a cost deferral mechanism. Cost deferral may be necessary if the Tacoma LNG Facility is placed in service in advance of the effective date for rates. Under this option, PSE would request deferral of fixed and variable costs associated with the Tacoma LNG Facility.

6. Project Execution

PSE will execute this project as part of its regulated operations, in a similar manner to other large infrastructure projects recently undertaken. PSE will finance the project on balance sheet and will recover the investment as it would any other ratebased asset. Project execution will largely be completed by outside contractors with PSE's oversight. Ultimately, PSE anticipates operating the project as part of the Energy Operations organization. In accordance with PSE's corporate policies, PSE has conducted a risk analysis and believes that risks for the project can be appropriately mitigated. Having considered risks, mitigations and project benefits, Management recommends approval of the resolution in ***Exhibit A.***

Financing

The Project will be financed consistent with past utility financing practices, employing a combination of funds from operations, short-term debt drawn from the Company's capital expenditure facility, long-term debt and, as needed to balance debt, equity provided from PSE's parent company Puget Energy.

Development and Construction Execution

PSE's Strategic Initiatives team will lead the development of the project with support from other internal departments including Project Management, Rates, Regulatory, and Accounting. PSE will also rely on legal and engineering expertise from outside firms (discussed further in the exhibits) to work through the development phase of the Project including permitting, negotiating long-term fuel supply agreements and filing an LNG tariff with the WUTC. The Company will update the Board of Directors continuously and will return to recommend the execution of an EPC contract after PSE has received all permits and regulatory approval necessary to construct and operate the Tacoma LNG Project. PSE anticipates seeking approval of the EPC contract and any other contracts needed to execute the project in Q3 2015, but acknowledges that permitting delays due to appeal or other legal actions could delay this schedule.

PSE will oversee the execution and construction of the Project. All Project elements will be managed by PSE's Project Management organization, which includes project managers and support staff, a project controls organization (cost and schedule tracking), and a ready network of supporting engineering, construction management, and quality assurance resources. The gas distribution upgrades will be executed in a similar manner to other projects regularly

performed by PSE in its role as a natural gas utility. PSE's strategy for construction of the Facility includes a combination of an EPC contract for plant construction and commissioning, and direct contracting for ancillary features (site preparation and marine work).

Management and Operations of the Project

The Tacoma LNG Facility will be managed and operated by PSE's Energy Operations group, under the direction of Natural Gas Resources, which also manages the Jackson Prairie underground storage facility. The Facility will operate and be staffed 24 hours per day, 365 days per year. Onsite management and operations staff will include: plant manager, plant engineer, operations and maintenance supervisor, maintenance planner, controls technician, office administrator and 10 represented gas operators.

Staff will be located onsite, housed in an existing onsite building that will be retrofitted for use by the Tacoma LNG Facility. Most work will be conducted within the boundaries of the leased property; however, PSE staff will also be responsible for operating and maintaining the direct pipeline and fuel loading equipment that will be located on TOTE's property. Maintenance and operating protocols will be developed taking into account regulations, PSE policies and practices, and best industry practices.

In addition to the staff detailed above, PSE will contract for security service as required to meet regulatory requirements, and stevedoring services to bunker TOTE's ships and load other marine vessels.

Estimates of future Tacoma LNG Facility expenses are reflected in the pro forma financial statements included as ***Exhibit O***, and an operations organization chart can be found in ***Exhibit Q***.

Insurance

PSE will procure builder's risk insurance for the plant while under construction. PSE typically procures this insurance on large capital projects because PSE can obtain it at a lower cost than the contractor performing the work. Builder's risk insurance covers material on site and any work in progress from typical risks such as fire, wind, theft, vandalism, etc.

At the end of the construction period, the plant will be covered by PSE's insurance program. PSE's insurer, FM Global, has reviewed preliminary designs of the plant and may be involved with further design and construction to provide additional guidance on risk mitigation strategies.

Risk Analysis

Consistent with past resource acquisition and development activity, PSE staff has identified incremental risks associated with the development and execution of the Project.

There are known areas of contamination on and adjacent to the Facility site and in the area that may be used for the new high pressure pipeline that extends to the Facility. Cooperation and consensus will be required among the cleanup agencies to ensure that construction and operation of the Tacoma LNG Facility will not impede cleanup efforts nor affect compliance with established cleanup agreements. PSE has been working closely with cleanup staff from EPA, WDOE and the Port to ensure that our construction is not impacted or delayed by these issues, and that the Project's construction and operations will not impede future cleanup.

In the development of this project, the development team has referenced internal audit findings related to the Snoqualmie Falls Redevelopment Project. These findings describe concerns associated with a "lack of enterprise-wide policies and procedures" related to consolidated business case development, risk management, schedule management, estimating issues, and project delivery system selection. Although PSE is developing new policies and procedures in parallel with the Tacoma LNG Project development, the development team is placing specific emphasis on using the lessons learned from the Snoqualmie Falls audit report.

PSE has prepared a detailed description of the principle risks for each phase of the Project and has identified mitigation plans to address these risks. Risks associated with specific project components (such as permitting, commercial and others) are discussed in more detail in the exhibits attached to this report. Management believes that the proposed mitigation plans adequately address the risks identified. ***Exhibit H*** provides a summary of these risks and mitigation plans.

Project Benefits

PSE's development and construction of the Tacoma LNG Project benefits PSE customers, the Pacific Northwest and the natural environment. The principle benefits of this new resource include:

1. The Tacoma LNG Project will help ensure continued dependable service and additional benefits to PSE natural gas customers.
    - The Tacoma LNG Facility will be an integral part of PSE's strategy for serving its gas customers on the coldest days of the year

- Serving new commercial markets –like transportation—helps lower costs for existing and future natural gas customers
- The Tacoma LNG Facility provides critical infrastructure more cost-effectively for PSE customers
- Construction of the Tacoma LNG plant will bring upgrades to local natural gas lines ahead of schedule, improving reliability to Tacoma customers

2. The Tacoma LNG Project will provide important environmental benefits.
   - Switching from diesel to LNG reduces carbon dioxide emissions by up to 30 percent
   - Clean-burning LNG eliminates harmful particulate emissions
   - Converting to LNG will help companies like TOTE comply with new, stricter federal low-sulfur emission standards
   - The Project reduces the potential for harmful fuels spills that could damage Puget Sound
   - Driving innovative uses for natural gas demonstrates PSE's leadership in delivering cleaner energy options to customers
3. The Tacoma LNG Project will generate important economic benefits for all South Sound residents
   - Switching to clean, abundant natural gas will help local employers remain competitive and protect local jobs
   - The Tacoma LNG Project helps the Port diversify its customer base, support new industries, and enhance its position as a driver of job creation and economic activity
   - Construction and operation of the Tacoma LNG Facility will create many direct and indirect jobs in the area
4. Utilizing LNG reduces reliance on foreign fuels, using North America's natural resources here at home to benefit human health, the environment and the economy.

Recommendation

Based on the determination of need, the identification and analysis of alternatives and the established benefits of the Project, management recommends that the Board of Directors adopt the Resolutions stated in ***Exhibit A***, approving the continued development of the Tacoma LNG Facility, which includes entering into a long-term fuel supply agreement and an interim supply agreement with TOTE.

PUGET SOUND ENERGY

Report to the Board of Directors:

Tacoma LNG Facility

July 2, 2014

Table of Contents

List of Exhibits

1. Executive Summary

The purpose of this Report to the Board of Directors ("Report") is to recommend approval to continue development of the Tacoma LNG Project (the "Project"), in accordance with the resolutions set forth in ***Exhibit A***. Specifically, approval will authorize PSE to enter into a long-term Fuel Supply Agreement ("FSA") to sell to Totem Ocean Trailers Express ("TOTE") liquefied natural gas ("LNG") supplied from the Tacoma LNG Facility (the "Facility"). Approval will also authorize PSE to enter into an agreement to sell to TOTE LNG procured by the Company from third parties until completion of the Tacoma LNG Facility (the "Interim Supply Agreement"), and to enter into a long-term lease with the Port of Tacoma for the land upon which the Facility will be sited.

This Report, and this request for certain approvals, is anticipated to be the first of multiple decision-points for the Board. Due to the timing of the development process, management currently seeks approval of the contracts with TOTE, the interim fuel supplier and the Port of Tacoma. The Company will return to the Board (later in 2014 and in 2015) to seek its approval of other aspects of the Project. Upon completion of a marketing or co-ownership agreement with a third party LNG fuel marketer, management will bring such agreement to the Board for its consideration. Also, after issuance by the relevant agencies of environmental permits authorizing construction of the Facility, management will seek the Board's approval of the construction of the Facility and authority to execute the requisite engineering, procurement and construction ("EPC") agreement with the lead contractor. In the event that construction of the Facility does not proceed, for whatever reason, the contracts put forth for approval at this time are terminable by the Company, and in such event would leave the Company with relatively limited exposures, as detailed elsewhere in this Report.

This Report describes the Project, which includes development, construction and operations of the Facility and associated upgrades to PSE's natural gas distribution system (see ***Section 2*** for additional details). Details include the commercial aspects of the Project, the development plan, anticipated financial performance, risks and mitigation plans, and an analysis of Project costs and benefits as conducted by PSE's Natural Gas Resource, Strategic Initiatives and Project Management teams. The report concludes with a recommendation to authorize PSE to enter into fuel supply agreements under which PSE will be obligated, subject to conditions precedent, to provide LNG to TOTE on a long-term basis.

PSE anticipates that regulatory and permitting approvals will be received by Q3 2015 and the Project will be in-service in Q4 2018, assuming there are no appeals or other legal action during

the permitting and development phase. The estimated cost of the development phase is $14 million and the total project capital cost is estimated to be $323 million.

2. Project Description

The Project will enable PSE to liquefy natural gas and to store and dispense LNG. The Project will be an integral part of the PSE gas business by providing additional peaking capability. Additionally, PSE will secure long-term commercial contracts to sell LNG to customers who will use or market the LNG as a fuel. Project components include development, construction and operations of the LNG Facility, and associated upgrades to PSE's gas distribution system.

What is meant by Tacoma LNG Facility vs. Tacoma LNG Project?

Tacoma LNG Facility (the "Facility")

- Buildings, gas processing, storage and support equipment, and foundations located on PSE's leased site at the Port of Tacoma
- Underground LNG fuel line connecting the LNG tank to TOTE's berthing area, marine fueling system and in-water platform at TOTE's site
- LNG tanker truck loading racks
- Ground lease from the Port of Tacoma

Tacoma LNG Project (the "Project")

- Development, construction and operations of the Facility
- Improvements to PSE's gas distribution system needed to support the Facility
- Commercial contracts to sell LNG to customers
- Regulatory approvals to operate the Facility and sell LNG as part of a regulated service

The Facility

The Facility will be located at the Port of Tacoma, adjacent to the Hylebos waterway, on the corner of East 11th Street and Alexander Avenue East (see ***Figure 1*** on page 9). It will be capable of liquefying 250,000 gallons of LNG per day and storing approximately 8 million gallons of LNG on site. The Facility will be capable of injecting 66,000 Dth/day of vaporized gas and diverting 19,000 Dth/day of gas into PSE's distribution system to provide 85,000 Dth/day of peak-day supply. The Facility will also dispense LNG to other end-use customers via a tanker truck loading system and marine loading facilities located on the water.

Northwest Pipeline's ("NWP") interstate system will deliver natural gas to PSE's distribution system, which will in turn deliver the gas to the Facility. PSE's distribution system will require improvements to support the Facility, including a pressure increase on an existing section of pipe, constructing a new limit station, modifying an existing gate station and adding approximately five miles of new higher pressure pipe. The increase in operating pressure on the existing pipeline (from 250 psig to 500 psig) is a planned system upgrade to be implemented in

2017. The upgrade process begins in 2014 with a Pressure Authorization Request to the WUTC. Electricity for the Facility will be procured at Mid-C based market prices and will be wheeled through Tacoma Power's 115 kV transmission system. The main energy consumer at the Facility will be the liquefaction compressor, which will draw approximately 14 MW of electricity.

See ***Exhibit C*** for a more detailed description of the Project.

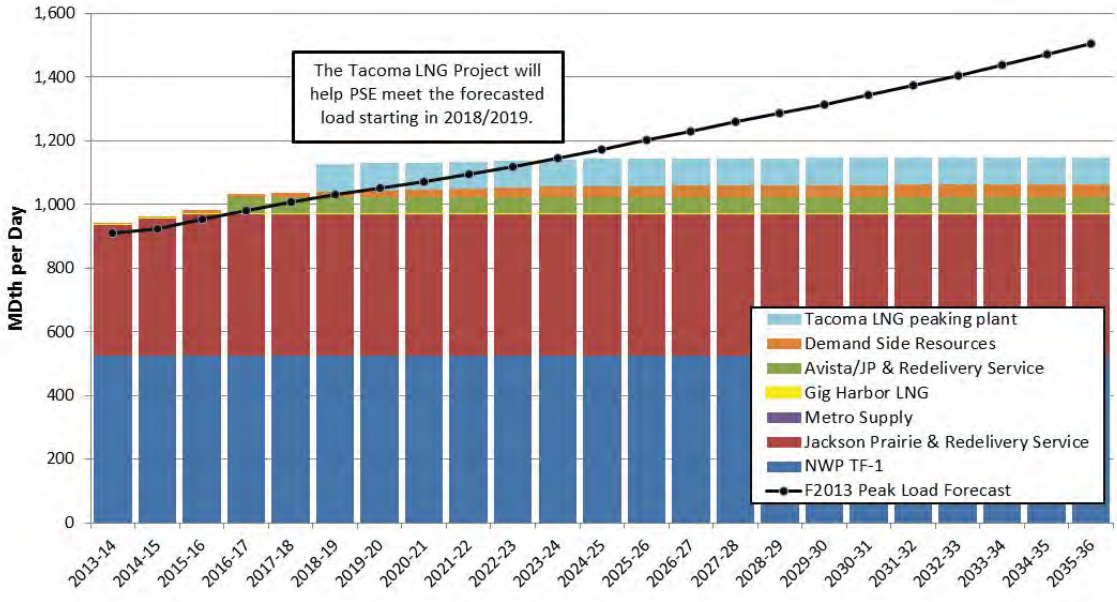
Figure 1. Tacoma LNG Facility Plot Plan

3. Determination of Need

PSE Resource Need

PSE's need for new peak-day resources to serve its retail natural gas customers is set forth in the 2013 Integrated Resource Plan (IRP). The IRP considered expected customer loads, including the effect of demand-side resource programs, based on expected regional economic growth. The 2013 IRP demonstrates a need for peaking resources beginning in 2017 that is expected to grow to a deficit of approximately 150,000 Dth per day by 2022, and 200,000 Dth per day by 2026. PSE will meet the resource needs with (i) additional Jackson Prairie storage (50,000 Dth/day) purchased from Avista Utilities and Williams-Northwest Pipeline redelivery transportation service; (ii) the Tacoma LNG Facility (85,000 Dth/day); and (iii) upgrading the SWARR propane-air facility (30,000 Dth/day; refurbishment is currently under evaluation). ***Figure 2*** shows the most recent load resource balance including the Tacoma LNG Project.

Figure 2. PSE's Peak Gas Resource Need (Tacoma LNG Project shown in light blue)



PSE evaluates various resource alternatives available to reliably meet customer demand and determines which resource, or set of resources, most cost effectively meets such customer demand. PSE evaluated the Tacoma LNG Project in comparison with long-haul interstate pipeline capacity as well as regional underground natural gas storage service and interstate pipeline storage redelivery service. Since interstate pipeline capacity in PSE's service territory is

generally fully subscribed, especially considering the level of PSE's resource needs, the resource alternatives analysis evaluated expansion of the regional pipeline grid. Due to the significant revenue contribution from marine and large scale truck fuel markets, the Tacoma LNG Facility is selected as a least-cost resource in PSE's analyses of resource alternatives.

A more detailed summary of the analysis of peak-day resource alternatives can be found in ***Exhibit N***.

Other LNG Customers

While the primary purpose of the Tacoma LNG Facility is to provide peak-day supply for PSE's retail natural gas customers, the Project's benefits are significantly enhanced by serving additional markets. LNG facilities are capital intensive and, therefore, costs for all customers are reduced when facilities are fully deployed. The peak-shaving component of the plant requires significant storage and relatively small liquefaction capacity, while the marine, heavy-duty trucking and other fuel markets require significant, steady liquefaction and minimal storage. By combining these complementary load profiles, PSE can optimize the Facility and minimize peaking-resource costs for PSE's retail natural gas customers.

Totem Ocean Trailers Express (TOTE)

A fuel supply agreement has been negotiated with TOTE and will be executed upon Board approval (see ***Exhibit E***). TOTE is a shipping company that transports approximately 30 percent of all consumer goods shipped to Alaska. It operates two Orca class ships between the Port of Tacoma and Anchorage on a regimented schedule of sailings departing from Tacoma every Wednesday and Friday evening. TOTE will consume more than 39 million gallons of LNG annually, which is approximately 44 percent of the LNG produced at the Tacoma LNG Facility. TOTE is fully owned by Saltchuk Resources Inc., a privately held investment group based in Seattle. TOTE's decision to use LNG (as opposed to a petroleum based fuel) has been driven by regulatory and economic factors. The following section, ***Market Drivers***, discusses these factors in further detail.

LNG Marketing Partner

PSE intends to have a marketing partner under contract prior to seeking board approval for the construction of the Facility, such that all or nearly all of the Facility is contracted. Much of the demand for LNG fuel is likely to come from markets unaccustomed or unwilling to enter into long-term contracts for fuel. This creates a need for an aggregator, or Marketer, to take on a long-term contract with PSE to resell and distribute the LNG at smaller volumes through shorter contracts. PSE has had discussions with several parties who could fulfill this role and has

targeted BP and Shell. These companies bring strong balance sheets, an existing marketing presence in transportation fuels, natural gas resources, and strategic value. With either company as a marketing partner, it is likely they will want to invest equity in the Facility, which would mitigate some of PSE's marketing and regulatory risks. In getting to this point, PSE has considered other potential partners including: Blu, Clean Energy, Tenaska, Linde and LNG America.

A long-term contract with a marketing partner may take one of several forms, including:

- ***Joint Ownership Agreement.*** If a marketing company desires an equity investment in the Tacoma LNG Facility, or must invest equity to mitigate its lack of credit, a joint ownership agreement will be negotiated, detailing the obligations of each party. PSE envisions that ownership would be structured as a tenancy-in-common, whereby each owner owns an undivided but specified percentage of the plant, broken down by its functional areas (i.e. liquefaction, storage, bunkering, truck loading, vaporization, and common). The ownership agreement would also set forth the role of each owner during the development, construction, and operational phases of the Facility (e.g., PSE develops, constructs and operates the plant; the counterparty invests equity, assumes a pro rata share of development and operating costs). Finally, the ownership agreement would set forth the allocation of output from the Facility and the payments required for future capital infusions and ongoing O&M.

- ***Tolling Agreement (TA).*** A tolling agreement will be similar to the FSA, but the customer would be responsible for delivering natural gas to PSE's distribution system. A TA customer would be required to make its gas available during peak periods to serve PSE's peak-day needs. The Facility will have adequate on-site storage to serve the tolling customer's needs during such peak periods.

- ***Fuel Supply Agreement (FSA).*** An FSA agreement provides for PSE to sell LNG to the customer as it's delivered into the customer's vessel. PSE procures and transports the natural gas to the Tacoma LNG Facility. Title and associated risks pass at the point of sale.

It is assumed that the provisions of any FSA or TA will be generally the same. Customer pricing will be based on standard cost-of-service principles, with capital costs generally recovered over the initial primary term (for project development purposes, PSE is seeking a minimum 10-year primary term). Customers will pay demand charges for fixed-priced components (capital recovery and fixed O&M) and volumetric charges for underlying natural gas costs, electricity and consumables. Natural gas and electricity costs will be recovered at market-sensitive rates (e.g., Sumas index for natural gas and Mid-C index for electricity). Pricing will vary by contract

term, with shorter-term contracts carrying a higher premium. Any contract shorter than 25 years (the depreciable life of the Facility as determined by the Port of Tacoma), will include a short-term contract premium.

As a fallback to a marketing partner, PSE would seek to contract with one or more large end-use customers in order to subscribe the Facility. PSE has been in discussion with other entities interested in entering into long-term LNG supply contracts and able to serve as an additional anchor customer. These parties are either shipping or marine customers, or utilities that cannot be served by interstate pipelines. They include Horizon, Matson and Hawaiian gas and electric utilities. In the supporting analyses found in the exhibits of this report, plant volumes and revenues for these customers have been combined under the caption of "Marketer."

Market Drivers

The success of PSE's marketing partner or other end-use contracts and the potential for plant expansion depends on the success of the LNG market as a whole. There are three factors driving the market for LNG as fuel:

- ***Economic.*** Recent development of unconventional gas resources has stabilized the cost of natural gas. At the same time, increasing global demand has increased the cost of diesel and other petroleum-based fuels. Wood Mackenzie (an energy sector consultant commissioned by PSE) studied these market factors and determined that the wide price spread between natural gas and oil (approximately $15/MMBtu) is sustainable. In fact, Wood Mackenzie concluded that it would be difficult to imagine a scenario where a significant spread was ***not*** sustained on a long-term basis over the study period (see ***Exhibit S***).

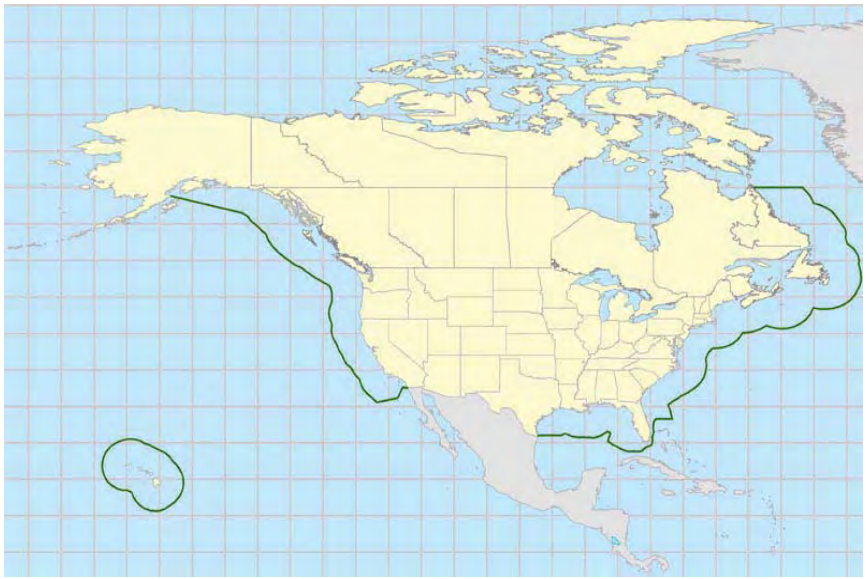
- ***Regulatory.*** Regulators have increasingly looked to natural gas to replace petroleum-based fuels in order to reduce pollution and increase air quality. The California Air Resource Board (CARB) recently passed rules on Low Carbon Fuel Standards (LCFS) which require fuel consumers to transition to lower carbon fuel alternatives including natural gas.

  In 2010, the International Maritime Organization (IMO) approved the North American Emissions Control Area (ECA), establishing more stringent emissions standards within 200 miles of the US and Canadian coast (see ***Figure 3*** on page 14). The Environmental Protection Agency (EPA) is responsible for administering vessels operating in the ECA. Ships operating within the ECA were required to reduce the sulfur content of their fuel to one percent in August 2012 and must further reduce it to 0.1 percent by 2015. Vessel operators can meet the new standard by switching to lower sulfur diesel fuels, installing scrubbers or

transitioning to a cleaner fuel, such as LNG. Many operators, including TOTE, are finding that LNG is the preferred alternative.

- ***Environmental.*** When compared to diesel or marine fuel oil, LNG has significant environmental benefits. Emissions from natural gas do not contain particulates or SO_x. LNG has been embraced by the American Lung Association as a "Clean Air Choice". Carbon dioxide emissions are also greatly reduced. Using LNG in long-haul trucking operations can result in a 25 percent reduction of CO_2 emissions.

Figure 3. North American Emissions Control Area



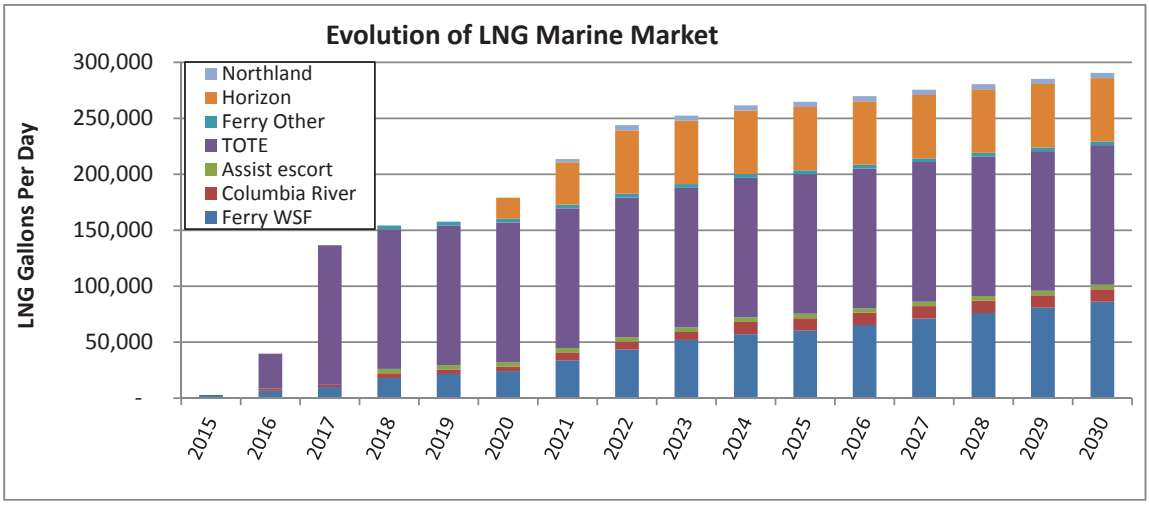
In order to fully understand this market, PSE retained Concentric Energy Advisors to assess the regional market potential for LNG in trucking, maritime and industrial applications. Concentric also provided a view of market drivers and insights into how the demand for LNG will develop over time. Concentric's full report can be found in ***Exhibit Q***.

Evolution of the Marine Market

Growth in the demand for LNG in the marine market will be driven by ECA and IMO requirements, which phase in over the next several years, resulting in higher fuel costs to the maritime industry. To assess growth in this market, Concentric looked at all potential candidates for conversion. Concentric's analysis in the marine market was relatively conservative, considering only vessels that burn a large amount of fuel and operate mostly or

entirely within the North American ECA (200 miles from the coast of the US and Canada). The cruise industry could also represent substantial demand; however, at this time, the industry has not embraced LNG as an alternative. The results of Concentric's analysis of the maritime market are shown in ***Figure 5***.

Figure 4. Demand for LNG by the marine vehicles industry in PSE's market area[1]



It is important to note that the study specifically excluded shipping companies in the Hawaii trade, such as Matson and Horizon (the Horizon volumes above are for its Alaska trade), two entities that have subsequently announced they are purchasing LNG-ready ships or converting existing vessels. Both Matson's and Horizon's Hawaii trade consumption is similar to TOTE's volumes.

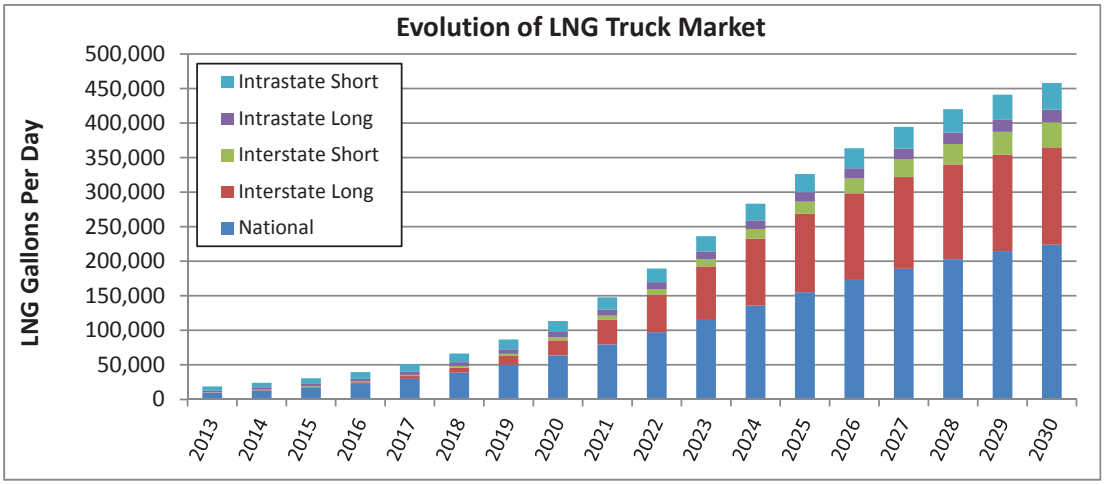
Evolution of the Heavy Duty Truck Market

The heavy-duty trucking demand for LNG will be driven by the price spread between low-sulfur diesel and natural gas. As market interest in LNG increases, engine and truck manufacturers will begin to roll out more LNG tractors and engines, which will help drive down costs. The first adopters of LNG trucks in the region are likely to be large interstate fleets (such as UPS) that can afford to convert their trucks and will realize savings due to high consumption. As this market develops, retailers like Clean Energy and Flying J, will begin to offer LNG at some key stations along interstate corridors. Blu LNG opened a station in Sumner, WA in Q4 2013. These stations will expand the market to smaller interstate and regional fleets that cannot afford the capital for a dedicated LNG station.

[1] Source: Concentric Energy Advisors

Concentric modeled fleet characteristics for all heavy duty combination trucking fleets that operate in Washington. By modeling fleet fuel consumption, diesel and LNG price forecasts, and conversion costs, Concentric projected when it would be economical for fleets to convert to LNG (assuming a 15 percent hurdle rate).

Figure 5. Demand for LNG by the trucking industry in PSE's market area[2]



[2] Source: Concentric Energy Advisors

4. Project Development

This section of the report summarizes PSE's past, current and future development work including siting, permitting, community outreach, plant engineering and financial modeling. To date, PSE has negotiated a ground lease for the Facility at the Port of Tacoma; completed a full front-end engineering and design ("FEED") study with Chicago Bridge and Iron ("CBI"), a leading firm in the design and construction of LNG facilities; and assembled an engineering team of consultants in the geotechnical, marine, and LNG sectors. (See ***Engineering and Construction*** on page 19 for more information.) PSE has also garnered support from local and state elected officials and has successfully supported legislation that achieved tax parity between natural gas and diesel as a transportation fuel. Permitting studies are being prepared by CH2MHill and permit applications will be submitted in Q3 2014. In addition to developing the Facility at the Port of Tacoma, the Project requires upgrades and improvements to PSE's gas distribution system.

Siting

PSE conducted an exhaustive site review of locations throughout Puget Sound. There were three primary siting criteria considered in the analysis:

1. Appropriate placement on PSE's gas distribution system to effectively provide peaking services;
2. A parcel large enough to support regulatory and other siting requirements;
3. Proximity to marine and other fuel markets.

Selected Site

After exploring multiple locations, the development team selected a 33-acre parcel at the Port of Tacoma as the most suitable site for the Facility. The site is located on the Hylebos waterway, on the corner of East 11th Street and East Alexander Avenue. The site will be connected to PSE's North Tacoma high pressure system with approximately four miles of new 16-inch pipe, allowing the plant to inject gas directly into PSE's distribution system.

The Pipeline and Hazardous Materials Safety Administration ("PHMSA") is a branch of the U.S. Department of Transportation that is responsible for regulating LNG facilities. PHMSA defines siting requirements based on two criteria. The first criterion is that in the event of a spill, all vapor must be contained on the property and cannot drift onto neighboring property. The

second criterion is that in the event of a fire, heat from the fire at the property line must be below a prescribed level. To satisfy these PHMSA requirements, the parcel must be appropriately sized. There are few parcels in areas zoned for industrial use that are both large enough to satisfy these regulations and capable of supporting PSE's resource needs.

The selected site at the Port of Tacoma is ideally situated for serving LNG fuel markets. Providing service to these LNG fuel customers optimizes use of the Facility and generates revenues that significantly lower the cost of the peaking resource for PSE's gas customers. The site is located across Alexander Avenue from the TOTE terminal. This location will allow PSE to meet TOTE's needs directly and at an inherent cost advantage over a network of LNG barges and bunker stations, which may be available in the future. The Facility will also be able to serve other marine customers from this location.

The Port of Tacoma is also centrally located to serve regional trucking demand concentrated in the Tacoma, Federal Way and Kent areas. The selected site has access to an existing rail spur that connects to Tacoma Public Rail's system. While LNG is not currently railed in the U.S., this may prove a viable option for transporting large volumes of LNG in the future.

The siting analysis and characteristics of the selected site are discussed in detail in ***Exhibit I***.

Port of Tacoma Lease

PSE will lease the 33-acre project site from the Port of Tacoma under a 25-year lease with extension rights for a second 25-year term, provided certain conditions are met. Details of the lease can be found in ***Exhibit I***.

Permitting

For a discussion of the permits and approvals required for the Tacoma LNG Project, refer to the confidential attorney-client privileged memo from Steve Secrist to the Board of Directors, dated July 2, 2014.

Community and Government Outreach

A coordinated communications and outreach strategy has been developed for local and state government, the Tacoma community, special interest groups, commercial partners, regulators and PSE customers. The plan, which includes a discussion of potential risks and mitigations, is designed to maintain and grow public support for the Project by educating stakeholders about the regional benefits of LNG and the Project. Plan details are summarized in ***Exhibit K***.

Engineering and Construction

The Facility will be engineered and constructed using a combination of two execution methodologies to obtain the best value for PSE. The Facility work (including pre-treatment, liquefaction, storage tank, truck rack, vaporization system, and balance of plant) will be performed in accordance with an engineering, procurement and construction ("EPC") contracting methodology. Site preparation (including demolition, ground improvement, and underground utilities) and marine facilities construction will be performed by PSE using a design-bid-build contracting methodology.

PSE considered several methodologies for engineering and constructing the Facility before selecting a strategy. Ultimately, PSE relied upon input from national engineering firm CH-IV and on market research in its determination of the preferred option.

Engineering, Procurement and Construction

An EPC contract is a firm, fixed price contract with performance guarantees and liquidated damages. In exchange for control of all elements of the project (engineering, procurement, and construction), the EPC contractor retains cost and schedule risks during project delivery. Because a single entity is responsible for both design and construction, a more active consideration of constructability and construction efficiency in the design of the Project is more likely than it would be with alternative contracting methodologies, such as design-bid-build, or even design-build.

PSE considered a pool of seven candidate firms and selected Chicago Bridge & Iron ("CBI") to perform an initial Front End Engineering Design ("FEED") study that developed the Facility to a conceptual level and provided budgetary pricing. CBI completed this work, which culminated in an open book price review and firm bid price in fall 2013. This design and pricing has been used to support commercial, permitting and regulatory efforts. In the coming months, remaining design uncertainties will be resolved and the design of the Facility will be frozen to allow CBI to re-bid all material and sub-contract elements, in order to present a final bid for open book review prior to signing an EPC contract.

CBI is an international leader in LNG plant and tank engineering and construction and has four decades of experience. CBI has designed and built peak-shaving LNG plants around the world. Projects have included complete peak shaving facilities—including pre-treatment, liquefaction, storage and send-out systems; stand-alone liquefaction systems; plant revamps; retrofits; and expansions. In addition, CBI has extensive experience with the key processes and equipment that are utilized in baseload natural gas liquefaction plants, including gas metering, CO_2

removal, dehydration, liquefaction, boil-off/flash gas recovery, gas vaporization, truck loading and unloading and fire protection. CBI is one of the leading contractors for LNG storage and loading systems. This experience includes the design and construction of approximately 220 LNG storage tanks, the majority were double-wall single containment storage tanks up to 200,000 cubic meters. In addition to the LNG sector, CBI provides engineering and construction solutions in the petrochemical, wastewater treatment, mining, nuclear power, and heavy infrastructure sectors with nearly 50,000 employees worldwide.

In order to ensure a competitive bid for the EPC contract, PSE is engaging Black & Veatch to perform a parallel FEED study. This FEED will be based upon the same design criteria used for the proposed CBI plant and will provide another price point for the Facility. Black & Veatch was a top contender for the original FEED contract and has experience designing and building LNG facilities globally. The value of having competitive options for the EPC contract is significant, particularly when compared with the relatively low cost of a second FEED study (approximately 0.5 percent of the plant cost).

CBI presented a proposed contract format as part of its FEED study deliverables in fall 2013. Black & Veatch will provide a competing contract proposal at the end of its FEED study. PSE will have an open book review of the EPC contractor's pricing package prior to contract signing. This gives PSE the ability to review all material and subcontractor bids, EPC contractor contingency (and methodology for determining it), and markup.

After selecting the winning EPC proposal, the EPC contract will be executed and Notice to Proceed will be issued once permitting is complete and the Board approves a subsequent request. This is expected to occur in Q3 2015. ***Exhibit L*** summarizes the contract features indicative of CBI's proposed contract form. These features may be amended during contract negotiations with either potential EPC contractor.

PSE will select an EPC contractor prior to final Board approval of the EPC contract. Details about the selection decision and negotiated contract terms will be included in a Board package at that time.

Work Performed by PSE

PSE will perform all design and construction work necessary to ready the site for the EPC contractor (site demolition, soil improvement, and underground utilities), as well as all marine work (TOTE loading platform). PSE is choosing to perform these project elements because they are outside the value-added capability of an EPC contractor and can be more cost effectively managed by PSE using local resources.

The list below summarizes the team PSE will use to complete its design and construction work, as well as each firm's scope of work. Many of the firms have experience with LNG facility development and several have experience working with the Port of Tacoma and/or other engineering and consulting firms retained by PSE for the Project. The qualifications and benefits of each firm are discussed in detail in ***Exhibit L.***

- ***GeoEngineers (Geotechnical Design).*** Develop ground improvement strategies to meet federal and local seismic design requirements, coordinate structural and foundation requirements with the EPC firm and provide contracting and quality assurance support for the execution of the ground improvement program.

- ***Moffatt & Nichol (Marine Design).*** Develop a demolition plan for the existing timber pier and design a new concrete pier on the Hylebos Waterway, design a new loading platform on the Blair Waterway, and marine construction oversight as necessary.

- ***Sanborn Head & Associates (Owner's Engineer).*** Review EPC design work product, perform a peer review of GeoEngineers work product, assist with EPC contract preparation, and provide support on permitting and community outreach efforts, as needed.

- ***Jim Lewis LNG Expertise, LLC (LNG Consultant).*** Work on select engineering tasks and regulatory discussions.

- ***Tacoma Power (Substation Design/Construction).*** Design and construct the utility substation located on the site. Tacoma Power has already completed an initial preliminary power supply study and will be further engaged as the Project moves forward.

- ***Proposed Firms – Site Civil Design.*** PSE has received proposals from four local civil engineering firms to work on the design of the site storm water management system, as well as modifications to the fire water and sanitary sewer systems. The contract will be awarded as the Project progresses.

Construction work performed by PSE has not yet been contracted. This includes site soil improvement work, which can only be performed by a limited number of specialized contractors, and site demolition and underground utility work, which can be performed by a number of general contractors in the Seattle-Tacoma area. See ***Exhibit L*** for additional details about the bid and selection process for the construction work.

Gas Distribution Upgrades

The PSE distribution system will require improvements to support the Tacoma LNG Facility, including approximately five miles of new pipeline in the cities of Fife/Tacoma and Pierce County, a new limit station and existing gate station modifications. A detailed discussion of the gas distribution upgrades can be found in ***Exhibit M***.

The design, engineering and execution of this work will be managed by PSE's Project Management and Gas Engineering organizations. The work is expected to be completed by the end of 2017 to support plant startup and commissioning in 2018. The cost of the upgrades, estimated to be $49 million, will be incorporated into PSE's gas ratebase and recovered through rates, including rates charged to LNG fuel customers for gas transportation service across the PSE distribution system. PSE included the cost of the distribution upgrades, which will be significantly offset by incremental revenue recovered from LNG fuel customers, as part of the analysis of the prudence of the Facility. The results of this analysis are discussed in detail in ***Exhibit N***.

Natural Gas Supply

PSE will provide natural gas supply for liquefaction services, unless a customer selects a tolling arrangement. The natural gas required for the initial design capacity of the plant is relatively modest—approximately 21,000 Dth per day[3], which is approximately two percent of PSE's current peak-day requirement and approximately five percent of PSE's annual daily average demand. Natural gas supply for turn-key customers will be provided under a market-sensitive pricing mechanism, tied to the monthly Sumas index (with "Sumas" being the interconnection point between Spectra Energy's BC pipeline system and the NWP interstate system, near Sumas, Washington). With this structure, PSE will carry no natural gas supply price risk.

Sufficient firm NWP interstate pipeline service will be procured to transport the natural gas to PSE's system. Customers will pay the transportation costs, except when PSE diverts the gas to serve retail customers during peak periods. The natural gas will generally be managed as a part of PSE's portfolio, but will not utilize PSE's underground storage resources because the Facility will have storage onsite.

[3] The Tacoma LNG Facility will require 21,000 Dth per day to meet the 250,000 LNG gal per day output. The capacity of the Facility to divert natural gas typically used during liquefaction is 19,000 Dth per day. This difference is attributed to the fact that PSE will not hold firm, year round, pipeline capacity for the gas needed for peak shaving (approximately 10 percent of the liquefaction capacity).

Budget and Schedule

The Project will be completed in two distinct phases: development and construction. The development phase is underway and will be considered complete upon issuance of environmental permits, execution of commercial contracts, approval of the LNG tariff and upon successful negotiation of all construction contracts, including the EPC contract. Barring any appeals or legal action during the permitting process, PSE anticipates completing this phase of the project in Q3 2015 at a cost of $14 million. Upon completion of the development phase, PSE will seek board approval to construct the Facility and gas distribution upgrades, and to execute an EPC contract with the lead contractor. The majority of the development phase costs are associated with preliminary engineering, permitting studies and permit application preparation.

The construction phase of the Project will begin with execution of the EPC contract and consist of detailed engineering, procurement, construction and commissioning of the Facility and the gas system upgrades. Capital construction costs for the Project are estimated to be $323 million ($274 million for the Facility and $49 million for the gas system upgrades). The majority of the Facility costs will be covered under a fixed price EPC contract. Other significant components include demolition and soil work. Furthermore, projected Project costs include a construction contingency which is determined by the level of engineering design and based off of industry standards. PSE anticipates construction will be complete in mid-2018, with plant commissioning to follow. The in-service date for the Project is expected to be January 1, 2019.

The figure on the following page shows a high level summary of the Tacoma LNG Project budget. The budget is shown under 2 scenarios:

1. PSE is the sole owner of the Facility;
2. PSE enters into a joint ownership agreement with a marketer and the marketer provides equity for their share of the Facility costs (defined by their utilization of plant capacity).

A detailed Project budget by quarter and a Project schedule can be found in ***Exhibit F.*** Project costs are described in detail in ***Exhibit O***.

Figure 6: Tacoma LNG Project Budget (1,000s)

DEVELOPMENT BUDGET		Total Budget		PSE Cost Under Joint Ownership[2]
PSE Labor and OH	$	2,193	$	1,527
Engineering and Analysis	$	4,474	$	3,116
Permitting & Legal Support	$	3,339	$	2,325
Communications/Outreach	$	391	$	272
Distribution Upgrades	$	1,126	$	1,126
Commercial and Regulatory[1]	$	1,100	$	1,100
Real Estate and Lease	$	766	$	533
Contingency	$	442	$	308
Project Development Sub-Total	**$**	**13,831**	**$**	**10,307**
PROJECT BUDGET				
O&M Total	**$**	**1,700**	**$**	**1,700**
Development Budget (Capital)	$	11,605	$	8,081
PSE Labor and OH	$	5,800	$	4,039
Engineering & Legal	$	1,400	$	975
Real Estate and Lease	$	6,132	$	4,270
Geotechnical and Demolition	$	13,000	$	9,053
In Water Work	$	4,000	$	2,600
EPC Scope	$	181,792	$	127,351
Miscellaneous	$	6,900	$	4,433
Contingency	$	22,650	$	15,440
PSE Construction OH	$	7,830	$	5,460
Sales Tax	$	12,960	$	8,576
Tacoma LNG Facility Sub-Total	$	274,069	$	190,278
Gas Distribution Upgrades	$	49,041	$	49,041
Project Capital Total	**$**	**323,110**	**$**	**239,319**
AFUDC	$	46,841	$	33,261
GROSS PLANT	**$**	**369,951**	**$**	**272,580**

[1]Commerical and Regulatory expenses are not capitalized
[2]Assumes Marketer provides equity contribution for their full utilization of plant services (31% of Plant)

Pro Forma Financial Statements

The Project pro forma models the 25-year revenue requirement to recover all capital investment made during development and construction of the Tacoma LNG Project, and the subsequent 25 years of O&M expenses to operate the Facility and associated distribution upgrades. The pro forma considers revenue contributions from other Facility customers that purchase LNG as a fuel. These revenue contributions are calculated based on the percentage of plant facilities that will be charged to these customers. In addition to contributing revenue needed to pay for the incremental cost of the Facility, LNG fuel customers will also contribute revenues to cover PSE administrative and general costs, and to pay a short-term contract premium if the initial contract term is less than 25 years. PSE has engaged Deloitte & Touche to review and validate the LNG financial model and pro forma financial statements. The work is expected to be completed in mid-July. The costs for Project construction and operation, as well as projected revenue contributions, are discussed in detail in ***Exhibit O***.

The pro forma for the Tacoma LNG Facility assumes that the entire plant has a depreciable life of 25 years. This assumption is based on the primary lease term that PSE will execute with the Port of Tacoma, which is expected to occur in July 2014.[4] PSE's unilateral right to extend the lease will be conditional as discussed in ***Exhibit I***. By assuming a 25-year life, the plant will fully depreciate by the time the lease expires. The engineering life of certain plant components (control systems, IT systems, etc.) may be less than 25 years; however, to simplify the analysis, the shorter life of these items is included in the pro forma as a more conservative O&M estimate, rather than a calculation of depreciation expenses on a more granular basis. The natural gas distribution system upgrades are depreciated over 50 years, which is typical for PSE distribution system facilities.

The pro forma assumes the gas distribution system upgrades go into service in January 2018 and the Facility goes into service in January 2019. The gas system upgrades must be in place to support plant startup and commissioning. The pro forma assumes perfect ratemaking. The LNG Facility and gas system distribution upgrades will be placed in ratebase at the conclusion of a general rate case timed to coincide with the in-service date of the LNG Facility. Revenues from LNG service customers will commence upon plant start-up for both LNG and distribution service.

[4] The 25-year depreciable life of the Tacoma LNG Facility will begin with the plant goes into operation (not in July 2014).

5. Regulatory Process

The regulatory process regarding the Tacoma LNG Facility will occur in two phases that will take place over several years. In the first phase, PSE will seek approval from the Washington Utilities and Transportation Commission ("WUTC") for the delivery of LNG to customers for use as fuel for marine vessels, motor vehicles, and industrial end-uses (the "LNG Fuel Supply Service"). In the second phase, PSE will seek a prudence determination and rate recovery of the Facility.

Phase 1: Approval of the LNG Fuel Supply Service Tariff Schedule and Agreements

The first phase of the regulatory process will commence in 2014 with the filing of an LNG Tariff Schedule pursuant to which PSE will provide a service consisting of the delivery of LNG to any customer for use as fuel for marine vessels, motor vehicles, and industrial end uses (the "LNG Fuel Supply Service"). The draft rate schedule will provide the details for the LNG Fuel Supply Service and outline the minimum terms for LNG Services Agreements pursuant to which customers will take such service. Concurrent with the filing of the draft rate schedule, PSE will file LNG Services Agreements that will provide the specific terms, conditions, and rates associated with the LNG Fuel Supply Service that PSE will provide to these customers.

During the LNG Fuel Supply Service and LNG Services Agreements approval process, PSE will need to demonstrate:

1. the rates charged under the LNG Services Agreements recover all costs resulting from providing the LNG Fuel Supply Service and contribute to PSE's other fixed costs associated with the Tacoma LNG Facility;

2. the need for and nature of the Tacoma LNG Facility, including, but not limited to, a discussion of the economies of scale provided by the provision of the LNG Fuel Supply Service and the resulting benefits to the peak day gas supply service;

3. satisfactory commercial terms and conditions of the LNG Fuel Supply Service, including but not limited to an explanation of the basis and derivation of the proposed rates charged for such service; and

4. the LNG Services Agreements do not provide an unreasonable preference for, or rate discrimination with respect to, the counterparties.

Phase 1 will not be the process by which PSE will seek a prudence determination of or rate recovery for the Tacoma LNG Facility. Those issues will be addressed in Phase 2.

Phase 2: Prudence Determination and Rate Recovery of the Tacoma LNG Facility

PSE will seek a prudence determination and rate recovery for the Tacoma LNG Facility in a General Rate Case ("GRC") filed with the WUTC in the second or third quarter of 2018. Construction is estimated to be completed in January 2019. The filings may occur before all construction costs are known with certainty. If necessary, cost estimates may be updated during the filing. The figure below lists the major milestones associated with the second phase.

Figure 7. Projected Rate Recovery Milestone Dates Based on Current Permitting and Construction Timelines

Projected Date	Milestone
Q2/Q3 2018	PSE files GRC with rate recovery for Tacoma LNG Facility
Q2/Q3 2019	WUTC order with new rates

The GRC would seek a prudence determination for the Tacoma LNG Facility (as well as other potential resource acquisitions or contract restructurings for unrelated resources). In order to demonstrate the prudence of the Tacoma LNG Facility, PSE will need to address:

1. the necessity of the Tacoma LNG Facility;
2. the cost-effectiveness of the Tacoma LNG Facility;
3. the resource alternatives considered by PSE to meet its need, including consideration of factors such as capital costs, impact on the utility's credit quality, dispatchability, transportation costs, and other need-specific analysis at the time of the acquisition decision;
4. the contemporaneous information provided to and used by the Board of Directors in making the acquisition decision and its costs; and
5. the contemporaneous records of PSE to allow the WUTC to evaluate PSE's actions with respect to the decision process.

Concurrent with the rate filing, PSE may also file an accounting petition with the WUTC to request a cost deferral mechanism. Cost deferral may be necessary if the Tacoma LNG Facility is placed in service in advance of the effective date for rates. Under this option, PSE would request deferral of fixed and variable costs associated with the Tacoma LNG Facility.

6. Project Execution

PSE will execute this project as part of its regulated operations, in a similar manner to other large infrastructure projects recently undertaken. PSE will finance the project on balance sheet and will recover the investment as it would any other ratebased asset. Project execution will largely be completed by outside contractors with PSE's oversight. Ultimately, PSE anticipates operating the project as part of the Energy Operations organization. In accordance with PSE's corporate policies, PSE has conducted a risk analysis and believes that risks for the project can be appropriately mitigated. Having considered risks, mitigations and project benefits, Management recommends approval of the resolution in ***Exhibit A.***

Financing

The Project will be financed consistent with past utility financing practices, employing a combination of funds from operations, short-term debt drawn from the Company's capital expenditure facility, long-term debt and, as needed to balance debt, equity provided from PSE's parent company Puget Energy.

Development and Construction Execution

PSE's Strategic Initiatives team will lead the development of the project with support from other internal departments including Natural Gas Resources, Project Management, Rates, Regulatory, and Accounting. PSE will also rely on legal and engineering expertise from outside firms (discussed further in the exhibits) to work through the development phase of the Project including permitting, negotiating long-term fuel supply agreements and filing an LNG tariff with the WUTC. The Company will update the Board of Directors continuously and will return to recommend the execution of an EPC contract after PSE has received environmental permits and regulatory approvals[5]. PSE anticipates seeking approval of the EPC contract and any other contracts needed to execute the project in Q3 2015, but acknowledges that permitting delays due to appeal or other legal actions could delay this schedule.

PSE will oversee the execution and construction of the Project. All Project elements will be managed by PSE's Project Management organization, which includes project managers and support staff, a project controls organization (cost and schedule tracking), and a ready network of supporting engineering, construction management, and quality assurance resources. The gas

[5] Building permits and WUTC approval to construct the Facility, which are administrative in nature, will come after executing the EPC contract (upon completion of detailed engineering).

distribution upgrades will be executed in a similar manner to other projects regularly performed by PSE in its role as a natural gas utility. PSE's strategy for construction of the Facility includes a combination of an EPC contract for plant construction and commissioning, and direct contracting for ancillary features (site preparation and marine work).

Management and Operations of the Project

The Tacoma LNG Facility will be managed and operated by PSE's Energy Operations group, under the direction of Natural Gas Resources, which also manages the Jackson Prairie underground storage facility. The Facility will operate and be staffed 24 hours per day, 365 days per year. Onsite management and operations staff will include: plant manager, plant engineer, operations and maintenance supervisor, maintenance planner, controls technician, office administrator and 10 represented gas operators.

Staff will be located onsite, housed in an existing onsite building that will be retrofitted for use by the Tacoma LNG Facility. Most work will be conducted within the boundaries of the leased property; however, PSE staff will also be responsible for operating and maintaining the direct pipeline and fuel loading equipment that will be located on TOTE's property. Maintenance and operating protocols will be developed taking into account regulations, PSE policies and practices, and best industry practices.

In addition to the staff detailed above, PSE will contract for security service as required to meet regulatory requirements, and stevedoring services to bunker TOTE's ships and load other marine vessels.

Estimates of future Tacoma LNG Facility expenses are reflected in the pro forma financial statements included as ***Exhibit O***, and an operations organization chart can be found in ***Exhibit P***.

Insurance

PSE will procure builder's risk insurance for the plant while under construction. PSE typically procures this insurance on large capital projects because PSE can obtain it at a lower cost than the contractor performing the work. Builder's risk insurance covers material on site and any work in progress from typical risks such as fire, wind, theft, vandalism, etc.

At the end of the construction period, the plant will be covered by PSE's insurance program. PSE's insurer, FM Global, has reviewed preliminary designs of the plant and may be involved

with further design and construction to provide additional guidance on risk mitigation strategies.

Risk Analysis

Consistent with past resource acquisition and development activity, PSE staff has identified incremental risks associated with the development and execution of the Project.

There are known areas of contamination on and adjacent to the Facility site and in the area that may be used for the new high pressure pipeline that extends to the Facility. Cooperation and consensus will be required among the cleanup agencies to ensure that construction and operation of the Tacoma LNG Facility will not impede cleanup efforts nor affect compliance with established cleanup agreements. PSE has been working closely with cleanup staff from EPA, WDOE and the Port to ensure that our construction is not impacted or delayed by these issues, and that the Project's construction and operations will not impede future cleanup.

In the development of this Project, the development team has referenced internal audit findings related to the Snoqualmie Falls Redevelopment Project. These findings describe concerns associated with a "lack of enterprise-wide policies and procedures" related to consolidated business case development, risk management, schedule management, estimating issues, and project delivery system selection. Although PSE is developing new policies and procedures in parallel with the Tacoma LNG Project development, the development team is placing specific emphasis on using the lessons learned from the Snoqualmie Falls audit report.

PSE has prepared a detailed description of the principle risks for each phase of the Project and has identified mitigation plans to address these risks. Risks associated with specific project components (such as permitting, commercial and others) are discussed in more detail in the exhibits attached to this report. Management believes that the proposed mitigation plans adequately address the risks identified. ***Exhibit H*** provides a summary of these risks and mitigation plans.

Project Benefits

PSE's development and construction of the Tacoma LNG Project benefits PSE customers, the Pacific Northwest and the natural environment. The principle benefits of this new resource include:

1. The Tacoma LNG Project will help ensure continued dependable service and additional benefits to PSE natural gas customers.

- The Tacoma LNG Facility will be an integral part of PSE's strategy for serving its gas customers on the coldest days of the year
- Serving new commercial markets –like transportation—helps lower costs for existing and future natural gas customers
- The Tacoma LNG Facility provides critical infrastructure more cost-effectively for PSE customers
- Construction of the Tacoma LNG Project will bring upgrades to local natural gas lines ahead of schedule, improving reliability to Tacoma customers

2. The Tacoma LNG Project will provide important environmental benefits.
   - Switching from diesel to LNG reduces carbon dioxide emissions by up to 30 percent
   - Clean-burning LNG eliminates harmful particulate emissions
   - Converting to LNG will help companies like TOTE comply with new, stricter federal low-sulfur emission standards
   - The Project reduces the potential for harmful fuels spills that could damage Puget Sound
   - Driving innovative uses for natural gas demonstrates PSE's leadership in delivering cleaner energy options to customers
3. The Tacoma LNG Project will generate important economic benefits for all South Sound residents
   - Switching to clean, abundant natural gas will help local employers remain competitive and protect local jobs
   - The Tacoma LNG Project helps the Port diversify its customer base, support new industries, and enhance its position as a driver of job creation and economic activity
   - Construction and operation of the Tacoma LNG Facility will create many direct and indirect jobs in the area
4. Utilizing LNG reduces reliance on foreign fuels, using North America's natural resources here at home to benefit human health, the environment and the economy.

Recommendation

Based on the determination of need, the identification and analysis of alternatives and the established benefits of the Project, management recommends that the Board of Directors adopt the Resolutions stated in ***Exhibit A***, approving the continued development of the Tacoma LNG Facility, which includes entering into a long-term fuel supply agreement and an interim supply agreement with TOTE.

PUGET SOUND ENERGY

Exhibit A.

Resolutions

Approval of Liquefied Natural Gas Fuel Supply and Related Agreements

At the July 30, 2014 meeting of the Board of Directors, Ms. Harris is expected to call on Mr. Riding and Mr. Garratt to present to the Board for decision a fuel supply agreement for the sale of liquefied natural gas ("LNG") to TOTE, Inc., and related agreements (referred to herein as the "LNG Project"). Mr. Riding and Mr. Garratt will review with the Board a presentation entitled, "Report to the Board of Directors: Tacoma LNG Facility." Materials regarding the LNG Project are being provided to the Board in advance of this meeting, and a copy is filed with the records of this meeting. As more fully described in such materials, the LNG Project relates to the sale to TOTE, Inc., a marine shipper, of LNG to be manufactured at a natural gas liquefaction facility to be constructed by the Company in Tacoma, Washington (the "LNG Facility"). The sale of LNG is to be pursuant to an LNG Fuel Supply Agreement between the Company and TOTE (the "FSA"). The LNG Facility is to be built on real property which the Company has leased from the Port of Tacoma (the "Port") pursuant to a ground lease (the "Lease"). Further, the LNG Project contemplates entry by the Company into an agreement to sell to TOTE LNG procured by the Company from third parties for a period prior to the completion of the LNG Facility (the "Interim Supply Agreement").

The Board and the Company's senior officers held a lengthy discussion about the LNG Project, including: the Company's need for cost-effective peaking resources for its natural gas retail customers and the analysis supporting the LNG Facility's ability to meet that need; the construction schedule of the LNG Facility; risks to that schedule and the consequences of any delays; the payment schedule for the LNG Facility's various components and the impact of such spending on the Company's capital budgets; strategies for recovery of its costs through the regulatory process; the credit-worthiness of the various counterparties; indemnity obligations, limitations of liability and other exposures to the Company under the FSA, the Interim Supply Agreement and the Lease; and other matters. Upon conclusion of this discussion, and upon a motion duly made and seconded, the Board approved the resolutions set forth below:

> WHEREAS, this Board of Directors of Puget Sound Energy, Inc. (the "Company") has determined that it is in the best interests of the Company, in its capacity as a regulated utility, to develop an LNG facility to meet peak resource need and, in order to minimize the cost of such a peaking resource, to enter into the business of selling liquefied natural gas ("LNG") to customers on a cost-of-service basis pursuant to a tariff to be submitted to the Washington Utilities and Transportation Commission ("WUTC") for consideration;

WHEREAS, TOTE, Inc., owner of Totem Ocean Express, Inc., which operates two diesel-fueled ships that provide cargo service on a nearly continuous basis between the ports of Tacoma, Washington and Anchorage, Alaska, conducted a request for proposals for a long-term supply of LNG following its decision to convert its ships to operate on LNG;

WHEREAS, the Company has taken steps to develop, with the goal of constructing and operating, a natural gas liquefaction facility for the production of LNG, located at the Port of Tacoma (the "LNG Facility") to provide peak-day natural gas supply to its retail sales customers and LNG as a fuel for maritime vessels and large trucks;

WHEREAS, the Company concurrently has determined that the LNG Facility would provide a cost-effective peaking resource to its natural gas customers in comparison with alternative peaking resources;

WHEREAS, the Company's proposal to supply LNG to TOTE on a long-term basis was selected by TOTE as the winner of its RFP for LNG supply;

WHEREAS, the Company's management has negotiated with TOTE the terms and conditions of a contract for the long-term supply of LNG from the LNG Facility, has negotiated with each of TOTE and FortisBC, Inc. ("Fortis") the terms and conditions of contracts for a short-term supply of LNG to provide to TOTE during the period between the completion of the conversion of TOTE's ships and the completion of the LNG Facility, and has negotiated and executed with the Port of Tacoma (the "Port") the terms and conditions of a ground lease for real property upon which the LNG Facility will be located, all pursuant to the definitive transaction documents (the "Principal Transaction Documents") described in part below:

1. PSE will sell LNG to TOTE for a minimum term of ten years starting January 1, 2019 and extendable for up to a total of 15 additional years, pursuant to a Fuel Supply Agreement (the "FSA"). PSE's obligations to deliver LNG under the FSA will be conditioned upon, among other things, receipt by PSE of all requisite permits and approvals necessary to construct the LNG Facility, as well as the approval of the WUTC. The FSA specifies minimum annual delivery obligations as to quantity and quality of LNG, and delineates the method for determining the contract price of LNG sold, which includes both fixed and index-tied variable components. The FSA does not impose any damages on PSE in the event an act of force majeure impedes the delivery of LNG, but does expose the Company to up to [$10 million] in any year in the event of a failure to deliver not caused by force majeure. Also, TOTE may terminate the FSA without penalty under certain scenarios involving the price of fuel oil or of ultra low sulfur diesel. A guaranty of the obligations of TOTE under the FSA will be provided by its ultimate parent, Saltchuck Resources.

2. In order to provide LNG to TOTE during the period between the delivery to TOTE of its converted ships, the first of which is expected in early 2016, and the first commercial delivery from the LNG Facility, anticipated to be no later than January 1, 2019, the Company is negotiating with TOTE the Interim Fuel Supply Agreement. This contract will have a three-year term, and will obligate PSE to pay damages to TOTE in the event PSE fails to complete the LNG Facility by January 1, 2019, the amount of which would be calculated as a function of expected FSA price, but in any event not to exceed [$15 million]. The Company will contract with FortisBC for the LNG it will re-sell to TOTE, and will arrange for its shipment in ISO containers to TOTE's facilities at the Port by barge.

3. PSE and the Port intend to enter into a ground lease for 33 acres at the Port of Tacoma (the "Lease"), which includes a two-year due diligence period (during which time PSE may terminate with 30 days' notice), followed by a three-year construction period, followed by a 25-year term commencing upon commercial operation of the LNG Facility. The term may be extended for an additional 25 years. Rent, lower during the diligence period, will step up to $146,000 per month for the construction period, and then to $212,000 per month subsequent to operation, escalating annually at CPI.

4. The provisions of each of the Principal Transaction Agreements are more fully described in the Summary of Commercial Terms, attached as Exhibit E of the LNG Project Proposal.

WHEREAS, the Principal Transaction Documents, the current development status and development plan of the LNG Facility and the LNG Project, its anticipated budget, and the primary risks relevant to its development, construction and operation are described more fully in a report provided to the Board of Directors in advance of this meeting and filed with the minutes (the "LNG Project Proposal"); and

WHEREAS, the officers now seek Board approval of and authority to enter into the Principal Transaction Documents set forth above and such other contracts or actions described in the LNG Project Proposal and relating to the sale of LNG as set forth therein;

IT IS, THEREFORE

RESOLVED, that the Board, after full consideration and due deliberation, deems it advisable and in the best interests of the Company to approve the sale of LNG to TOTE pursuant to the Principal Transaction Documents, and to approve or ratify any related

agreements and the other transactions described in the LNG Project Proposal and in accordance with the budget and other materials set forth therein; and

RESOLVED, that the Board hereby authorizes the Company's Chief Executive Officer and its Chief Financial Officer (the "Authorized Officers") to execute the Principal Transaction Documents, which may include such further additions, amendments or changes to the terms thereof as are deemed necessary and appropriate by the Authorized Officers, and further authorizes any such other officer the Chief Executive Officer deems appropriate to execute any agreements or contracts described in the LNG Project Proposal other than the Principal Transaction Documents; and

RESOLVED, that the Authorized Officers are further authorized to waive any conditions precedent to the closing of any of the Principal Transaction Documents in order to facilitate the closing of such agreement, provided that each of the Authorized Officers agree to such waiver and deem it to be in the best interest of the Company.

GENERAL AUTHORITY

RESOLVED, FURTHER, that any and all actions taken by the officers of the Company, or any of them, as deemed by such officers to be necessary or advisable to effectuate the transactions contemplated by the foregoing resolutions, including the filing of appropriate documentation with the Washington Utilities and Transportation Commission, whether prior to or subsequent to this action by this Board of Directors, are hereby authorized, approved and ratified, and the taking of any and all such actions and the performance of any and all such things in connection with the foregoing shall conclusively establish such officers' authority therefore from the Company and the approval and ratification thereof by this Board of Directors.

PUGET SOUND ENERGY

Exhibit B.

Presentation to the Board of Directors

July 2, 2014

CONFIDENTIAL per Protective Order in WUTC Docket No. UG-151663

Report to the Board of Directors:

Tacoma LNG Project

PSE PUGET SOUND ENERGY

July 2, 2014

July 30, 2014 Board Recommendation

Based on the determination of need, the analysis of alternatives, and the benefits of the proposed transaction, PSE Management recommends that the Board of Directors approve the continued development of the Tacoma LNG Project. Specifically, approval will authorize PSE to:

- ***Enter into a long-term Fuel Supply Agreement*** to sell to Totem Ocean Trailers Express ("TOTE") LNG supplied from the Tacoma LNG Facility.
- ***Enter into an Interim Supply Agreement*** to sell to TOTE LNG procured by the Company from third parties until completion of the Tacoma LNG Facility.
- ***Enter into a long-term lease with the Port of Tacoma*** for the land upon which the Facility will be sited.

Project Description

PSE is developing an LNG facility to serve as a peaking resource for its core natural gas customers and to provide fuel to marine and on-road transportation markets.

Site: Port of Tacoma at corner of E. 11 St. and Alexander Ave. E.

Project In-service Date: January 1, 2019

LNG liquefaction capability: 250,000 gallons/day

On-site storage: 8 million gallons

Vaporized gas injection capability (into PSE's system)[1]: 66,000 Dth/day

Gas delivery to PSE's system: Northwest Pipeline

Electricity for facility: Procured at Mid-C market prices; wheeled via Tacoma Power's 115 kV system

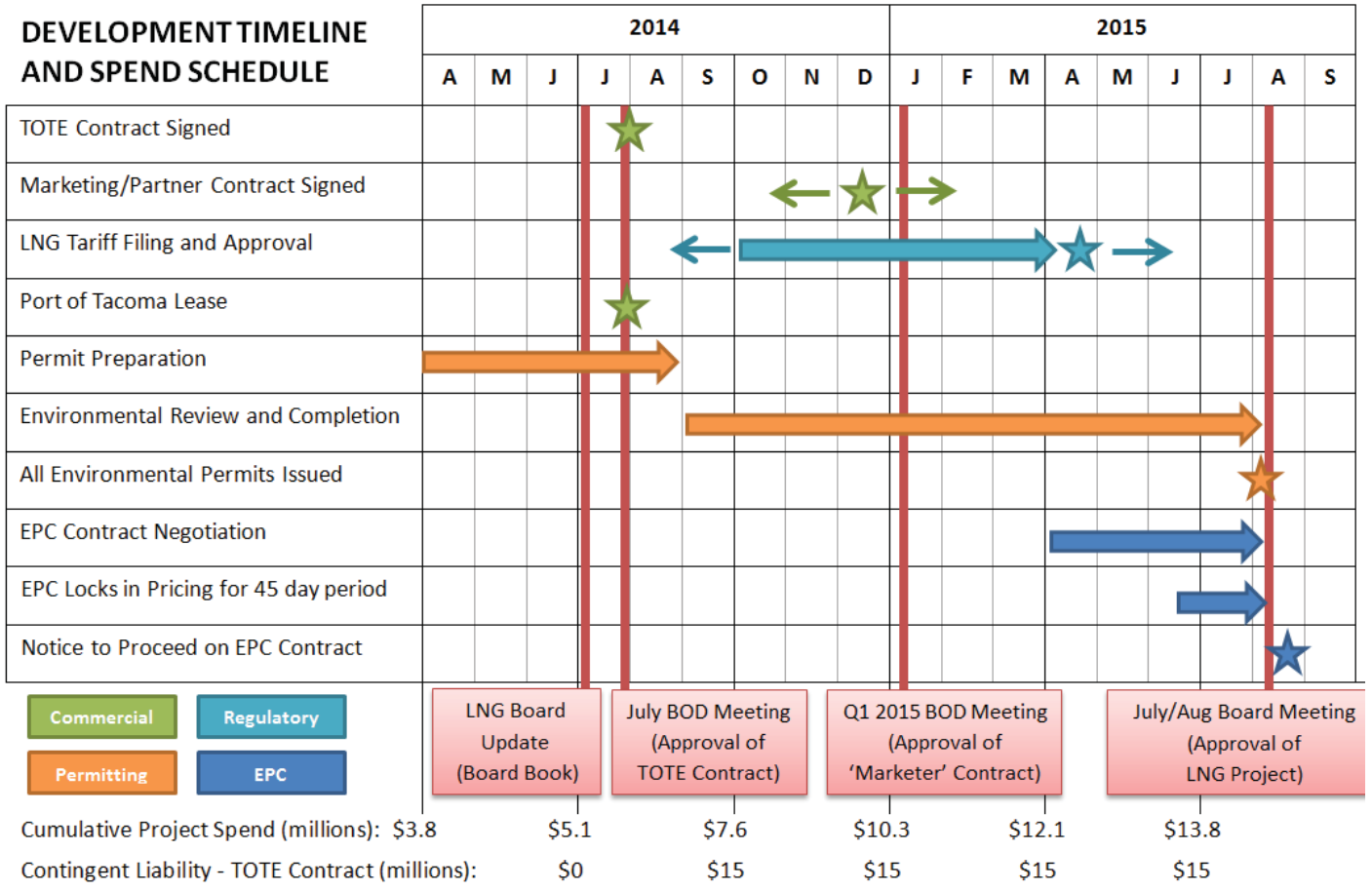
Total Project Cost: $323 million

Tacoma LNG Facility in Tacoma, Washington

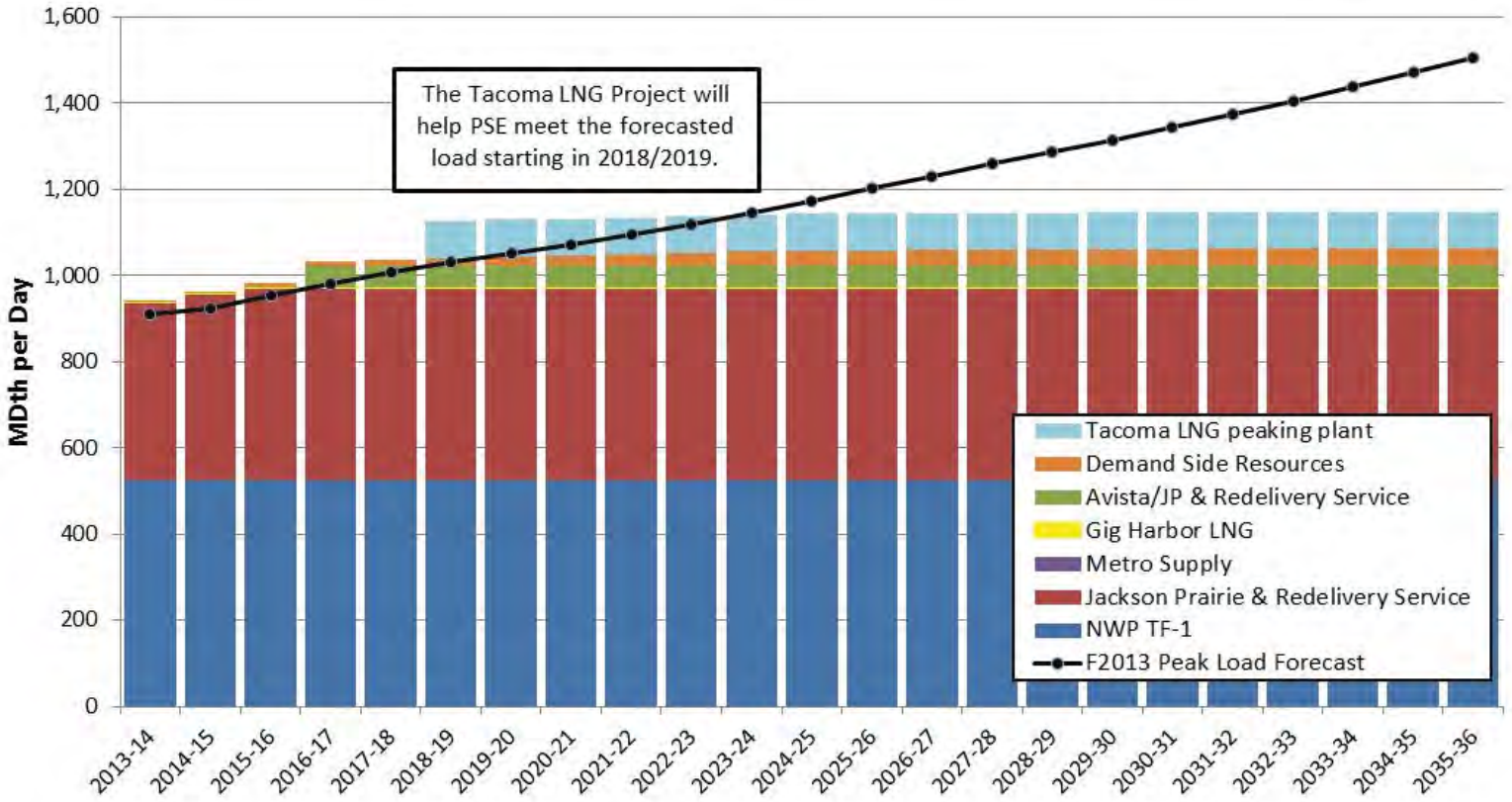
PUGET SOUND ENERGY

[1]To meet peak-day demand of PSE retail gas customers

Development Schedule



PSE Natural Gas Resource Need



PUGET SOUND ENERGY

Facility Siting

Selected Site

- 33-acre site at the Port of Tacoma.
- Inside PSE's gas system.
- Situated on waterway.
- Located adjacent to TOTE.

Siting Requirements

- **PSE Resource Need:** Capable of supporting PSE peak-day needs.
- **Market Access**: Safe, efficient and dependable supply to LNG fuel customers.
- **Compliance:** Comply with setbacks and exclusion zones as defined in federal codes and national safety standards.

PUGET SOUND ENERGY

Port of Tacoma Lease

Lease terms have been negotiated with the Port of Tacoma for a 33-acre site adjacent to TOTE's facility.

- **Term:** 25 years from date of first commercial operations.
  - 25-year renewal option, unilateral if 45% of capacity is used for marine purposes.
  - **Termination:** Anytime during the 2-year due diligence and permitting phase with notice and $50,000 termination fee; termination fee not applicable, if due to existing environmental contamination.
- **Pricing:** Varies by phase; requires security deposit of $2.9 million (one year's rent).
  - **Due diligence period:** $49,725 per month.[1]
  - **Construction period:** $146,000 per month.
  - **Operating period:** $212,445 per month.
  - **Volumetric charge:** $0.085/barrel for volumes sold; Port reserves right to establish LNG or other tariffs (but will collaborate with PSE and give 10-years' notice).
  - **Escalation:** Lease pricing components escalate annually at CPI.
- **Indemnification:** PSE must indemnify Port, if activities adversely inhibit normal Port operations.
- **Removal of Improvements:** Upon lease termination, Port reserves right to retain or have PSE remove leasehold improvements.

PUGET SOUND ENERGY

[1]*Increases $7,000 each month of extended due diligence (beyond initial 12 month period)*

LNG Fuel Customers

TOTE's Orca-class Midnight Sun

Totem Ocean Trailers Express

- Shipping company fully owned by Saltchuk Resources Inc., a privately held investment group based in Seattle.
- Transports 30% of consumer goods shipped to Alaska.
- Operates two Orca class ships between Port of Tacoma and Anchorage; sailings from Tacoma Wednesdays and Fridays.
- Will consume more than 39 million gallons of LNG annually (approx. 44% of the LNG produced at the Tacoma LNG Facility).
- Fuel supply agreement negotiated; to be executed upon Board approval.

Targeted Marketing Partner

Likely an equity investment or tolling arrangement

- **BP**
- **Shell**

Other LNG Marketers Considered

- **Blu** – Joint venture of Transfuels, an SLC-based alternative fuels company and ENN, a large Chinese utility.
- **Clean Energy** – NG fuel provider.
- **Tenaska** – Independent energy company.
- **Linde –** Cryogenics company.
- **LNG America** – NG fuel provider.

TOTE Fuel Supply Agreement

- **Guaranteed Completion** with penalties after January 1, 2019; plant must be in place by January 1, 2021.
- **Capped Maximum Price** on plant and fixed O&M charges.
- **First Option Right** with similar terms and pricing for TOTE and affiliates.
- **Deficiency Payments,** if TOTE fails to purchase at least 95% of contract volumes.
- **Conditions precedent:**
  - All permits and regulatory approvals received.
  - WUTC approval.
  - Board approval to execute the EPC contract.
  - Binding site lease with Port of Tacoma.
- **Interim supply agreement** will contain damages if the plant is late or PSE cancels the project (estimated ~ $15 million if PSE cancels the project).
- **Damages:**
  - No damages on failure to deliver due to Force Majeure.
  - Limited damages on non-Force Majeure event: TOTE is asking for up to $10 million in any contract year (low probability event).
  - No limit to damages on willful failure to deliver.
  - Damage to TOTE's property if PSE provides off-spec LNG - TOTE asking for up to $15 million in any contract year (low probability event; will be insurable).

Interim Supply for TOTE

Risk Management: Interim Supply Contract risks will be passed through to counterparties.

Current Proposed Supply Chain

Alternate Plans

- LNG could be moved by trucks to temporary storage for TOTE.
- Storage could be onshore tanks, or an LNG barge.
- LNG could be trucked from:
  - Vancouver, BC (Fortis BC)
  - Plymouth, WA (Northwest Pipeline)
  - Reno, NV (Colony – *Proposed*)

Marketing Partners

PSE is working towards a joint ownership or long-term tolling agreement with Shell or BP for the remain liquefaction capacity:

- Strong balance sheets
- Existing marketing presence for transportation fuels
- Natural gas resources
- Strong strategic partners

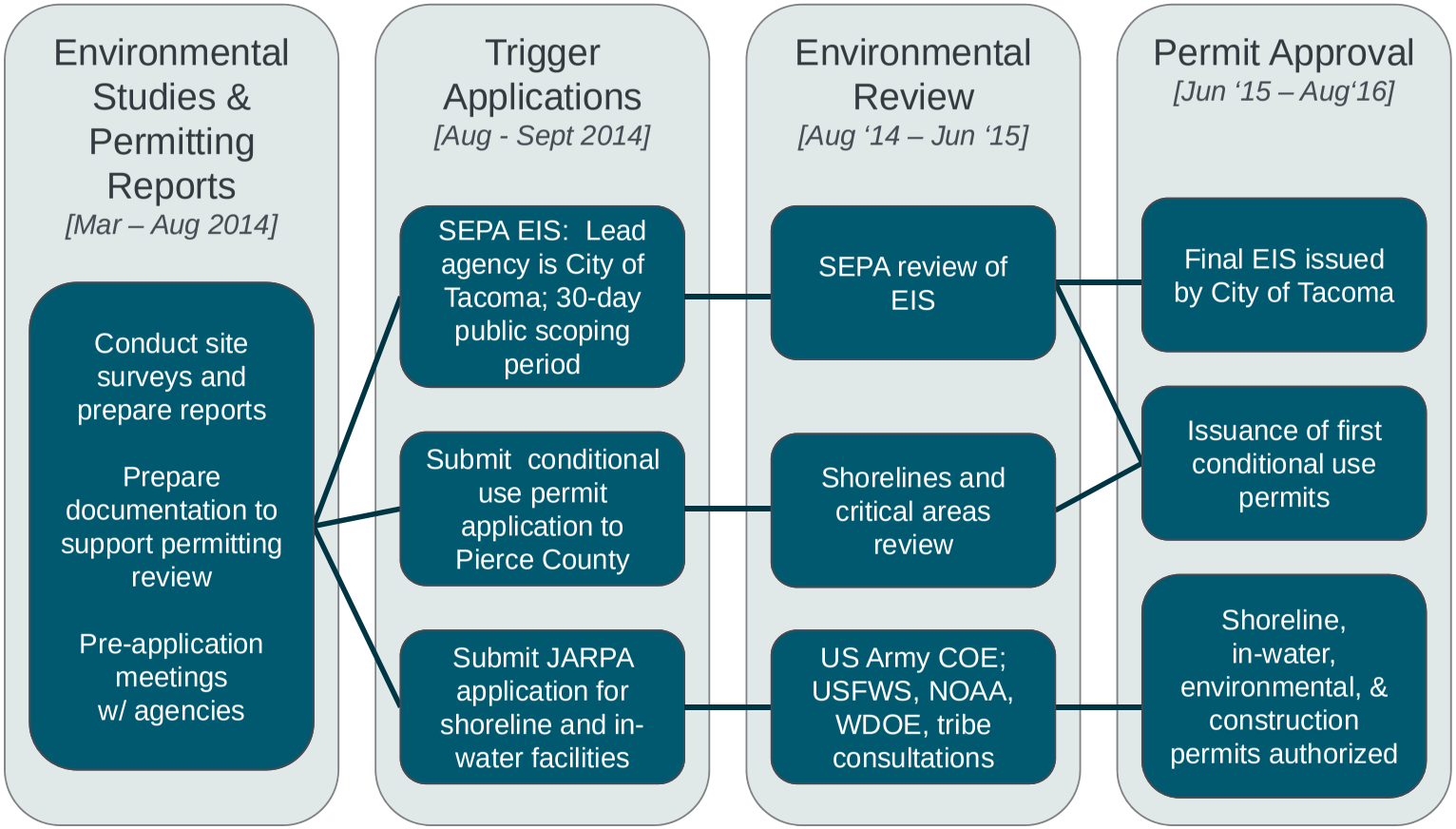
BP:

- PSE has shared indicative pricing and BP is interested in participating in the project.
- BP has expressed a desire to take an equity position.
- BP may require part of the TOTE capacity and contract to participate.

Shell:

- Currently working to develop a separate LNG facility at the Port of Tacoma.
- Current maritime fuel supplier in Port of Tacoma and strategically focused on LNG as transportation fuel.
- Minority ownership stake may run counter to corporate culture.

Permitting Timeline



PUGET SOUND ENERGY

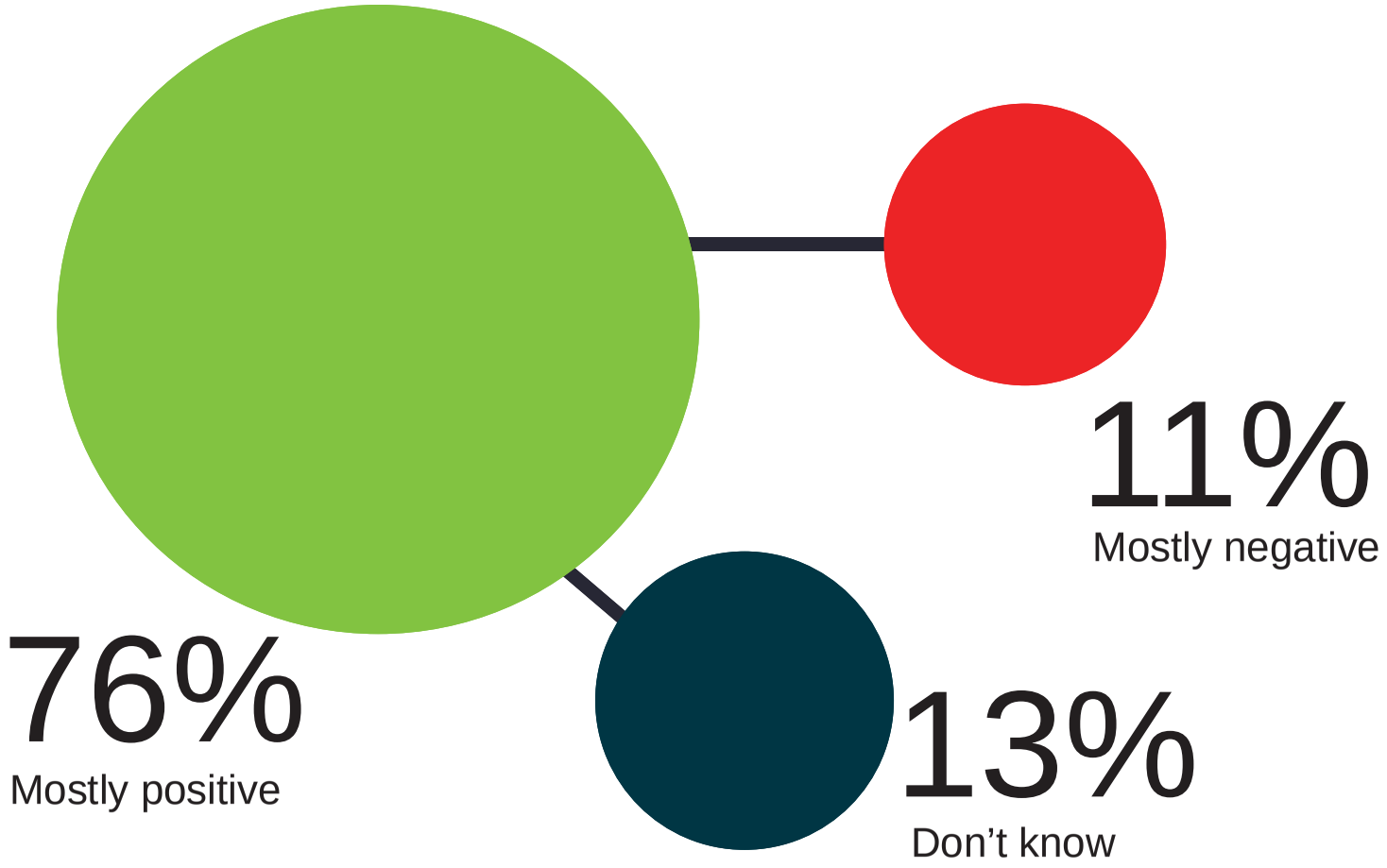
Outreach Strategy

Primary Objective: Enable the siting and permitting of the LNG Facility.

Secondary Objective: Develop strong key constituency support for the LNG Project.

- **Local Outreach –** Includes local public officials, business and community organizations, Port of Tacoma and neighborhood stakeholders.
- **State Outreach –** Includes Governor's office, key Senate and House members/staff and State Agencies.
- **Federal Outreach –** Includes Senators Murray and Cantwell, Congressmen Smith, Heck, Kilmer and Larsen, and Federal Agencies.

Reaction to LNG development



Communications Strategy

Key Messages

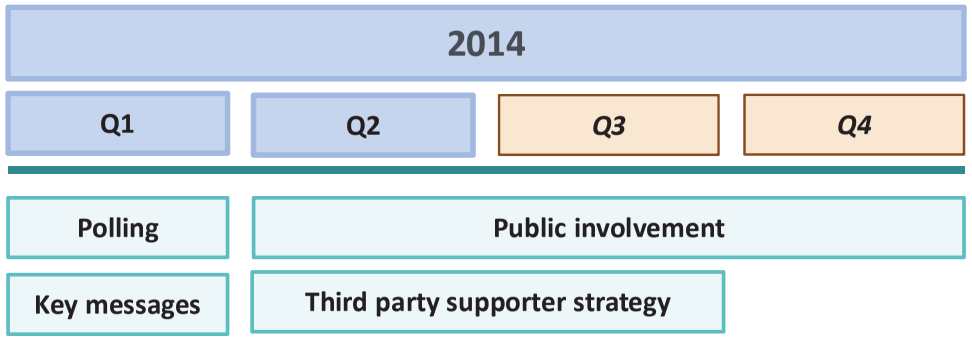
- Greater reliability for Tacoma/Pierce NG customers
- Local jobs and economic opportunity
- Environmental benefits (local air quality, marine and global)
- Safe, proven use of a domestically-sourced fuel

Key Risks

- Neighborhood group opposition (safety)
- Confusion with other Port NG projects (exports)
- Special interest group intervention (fracking)

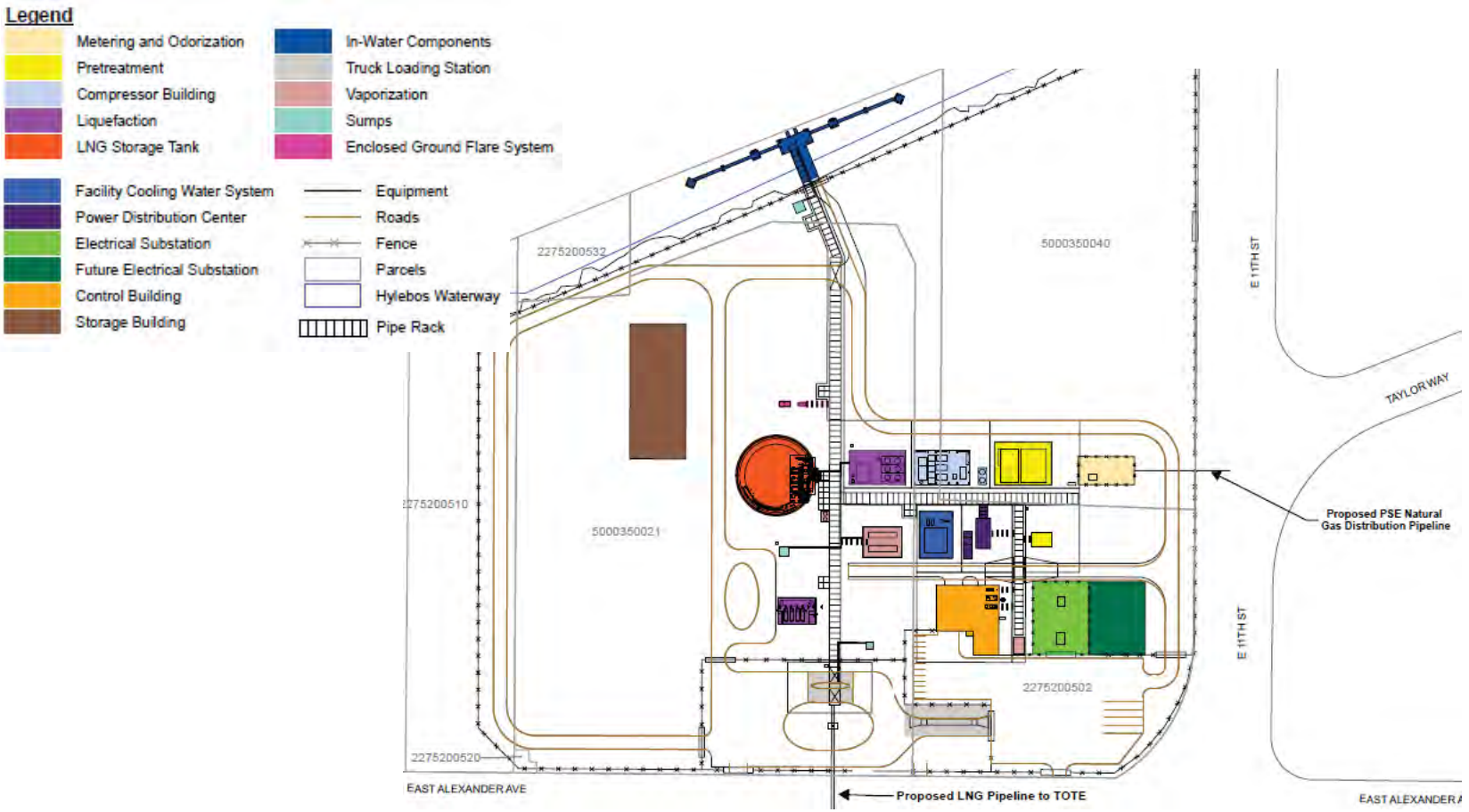
Mitigation

- Process modeled after Thurston County effort
- Emphasis on local benefits (system reliability, economy, environment)
- Careful differentiation from other proposed facilities
- Communications focus on messaging, large audiences



PUGET SOUND ENERGY

Proposed Layout



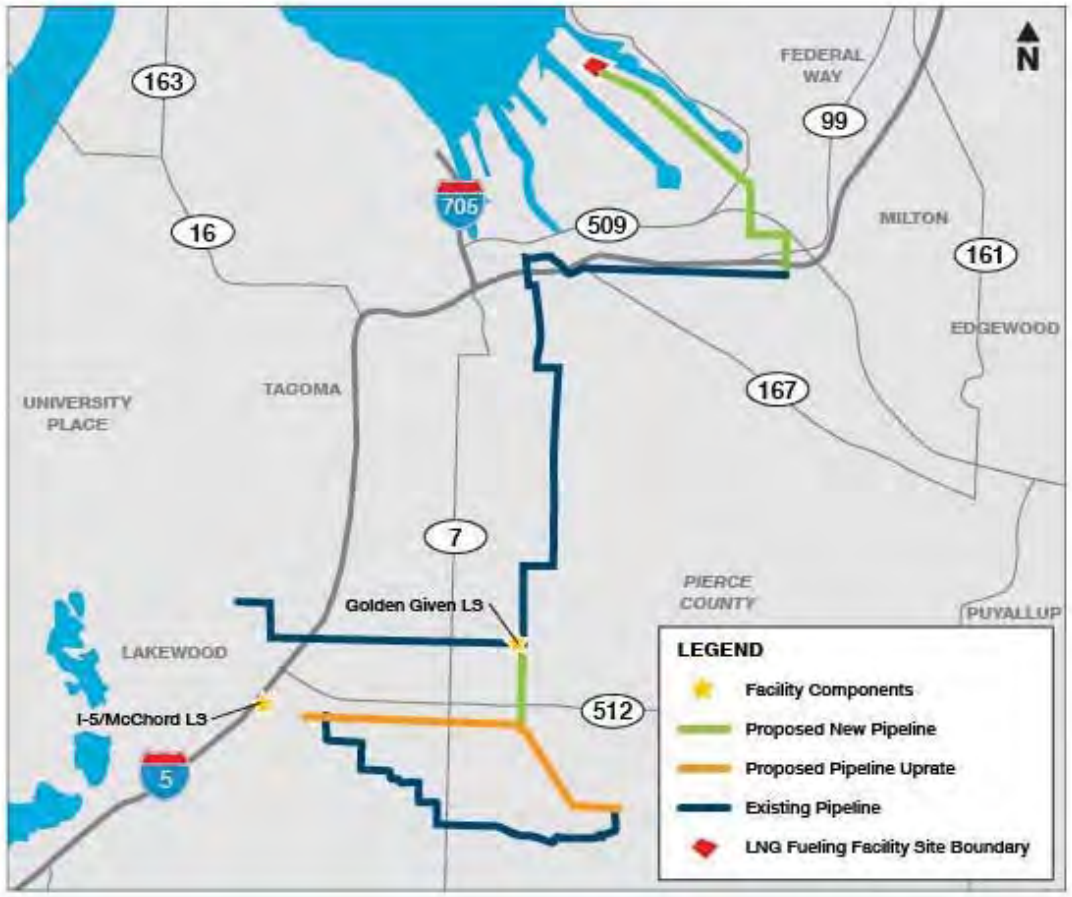
EPC Contract

EPC contractor takes most of the construction risk

- **Chicago Bridge & Iron** proposed contract format as part of FEED study deliverables in fall 2013.
  - **Pricing:** Firm, fixed-price, lump sum includes all engineering, materials, construction, overhead, contingency, and markup, subject to exclusions.[1]
  - **Payment:** According to an agreed-upon milestone schedule based upon actual work completion.
  - **Performance guarantees and penalties:** For completion delay, liquefaction, vaporization, utilities consumption, power factor, LNG tank volume, truck loading rate and marine loading rate.
  - **Warranty:** 12 months.
  - PSE to provide utilities, consumables, feed stock and plant personnel at specified times.
- PSE to engage **Black & Veatch** for an independent FEED study and competing contract proposal.

[1]*See Exhibit L of the Report to the* Board of Directors: Tacoma LNG Project *for specific exclusions*

Gas Distribution System Upgrades



Regulatory Strategy

Phase 1: Commences in 2014

WUTC Approval of LNG Fuel Supply Service Tariff Schedule and Agreements.

PSE will demonstrate:

1. Rates recover all costs to provide LNG fuel supply service and contribute to other Facility fixed costs.
2. Need for and nature of the Facility.
3. Satisfactory commercial terms and conditions of LNG fuel supply service.
4. Agreements do not impose unreasonable preference for/rate discrimination to the counterparties.

Phase 2: General Rate Case in Q3/Q4 2018[1]

WUTC Prudence Determination and Rate Recovery of the Tacoma LNG Facility.

PSE will demonstrate:

1. Need for the Facility.
2. Facility is cost-effective.
3. Alternatives considered and analysis conducted.
4. Contemporaneous information used by the Board to make acquisition decision.
5. Contemporaneous records kept by PSE.

[1]PSE may also file an accounting petition with the WUTC to request a cost deferral mechanism for fixed and variable costs of the Tacoma LNG Facility, if the Facility is placed in service in advance of the effective date for rates.

Regulatory Timing

PSE is weighing the benefits and risks of filing the LNG Tariff:

- After Board Approval (Aug 2014); or
- When contracting with the marketing partner (as late as Feb 2015)

Filing Trigger:	July Board Approval	Marketing Partner Onboard
Filing Elements:	• TOTE Contract • Pro Forma Tolling Agreement • Peaking Prudence • Distribution Upgrades	• TOTE Contract • Equity Investor or Tolling Agreement • Peaking Prudence • Distribution Upgrades
Benefits:	Regulatory risk is reduced earlier in the development process.	Commission is more likely to react favorably to having contracts to support full plant capacity (non-peaking portion).
Risks:	Staff capacity limited in 2014. Lower chance of approval without contracts to support full plant capacity.	Tariff approval may not come until late in Q2 2015.

Project Budget

Development Budget		
PSE Labor and OH	$	2,193
Engineering and Analysis	$	4,474
Permitting & Legal Support	$	3,339
Communications/Outreach	$	391
Distribution Upgrades	$	1,126
Commercial and Regulatory[1]	$	1,100
Real Estate and Lease	$	766
Contingency	$	442
Project Development Sub-Total	**$**	**13,831**

[1]Commerical and Regulatory expenses are not capitalized

Budget assumes NO equity investment by marketing partner.

PROJECT BUDGET		
O&M Total	**$**	**1,700**
Development Budget (Capital)	$	11,605
PSE Labor and OH	$	5,800
Engineering & Legal	$	1,400
Real Estate and Lease	$	6,132
Geotechnical and Demolition	$	13,000
In Water Work	$	4,000
EPC Scope	$	181,792
Miscellaneous	$	6,900
Contingency	$	22,650
PSE Construction OH	$	7,830
Sales Tax	$	12,960
Tacoma LNG Facility Sub-Total	$	274,069
Gas Distribution Upgrades	$	49,041
Project Capital Total	**$**	**323,110**
AFUDC	$	46,841
GROSS PLANT	**$**	**369,951**

PUGET SOUND ENERGY

Financial Summary

Puget Sound Energy
2014 Financial Plan Update for July 2nd, 2014 Board of Directors Meeting
Liquefied Natural Gas Project (LNG)

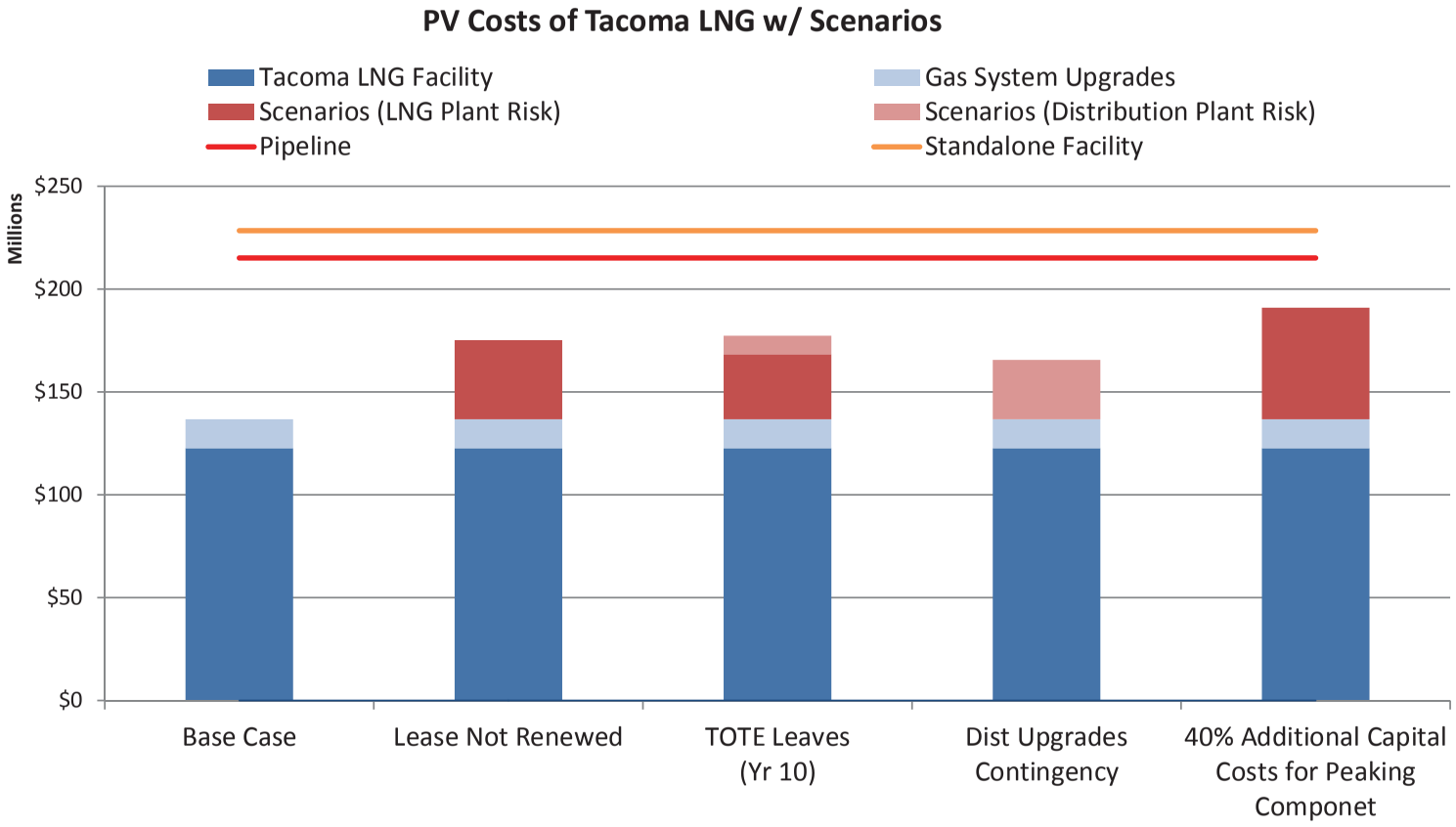
Line		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
1	*$ in millions*	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2013-2019**
2	Capital Expenditures[1]	$2	$6	$31	$90	$140	$53	$0	$322
3	AFUDC	0	1	2	7	16	21	-	47
4	**Total Capex (including AFUDC)**	**$2**	**$7**	**$33**	**$97**	**$157**	**$74**	**$0**	**$369**
5									
6	Income Statement Impacts								
7	Revenue	$0	$0	$0	$0	$0	$0	$68	$68
8	Operating Expenses	(0)	(1)	(0)	(0)	(0)	(1)	(49)	(52)
9	**EBITDA**	**($0)**	**($1)**	**($0)**	**($0)**	**($0)**	**($1)**	**$19**	**$16**
10	AFUDC	0	1	2	7	16	21	-	47
11	Interest Expense	(0)	(0)	(1)	(2)	(5)	(6)	(11)	(25)
12	Depreciation & Amortization	-	-	-	-	-	(1)	(15)	(16)
13	Taxes	0	0	0	1	2	0	(9)	(6)
14	**Net Income**[2]	**$0**	**$0**	**$1**	**$5**	**$13**	**$13**	**($17)**	**$16**

Assumption Owners: Garratt, Riding, Wiegand

[1]Assumes no equity investment by marketing partner. Also note that 2012 capital costs have been omitted from the 5-year plan resulting in a small discrepancy from the project budget.

[2]The 5-year plan does not assume a GRC between now and 2019 so revenues attributed to PSE peaking resource are not shown, resulting in a negative net income in 2019. The project pro forma in Exhibit O of the report assumes perfect ratemaking.

Comparison of Resource Alternatives



Assumes no equity investment by marketing partner.

Key Risks and Mitigations

Risk	What	Probability	Magnitude	Mitigation Plan
Permitting	Permits are appealed; delays ensue	Low	High	Preparing an EIS that incorporates baseline information from the existing Port of Tacoma EIS. Work closely with permitting agencies to mitigate environmental challenges. Talk early and often to stakeholders.
Regulatory	WUTC could deny regulated rate-base treatment	Medium	High	Working with WUTC commissioners, staff and Governor's office to demonstrate cost effective supply for PSE customers and espouse clean energy and economic regional benefits.
Reputational	LNG facilities attract NIMBYs and environmental activists	Medium	Low	Develop public outreach programs, engage stakeholders, and build network of supporting community organizations. PSE builds and operates many NIMBY-attracting facilities.
Financial	Customer credit	Low	Medium	Saltchuk parental guaranty to support TOTE supply agreement. Will require marketing partner to provide appropriate credit consistent with ultimate deal structure.
	Merchant Risk	Low	High	PSE will need to show merchant risk is managed and overall arrangement is prudent to put plant in ratebase. Strong marketing partner who invests equity in plant can mitigate merchant, credit, and regulatory risk.
	Project costs	Medium	Low	Contract pricing will be established with EPC guaranteed pricing.
	Fuel oil price trigger	Low	Low	Termination fees will recover much of TOTE's allocated plant cost in the first five years.

Tacoma LNG Project Benefits

A cost-effective way to meet the capacity needs of PSE's retail gas customers

- Least cost peak-day supply resource option to meet demonstrated capacity needs of PSE gas customers.
- Improves gas system reliability.
- Diversifies peak-day resources for PSE customers (on-system resource) and eliminates the need for long-haul interstate pipeline capacity.
- Supports WA's statutory goals to reduce carbon emissions from the state's transportation sector.
- Supports economic development at the Port of Tacoma.
- Supplies LNG fuel to region, which when compared to petroleum-based fuels:
  - Reduces harmful emissions that effect local air quality.
  - Emits less carbon dioxide.
  - Costs less, allowing operators to invest in conversion and new builds.
  - Complies with new maritime regulations.
  - Complies with California's Low Carbon Fuel Standard.

July 30, 2014 Board Recommendation

Based on the determination of need, the analysis of alternatives, and the benefits of the proposed transaction, PSE Management recommends that the Board of Directors approve the continued development of the Tacoma LNG Project. Specifically, approval will authorize PSE to:

- ***Enter into a long-term Fuel Supply Agreement*** to sell to Totem Ocean Trailers Express ("TOTE") LNG supplied from the Tacoma LNG Facility.
- ***Enter into an Interim Supply Agreement*** to sell to TOTE LNG procured by the Company from third parties until completion of the Tacoma LNG Facility.
- ***Enter into a long-term lease with the Port of Tacoma*** for the land upon which the Facility will be sited.

Future Board Decisions

Decision	When
PSE Management will recommend approval of the TOTE Fuel Supply Agreement, Interim Supply Agreement and enter into a long-term lease with the Port of Tacoma.	July 30, 2014
Execution of Joint Ownership Agreement or Tolling Agreement with Marketing Partner	Upon completion of a marketing or co-ownership agreement with a third-party fuel marketer
Final project approval; execute all project construction agreements including requisite engineering, procurement and construction ("EPC") agreement with the lead contractor; and issue Notice to Proceed	Upon receipt of a final non-appealable EIS, Section 10/404 Permits, Shoreline and Pierce County CUP;[1] execution-ready construction contracts and all required real-estate rights.

[1]Permits yet to be obtained, such as a Building Permit, will require final design.

Next Steps

- **Commercial**: Ensure that the LNG facility is fully contracted by PSE customers, TOTE and a third-party marketer (i.e., BP, Shell, or others).
- **Permitting**: Submit permit applications and continue to educate and work with permitting agencies (City of Tacoma as lead agency).
- **Regulatory**: Demonstrate full prudency for LNG facility by validating resource need and regional resource benefits (e.g., economic, environmental).
- **Community Outreach**: Engage community and political leaders to garner support for the LNG project by emphasizing project benefits to customers and the region.
- **Engineering and Construction:** Black & Veatch FEED study and finalize site infrastructure designs.

Appendix

- Potential marketing partner agreement forms
- Permitting and approvals
- Contractual relationships charts: development, and design and construction
- PSE's Operations organization
- Additional quantitative analysis
- Additional financial details
- Market drivers
- Summary of Wood-Mackenzie report on the price spread between gas and oil
- Examples of public outreach communications materials

LNG Marketing Partner Agreement

Potential marketing partner agreement forms:

- **Joint Ownership Agreement:**
  - Structured as tenancy-in-common; owners own an undivided but specified % of plant.
  - Defines owner roles and responsibilities (e.g., PSE develops ,constructs and operates plant; counterparty invests equity, assumes pro rata share of development and operating costs).
  - Defines allocation of output, and payments for future capital infusions and ongoing O&M.
- **Tolling Agreement:**
  - Generally the same as Fuel Supply Agreement, but customer delivers natural gas to PSE's distribution system.
  - Customer required to make its gas available to PSE during peak periods.[2]
- **Fuel Supply Agreement:**
  - PSE procures and transports natural gas to Facility; sells LNG to customer.
  - Pricing based on standard cost-of-service principles, with capital costs generally recovered during initial primary term (PSE seeking minimum of 10 years).[1]
  - Customers pay demand charges for fixed-price components (capital recovery and fixed O&M), and volumetrically for natural gas costs (Sumas), electricity (Mid-C) and consumables.

[1]Any contract less than 25 years (the initial lease term with Port of Tacoma) will include a short-term contract premium.
[2]Facility will have adequate on-site storage to serve the tolling customer's needs during such peak periods.

Permitting and Approvals

Federal

- **U.S. Dept. of Transportation:** Consult with WUTC on Federal Safety Standards governing design, installation, etc.
- **U.S. Dept. of the Army Corps of Engineers:** Conduct NEPA review in support of Rivers and Harbors Act Section 10 Permit, Clean Water Act 404 Permit, Section 106 consultation with DAHP and applicable tribes.
- **U.S. Fish & Wildlife Service:** Section 7 Endangered Species Act Consultation.
- **National Marine Fisheries Service :** Sec 7 ESA Consultation; Magnuson-Stevenson Management and Conservation Act review re: Essential Fish Habitat and Marine Mammal Protection Act re: underwater noise and incidental harassment.
- **U.S. Coast Guard:** Issues Letter of Recommendation and develops OPLAN for sea ports, waterway suitability analysis, grants permission to establish *Aids to Navigation.*

Local

- **City of Tacoma:** As SEPA lead agency conducts environmental review in support of local and state permits including Shoreline Substantial Development, Critical Areas, Clearing and Demolition, Building Permit, Street/Right-of–Way Use.
- **Pierce County:** Reviews and issues permits for Street Use/Right-of-Way Use, Conditional Use for the Limit Station, Clear and grade, Building Permit, and Critical Areas.
- **City of Fife:** Reviews and issues permits for Right-of-Way/Utility, Flood Ways, and Critical Areas review.

State

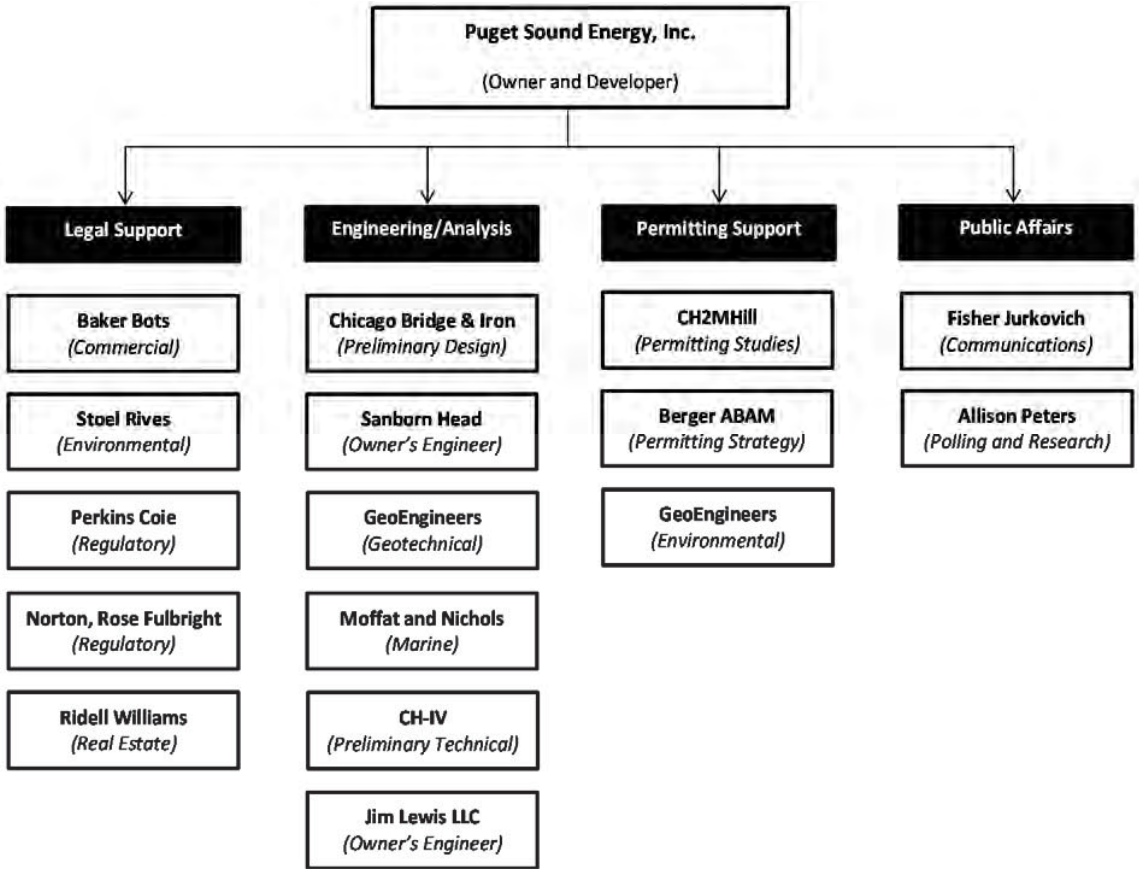
- **Department of Ecology**: Reviews and issues NPDES permits for Stormwater and Waste Discharge, Coastal Zone Consistency Determination, Water Quality Certification, Hazardous Chemical Inventory reporting requirements.
- **Utilities and Transportation Commission Office of Pipeline Safety:** Compliance with federal pipeline safety and LNG siting and development regulations.
- **Department of Fish and Wildlife:** Hydraulic Project Approval.
- **Department of Transportation:** State Highway Crossing Permit (right-of-way).
- **Department of Archaeology and Historic Preservation:** Corps of Engineers will consult with tribes under Section 106 of the National Historic Preservation Act and may issue an Archaeological Excavation Permit if required.

Other entities

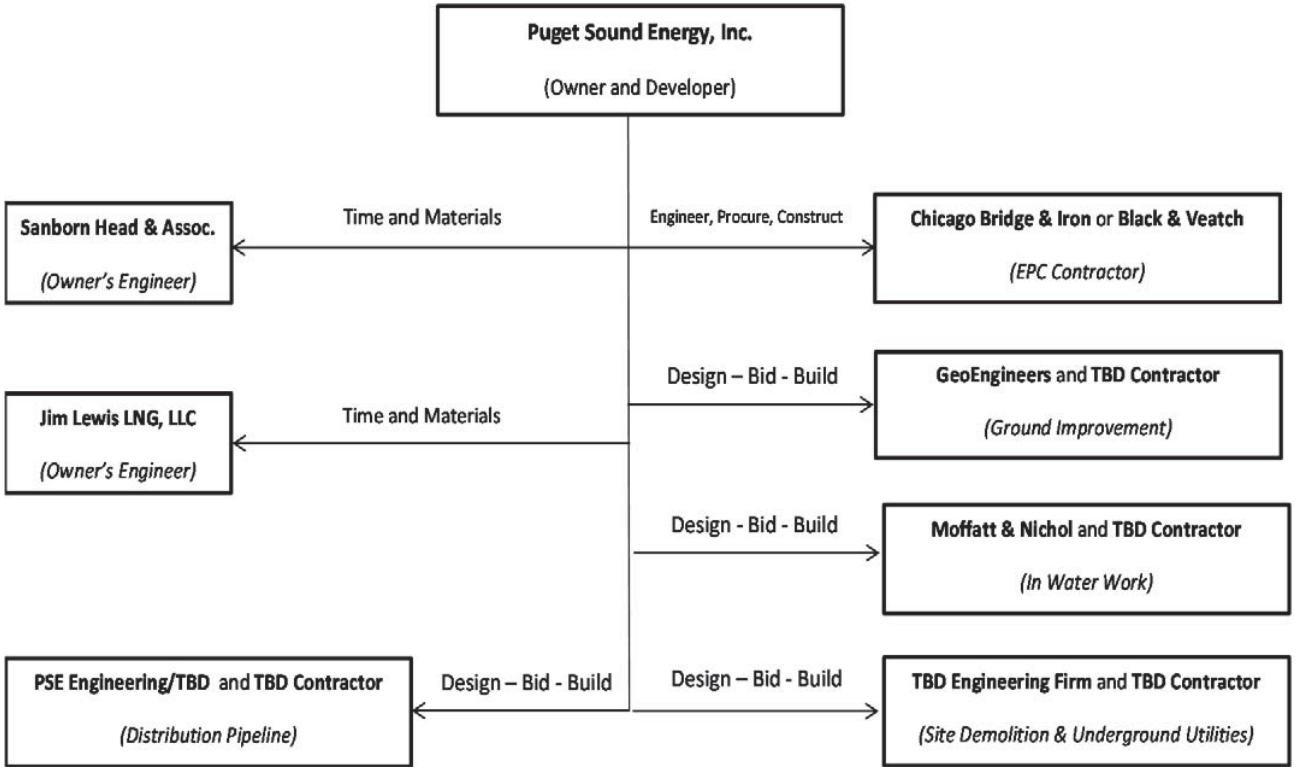
- **Port of Tacoma:** Tenant Improvement Procedure for site.
- **Puyallup Tribe:** Informal coordination; no action required.

For a more detailed list of required permits and approvals and a discussion of PSE's permitting plan, refer to the confidential attorney-client privileged memo from Steve Secrist to the Board of Directors, dated July 2, 2014.

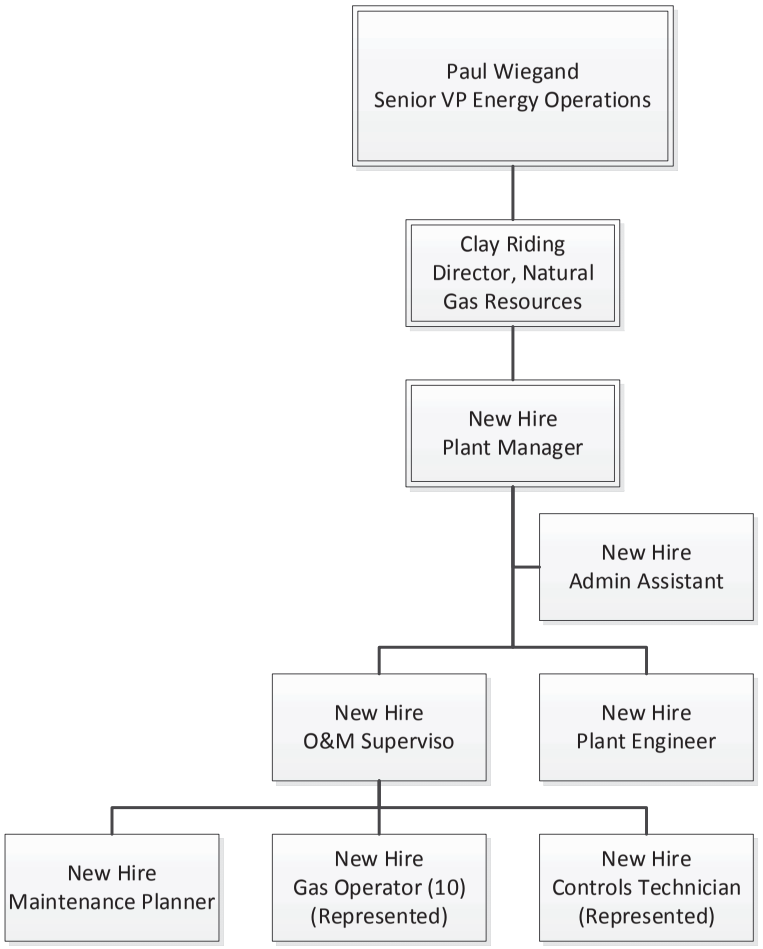
Development Contractual Relationships



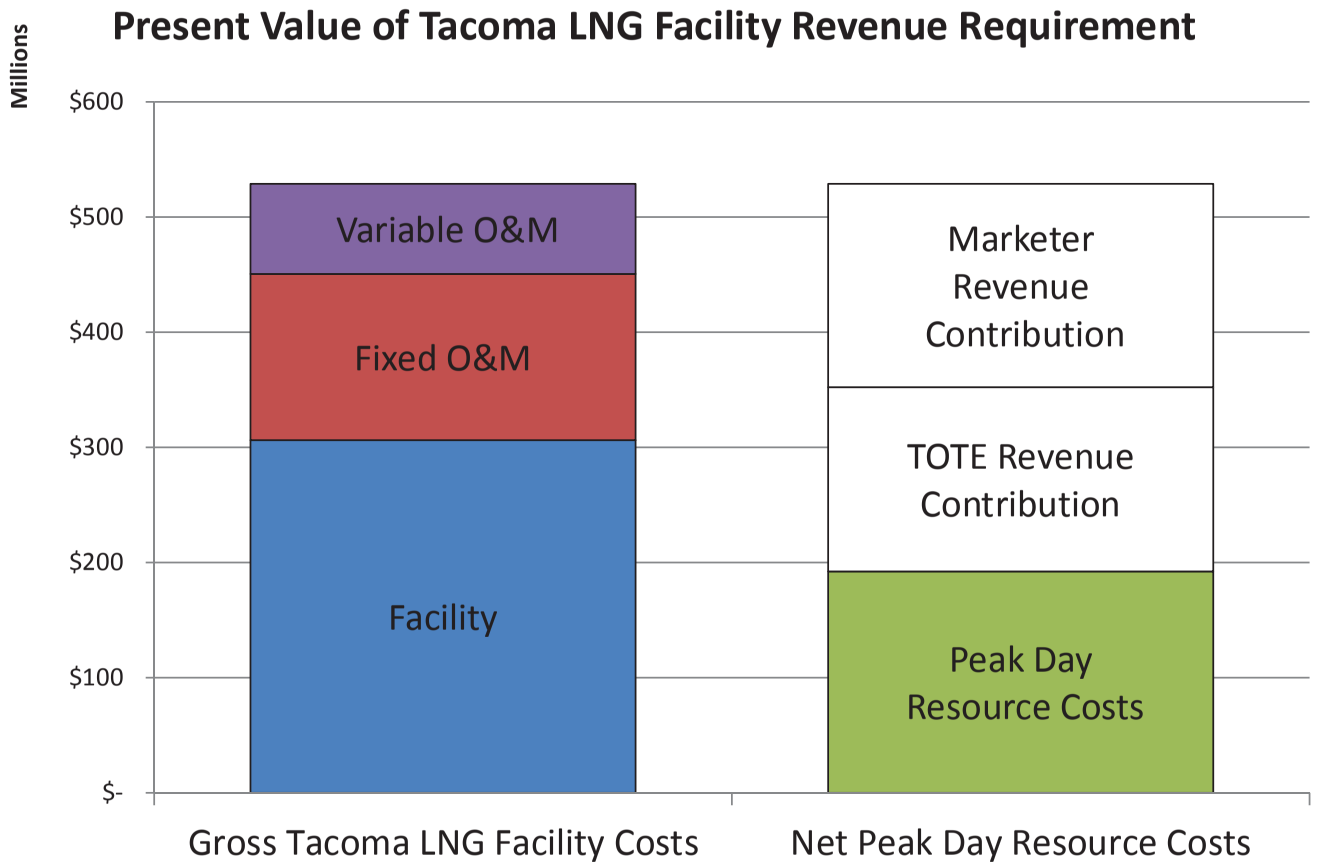
Design and Construction Relationships



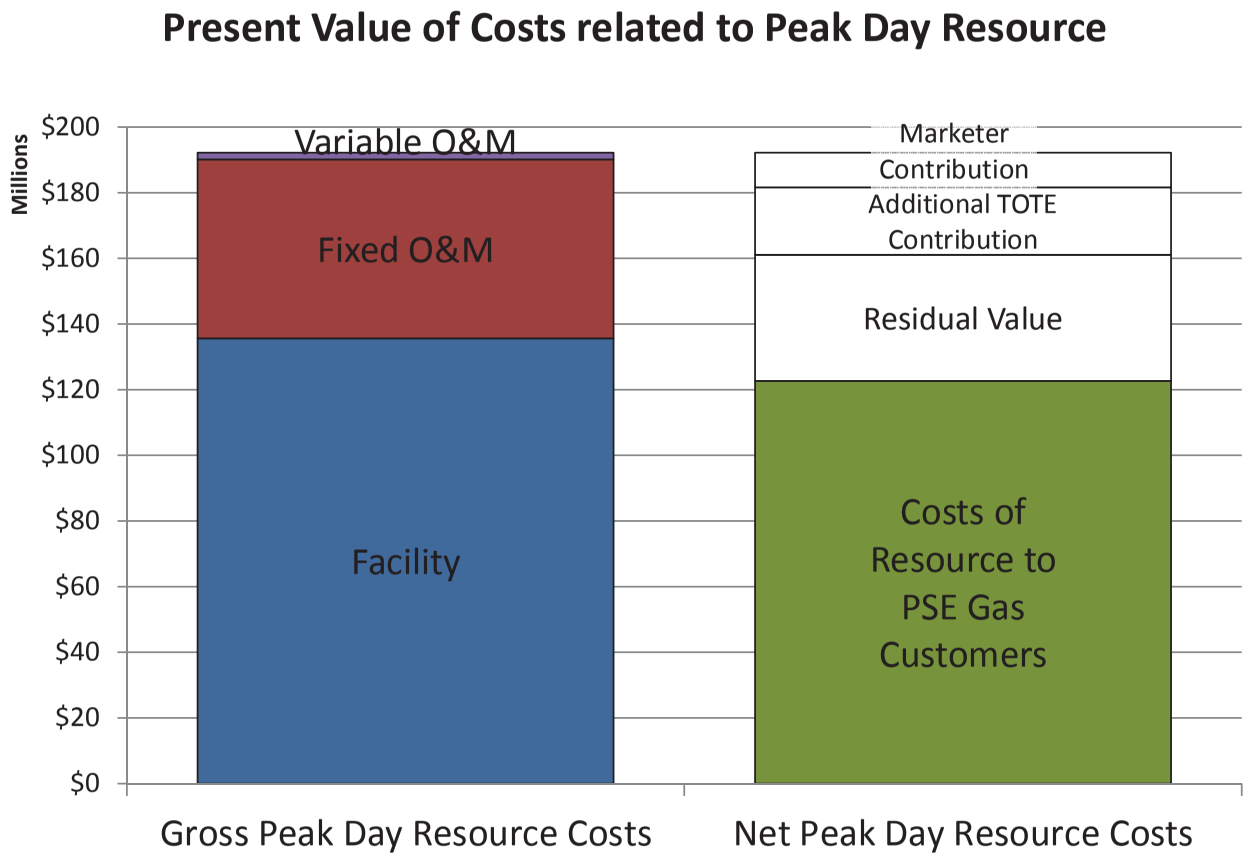
PSE Operations Organization Diagram



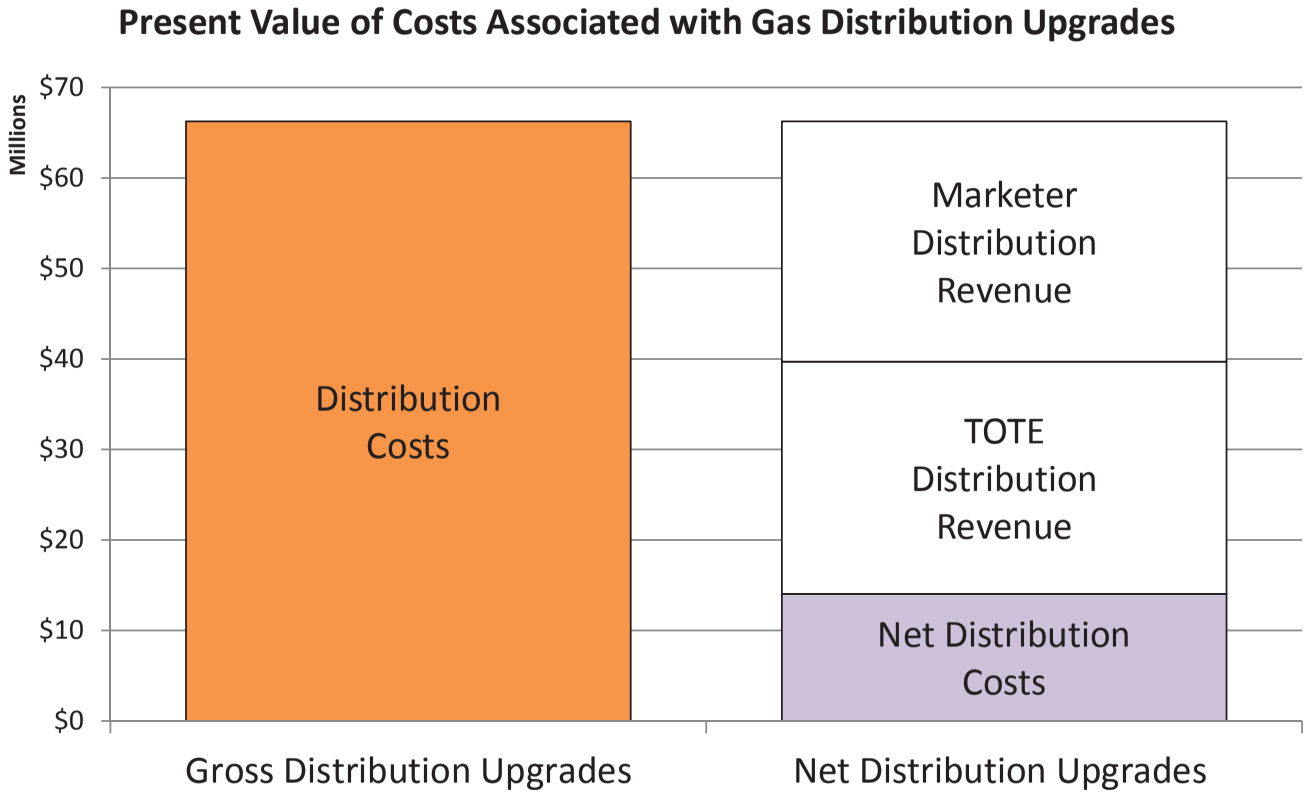
Project Revenue Requirement



Costs Related to Peak Day Resource



Gas Distribution Upgrades Costs



Allocation of LNG Plant

Facility Services	Capital Allocated to Each Service	Contributions from Customers Towards Services		
		PSE	TOTE	Marketer
Liquefaction	$81,591	10%	44%	46%
Storage	$82,378	79%	6%	15%
Bunkering	$21,165	0%	65%	35%
Truck Loading	$6,829	1%	0%	99%
Vaporization	$16,700	100%	0%	0%
Common Items	$65,406	45%	25%	30%
Gross Facility Contributions	$274,069	$118,610	$71,667	$83,792
Capital Allocation Ratio	100%	43%	26%	31%

Development Budget by Quarter

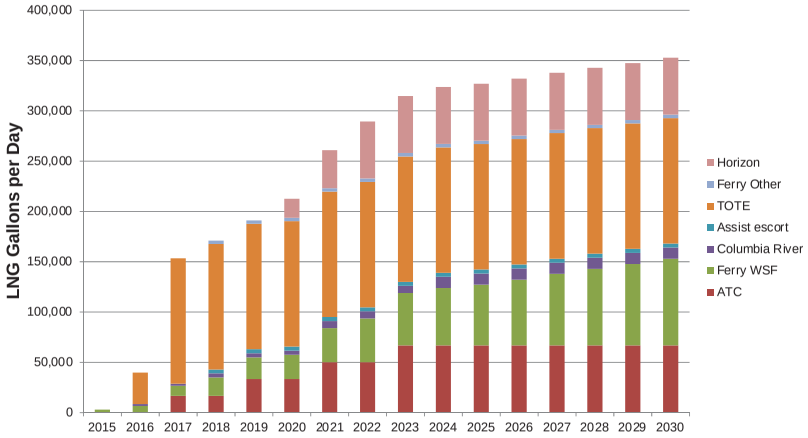
Development Budget	2012		2013				2014				2015		
($1,000's)	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	**TOTAL**
PSE Labor and OH	21	133	152	114	81	73	165	276	300	305	289	284	**2,193**
Engineering and Analysis	31	761	398	575	13	-	15	320	582	911	473	395	**4,474**
Permitting & Legal Support	23	271	262	22	(2)	-	49	299	835	635	525	420	**3,339**
Communications/Outreach	-	4	35	4	0	-	18	40	80	90	30	90	**391**
Distribution Upgrades	3	42	168	26	7	1	16	57	304	322	90	90	**1,126**
Commercial and Regulatory[1]	-	-	8	74	67	-	111	180	90	150	210	210	**1,100**
Real Estate and Lease	-	39	4	28	3	-	5	71	169	149	149	149	**766**
Contingency	-	-	-	-	-	-	-	26	118	128	88	82	**442**
Development Subtotal	78	1,250	1,027	843	169	74	379	1,269	2,478	2,690	1,854	1,720	**13,831**
Development Cumulative	78	1,328	2,355	3,198	3,367	3,441	3,820	5,089	7,567	10,257	12,111	13,831	

[1]*Commerical and Regulatory expenses are not capitalized (O&M expense)*

LNG Drivers in PSE Market Area

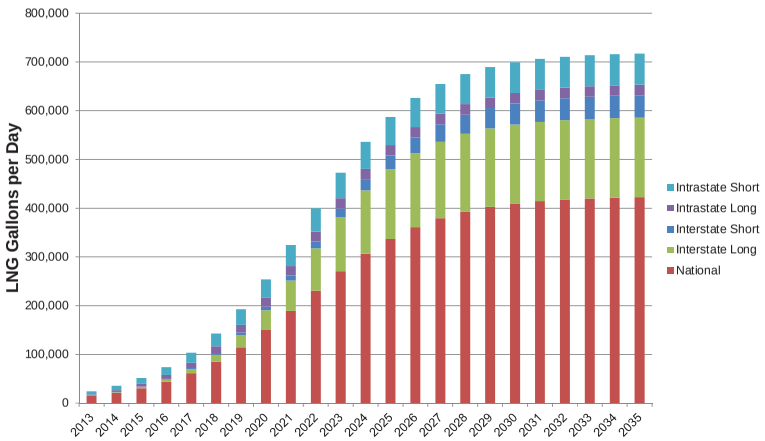
Marine Demand

Source: Concentric Energy Advisors 2012 study



Trucking Demand

Source: Concentric Energy Advisors 2012 study



Market drivers

- **Economic** – Sustainable price spread between natural gas and oil prices (approx. $15/Dth).
- **Regulatory** – New rules to reduce pollution and increase air quality: CARB Low Carbon Fuel Standards[1], IMO emission standards.[2]
- **Environmental** – No SOx particulates; carbon dioxide emissions greatly reduced compared to diesel or marine fuel oil.

[1] California Air Resource Board (CARB) Low Carbon Fuel Standards require fuel consumers to transition to lower carbon alternatives such as natural gas.
[2] International Maritime Organization (IMO) emission standards required that ships operating within 200 miles of the U.S.-Canadian coast reduce the sulfur content of their fuel to 1% in Aug. 2012 and must further reduce to 0.1% by 2015.

PUGET SOUND ENERGY

Supply/Demand Dynamics Support Gas/Oil Spread

Wood Mackenzie forecasts Sumas to remain in the $4.00 - $5.25/Dth range.

- N. American gas supply of ~430 tcfe under current prices (enough supply for 15 years).
- Additional ~300 tcfe reserves with just a $1/Dth increase in price (enough supply for 24 years).

Refined products are expected to sustain a substantial premium to gas prices.

- Crude pricing is strengthened by increasing demand and higher breakeven economics for marginal projects.
- Bakken and other tight oil production skews refinery output towards the lighter end of the barrel, limiting potential supply of ULSD and IFO-380.

Wood Mackenzie identified potential risk factors to their forecast but expects the price spread to persist even in a "perfect storm" worst case scenario.

- Growth markets for natural gas demand are highly dependent on regulatory policy and are not expected to occur on a scale that would impact the price spread.
- Oil prices are supported due to a decreasing supply of heavier crude and higher production costs.
- Circumstances allowing for PSE's "price triggers" would be extreme market imbalances and would resolve as the market reacts in a span of months, not years.

Factors That May Impact the Spread

Natural Gas

Shale Gas Supply

- Significant downward pressure on gas prices with increased supply.

US Carbon Regulations

- Moderate upward pressure on gas prices with sizeable rise in power sector demand.

West Coast LNG Exports

- Slight upward pressure on gas prices with increased demand.

NG Vehicle Growth

- Little to no impact on gas prices as demand is insignificant relative to supply.

Petroleum Products

Lightening of Crude Supply

- Upward pressure on diesel and fuel oil prices as 'tight oil' from the Bakken skews the supply towards lighter refined products, reducing supply.

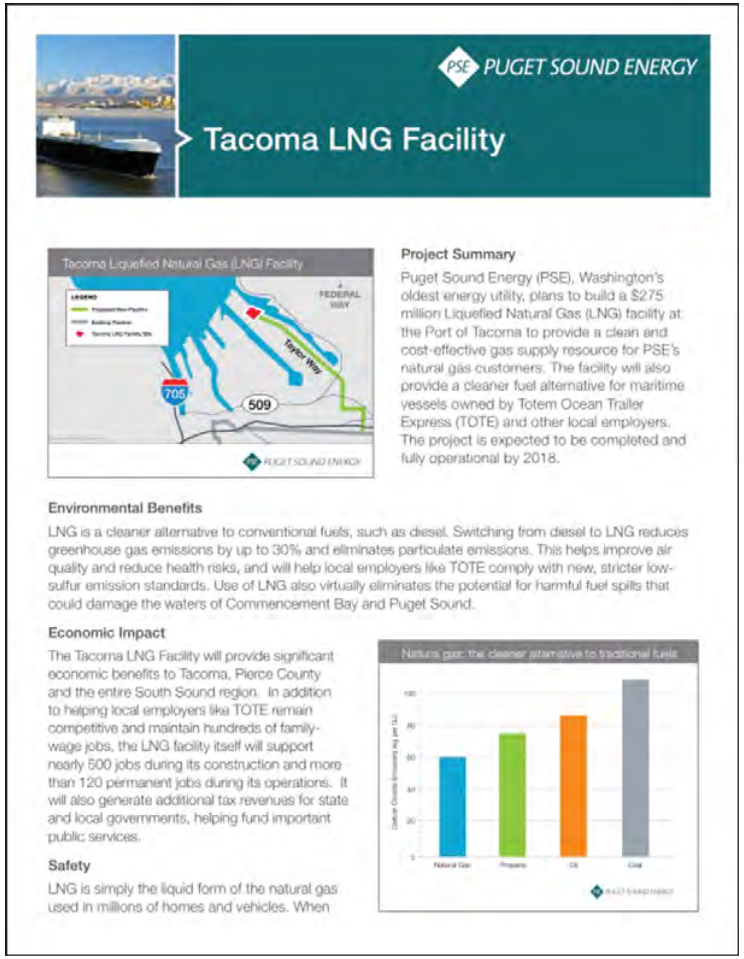
California Low Carbon Fuel

- Downward pressure on diesel prices due to extra PNW refinery output that cannot be consumed in California.

Transocean Shipping Regulations

- MARPOL regulations require shippers to switch to low sulfur diesel or LNG resulting in upward pressure on diesel.

Examples of Communications Materials



PUGET SOUND ENERGY

Exhibit C.

Project Description

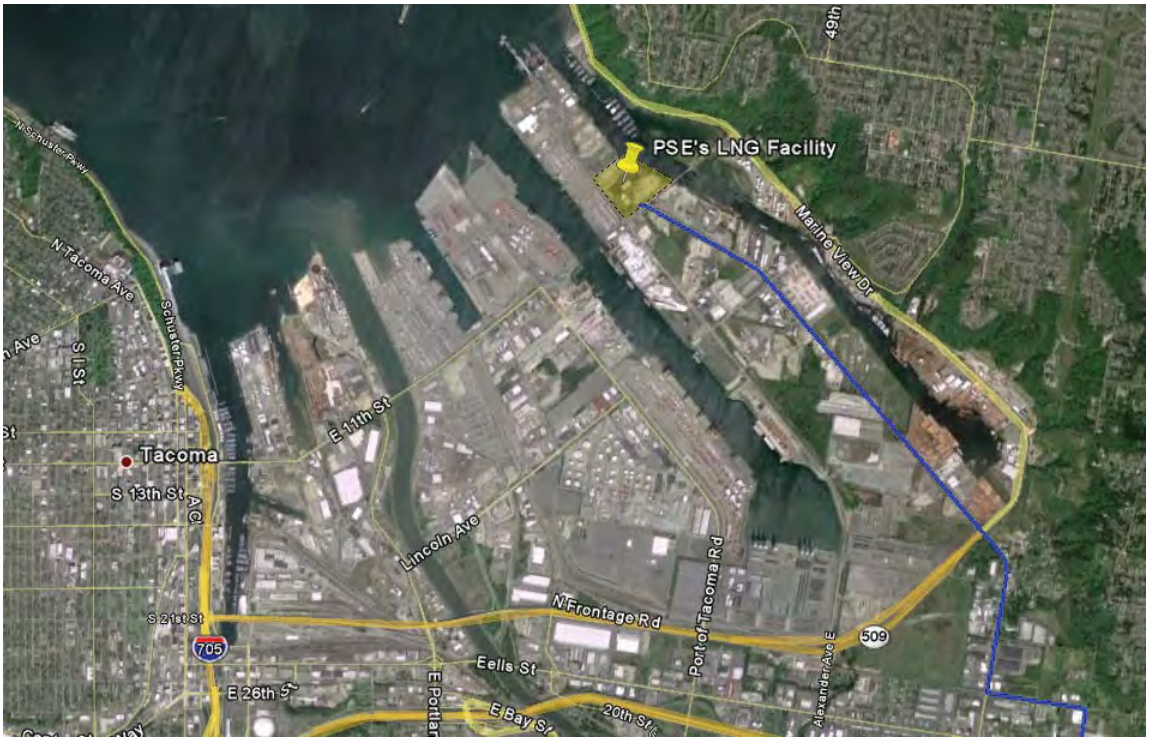
Contents

Project Description

The Tacoma LNG Project (or "the Project") consists of the permits, the land lease, other real estate rights, the commercial contracts, the upgrades to PSE's gas system and other necessary rights, agreements, equipment and work to develop, construct, own and operate a liquefied natural gas ("LNG") facility at the Port of Tacoma in Pierce County, Washington.

The project will enable the construction of the Tacoma LNG Facility (or the "Facility") which will liquefy natural gas, and store and dispense LNG. The facility will be located on a 33-acre parcel located at the Port of Tacoma, on the Hylebos waterway, on the corner of East 11th Street and Alexander Avenue East. ***Figure 1*** shows the location of the Tacoma LNG Facility.

Figure 1. Tacoma LNG Facility Location (new high pressure pipeline shown in blue).



Plant Capacity

The Project will be capable of producing 250,000 gallons of LNG per day and will have onsite storage capacaity of approximately 8 million gallons of LNG. The Facility will be capable of injecting 66,000 Dth/day of vaporized gas into PSE's system and when combined with the diversion of 19.000 Dth/day of delivered gas, will provide 85,000 Dth/day ofpeak-day demand service. The facility will dispense liquefied natural gas to LNG fuel customers via tanker truck loaders, and ship/bunker vessel loading facilities located on the water.

Purpose

The Tacoma LNG Project is being developed to achieve the following objectives:

1. Provide PSE's gas system with a cost effective resource to meet peak-day loads; and

2. Provide LNG as a transportation fuel to large maritime and trucking customers as well as industrial users in the region.

LNG plants have a long history as a natural gas resource used by utilities to manage peak-day loads. Natural gas is liquefied over the summer months and stored in a large cryogenic tank. During peak winter days, the liquefied gas is vaporized and injected into the distribution system. This resource will allow PSE to avoid purchasing 365-day pipeline capacity to meet a peak demand for a few days that may only occur once every few winters. PSE has compared the cost of this peak-day resource with other available peak-day resource alternatives and has determined that the Tacoma LNG Facility is the most cost-effective resource option under a wide range of scenarios (see ***Exhibit N***).

The Project will also help meet the demand for LNG as a fuel by regional maritime, heavy duty trucking and industrial customers. The development of an LNG facility to provide fuels for the transportation market is consistent with the regional and state efforts of the Puget Sound Clean Air Agency, U.S. EPA and the Washington Department of Ecology, to establish strategies and programs aimed at reducing impacts to the Puget Sound air shed. In order to meet the demands of the maritime market, the Facility will be located on the water at the Port of Tacoma and will be capable of filling TOTE ships and other vessels or bunker barges. The Facility will also be capable of filling LNG tanker trucks that will supply regional truck fleets and industrial customers.

Project Infrastructure

Project infrastructure includes the equipment and foundations located at the Port of Tacoma, as well as associated improvements to PSE's natural gas distribution system.

At a high level, the Project infrastructure includes the following components:

Site Improvement and Foundations	The Project will require significant soil improvement work to meet federal seismic guidelines for an LNG plant. Potential soil improvement techniques may include injected grout piles, sand cast piles, or driven piles. In addition, the storage tank will be built upon a foundation with seismic isolators.
Buildings and Structures	The Project will repurpose an existing building as the control room, office space, maintenance area, and indoor housing for weather-sensitive equipment. Other structures will include a compressor building, power distribution center building, an existing warehouse, and potentially sound walls around the liquefaction heat exchangers.
Receiving Equipment	Receiving equipment includes inlet gas compression, particulate filtration, and metering.
Pretreatment System	The pretreatment system removes carbon dioxide and sulfur compounds, as well as heavy hydrocarbons that have a higher freezing point than methane and would foul the downstream cooling process. The pretreatment system also removes any entrained water in the gas stream that had not been previously removed. The gas that is sent to the liquefaction train is mainly methane with a small amount of nitrogen.
Liquefaction Train and Compressors	The gas is cooled to -260 degrees Fahrenheit, using a heat exchanger to transfer heat from the gas to a refrigerant loop. The refrigerant loop is made up of other hydrocarbons and requires a large compressor, which consumes the majority of the electric load at the Facility (approximately 14 MW). The system used at the Facility will be a single mixed-refrigerant (or "SMR") system.

LNG Tank	LNG will be stored on site in a full-containment field-erected tank, which consists of an inner nickel-steel tank and an outer concrete tank that share a common roof. In the event of a failure of the inner tank, the outer tank will contain the LNG. LNG is removed from the tank via submersed pumps that pump LNG out through the roof. There are no wall penetrations in either tank. The tank is designed to withstand a 2,500-year earthquake, which greatly exceeds the earthquake design used for roads, bridges and most other commercial structures. LNG in full-containment tanks is stored at slightly above atmospheric pressure. The fact that the tanks are not kept under pressure is a key safety feature of the plant.
Vaporization Train	The vaporization train includes the facilities that PSE will need on a peak day to convert LNG in the storage tank to a gas vapor and inject it into the distribution system to serve PSE's retail gas customers.
Truck Loading System	The Facility will have two truck loading racks capable of filling tanker trucks simultaneously.
Underground Pipeline to TOTE's Vessel	The facility will include a cryogenic pipeline that will connect the onsite storage tank to a fueling station located at TOTE's berthing location. This line will be buried, crossing beneath a public road, rail line and TOTE's property.
Marine Fueling System	The marine fueling system will be located near the stern end of TOTE's berthing location. The system will include cryogenic hoses for fueling TOTE's vessel, and associated equipment used to raise the hoses to TOTE's loading flange and hold the hoses during bunkering operations.
In-Water Work	In order to support TOTE's bunkering operations, PSE must construct a small platform near the stern end of TOTE's berthing location. The platform will support parts of the marine fueling system and will be large enough to meet federal standards for personnel operations and emergency access.

Balance-of-Plant Equipment	Balance-of-plant equipment includes an onsite backup generator for essential loads, a gas flare, instrument air system, water treatment unit, power distribution systems, safety and security equipment, and an integrated plant control system.
Substation	Tacoma Power will construct a substation on site that connects to their 115 kV transmission system. PSE will own the substation.
Improvements to the Gas Distribution System	In addition to the Facility (located on PSE and TOTE's leased property), the Project will include improvements to PSE's distribution system required to support the Project. These upgrades include four miles of new pipe at the Port of Tacoma, one mile of new pipe and a new limit station in south Tacoma, and improvements at the Frederickson gate station.

Plant Expansion

The Tacoma LNG Project has been designed to allow for capacity expansions in the future. The site can accommodate two or possibly three additional liquefaction trains, each with capacities of up to 500,000 gallons per day. These expansions would provide up to 1.5 million gallons per day of liquefaction capacity. The amount of fuel PSE can logistically accommodate on the site is limited by the size of the tank. At one million gallons per day, the onsite storage tank will only hold eight days of production.

The Facility's current design does not include rail loading capability. However, there are railroad tracks that enter the site and facilities to load rail cars could be added later, if the market for LNG by rail develops. The Facility has access to the Hylebos waterway and facilities could be developed to load LNG barges from that side of the site. However, at this point the only marine loading facilities included in the design are located at TOTE's site on the Blair waterway. Both marine facilities are addressed in environmental review and site-specific permits.

The parcel adjacent to the Facility is currently an EPA Superfund clean-up site undergoing long-term remediation. While the timeline for remediation is unclear, we do know that it will not be complete prior to construction of the Facility. In the event that the market for LNG in the Northwest develops beyond the capacity the current site can accommodate, there may be an opportunity to expand into this adjacent parcel.

There are also known areas of contamination on and adjacent to the Facility site and in the area that may be used for the new high pressure pipeline that extends to the Facility. Cooperation and consensus will be required among the cleanup agencies to ensure that construction and operation of the Tacoma LNG Facility will not impede cleanup efforts nor affect compliance with established cleanup agreements. PSE has been working closely with cleanup staff from EPA, WDOE and the Port to ensure that our construction is not impacted or delayed by these issues, and that the Project's construction and operations will not impede future cleanup.

PUGET SOUND ENERGY

Exhibit D.

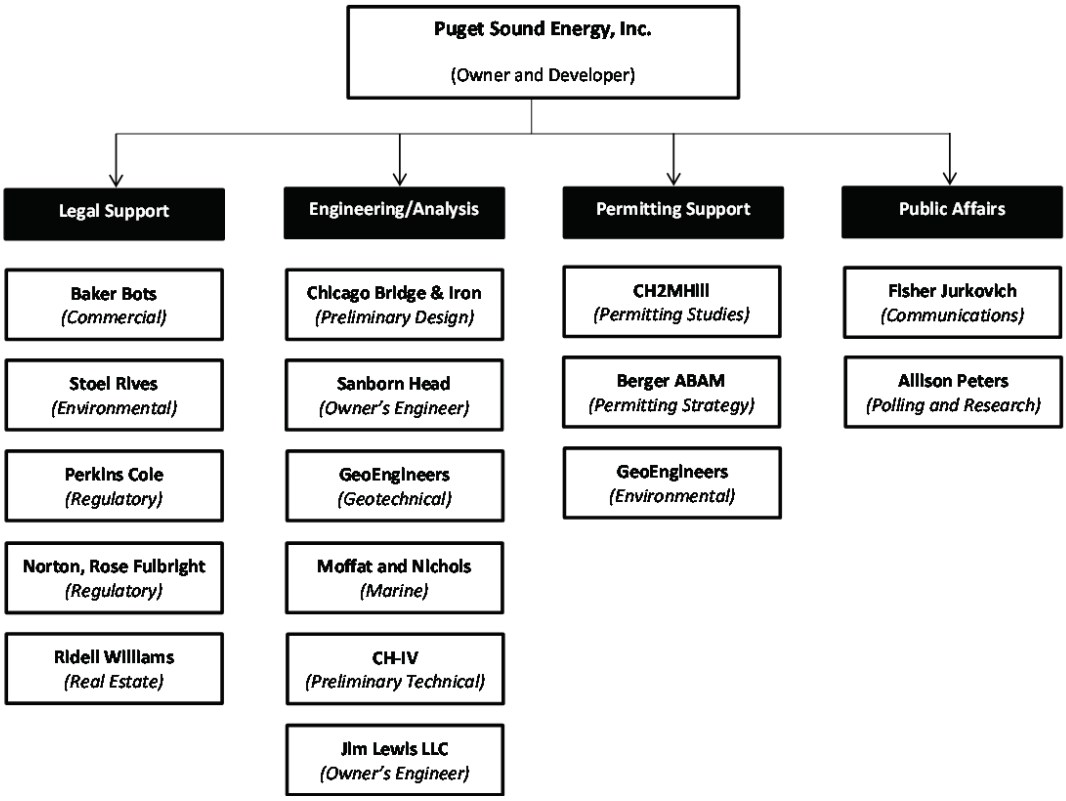
Principal Contractual Relationships

Contents

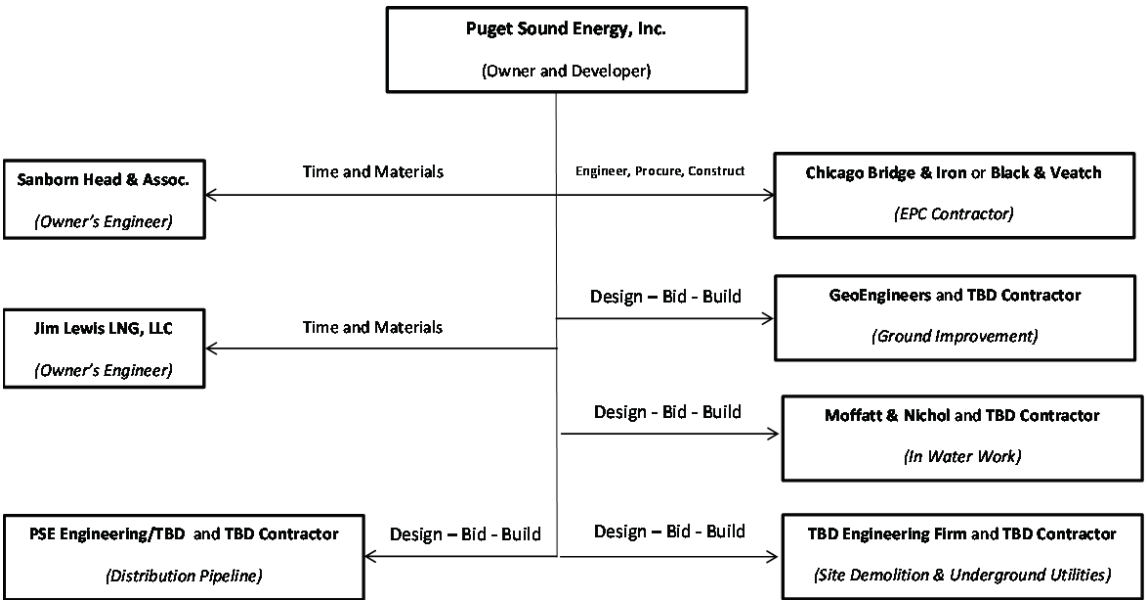
Principal Contractual Relationships

This exhibit presents the principal contractual relationships for each of the three remaining phases of the Project: Development, Design and Construction, and Operations.

Development



Design and Construction



Operations

PSE expects to operate the Facility. Contracts may be pursued with service providers for security, stevedoring and other minor services; however, this is not expected to represent a significant portion of the operations and maintenance of the Facility. See ***Exhibit P*** for a diagram that depicts PSE's Operations organization.

PUGET SOUND ENERGY

Exhibit E.

Summary of Commercial Terms

Contents

Summary of Commercial Terms

To achieve the economies of scale that will provide PSE's gas customers with a least cost resource, PSE will provide service to LNG fuel customers, who will receive LNG from the Tacoma LNG Facility for use in marine, heavy-duty trucking or industrial applications. Commercial arrangements will fall into two categories: end-use customers and fuel marketers.

The primary LNG fuel customer is Totem Ocean Trailer Express (TOTE). Based in Tacoma, TOTE operates two roll-on/roll-off container ships,[1] carrying consumer goods to and from Alaska. TOTE's ships follow a regimented schedule, refueling in Tacoma every Wednesday and Friday. TOTE typically has 100 to 102 bunkering events every year, and will consume 510,000 barrels of oil equivalent (BOE) per year (approximately 39.6 million gallons of LNG).

TOTE Fuel Supply Agreement

PSE will provide a turn-key LNG service to TOTE under an LNG fuel supply agreement (FSA) containing the following key provisions:

- ***Term:*** The initial term of the FSA will be 10 years, beginning on January 1, 2019 and terminating on December 31, 2028.
    - TOTE has the unilateral right to extend the agreement in five-year increments with 18 months' notice. Extension term pricing contains favorable terms for three successive extension periods, recognizing that TOTE will have paid a contract premium during the initial 10-year term.
- ***Pricing:*** Pricing will be provided under a cost-of-service model, with demand and variable components, and includes overhead allocations. Typical cost-of-service rate-making applies, with the following exceptions:
    - TOTE will be charged a short-term contract premium designed to recover associated capital charges over the primary term of the agreement.

[1] The term "roll-on/roll-off" in this context denotes a cargo operation in which cargo trailers are driven onto a ship pulled by tractors, rather than an operation in which containers are lifted on to the ship by cranes.

- Pricing will be subject to a maximum fixed-price component, recovering capital and fixed O&M. Provided TOTE gives proper notice to extend, extension pricing will include capital recovery at reduced rates, recognizing that TOTE will have paid a short-term contract premium during the initial term.
- Natural gas and electricity costs will be passed through to TOTE at market rates. Natural gas will be tied to the Sumas index and electricity will be tied to the Mid-C index. PSE will purchase and deliver the natural gas to the Tacoma LNG Facility.

- ***Conditions Precedent:*** The FSA contains the following conditions precedent through the development phase. Such conditions must be met by [June 1, 2016.].
  - All permits and regulatory approvals received
  - WUTC approval received
  - Board approval to execute the EPC contract received
  - Binding site lease with the Port of Tacoma executed
- ***Interim Supply Agreement:*** The interim supply agreement, which is further detailed on page E-4, provides for damages for TOTE if the Facility completion date is delayed or the Project is canceled by PSE.
- ***Direct Service Pipeline***: Bunkering is to be provided via an LNG pipeline from the Tacoma LNG Facility to TOTE's berthing location.
- ***Annual Contract Quantities:*** Estimated contract quantities are 510,000 BOE annually. TOTE has the right to modify the annual contract quantity by 7.5%, up or down, after the first year of operation to reflect actual consumption. After the first year, TOTE anticipates an annual variance of +/- 5%.
  - Deficiency payments – If TOTE fails to take 95% of the annual contract quantity, deficiency payments apply to allow PSE to recover charges not collected through demand charge components.
  - Excess LNG charges – If TOTE takes more than 105% of the annual contract quantity, additional demand charges apply. If TOTE exceeds 105% of the annual contract quantity in two consecutive years, PSE has the right to increase the annual contract quantity to reflect the increased consumption.

- ***Failure to Deliver/Receive:***
    - *Force Majeure –*
        - TOTE continues to pay demand charges during the 15 days of a PSE Force Majeure event, after which demand charges are suspended, but the contract is extended for a period equal to the duration of the Force Majeure event, with demand charges applying during the extended period. No damages apply.
        - TOTE continues to pay demand charges during the duration of a TOTE Force Majeure event, but the contract is extended for a period equal to the duration of the Force Majeure event, with no demand charges applying during the extended period. No damages apply.
    - *Non-Force Majeure (excluding Willful Failure to Deliver) –*
        - PSE pays for the incremental cost of replacement fuel subject to certain limits (price capped at double the contract LNG price and annual damages are capped at $10 million).
        - TOTE continues to pay demand charges and deficiency payments apply.
    - *Willful Failure to Deliver (e.g., PSE elects to use TOTE's gas to serve natural gas customers) –*
        - PSE pays the full incremental cost of replacement fuel.

- ***Delivery of Off-Spec LNG:*** PSE will be liable for damages to TOTE's engine/ship if it delivers off-spec LNG that is found to cause such damage. Damages are limited to $15 million per contract year. Damages would be covered by PSE's general liability insurance (and such an event is highly unlikely).

- ***Oil Price Triggers:*** TOTE has the right to terminate the agreement if the price spread between fuel oil and natural gas narrow to within a defined band. TOTE's termination fee compensates PSE at an amount relative to the undepreciated investment (based on the 10-year contract investment recovery) for the first five years of the contract and 50% of the undepreciated investment during the last five years of the initial term.

Interim Supply Agreement

In addition to the FSA, PSE will provide LNG to TOTE under an interim supply agreement. PSE will help to facilitate the interim supply but will note take on any contract risk related to the delivery of the supply. The interim supply agreement is being developed with counterparties that can supply LNG and handle delivery logistics. The current proposal for interim supply contains the following provisions:

- ***Supply:*** Supply will be purchased from FortisBC at its Tilbury LNG facility near Vancouver, BC.

- ***LNG Logistics:*** WesPac Energy Group, owned by Highstar Capital and Primoris Services, will provide ISO containers and arrange for container handling and bulk loading to move the LNG from FortisBC onto the LNG ship or barge.

- ***Shipping/Bunkering:*** Maersk Line Limited will provide the bunkering ship or barge and LNG system necessary to ship the LNG from Vancouver, BC to the Port of Tacoma and bulk load the LNG onto TOTE's ships.

- ***Natural Gas:*** PSE will supply natural gas to FortisBC to produce the LNG.

- ***Pricing:*** TOTE will bear the full cost of the interim supply agreement for a three-year term. The FortisBC, WesPac and Maersk charges will all be demand-charge-based. Natural gas charges will be based on the monthly Sumas index.

- ***Contracting:*** PSE will contract with Fortis for liquefaction services and WesPac for the logistics and shipping/bunkering services. PSE will contract with TOTE for interim supply and will pass through the costs and risks to TOTE. WesPac will contract with Maersk for shipping/bunkering services (unless PSE elects to contract with Maersk for credit reasons).

- ***Damages:*** As stated above, TOTE will bear the cost of interim supply for the three-year period. However, if PSE does not commence service at the Tacoma LNG Facility by January 1, 2019, PSE will for a period of up to two years (through 2020) pay to TOTE 50% of the difference between the interim supply costs and TOTE's expected LNG cost under its contract with PSE until PSE begins to provide service from the Tacoma LNG Facility. Similarly, if PSE cancels the Project for any reason (including permitting, regulatory hurdles, cost increases, etc.), PSE will pay 50% of the incremental cost of the interim supply for the two-year period. Damages for the full, two-year period are estimated to

be $15 million. The exact cost of the potential damages will be detailed in the interim supply agreement.

Other Commercial Agreements

PSE has had discussions with several potential customers to take the balance of the plant, including a few marketing companies, and has targeted BP and Shell. Commercial agreements will differ depending on the customer as indicated below.

- ***Marketer:*** Contracts with marketing customers may also take on one of the following forms: equity ownership, tolling arrangement, or full-LNG service.
    - ***Tolling arrangement:*** Under a tolling arrangement, the customer would deliver natural gas to PSE's interconnection point with the interstate pipeline system, but the remaining charges and terms would be similar in form to the TOTE contract, including a short-term premium for contracts less than 25 years.

Full-LNG service: A full LNG service arrangement will be similar in form to the TOTE contract, including a short-term premium for contracts less than 25 years.

- ***End-user:*** If the customer is an end-user, the contract will be similar in form to the TOTE contract.

PUGET SOUND ENERGY

Exhibit F.

Project Schedule and Budget

Contents

Project Schedule and Budget

The Tacoma LNG Project is broken into two distinct phases: development and construction. Development activities include the work PSE must undertake prior to entering into the construction contracts to build the Facility. The construction phase begins with the execution of the EPC contract and other construction contracts, and continues through the commercial operations date (COD).

Project Development

Project development work began in 2012 with due diligence and feasibility studies. Since that time, PSE has completed several milestones and is now preparing to submit permit applications. The major project development work includes:

- Commercial and technical feasibility and due diligence
- Identifying and securing the Facility site and procuring all required Project real estate rights
- Preliminary facility design
- Preliminary distribution upgrades design
- Contracting with long term LNG fuel customers
- Permitting
- Filing an LNG tariff with the WUTC

For further discussion of key project development activities, see ***Exhibit G***.

The development budget shown in ***Figure 1*** and ***Figure 2*** of this exhibit assumes that PSE submits permit applications in July 2014 and receives enviromental permits by Q3 2015. The spend shown could change if permits are appealed or delayed (for a full description of permitting timeline and costs risks see ***Exhibit J***). Assuming that there are no significant permitting or other development delays, PSE anticipates seeking Board approval for the Project, including approval to enter into an EPC contract in Q3 2015.

Through Q1 2014, PSE has spent $3.8 million on the Project and anticipates spending an additional $10 million over the next five quarters to complete the development phase.

Project Construction

Construction activities will commence immediately after Board final approval of the Project, including approval of the EPC contract with additional contracts awarded for building demolition, ground improvement, and underground utilities.

The timeframe for demolition and ground improvement will be dependent upon certain factors which require further exploration. Specifically, the quantity of hazardous materials in the existing buildings (lead paint, asbestos, etc.) will drive the level of segregation that will need to take place during demolition. A full environmental survey of the buildings will take place after the Port of Tacoma lease is executed. Additionally, the ground improvement program is still being specified by the geotechnical engineers and will be complete in Q3 2014. As a result, the timeframe shown in the current schedule is conservative.

The construction timeframe for the plant is well defined by scheduling information provided by Chicago Bridge & Iron. Based upon its extensive experience, its overhead costs for mobilization, and the expected liquidated damages in the EPC contract, PSE believes its schedule estimate to be accurate, if not somewhat conservative. Black and Veatch has provided preliminary schedule estimates that show similar timeframes if it is chosen to be the EPC contractor. Regardless of the winning EPC firm, the field-erected tank is the critical path item with an expected duration of 27 months. If permit approval is delayed, one schedule mitigation strategy will be to complete the ground improvements under the tank first and begin tank construction in parallel with the remaining ground improvement and utility installation under the process area.

In-water work in the Blair and Hylebos waterways is limited to a period between July 15 and February 16 of each year due to marine ecology requirements. Construction of any marine elements will occur during these timeframes.

Figure 1. Project Budget by Quarter

Development Budget	2012		2013				2014				2015		
($1,000's)	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	**TOTAL**
PSE Labor and OH	21	133	152	114	81	73	165	276	300	305	289	284	**2,193**
Engineering and Analysis	31	761	398	575	13	-	15	320	582	911	473	395	**4,474**
Permitting & Legal Support	23	271	262	22	(2)	-	49	299	835	635	525	420	**3,339**
Communications/Outreach	-	4	35	4	0	-	18	40	80	90	30	90	**391**
Distribution Upgrades	3	42	168	26	7	1	16	57	304	322	90	90	**1,126**
Commercial and Regulatory[1]	-	-	8	74	67	-	111	180	90	150	210	210	**1,100**
Real Estate and Lease	-	39	4	28	3	-	5	71	169	149	149	149	**766**
Contingency	-	-	-	-	-	-	-	26	118	128	88	82	**442**
Development Subtotal	78	1,250	1,027	843	169	74	379	1,269	2,478	2,690	1,854	1,720	**13,831**
Development Cumulative	78	1,328	2,355	3,198	3,367	3,441	3,820	5,089	7,567	10,257	12,111	13,831	

[1]Commerical and Regulatory expenses are not capitalized (O&M expense)

Construction Budget	2015		2016				2017				2018				
($1,000's)	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	**TOTAL**
Tacoma LNG Facility															
PSE Labor and OH	210	210	210	210	210	210	210	210	210	210	925	925	925	925	**5,800**
Engineering & Legal	100	100	100	100	100	100	100	100	100	100	100	100	100	100	**1,400**
Real Estate and Lease	438	438	438	438	438	438	438	438	438	438	438	438	438	438	**6,132**
Commercial and Regulatory[1]	-	-	50	50	50	50	50	50	50	50	50	50	50	50	**600**
Geotech and Demolition	1,300	5,200	6,500	-	-	-	-	-	-	-	-	-	-		**13,000**
In Water Work	400	1,600	2,000	-	-	-	-	-	-	-	-	-	-	-	**4,000**
EPC Scope	5,050	3,030	21,209	11,615	16,159	9,090	25,249	12,625	30,299	9,090	12,120	7,070	9,090	10,100	**181,796**
Miscellaneous	75	75	209	209	209	209	1,082	1,082	1,082	1,082	1,028	188	188	188	**6,906**
Contingency	1,226	3,626	5,831	866	1,204	677	2,002	1,061	2,378	797	1,023	527	677	753	**22,648**
PSE Construction OH	285	449	1,116	424	571	343	893	486	1,056	372	562	370	435	468	**7,830**
Sales Tax	649	1,088	1,877	668	924	525	1,583	826	1,886	614	764	423	538	596	**12,961**
Tacoma LNG Facility Subtotal	9,733	15,816	39,540	14,580	19,865	11,642	31,607	16,878	37,499	12,753	17,010	10,091	12,441	13,618	**263,073**
Gas Distribution Upgrades	-	-	1,407	1,407	1,407	1,407	10,572	10,572	10,572	10,572					**47,916**
Construction Subtotal	9,733	15,816	40,947	15,987	21,272	13,049	42,179	27,450	48,071	23,325	17,010	10,091	12,441	13,618	**310,989**
Project Cumulative[2]	23,564	39,380	80,327	96,313	117,585	130,633	172,812	200,263	248,334	271,659	288,669	298,760	311,201	**324,819**	

[1]Commerical and Regulatory expenses are not capitalized (O&M expense)

[2]Includes development costs in cumulative total

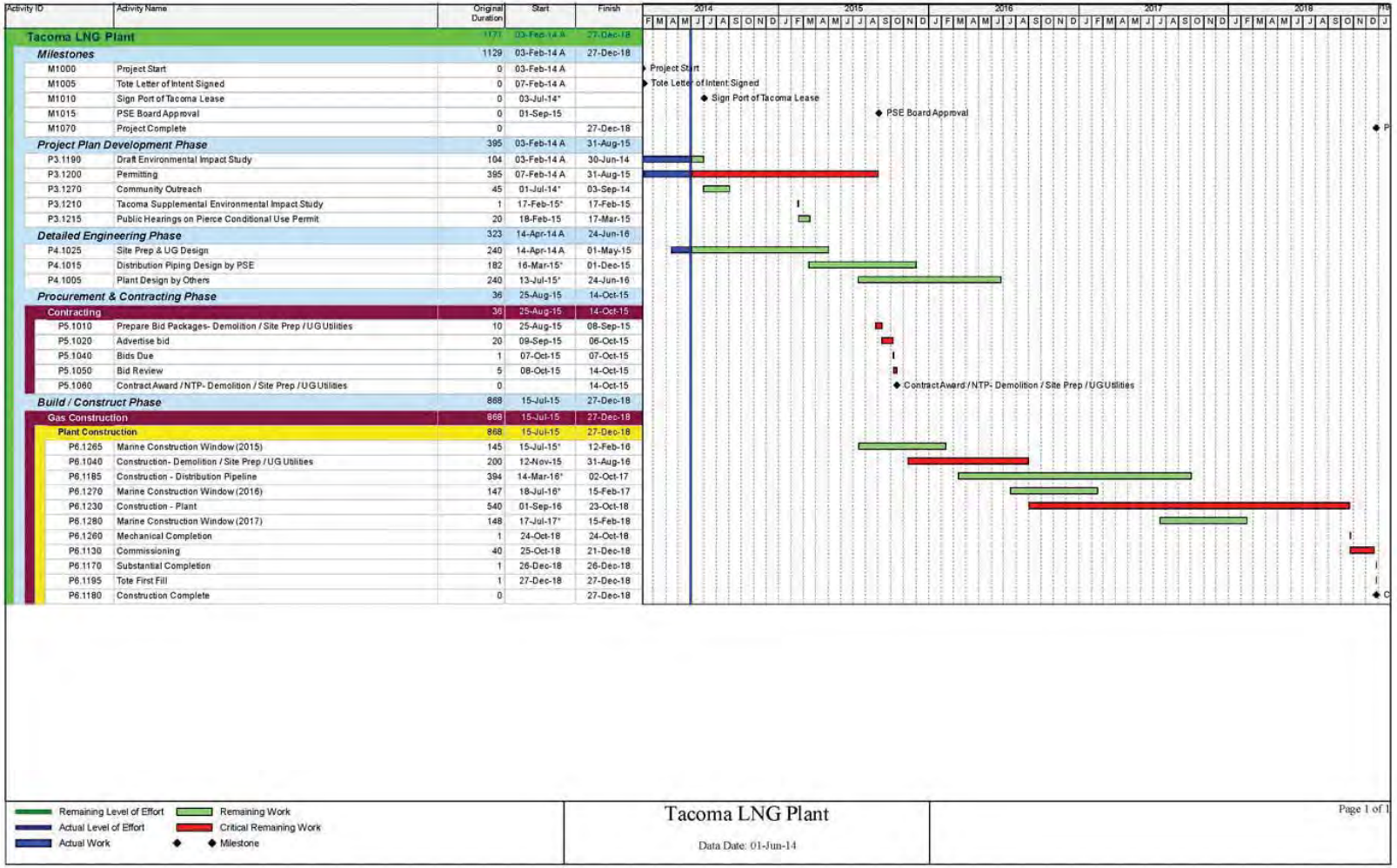
Figure 2. Project Development Budget by Month

Development Budget by Major Contractor

($1,000's)	2014												2015					
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Engineerign & Analysis																		
CB&I	-	22	-	32	38	30	15	15	15	15	15	15	15	15	30	30	30	30
Sanborn Head	-	-	-	-	-	10	10	10	10	10	10	10	20	20	20	20	20	20
Geo Engineers	-	6	-	47	51	40	35	35	30	20	25	20	12	12	12	15	15	15
Black and Veatch	-	-	-	-	-	-	-	-	167	167	167	167	167	-	-	-	-	50
Moffat and Nichol	-	-	-	15	11	40	40	40	50	50	50	50	50	50	50	50	50	50
Other	0	0	(13)	-	6	-	70	-	40	40	40	40	-	-	-	-	-	-
Permitting Legal																		
CH2MHill	-	-	12	20	44	90	100	120	60	50	40	60	20	20	20	20	20	20
Stoel Rives (Legal Support)	-	-	11	14	-	35	35	35	35	35	50	50	50	50	50	15	15	15
Berger ABAM	-	-	4	0	3	40	40	40	40	40	40	40	30	30	30	30	30	30
Fees and Agency Staff	-	-	-	-	-	30	80	30	80	30	80	30	40	40	40	40	40	40
Other	4	19	-	-	3	20	20	50	70	50	20	20	35	35	35	35	35	35
Siting/Real Estate																		
Option Payments	-	-	-	-	-	-	50	50	50	50	50	50	50	50	50	50	50	50
Legal/other	-	-	5	2	9	60	10	10	-	-	-	-	-	-	-	-	-	-
Regulatory/Commercial																		
Baker Botts (commercial)	-	-	85	21	50	-	-	-	60	60	60	-	30	30	30	30	30	30
Perkins Coie (regulatory)	-	4	22	10	10	10	10	10	10	10	10	10	40	40	40	40	40	40
Other	-	-	-	-	79	-	-	-	-	-	-	-	-	-	-	-	-	-
Communications	-	18	-	-	30	10	20	30	30	30	30	30	10	10	10	30	30	30
PSE Labor & OH's (for Facility)	32	66	67	76	106	94	98	97	104	102	104	100	100	95	95	94	94	96
Distribution System	6	1	8	16	23	18	18	252	35	158	129	35	30	30	30	30	30	30
Contingency	-	-	-	-	-	26	33	41	44	46	46	36	35	26	27	26	26	29
TOTAL	**42**	**134**	**202**	**253**	**462**	**553**	**683**	**865**	**930**	**962**	**965**	**763**	**733**	**553**	**569**	**555**	**555**	**609**

Values highlighted in blue represent actual spend

Figure 3. Project Schedule



Activity ID	Activity Name	Original Duration	Start	Finish
Tacoma LNG Plant		1177	03-Feb-14 A	27-Dec-18
Milestones		1129	03-Feb-14 A	27-Dec-18
M1000	Project Start	0	03-Feb-14 A	
M1005	Tote Letter of Intent Signed	0	07-Feb-14 A	
M1010	Sign Port of Tacoma Lease	0	03-Jul-14*	
M1015	PSE Board Approval	0	01-Sep-15	
M1070	Project Complete	0		27-Dec-18
Project Plan Development Phase		395	03-Feb-14 A	31-Aug-15
P3.1190	Draft Environmental Impact Study	104	03-Feb-14 A	30-Jun-14
P3.1200	Permitting	395	07-Feb-14 A	31-Aug-15
P3.1270	Community Outreach	45	01-Jul-14*	03-Sep-14
P3.1210	Tacoma Supplemental Environmental Impact Study	1	17-Feb-15*	17-Feb-15
P3.1215	Public Hearings on Pierce Conditional Use Permit	20	18-Feb-15	17-Mar-15
Detailed Engineering Phase		323	14-Apr-14 A	24-Jun-16
P4.1025	Site Prep & UG Design	240	14-Apr-14 A	01-May-15
P4.1015	Distribution Piping Design by PSE	182	16-Mar-15*	01-Dec-15
P4.1005	Plant Design by Others	240	13-Jul-15*	24-Jun-16
Procurement & Contracting Phase		36	25-Aug-15	14-Oct-15
Contracting		36	25-Aug-15	14-Oct-15
P5.1010	Prepare Bid Packages- Demolition / Site Prep / UG Utilities	10	25-Aug-15	08-Sep-15
P5.1020	Advertise bid	20	09-Sep-15	06-Oct-15
P5.1040	Bids Due	1	07-Oct-15	07-Oct-15
P5.1050	Bid Review	5	08-Oct-15	14-Oct-15
P5.1060	Contract Award / NTP- Demolition / Site Prep / UG Utilities	0		14-Oct-15
Build / Construct Phase		868	15-Jul-15	27-Dec-18
Gas Construction		868	15-Jul-15	27-Dec-18
Plant Construction		868	15-Jul-15	27-Dec-18
P6.1265	Marine Construction Window (2015)	145	15-Jul-15*	12-Feb-16
P6.1040	Construction- Demolition / Site Prep / UG Utilities	200	12-Nov-15	31-Aug-16
P6.1185	Construction - Distribution Pipeline	394	14-Mar-16*	02-Oct-17
P6.1270	Marine Construction Window (2016)	147	18-Jul-16*	15-Feb-17
P6.1230	Construction - Plant	540	01-Sep-16	23-Oct-18
P6.1280	Marine Construction Window (2017)	148	17-Jul-17*	15-Feb-18
P6.1260	Mechanical Completion	1	24-Oct-18	24-Oct-18
P6.1130	Commissioning	40	25-Oct-18	21-Dec-18
P6.1170	Substantial Completion	1	26-Dec-18	26-Dec-18
P6.1195	Tote First Fill	1	27-Dec-18	27-Dec-18
P6.1180	Construction Complete	0		27-Dec-18

PUGET SOUND ENERGY

Exhibit G.

Conditions for Moving to the Construction Phase

Contents

Conditions for Moving to the Construction Phase

Prior to requesting final Board approval of the Project, including approval to enter into an EPC contract to construct the Facility, PSE will ensure that all significant approvals and appropriate risk mitigations are in place. Final Board approval of the Project will mark the completion of the development phase of the Project and the start of the final design and construction phase. To date, PSE has completed several important project milestones including selecting a site, completing a front-end engineering study, negotiating a lease with the Port of Tacoma and negotiating the TOTE contract. This exhibit identifies, at a high level, other key project milestone that will be achieved prior to moving onto the construction phase of the project. A detailed development checklist is being prepared and a draft will be included in the Board package prepared for the July 30, 2014 meeting.

Development Milestone

Commercial

PSE anticipates having commercial contracts to support the entire capacity of the Facility prior to moving to the construction phase of the project. In Q2 of 2014, PSE successfully negotiated a fuel supply agreement with TOTE. Prior to moving to the construction phase of the project, PSE will:

- Finalize an interim supply agreement with TOTE;
- Execute the TOTE fuel supply agreement and interim supply agreement pending approval from the Board of Directors at the July 30, 2014 meeting; and
- Execute (pending a future Board approval) a sales, tolling or joint-ownership agreement with a marketing partner.

Commercial terms are discussed in more detail in ***Exhibit E.***

Siting and Real Estate

PSE has completed a siting analysis and selected a parcel at the Port of Tacoma to be the site for the Facility (see ***Exhibit I*** for a discussion on siting requirements and the selection process). In addition to selecting a parcel, PSE is nearing completion of a site geotechnical and environmental review. PSE has been working with the Port of Tacoma and utility providers at the site (such as Tacoma Public Utilities) on the requirements necessary to support construction and operations of the Facility. Before moving to the construction phase of the Project, PSE will:

- Execute a lease with the Port of Tacoma (terms have largely been agreed to by both parties); and
- Secure all necessary real estate rights for the Project, including fee ownership, easements, use agreements, and subordination agreements.

Permitting

PSE has developed a comprehensive permitting strategy, which is discussed in a confidential attorney-client privileged memo from Steve Secrist to the Board of Directors dated July 2, 2014. Before final Project approval, PSE anticipates obtaining all permits and approvals to construct and operate the Facility, except those routinely received during the course of construction. Final approval for construction of the facility will be predicated on WUTC Pipeline Safety Office approval of the facility design. Continued ongoing coordination with Pipeline Safety staff during the design phase will mitigate the risk of disapproval. At a high level, the key permitting milestones that will be achieved are:

- Finalization of the EIS after the public comment period;
- Issuance of conditional use permits;
- Issuance of shoreline, in-water, and environmental permits; and
- Agreement with WUTC Pipeline Safety Office on Facility basis of design.

Regulatory

The key regulatory milestones during the development phase of the Project are the filing and WUTC approval of an LNG service tariff along with the approval of the TOTE fuel supply agreement and any marketer arrangements. Approval of the tariff will allow PSE to sell LNG as part of its regulated business. The general rate case that will allow for rate recovery of the

Project will not happen until the end of the construction phase or early in the operational phase of the Project.

Engineering and Construction

PSE has put together a team of technical firms that are experts in their fields to support the engineering and design of the Facility. In 2013, PSE completed a full front-end engineering and design (FEED) study with Chicago Bridge & Iron. PSE has also completed a geo technical review of the site and preliminary designs for marine and in-water work. Pending Board approval of the TOTE contract, PSE will complete a second FEED with Black & Veatch to obtain a competitive bid for the Facility. Before requesting final Board approval for the Project, PSE will have:

- Completed preliminary engineering of the Facility;
- Formally submitted an interconnection request and entered into a substation construction agreement with Tacoma Public Utilities;
- Selected an EPC firm to engineer, procure materials and construct the Facility;
- Negotiated a fixed price EPC contract with the selected firm; and
- Negotiated other Project construction agreements related to geotechnical work, marine and in-water work, and distribution upgrades.

Communications and Public Affairs

PSE's Communications and Public Affairs teams will lead an effort to educate and gain support of the public, key elected officials and third party special interest groups. This work will include legislative briefings, community meetings and coordinating news and press releases. Key milestone during the development phase of the Project include the public announcement of the Project (leading up to the execution of the Port of Tacoma lease) and the launch of a public website with Project information and updates. Prior to requesting final Board approval of the Project, PSE will develop an outreach plan for the construction phase of the Project.

PUGET SOUND ENERGY

Exhibit H.

Risk Analysis

Contents

Risk Analysis

This exhibit summarizes the risks associated with the Tacoma LNG Project (the "Project") and describes the management actions PSE has developed to address them. There are three principle Project phases, each with a different risk profile:

- Development Phase
- Construction Phase
- Operations Phase

PSE has identified risks associated with each Project phase and developed plans to eliminate or mitigate them to the extent that it is reasonable and practicable.

Many of the risks associated with specific project elements are discussed in detail in other exhibits:

- Commercial risks related to the TOTE contract are discussed in ***Exhibit E***
- Permitting risks are discussed in detail in ***Exhibit J***
- Community relations risks are discussed in detail in ***Exhibit K***

Development Risks

Development risks include risks assumed prior to entering the construction phase of the Project, which occurs when PSE enters into an engineering, procurement and construction (EPC) contract and other Project construction agreements. To date, PSE has completed a significant amount of work required to demonstrate that the Project is feasible (as summarized in this report). However, there are risks associated with obtaining permits, regulatory approvals and community support that must be mitigated and controlled.

In addition to a summary of risks and mitigations, this exhibit includes a development timeline with associated dollars spent to reach key milestones. Prior to requesting board approval to execute the EPC contract, PSE will obtain all environmental permits necessary to construct and operate the Facility. Building permits and WUTC approvals, which are administrative in nature, will come after executing the EPC contract (upon completion of detailed engineering).

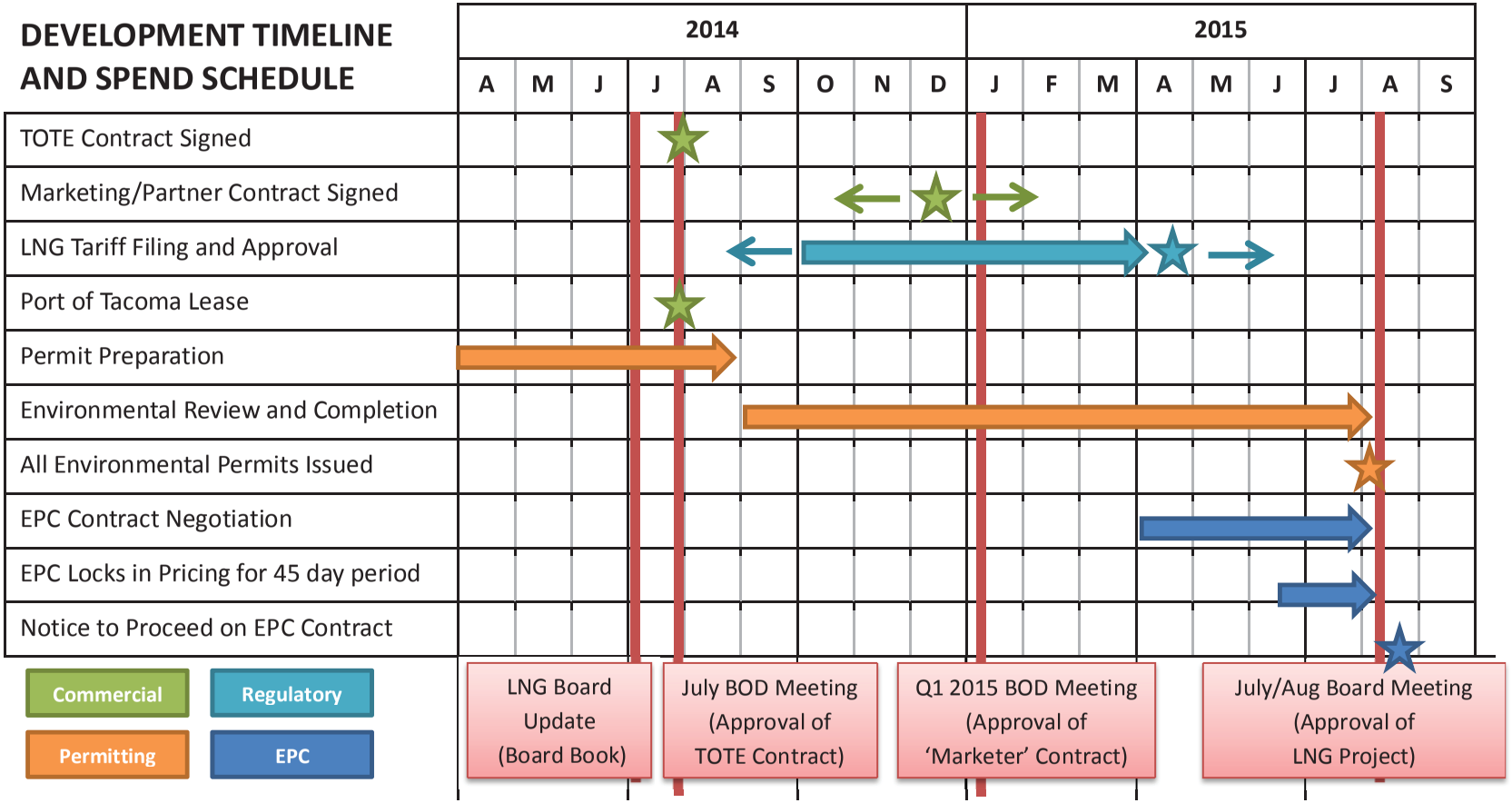
Construction Risks

Construction risks can usually be categorized as cost, schedule or performance risks. Most of the Plant costs and schedule are driven by the EPC scope of work, which is performed under a fixed-price contract with liquidated damages for late completion. Site preparation and in-water work performed by PSE carries greater schedule risks, specifically due to uncertainties related to the ground improvement program. Schedule float has been included to allow sufficient lead-time to address these uncertainties. The PSE-performed work will be completed under fixed-priced contracts (most likely design-bid-build, or design-build), which will minimize the cost risks to PSE. Performance risk will be managed by detailed specifications and definitions associated with the scope of work backed by contract warranties.

Operations Risks

PSE is considering Chicago Bridge & Iron or Black and Veatch for its EPC contractor. Both firms are established world leaders in LNG plant design and construction. The selected firm's experience, along with the expected contract performance guarantees and liquidated damages, will limit PSE's exposure to Facility performance risks. PSE will staff and operate the Facility according to established safety standards and the designer's operational procedures; staff training, maintenance and operating protocols will be developed taking into account regulations, PSE policies and practices, and best industry practices.

DEVELOPMENT TIMELINE AND SPEND SCHEDULE



Cumulative Project Spend (millions):	$3.8	$5.1	$7.6	$10.3	$12.1	$13.8
Contingent Liability - TOTE Contract (millions):		$0	$15	$15	$15	$15

DEVELOPMENT Risk	Cause	Probability	Magnitude	Mitigation
Counterparty Credit	Long-term LNG fuel customers default or cannot fulfill contract obligations.	Low	Medium	LNG fuel supply agreements will have contractual provisions to mitigate counterparty credit risks. The TOTE contract will include a parental guaranty from Saltchuk Resources.
Merchant Risk	PSE assumes merchant risk on a small portion of the plant capacity.	Low	Medium	PSE intends to fully contract the Facility's capacity. However, to the extent that there is excess capacity, PSE will have to demonstrate that merchant risk is prudent.
Project Costs	Final EPC contract pricing is significantly higher than the original FEED study.	Medium	Medium	PSE's budget includes contingency amounts commensurate with current estimate stage. PSE's offtake contracts will allow for some pass through of cost escalations. PSE's prudency demonstrates that the Project can withstand a significant cost increase and still be the least cost peaking option for PSE's retail gas customers. (See ***Exhibit N*** for a discussion of PSE's resource alternatives analysis and results.)
Commodity Pricing	The LNG fuel market is predicated on a substantial spread between natural gas and diesel prices. This spread could collapse.	Low	Medium	PSE commissioned Wood Mackenzie to study the probabilistic spread between natural gas and diesel prices. The results of this study validated PSE's position regarding the sustainability of the spread. Even so, PSE will take on long-term contracts that will generate revenues sufficient to cover the costs of facilities during the contract term. TOTE has a specific right to exit their contract if a drastic collapse of the spread occurs; however, there are significant early termination fees.

DEVELOPMENT Risk	Cause	Probability	Magnitude	Mitigation
Permits Delayed	Permitting delays may be caused by third-party interveners or delayed agency action. *See **Exhibit J** for a more detailed analysis of permitting delay risks.*	Low	High	To mitigate permitting delays PSE will do the following: • Initiate Project introduction meetings with all involved agencies to provide advance notice of the Project and schedule; • Initiate regular Project meetings with the agencies during permitting; • Engage an independent coordinator to help facilitate decision-making among agencies; • Reimburse key agencies for time dedicated to this Project.
Permits Not Granted	Permitting agencies determine that project impacts cannot be mitigated. *See **Exhibit J** for a more detailed analysis of potential permitting delay risks.*	Low	High	PSE has already begun to gain support for the Project from key community, business and government organizations to ensure its success. The Company will continue to educate others in federal, state and local government about the substantial public benefits of the Project.
Regulatory	WUTC could deny regulated ratebase treatment of the Facility.	Medium	High	PSE has and will continue to work with WUTC commissioners and staff to promote the cost and reliability benefits of the Project to PSE's gas customers, and the economic and clean air benefits for the region. PSE has garnered support from state and local elected officials. Additionally, PSE continues to support legislation that promotes a regulatory environment that encourages the development of alternative fuels.

DEVELOPMENT Risk	Cause	Probability	Magnitude	Mitigation
Environmental Contamination	PSE could encounter environmental contamination at the Port of Tacoma or along the gas distribution system upgrades route.	Medium	Medium	PSE has, and will continue to perform environmental sampling at the site and along the pipeline route. If contamination is found during the development phase, the Port will generally bear the financial responsibility of remediation. PSE will work to mitigate any schedule risk the remediation might pose.
Community Concerns	PSE anticipates potential community concerns regarding: • LNG safety; • Any project involving fossil fuels; • Opposition to using "fracked" gas.	Medium	Low	PSE will work with communities to educate them about the benefits of LNG and the Project, and to address concerns. This will take the form of an outreach campaign, including community meetings and presentations, a web site and/or other forms of communication to help address any concerns the communities may have. (*See **Exhibit K** for details about PSE's plan to engage the community.)*

CONSTRUCTION Risk	Cause	Probability	Magnitude	Mitigation
Cost Risk	Changes to plant design after EPC contract is executed, or unforeseen environmental contamination	Low	Low	Facility construction will be executed via a lump sum EPC contract. Remaining construction is accomplished by firm, fixed-price competitive bids. Scope control will be managed after contract execution. Environmental conditions will be characterized prior to the start of construction.

CONSTRUCTION Risk	Cause	Probability	Magnitude	Mitigation
Contractor Performance	Failure to meet scope or quality requirements	Low	Low	Contractors are pre-qualified and selected based upon best value and historical performance. PSE will use independent Quality Assurance inspection to validate contractor performance and require contract warranties to backstop risk.
Construction Delays	Supply chain disruptions, unforeseen site conditions, productivity issues, etc.	Medium	Low	The overall construction schedule includes float to accommodate uncertain duration of demolition and site work. The EPC contract will have liquidated damages for late completion.
Safety	Injuries to workers or accidents on site	Low	Medium	All contractors will be required to have rigid safety programs that meet or exceed PSE's standards.
Distribution Upgrades Construction Risk	Cost increases or schedule delays due to: • complexities associated with route (railroad crossings/contamination) • permitting • environmental impacts/ restoration work • regulatory approval for pressure increase	Medium	Medium	More detailed staff review/analysis, engineering work and testing will be performed as Project progresses. PSE will consider construction methods, hours of work and restoration requirements as they relate to permitting. Special material handling and HAZWOP[1] training will be necessary. PSE intends to work with jurisdictions on cost impacts of unknown restoration requirements. (*See **Exhibit M** for more details about distribution system upgrade risks.*)

[1] Hazardous Waste Operations ("HAZWOP")

OPERATIONS Risk	Cause	Probability	Magnitude	Mitigation
Customer Defaults or Breaks Contract	Long-term customers default and breach contracts jeopardizing revenue contributions to the Project	Low	Medium	LNG fuel supply agreements will have contractual provisions to mitigate counterparty credit risks. PSE will mitigate revenue impact by selling volumes associated with any breached contracts.
Customer Consumption	Plant customers take significantly lower volumes than anticipated, resulting in sub-optimal plant operations	Medium	Low	PSE will include contractual provisions such as deficiency payments or penalties to mitigate efficiency losses from running the Facility at a lower output. Alternatively, PSE could operate the Facility with longer or more frequent outages and use the LNG storage tank to mitigate operational inefficiency.
Liquefaction and Performance Efficiency	Failure of EPC design to meet PSE specifications	Low	Low	The EPC contractor will guarantee production capability and plant design will include a safety factor; the contract will include warranty provisions to meet specifications and/or liquidated damages.
Safety	Equipment failure or operational error	Low	Medium	The Facility will be designed, constructed, and inspected according to the latest safety standards. Extensive regulations govern the required procedures and training for Facility personnel. The Facility will be insured under PSE's policy.
Maintenance of Plant Equipment	Premature failure of components	Low	Medium	Major components will be inspected and tested at the factory prior to installation. Only qualified suppliers will be used. The Facility will have full operations and maintenance manuals, and will maintain onsite spares for component parts with higher failure rates.

PUGET SOUND ENERGY

Exhibit I.

Siting and Lease Terms

Contents

Siting and Lease Terms

PSE conducted an extensive siting review to determine the most suitable location for the Facility. The Facility must be capable of supplying gas into the PSE system on peak load days, as well as serving LNG fuel markets. The siting investigations considered the costs of being on the water with logistical challenges of serving marine customers, particularly TOTE. Many sites had regulatory, permitting and logistical fatal flaws associated with them. The remaining sites were analyzed using cost benefit and economic analyses to determine the lowest cost for PSE customers. Ultimately a site at the Port of Tacoma adjacent to TOTE's facilities was selected as the best site for the Facility.

There are two main challenges when siting an LNG facility:

1. ***Inherent constraints:*** All LNG facilities are subjected to siting constraints. These constraints are dictated by regulations, permitting agencies and others. There are also technical constraints that limit how LNG can be moved efficiently and cost effectively.

2. ***Ensuring the greatest value for PSE customers:*** The siting effort included evaluations to determine the most cost effective location for PSE retail gas customers. PSE evaluated all sites to ensure that costs associated with serving LNG fuel markets were less than the additional LNG fuel market revenues.

Inherent constraints around LNG siting are unavoidable and mitigation is either impossible or cost prohibitive. Potential sites that could not meet these constraints were deemed to have a fatal flaw. PSE met the second challenge of siting a facility that brings the greatest value to PSE customers by finding a site that can produce the lowest cost LNG. Lowest per unit cost is best achieved with economies of scale at the plant. TOTE's willingness to make a large commitment at this early stage of the market will enable PSE customers to benefit from the larger scale of the Facility. Therefore, the selected site must be able to serve PSE's peak-day resource needs as well as TOTE's fueling requirements.

The following sections highlight the challenges of siting an LNG facility and summarize the analyses that went in to the siting investigation.

Inherent LNG Siting Constraints

All LNG plants are subject to the regulations of 49 CFR 193. These regulations are administered by the US Department of Transportation through the Pipeline and Hazardous Materials Administration ("PHMSA"). Typically, these regulations are enforced by the Federal Energy Regulatory Commission ("FERC"); however, the Facility will not be FERC jurisdictional. In Washington, PHMSA delegates enforcement of 49 CFR 193 to the Washington Office of Pipeline Safety. The regulations detailed in 49 CFR 193 uses national engineering standards and fire codes to help guide the siting restrictions of LNG facilities. These restrictions include exclusions zones for vapor dispersion and heat radiation, zoning requirements, and setbacks from key infrastructure. In addition to restrictions mandated by code, there are also public relations and commercial constraints as well.

The major inherent LNG siting constraints are exclusion zones, proper zoning, community acceptance and access to markets.

Exclusions Zones

The National Fire Protection Association (NFPA) defines two exclusion zones related to an LNG facility: thermal radiation exclusion zone and a vapor dispersion exclusion zone. Thermal radiation exclusion zones are defined by the resulting heat from a fire from the largest containment of LNG onsite, which in PSE's case is the full containment tank. Therefore the thermal radiation zone is based on the tank and defined by the surface area and height of its roof. The vapor dispersion exclusion zone is defined by the results of a computer model that simulates a release of LNG or refrigerant from plant piping. The size of this zone is determined largely by the maximum flow rate and pressure of any pipe in the plant.

Exclusion zones must be contained on the parcel with the exception of transient zones (i.e. waterways and roads) and in some instances public lands. The exclusion zones associated with the Facility will be driven by a tank that is large enough to support PSE's peak shaving needs and the storage required by our customers (approximately eight million gallons), and plant piping and liquefaction equipment. PSE estimates that the minimum site acreage to accommodate these exclusion zones is 30 acres, even though the actual footprint of plant equipment is substantially smaller.

Proper Zoning

Due to the nature of an LNG facility, it must be sited either in a remote or industrial zoned area. Western Washington is extremely limited in the number of industrial zoned areas.

Furthermore, it needs to have reasonable access to a high pressure natural gas line and have access to marine markets. The options for available industrial sites located on the water in Puget Sound are mostly limited to Port areas where land costs are high and access to the water is at a premium.

Community Acceptance (NIMBY)

The potential community concerns around LNG may be a significant factor in siting an LNG facility. PSE is preparing for potential community opposition from some neighbors of the Facility, and while opposition may come from a minority of stakeholders they can be vocal and persuasive. Therefore, even though some sites may satisfy codes and regulations, they risk drawing a large level of community opposition that could slow permitting and bring an unwanted amount of publicity to the Facility.

As with setbacks, the community opposition concern may extend beyond the location of the Facility. PSE must also consider how the LNG will leave the Facility as well as the impact of required upgrades to the natural gas distribution system. For example, PSE considered railing LNG from the Frederickson Industrial park to the Port of Tacoma. While this is technically possible, PSE anticipated significant local opposition where the railroad crosses through these communities. The Port of Tacoma has heavy industrial uses and PSE's proposed LNG Facility is compatible with existing uses and character.

Access to Markets

LNG is quickly gaining momentum as a clean and economic fuel source to replace diesel and fuel oil. The immediate markets for LNG are heavy duty trucks and marine vessels that operate in the North American Emissions Control Area. By the time the Facility is operational there may be many other end-users for LNG including the railroad, remote industrial end-users and power plants, and trans-oceanic trade. While the siting investigation was driven by the immediate markets it is critical not to discount all the opportunities of future markets.

LNG conversion is capital intensive for any end-user and thus the payback is greatest with higher fuel consumption. For industries that face higher fuel costs due to increased pressure from regulators to reduce emissions the payback is even greater. Industrial/power plants and large marine shippers are key markets that will benefit by investing in LNG. Furthermore, these large customers are more likely to have the demand and credit worthiness that make future capital investments by PSE prudent. These customers are almost certain to require delivery over the water since their large volumes make trucking the LNG uneconomic and logistically

challenging. In order to serve these critical markets, it is important that PSE has the capability to load the LNG on a barge or vessel.

Creating the Least Cost Resource for PSE Customers

This plant can be characterized by the two customer classes it serves: utility customers and LNG fuel customers. One critical component of the siting investigation is to ensure that one of these customer classes does not overly burden the other because of location. To that end it is critical that the site allows for the most cost effective service for both customers classes.

Capital Costs and Plant Capacity

LNG plants are capital intensive and the unit costs of these facilities benefit from scale. The most expensive plant items are the full containment storage tank and the equipment related to the liquefaction process. While the all-in cost of this equipment scales with capacity, it is not linear. CH-IV International (an LNG consulting company hired by PSE) provided a range or order-of-magnitude cost estimates for LNG plants.

Figure 1 shows the unit cost estimates for LNG plant equipment of varying liquefaction capacities. Unit capital costs are defined by the total capital costs over the total capacity. Note that these estimates do NOT represent the $/LNG gallon costs and that the capital costs in this estimate are only for plant equipment. Including other fixed costs such as the lease and plant staffing make the savings even more dramatic.

Figure 1: Unit Capital Cost of LNG Facilities with Different Total Plant Capacity

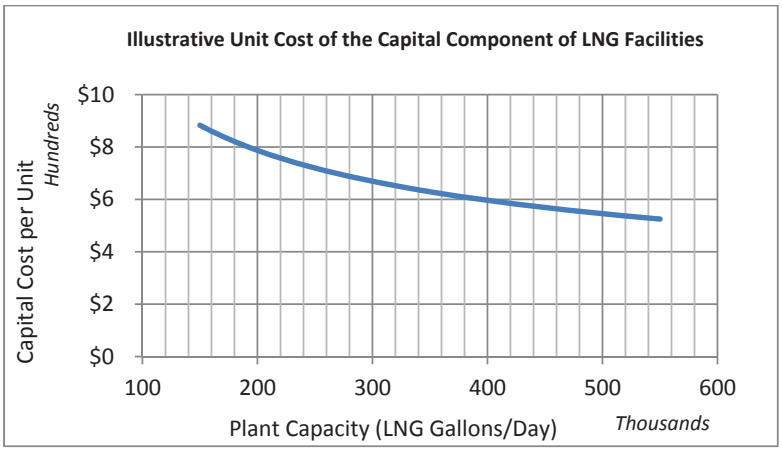


Figure 1 clearly shows that unit costs decrease with a larger plant. This trend affirms the notion that every customer class benefits from choosing a site that can accommodate a bigger plant, provided that the target markets can absorb the LNG that will be produced. Of course, the benefit of increased economies of scale was weighed against increased land costs. Waterfront sites can serve markets that support the largest plant but also come with higher land costs as well as added costs for distribution system upgrades.

TOTE

Most diesel and petroleum based end-users have been relying on a robust network of infrastructure that has been around for decades. This enables trucking fleets and large marine customers to buy their fuel on spot or under short-term contracts with no commitments to take a certain volume. In sharp contrast, LNG infrastructure will have to be developed to accommodate transportation customers and that will require parties to commit to long-term contracts to pay for the new assets. While the industry sees a large pay off for those willing to convert, it comes with commitment and the resultant risks.

Due to anticipated high fuel costs resulting from more stringent regulations, TOTE has committed to converting its vessels to LNG. In doing so, TOTE will take on a 10-year contract for LNG supply. TOTE's commitment to LNG (approximately 110,000 gallons/day) makes the development of a large-scale plant feasible. Without TOTE or another large anchor customer, an LNG peak shaving facility would likely not be more cost effective than alternative resources, such as long-haul interstate pipeline capacity.

PSE looked at opportunities to serve TOTE from locations with marine access in Ferndale and the Port of Everett, and inland at the Frederickson Industrial Park, amongst others. All of these locations were more expensive due to the logistics of moving LNG.

Transportation Customers Bring Increased Peaking Capacity

The peaking component of this plant (needed to serve all of PSE's retail gas customers) provides benefits in more ways than just economies of scale. The peaking capacity of the plant will be expanded beyond the physical vaporization capacity at the plant to include the diverted gas that otherwise would be delivered to the Facility to produce LNG for transportation customers. The facility will have the capability to inject 66,000 Dth/day of natural gas into the distribution system on a peak day. When the plant is liquefying, it consumes approximately 19,000 Dth/day. During a peak day event this gas can be diverted to serve other PSE retail customers. During a peaking event, PSE will keep transportation customers whole by delivering LNG from storage.

Tacoma LNG Facility Site

PSE selected a site located on the corner of East 11th Street and East Alexander Avenue at the Port of Tacoma in Pierce County Washington (shown in ***Figure 2***). The site was formerly a U.S. Navy site, commonly referred to as the BRAC site (named after the Base Realignment and Closure Commission that closed the base).

Figure 2: PSE LNG Facility Site

This location meets all the inherent requirements previously discussed, and allows PSE to meet the peak-day needs of gas customers by connecting to PSE's high pressure distribution system with approximately four miles of 16-inch pipe that will be constructed predominately inside the Port of Tacoma.

The location also allows PSE to serve LNG fuel markets whose revenue contributions will enable the lowest cost peaking resource for PSE retail gas customers. The site is located on the Hylebos Waterway and is adjacent to TOTE's facility on the Blair Waterway. PSE intends to build a direct LNG fuel line to TOTE's bunker location. From this location, PSE plans to serve other markets via LNG barges and vessels. The site is also close to major heavy duty trucking hubs located at the Port and in the Kent/Auburn Valley. Finally, the site has rail spurs which may eventually be used to serve LNG rail markets.

Port of Tacoma Lease

PSE has negotiated lease terms with the Port of Tacoma for the selected site. The Port of Tacoma lease contains the following key provisions:

- ***Premises:*** PSE is leasing approximately 30.15 acres of uplands and approximately three acres of submerged lands, together with all improvements located thereon, for the purpose of LNG production, storage, and distribution. The property is located at 901 and 1001 Alexander Avenue and 3533 E 11th St, Tacoma, Pierce County, Washington 98421.

- ***Term:*** The lease has an effective operating term of 25 years from the date of first commercial operations. The lease also provides for a two-year due diligence and permitting phase, and a three-year construction phase.

    - With timely notice, the lease provides for a 25 year renewal, provided at least 45% of the capacity involves marine uses (either fueling or transported by marine vessel); otherwise the renewal is at the Port of Tacoma's discretion.
    - The lease can be terminated at any time during the due diligence and permitting phase upon notice, subject to a $50,000 termination payment (the termination fee is not applicable if termination is due to existing environmental contamination).

- ***Pricing:*** Pricing is as follows:

    - ***Due diligence phase (initial 12 months):*** $49,725 per month
    - ***Extended due diligence period:*** the lease payment increases $10,000 each month of the extended due diligence period (for up to 12 additional months) eventually growing to $169,725 in month 24
    - ***Construction period:*** $212,445 per month, commencing the earlier of beginning site improvements or month 25
    - ***Operating term:*** $212,445 per month, commencing on the first date of commercial operations
    - ***Volumetric charge:*** $0.085/barrel for all bulk volumes sold, with the Port reserving the right to establish an LNG specific tariff
    - ***Escalation:*** the lease pricing components escalate annually at CPI
    - Requires security deposit of one year's rental payments ($2.9 million)

- ***Environmental:*** Environmental responsibilities are allocated as follows:
    - During construction of the Facility the Port will responsible for removal and disposal of (1) any contaminated media that PSE encounters up to a depth of five feet below ground surface, and (2) any hazardous substances, such as asbestos or lead paint, encountered during site demolition.
    - For any contamination encountered beneath depths of five feet below ground surface during construction, PSE will be responsible for removal and disposal.
    - PSE will be responsible for any additional remedial investigations or cleanup work caused solely by construction of the Facility.
    - During construction and operation of the Facility PSE must demonstrate that its use of the property complies with all environmental laws and is responsible for any related spills or releases.
- ***Indemnification:*** In addition to typical indemnification language, PSE must indemnify the Port of Tacoma if PSE's activities adversely inhibit the normal course of operations in the Port.
- ***Removal of Improvements:*** Upon termination of the lease, the Port reserves the right to retain or have PSE remove the leasehold improvements. Notice provisions take such removal into account.

PUGET SOUND ENERGY

Exhibit J.

Permitting and Authorizations

Permitting and Authorizations

For a discussion of the permits and approvals required for the Tacoma LNG Project, refer to the confidential attorney-client privileged memo from Steve Secrist to the Board of Directors, dated July 2, 2014.

PUGET SOUND ENERGY

Exhibit K.

Public Affairs and Communications

Contents

Public Affairs and Communications

Joint Strategy and Messaging

This Public Affairs plan intends to grow and maintain support for the project, with a specific focus on permitting and siting the Facility. Central to the plan is a coordinated communications and outreach strategy for local and state government, the Tacoma/Pierce County community and special interest groups, including environmental, commercial partners, regulators and PSE customers.

The strategy for the Project's communications and outreach program was built in part using:

- Public opinion research to test existing perceptions of LNG and potential focus areas for the key message platform, including:
    - Two focus groups (King County and Tacoma)
    - A telephone poll with 1,000 respondents in Pierce County and King County
- Stakeholder interviews with subject matter experts, commercial partners, local decision makers and project team.
- Study of best practices and lessons learned from other LNG and natural gas projects, including their key messaging and outreach strategy.

<u>The key messages include:</u>

1. **The Tacoma LNG Project will provide important environmental benefits for the people of Tacoma and for the State of Washington.**
    a. Talking points focus on how the LNG provided by this Facility will help address the community's air quality issues as well as Washington State's ability to meet its carbon emission goals. Other environmental benefits include eliminating the threat of marine spills and PSE's leadership as an early adopter of environmentally progressive alternative fuel options for our customers.

2. **The Tacoma LNG Project will help ensure continued dependable service and additional benefits to PSE natural gas customers.**

    a. Talking points include the substantial peak shaving benefit for PSE natural gas customers and the cost advantage of LNG compared to alternative resources such as long-haul interstate pipeline capacity for peak days.

3. **The Tacoma LNG Project will generate important economic benefits for all South Sound residents.**

    a. Talking points include new job growth and existing job security due to the economic advantages of natural gas and the overall economic benefit for the Port of Tacoma, City of Tacoma and State.

4. **Natural gas is a proven, safe source of energy that reduces reliance on foreign fuels.**

    a. Talking points include the safe history of LNG use world-wide, PSE's experience with LNG and natural gas and the benefits of relying on an abundant, North American fuel source.

<u>The Project communications tools, consistent with our messaging, include:</u>

- Project webpage (see below for screenshot)
- Project fact sheets and FAQs
- Graphics, including:
    - Visual simulations of the Facility
    - Maps of the Port and pipeline
    - Graphs illustrating the environmental benefit
- A briefing packet for PSE messengers to use in their outreach activities

<u>The coordinated outreach strategy includes but is not limited to:</u>

- Targeted stakeholder briefings, with:

  - Puget Sound Pilots
  - Port of Tacoma Customers
  - Labor
  - Northeast Tacoma community leadership
  - Customers affected by new pipeline construction
- Grassroots outreach to:
  - Local Government officials
  - State Government officials
  - Potential Project supporters

State Government

The Tacoma LNG Facility received strong proactive support from State legislators and the Governor. These elected officials view the Project as a multifaceted win. The Mayor and Governor are especially attracted to the Project because it promotes State and local economic development and positions both governments as regional and national leaders in the low carbon transportation fuels arena. The Project also creates jobs, improves the environment through the reduction of greenhouse gas emissions and particulate matter, and provides infrastructure support for PSE's natural gas customers in the form of peaking resources and pipeline development. The primary area of concern has been related to Project operational safety, which is addressed through education around the Facility and its operation and separating PSE from other Tacoma area natural gas projects.

Local Government

The goal of the Local Government Affairs strategy is to maintain support from elected officials and key community leaders in order to provide a platform for regulatory tax reforms, approval of the lease from the Port of Tacoma, timely permitting and successful construction of the LNG Facility.

Initial briefings have been conducted with over 30 elected officials and key leaders and City permitting officials and the reception has generally been very favorable. Leaders view this Project as positive for the Port of Tacoma, for the environment and air, and as a driver of a new industry and fuel source.

Media Relations

There has been some early news coverage of the Tacoma LNG Facility in local media and trade journals. The Public Affairs plan includes news releases and interviews with local publications, including the Tacoma News Tribune, at certain project milestones. We anticipate generally favorable reaction in the media, based on early coverage and positive Project messages regarding economy, clean air and local customer peak shaving benefit.

PSE will respond to all requests for interviews and information with our consistent Project messaging strategy.

Speaking Engagements

Puget Sound Energy representatives testified at several state committee hearings in 2014 to support tax legislation needed to level the playing field regarding taxation for PSE to develop the Project. Additionally PSE staff continues to meet individually with elected officials to provide update information in support of permitting and development of the Tacoma LNG Facility.

Agency and Local Jurisdiction Outreach

PSE will be working closely with state agencies to educate staff on the Tacoma LNG Project to ensure favorable outcomes in the permitting and regulatory arenas. Outreach to Energy Facility State of Washington, the Department of Ecology, and other agencies will smooth concerns and provide positive outcomes for Project development.

Community Involvement

The community outreach plan includes strategies for engaging with local community leaders, special interest groups and members of the public. The primarily grassroots approach includes tactics like:

- Attending public meetings (such as Home Owners Associations and local Chambers of Commerce) to educate groups about LNG and the Project
- Seeking public support from groups like the American Lung Association
- Natural gas safety and education tables at local events

Potential Risks to Public Acceptance

Risk 1: Public confusion of the LNG Facility and larger nearby proposed projects, including:

- A proposed methanol plant at the Port of Tacoma
- A feasibility study being conducted by a global energy company looking to build an LNG plant close to but not on Port property

Mitigation: Messaging will focus on the characteristics that differentiate the facilities, highlighting the local partners and local benefit of the Tacoma LNG Project.

Risk 2: Delayed permits and regulatory decisions due to:

- Agencies simultaneously permitting both the LNG and methanol plant and wanting to address the "combined impacts"
- Federal, state and local governments' ability to stay on timelines

Risk 3: Opposition groups (e.g., groups opposed to natural gas fracking or the use of fossil fuels) will attempt to disrupt the Project's success through activism or other methods.

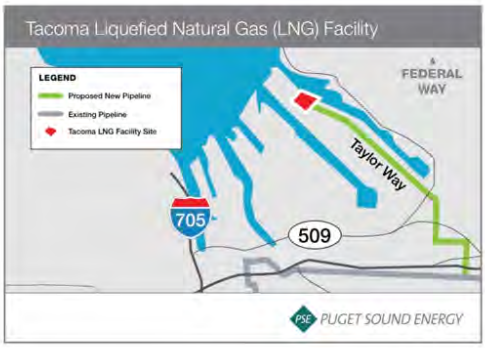
Mitigation: Contingency plans for potential activism or protests will be in place prior to public rollout. Project messaging and strategy addresses some potential concerns proactively.

Sample Communication Tools

Project Fact Sheet (Page 1)

PSE PUGET SOUND ENERGY

Tacoma LNG Facility



Project Summary

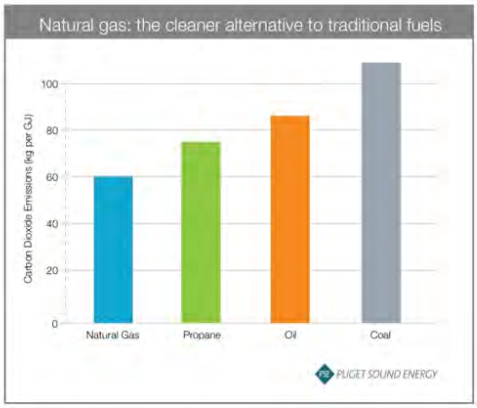
Puget Sound Energy (PSE), Washington's oldest energy utility, plans to build a $275 million Liquefied Natural Gas (LNG) facility at the Port of Tacoma to provide a clean and cost-effective gas supply resource for PSE's natural gas customers. The facility will also provide a cleaner fuel alternative for maritime vessels owned by Totem Ocean Trailer Express (TOTE) and other local employers. The project is expected to be completed and fully operational by 2018.

Environmental Benefits

LNG is a cleaner alternative to conventional fuels, such as diesel. Switching from diesel to LNG reduces greenhouse gas emissions by up to 30% and eliminates particulate emissions. This helps improve air quality and reduce health risks, and will help local employers like TOTE comply with new, stricter low-sulfur emission standards. Use of LNG also virtually eliminates the potential for harmful fuel spills that could damage the waters of Commencement Bay and Puget Sound.

Economic Impact

The Tacoma LNG Facility will provide significant economic benefits to Tacoma, Pierce County and the entire South Sound region. In addition to helping local employers like TOTE remain competitive and maintain hundreds of family-wage jobs, the LNG facility itself will support nearly 500 jobs during its construction and more than 120 permanent jobs during its operations. It will also generate additional tax revenues for state and local governments, helping fund important public services.

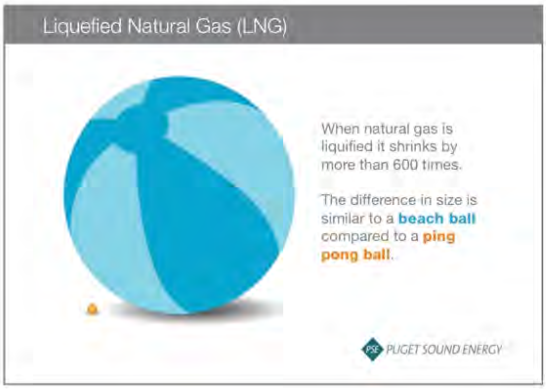


Safety

LNG is simply the liquid form of the natural gas used in millions of homes and vehicles. When

Project Fact Sheet (Page 2)

cooled, natural gas is reduced to a liquid that is one six-hundredth the volume, making it easier to store and transport. It is not compressed or stored under pressure, and is neither explosive nor flammable in its liquid state. When warmed, it returns to its gaseous state, and the same safe handling procedures are used as with natural gas. More than 100 LNG production, storage and fueling facilities currently operate in the US – including one that PSE has owned in Gig Harbor for more than a decade.



Review and Approval Process

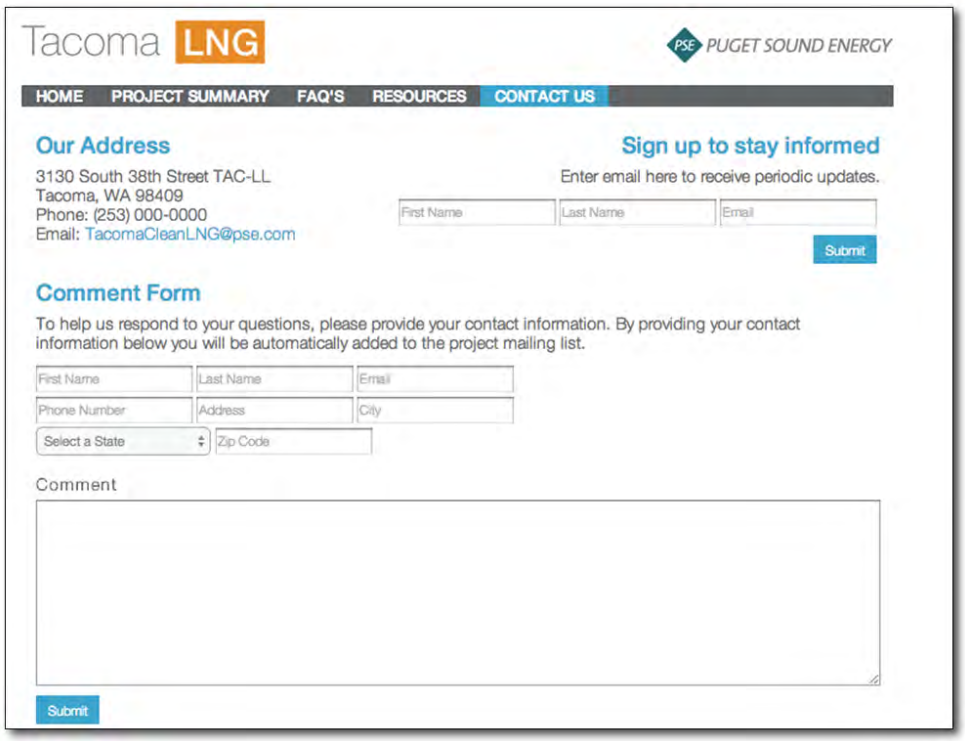
The Tacoma LNG Facility will go through an extensive review and approval process with federal, state and local government agencies. PSE will be required to develop and issue a supplemental environmental impact statement, obtain multiple permits and provide numerous opportunities for public comment. Some of the major agencies involved include: U.S. Coast Guard, Army Corps of Engineers, U.S. Environmental Protection Agency, Washington State Department of Ecology, Washington State Utilities and Transportation Commission, Washington State Department of Fish and Wildlife, Pierce County, City of Tacoma, and the Port of Tacoma.

PSE's Tacoma LNG Facility, to be completed by 2018

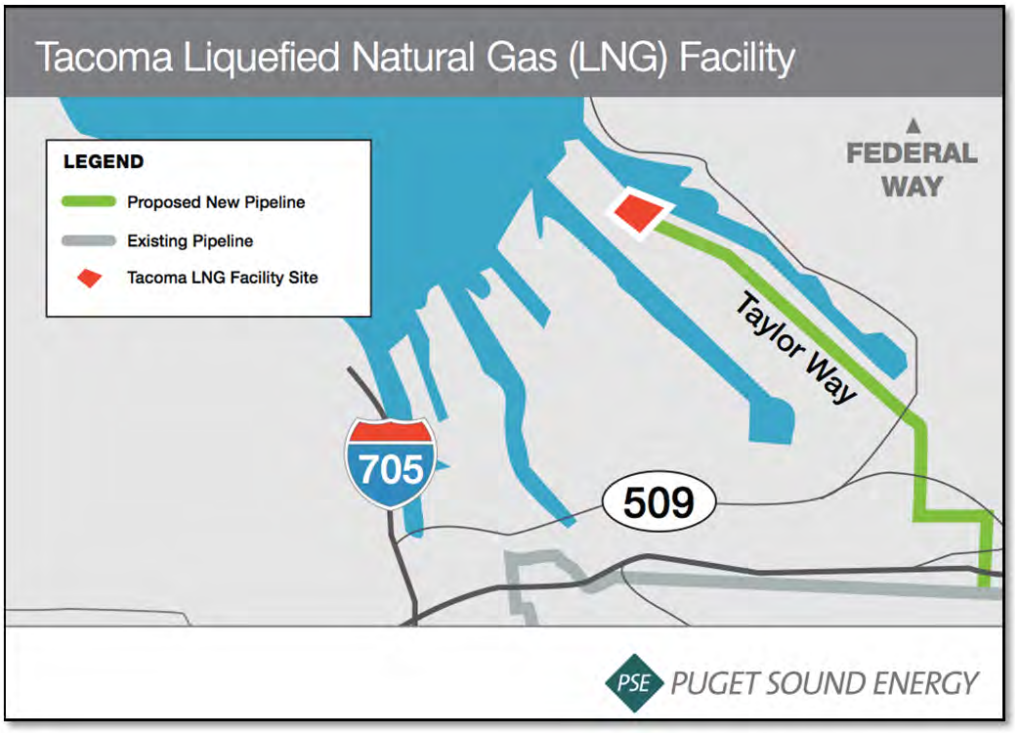
TacomaCleanLNG.com

4153_000 01/01

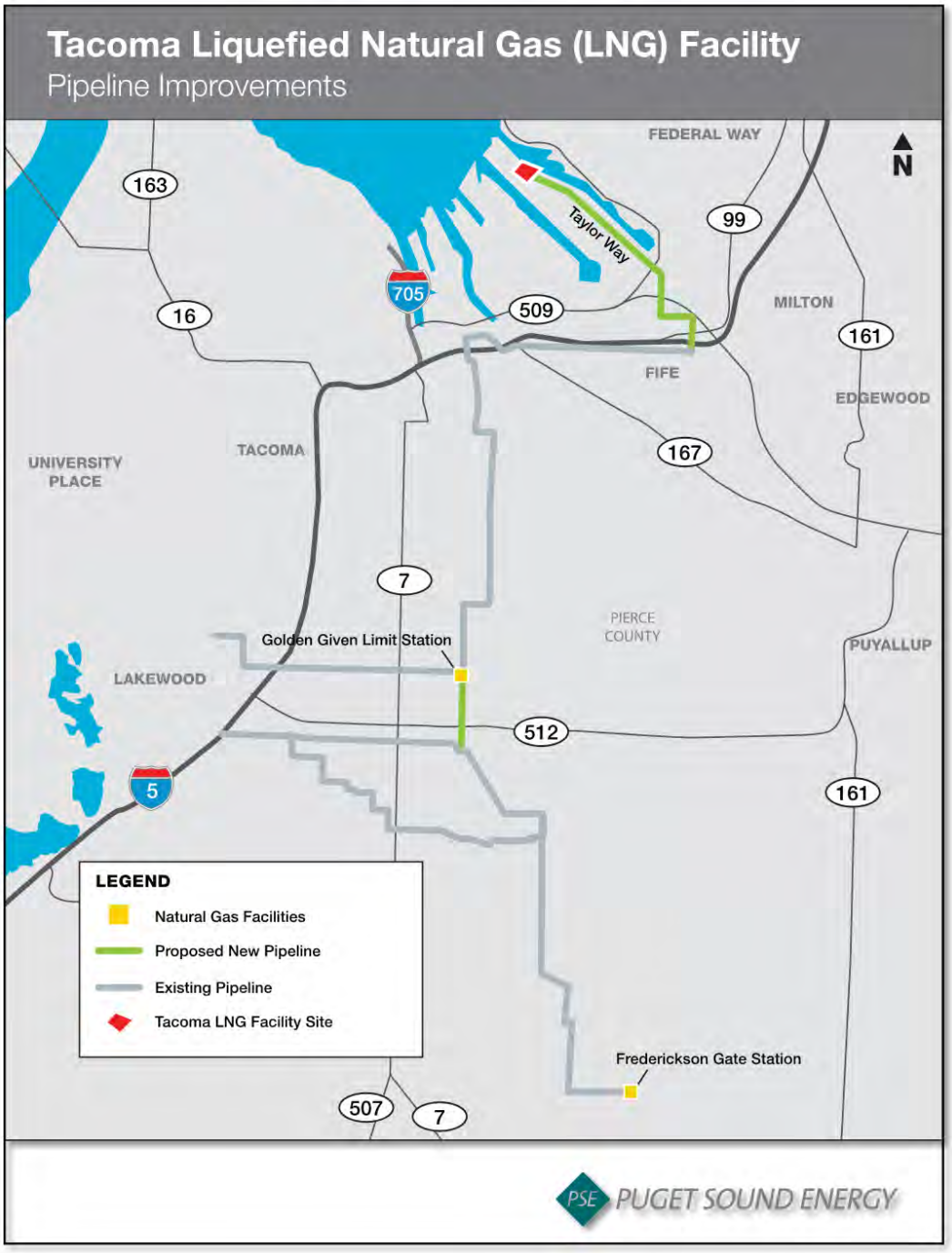
Website (www.TacomaCleanLNG.com)



Project Maps



Project Maps (continued)



PUGET SOUND ENERGY

Exhibit L.

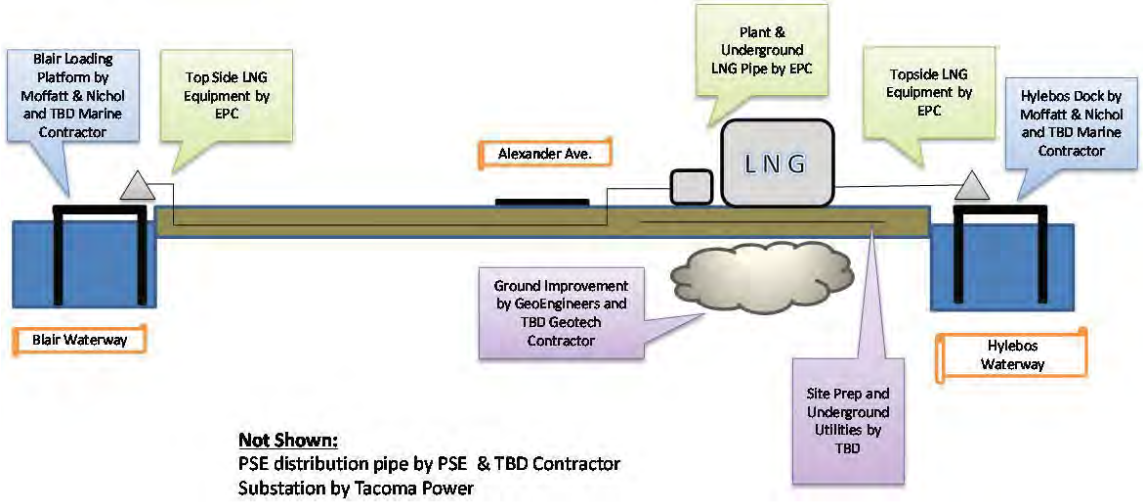
Engineering and Construction

Contents

Engineering and Construction

The Project will be engineered and constructed using a combination of two execution methodologies to obtain the best value for PSE. The LNG Facility (including pre-treatment, liquefaction, storage tank, truck rack, vaporization system, and balance of plant) will be performed according to an engineering, procurement and construction (EPC) contracting methodology. Site preparation (including demolition, ground improvement, and underground utilities) and marine facilities construction will be performed by PSE using a design-bid-build contracting methodology.

Figure 1. Plant Engineering and Construction Responsibilities



Engineering, Procurement and Construction

PSE originally retained the national engineering firm CH-IV to assist with feasibility studies for the Project. In 2012, based upon input from CH-IV and a study of the marketplace, PSE determined that an EPC contracting methodology would be the preferred method for contracting the LNG production portion of the Project. EPC contracts are particularly suitable for manufacturing or process plants where the owner can set specific performance criteria (in PSE's case, production quantity, storage quantity, and send-out requirements), but is not

heavily vested in the methodology of producing the product (i.e. technology neutral and/or the design of the facility is outside the owner's core business or skill set). The EPC contractor is therefore responsible for process design, including specifying, procuring, installing, and commissioning all elements of the project as required to meet performance specifications and guarantees stipulated by the owner in the contract. Since the EPC contractor also constructs the project, the owner has a single point of contact throughout the life of the project. Also, because a single entity holds responsibility for both design and construction, a more active consideration of constructability and construction efficiency in the design of the project is more likely than it would be with alternative contracting methodologies such as design-bid-build, or even design-build.

An EPC contract is a firm, fixed price contract with performance guarantees and liquidated damages. In exchange for control of all elements of the project (engineering, procurement, and construction), the EPC contractor retains cost and schedule risks during project delivery.

During the development phase of the Project, PSE selected a single EPC contractor to perform an initial front end engineering design (FEED) study to develop the plant to a conceptual level and provide budgetary pricing. PSE selected an international leader in LNG plant and tank engineering and construction, Chicago Bridge & Iron (CBI). CBI was selected from a field of seven candidate firms or teams to perform the FEED for the Project in January 2013, with the expectation that the EPC contract would most likely be executed with it based upon satisfactory completion of the FEED.

Due to the commercial uncertainty of this Project, CBI completed an initial FEED study, which culminated in an open book price review and firm bid price in fall 2013. Although there was no intention of executing on the firm price proposal at that time, the work product has been used to support continued commercial and regulatory development.

Since completing the first FEED study and pricing, CBI has been retained to continue value engineering and other plant design changes, as required, to support ongoing changes to the Project (TOTE direct loading line, permit preparation, developments in regulations, etc.). In the coming months, remaining design uncertainties will be resolved and the design of the plant will be frozen in order to allow CBI to re-bid all material and sub-contract elements of the Project and present a final bid for open book review at the appropriate time.

The target Project completion date of January 1, 2019 provides the opportunity to seek a competitive bid for the EPC contract. PSE is in discussions with Black & Veatch to perform a parallel FEED effort to develop pricing for a plant based upon the same design criteria as used for the existing CBI plant. Black & Veatch was a top contender for the original FEED contract

and has experience designing and building LNG facilities globally. Given the relatively small cost of a FEED study (approximately 0.5 percent of the plant cost) and the value to PSE of having competitive options for the EPC contract, this new schedule relief offers considerable value to the Project.

PSE will select an EPC contractor prior to final Board approval of the Project. Details about the selection decision and negotiated contract terms will be included in the Board package at that time.

During the construction period, the EPC contractor will maintain responsibility for the site and all sub-contractors working on the plant scope of work (pre-treatment, liquefaction, storage, send out, and balance of plant). PSE staff will be co-located onsite and provide overall project management, quality assurance of EPC work product, and project management of ancillary activities occurring in parallel on the Facility site (marine construction, Tacoma Power substation construction, and PSE-provided metering and odorization at the pipeline tie-in point). PSE will also manage and coordinate with TOTE for construction activities taking place at the TOTE terminal (direct LNG line to TOTE and the loading platform on the Blair waterway).

Work Performed by PSE

PSE will perform all design and construction work necessary to ready the site for the EPC contractor (demolition, soil improvement, and underground utilities), as well as all marine work (TOTE loading platform). PSE is choosing to perform these project elements because they are outside the value-added capability of an EPC contractor and can be more cost effectively managed by PSE using local resources.

The design team for the work performed by PSE includes the following firms:

- ***GeoEngineers (Geotechnical Design).*** GeoEngineers is a regional engineering firm that has worked on projects with PSE for over 25 years. GeoEngineers also has extensive experience working in the Port of Tacoma and other port facilities in the Northwest. Their scope of work includes developing ground improvement strategies to meet federal and local seismic design requirements, coordinating structural and foundation requirements with the EPC firm and providing contracting and quality assurance support for the execution of the ground improvement program.

- ***Moffatt & Nichol (Marine Design).*** Moffatt & Nichol is an international engineering firm specializing in infrastructure projects on coastlines, harbors, and rivers. Moffatt & Nichol has been involved in many of the LNG import/export terminal projects in North America

and has ongoing working relationships with the Port of Tacoma, GeoEngineers, and our proposed EPC contractor. Moffatt & Nichol also successfully participated in two prior projects for PSE (both the Upper and Lower Baker Dam Floating Surface Collectors). Moffatt & Nichol's scope of work includes development of a demolition plan for the existing timber pier and design of a new concrete pier on the Hylebos Waterway, the design of a new loading platform on the Blair Waterway, and marine construction oversight as necessary.

- ***Sanborn Head & Associates (Owner's Engineer).*** Sanborn Head is a regional engineering company located in New England with experience consulting on a number of LNG projects on the east coast and has worked on projects with CBI, PSE's proposed EPC contractor. Sanborn Head has been retained to: review EPC design work product, perform a peer review of GeoEngineers work product, assist with EPC contract preparation, and provide support on permitting and community outreach efforts, as needed.

- ***Jim Lewis LNG Expertise, LLC (LNG Consultant).*** PSE has retained Jim Lewis, a nationally recognized expert in the LNG industry, to work on select engineering tasks and regulatory discussions.

- ***Tacoma Power (Substation Design/Construction).*** Tacoma Power will design and construct the utility substation located on the site. It has already completed an initial preliminary power supply study and will be further engaged as the Project moves forward.

- ***Proposed Firms – Site Civil Design.*** PSE has received proposals from four local civil engineering firms to work on the design of the site storm water management system, as well as modifications to the fire water and sanitary sewer systems. The contract will be awarded as the Project progresses.

Construction work performed by PSE will be contracted to a minimum of two firms. The site soil improvement work can only be performed by a limited number of specialized contractors, some of which use proprietary soil improvement techniques. The design will be "performance-based" in nature, which allows contractors to bid different techniques to meet final design requirements. This Project is large enough to attract contractors from outside the Pacific Northwest, and both GeoEngineers and Sanborn Head will assist PSE in drawing interest from as many contractors as possible in order to ensure a competitive bid environment.

Site demolition and underground utility work can be performed by any number of general contractors in the Seattle-Tacoma area, and we expect the bidding environment to be quite competitive. Likewise, although marine construction is more specialized, there are a number of firms in the Pacific Northwest capable of performing the expected work. As the Project

develops, consideration will be given to combining various portions of the demolition, utility, and marine work under one general contractor to take advantage of any cost, schedule, and/or risk-mitigation benefits.

EPC Contract

CBI presented a proposed contract format as part of the FEED study deliverables in fall 2013. As noted above, PSE intends to engage Black & Veatch for an independent FEED study and contract proposal which would compete with the CBI proposal. After selecting the winning EPC proposal, the EPC contract will be executed and Notice to Proceed issued once permitting is complete and the Board approves a subsequent request. This is expected to occur in Q3 2015.

The following contract features are indicative of CBI's proposed contract form. These features may be amended during contract negotiations with either potential counterparty.

Pricing

The contract price is presented as a firm, fixed-price, lump sum that includes all engineering, materials, construction, overhead, contingency, and markup, subject to exclusions as follows:

- ***Key Material Escalation*** on nine percent nickel plate and aluminum plate: due to worldwide fluctuations of raw material prices, plating for the steel plate is quoted based upon pricing on the London Metals Exchange on a given day. PSE will see a material cost adjustment up or down based upon the actual price on the day of the material order. This has been accounted for as part of the contingency line item in the budget.

- ***Builder's Risk Insurance:*** PSE generally elects to procure this insurance, rather than the contractor. This cost is included in the budget.

- ***Soil removal or hazardous materials:*** The contract assumes that PSE provides a clean and ready site for construction, that no hazardous materials will be encountered during foundation construction and any spoils created during construction can be disposed of elsewhere onsite or removed by PSE. PSE is in the process of completing environmental sampling that will help characterize the soil that would be expected to be disturbed during construction activities. In the event that hazardous materials are found, the anticipated cost for disposal of these materials will be taken into account in the plant contingency, and/or accounted for in discussions with the Port of Tacoma as "historical contamination" that could perhaps be disposed of under the existing planned remediation program.

PSE will have an open book review of the EPC contractor's pricing package prior to execution. This allows PSE the ability to review all material and subcontractor bids, EPC contractor contingency (and methodology for determining it), and markup.

Payment

Payments will be made according to an agreed-upon milestone schedule based upon actual work completion.

Performance guarantees and liquidated damages

The contract will include performance guarantees and associated penalties for completion delay, liquefaction, vaporization, utilities consumption, power factor, LNG tank volume, truck loading rate, and marine loading rate.

Warranty: 12 months

Owner obligations: Requirements for PSE to provide utilities, consumables, feed stock, and plant personnel at times specified in the contract.

Attachments

Tacoma Future Fuels

EPC Contractor Selection Presentation

Jim Hogan

January 22, 2013

Procurement Overview

- PSE has completed the selection process for the Tacoma Future Fuels LNG plant project, which consists of designing and constructing a natural gas liquefaction and storage plant with

- A Request for Proposals was sent to 7 possible Engineering, Procurement, and Construction (EPC) firms:
  - Air Products
  - Black and Veach
  - Chart/Bechtel team
  - Chicago Bridge and Iron
  - Linde
  - Matrix
  - Skanska/Tetra Tech/Foster Wheeler team

Contractor Selection Process

- The EPC selection team consisted of:
  - Clay Riding, Director of LNG
  - Nathan Adams, Strategic Initiatives
  - Charley Daitch, Strategic Initiatives
  - Jim Hogan, Project Management
- 4 of the 7 firms submitted proposals based upon the RFP, however one proposal was for storage and send out only.
- The selection team met with all of the firms in Bellevue and/or at their offices.

Contractor Selection Process

- The three finalist firms were:

C B & I	• Most LNG experience in the US; has participated in half of the plants in North America • Expertise with respect to project management, tanks, regulations and exclusion zones • Prefers the open-book method of development that PSE is seeking • Extensive knowledge of DOT regulations that govern citing and design of LNG plants. • Competitive budgetary estimate. • In house construction services.
Black & Veatch	• Most experience with recent LNG peak shaving plants of this size (mainly in China) • Competitive budgetary estimate • Long history of working with PSE on other infrastructure projects • Would hire third party construction contractor • PSE would need to engage in a separate contract for the LNG storage tank
The Linde Group	• LNG bunkering and fueling experience in Europe • Marketing and distribution experience LNG and other cryogenics • One small U.S. LNG plant built to date; lack of understanding around U.S. regulations • PSE would need to engage in a separate contract for the LNG storage tank • Budgetary estimate was NOT competitive

Selection

- The team unanimously concluded that CB&I is the preferred EPC contractor based upon the following:
  - Most experience building comparable LNG facilities.
  - Since CB&I is also a leader in the design and construction of LNG tanks, we avoid having to deal separately with a tank manufacturer.
  - CB&I's open book contracting preference aligns with PSE contracting preferences.
  - CB&I demonstrated the most knowledge of regulatory issues and strategies to face regulatory hurdles associated with our project.
  - CB&I supports our design and construction schedule.

Conclusion

- The team recommends Chicago Bridge & Iron.
- The team recommends moving forward with a Time & Materials contract for Front End Engineering Design (FEED).
  - Not to Exceed $750,000
  - 20 week duration
  - Open book format
- Upon completion of FEED, PSE and CB&I will negotiate a firm priced lump sum contract for construction of the plant.
- A Project Action Change Tool Form formalizes this request.

PUGET SOUND ENERGY

PSE Project Phase Approval
Project Action Change Tool (PACT)

Project Name: Tacoma Future Fuels	**Date: 1/22/13**	☒ Approved ☐ Denied
Location: Tacoma	**WBS #: S.01731.03.02**	**Reason:**
Completed by: Jim Hogan	**Change Control #:**	
Title: Senior PM		

Note: If you require additional space for explanation, please attach to this sheet along with support materials.

Current Condition or Status:

PSE desires to enter into the liquefied natural gas (LNG) fuel market by constructing a gas liquefaction plant in the Port of Tacoma.

Proposed Change or Requested Action:

This PACT approves award of a contract for Front End Engineering and Design (FEED) to an Engineering, Procurement, and Construction (EPC) contractor. The FEED contract will support permitting and regulatory efforts, and will lead to a firm fixed price construction contract in approximately 20 weeks. The construction contract will be approved via a separate PACT document.

Justification or Impact of Delaying Action:

The FEED activity is on the critical path for this project, as several design decisions must be made in order to support the permitting timeline and firm-up facility cost estimates. Additionally, long lead materials and components must be specified and ordered in 2013 and are dependent on the FEED activities. Delay of this contract may construe a week by week delay of the project finish date.

Phase:	☒ **Planning Phase:**	☐ **Execution & Control Phase:**	☐ **Close-Out Phase:**
	☒ Scope Definition ☒ Selection of Engineering Firm & Budget ☐ Selection of Construction Firm & Budget	☐ Significant Deviations from Scope, Schedule or Budget	☐ Project Completion

Description: ***(include Cost, Schedule, Quality, Scope and Other Impact)***

This PACT requests permission to award the FEED contract to Chicago Bridge and Iron (CB&I).

The contract is T&M, NTE $750,000 with an expected 20 week duration.

A presentation outlining the selection process is attached to this document.

PUGET SOUND ENERGY

PSE Project Phase Approval
Project Action Change Tool (PACT)

Signature			
Submitted by: Jim Hogan		**Date:** 1/22/13	

Signatures
Clay Riding, Director of Natural Gas Services
Doug Loreen, Director of Project Delivery
Nathan Adams, Manager – Resource Acquisition

PUGET SOUND ENERGY

Exhibit M.

Gas Distribution System Improvements

Contents

Gas Distribution System Improvements

Expansion and Modifications to PSE's Gas Distribution System

Pipeline Project Description

Deliver natural gas to and receive gas from the Tacoma LNG Facility.

Required Service

- Provide natural gas distribution service to deliver gas to and receive gas from the Tacoma LNG Facility Plant located close to the north end of the Blair-Hylebos Peninsula at the intersection of Taylor Way and East 11th Street in the Port of Tacoma
- Firm delivery of up to 30,000 Dth per day (1,250,000 scfh) of natural gas for (when vaporization is not occurring)
- The ability to receive up to 66,000 Dth/day (2,750,000 scfh) into the system as a supply during colder weather events (full amount will be phased in)
    - The initial receipt capability, allowing natural gas to be delivered to gas retail customers from the Tacoma LNG Facility during peak, cold weather periods, will be 50,000 Dth/day (2,083,000 scfh)
    - Expanding the receipt capacity to 66,000 Dth/day (2,750,000 scfh) (or anything greater than 50,000 Dth/day) will require additional pipeline reinforcement of approximately 2.1 miles of 12-inch high pressure ("HP") pipeline along the existing Bonney Lake lateral (in parallel)

Distribution System Expansion Components

1. Install four miles of new 16-inch HP pipeline in the cities of Fife and Tacoma between Interstate 5 and the Facility site at the Port of Tacoma.

2. Install approximately one-mile of new 12-inch HP pipeline from the intersection of 112th St E and Golden Givens Road to 96th and Golden Givens Road in Pierce County.

3. Construct two new limit stations near:

    - I-5 in Lakewood; and
    - Golden Givens Road in Pierce County.

4. Modify and/or expand the Fredrickson gate station.

5. Modify the Clover Creek limit station.

6. Modify inlet piping to an existing pressure regulating station RS-2619 to allow 490 psig maximum allowable operating pressure (MAOP).

7. Increase pressure in approximately 5.2 miles of existing HP pipeline to a MAOP of 490 psi. The pressure increase requires authorization from the WUTC.

8. Obtain pressure authorization for the Golden Givens one-mile lateral for a MAOP of 500 psig. This will require authorization from the WUTC.

Items two through eight are collectively referred to as the "South Tacoma Distribution Upgrades."

Need Statement

This distribution system expansion project detailed below serves two purposes. The first purpose is supplying up to 30,000 Dth/day of natural gas to and receiving up to 66,000 Dth/day from the Tacoma LNG Facility.

In addition, existing low pressure issues in the Dupont, Steilacoom, University Place and Fircrest areas need to be addressed by increasing line pressure and installing a pressure regulating station (I-5 and Lakewood), these are the most pressing needs in this area. However, in the long-term, the South Tacoma Distribution Upgrades would move forward independent of the Tacoma LNG Facility.

Other than the four miles of 16-inch HP pipeline the South Tacoma Distribution Upgrades would eventually be required to provide reliable service in the Tacoma and surrounding areas (in the 10-20+ year planning horizon). However, the Tacoma LNG Facility requires that all of the South Tacoma Distribution Upgrades be undertaken before the LNG Facility commences

operations. The accelerated South Tacoma Distribution Upgrades are being funded as part of the Tacoma LNG Project; however, the pressure increase and the I-5 Lakewood pressure regulating station project would move forward in the near-term independent of the Tacoma LNG Facility and will, therefore, be funded through general distribution capital funding. Both components are being undertaken together due to similar timing and to optimize development resources.

Distribution Project Timing

The pressure increase and associated I-5 Lakewood pressure regulating station, which address current system issues, are needed in Fall 2017 to support retail customer growth in the area based on the current 10-year plan. The upgrades required to support the Tacoma LNG Facility (four miles of 16-inch HP and the remaining items of the South Tacoma Distribution Upgrades) are needed before 2018, to support commissioning of the Tacoma LNG Facility. All components will need to be completed at the same time to optimize development resources and implement the necessary pressure increase.

Port Of Tacoma LNG Project

The distribution pipeline planning team was asked to determine system upgrades needed to supply natural gas to and receive natural gas from the Tacoma LNG Facility in the Port of Tacoma.

To supply natural gas to the LNG Facility, many different pipeline/gate station/pressure regulating station configurations were explored. At the end of these studies, three separate feasible routes/solutions were identified. Over the course of project refinement, the location of the LNG Facility did not appreciably change, but many different delivery combinations were studied. These included current and future potential supply scenarios ranging from 10,000 Dth/day to 75,000 Dth/day. The current design accommodates up to 30,000 Dth/day.

With respect to receiving vaporized supply from the LNG Facility, various scenarios were evaluated, ranging from 30,000 Dth/day to 75,000 Dth/day. The current design accommodates 50,000 Dth/day (with some North Tacoma Gate Station pressure adjustments), which can be expanded to 66,000 Dth/day with the following system enhancements and adjustments:

- Reduce North Tacoma Gate Station operating pressure to an estimated 225 to 228 psig (depending on actual LNG Facility output pressure) to allow the 66,000 Dth/day to be delivered into the system on a 45 to 55 HDD cold weather day (average daily temperature of 10 degrees Fahrenheit).

- Install (based on current studies) approximately 2.1 miles of 12-inch HP pipeline along the start of the Bonney lake lateral. The Bonney Lake lateral is currently at capacity and lowering the North Tacoma Gate Station by 15 to 20 psig affects the pressure in this lateral and drops the pipeline below minimum pressure guidelines. To bring the pressures back up to the minimum levels, will require this 2.1 miles of reinforcement

    - It should be noted that the full 66,000 Dth/day is not projected to be needed until 2022/2023. As noted above, the Bonney Lake lateral is currently at capacity, so there will likely be reinforcements completed before 2022/2023 to accommodate customer growth in the area, and it's possible that the 2.1 miles will have already been added. Having said that, the Bonney Lake lateral is a seven mile six-inch diameter HP lateral and by design is being maintained at its minimum pressure guidelines. What this means is that in 2023, when this 66,000 Dth/day is required for system-wide peak-day resource purposes, a Bonney Lake reinforcement will likely be required in some configuration.

    - The current cost estimate for the 2.1 miles of 12-inch HP is estimated at $10,000,000 and is not included in the cost of system upgrades to be installed in 2017. However, the $10 million has been included as a future expenditure in the financial models.

Current System Requirements

In the current 2013 10-Year Plan, PSE GSI Gas Planning has documented the need for the Tacoma HP pressure increase in 2017, which is a part of the South Tacoma Distribution Upgrades. This pressure increase is needed for the low pressures that are occurring on the Dupont lateral that extends from I-5 and approximately SR512 to Joint Base Lewis McChord (JBLM) and the City of Dupont. Low pressures will also be experienced at the inlet to the Fircrest limit station ("LS") which feeds the Tacoma 150 psig system. Low pressures will also occur in the areas of University Place and Steilacoom. Both the Dupont LS and the Fircrest LS are projected to begin drooping below acceptable levels on the outlet side of the stations in 2017. It should also be noted that the load forecasting models do not have interruptible loads for JBLM.

The most cost effective solution to both of these problems is to complete a pressure increase from the existing Clover Creek LS located at 128th Street East and Waller Road East along Waller Road, west on 128th Street East, then northwest on Aqueduct Road and then west on 112st East until this road intersects I-5 around South Tacoma Way. This route is approximately five miles

long and is all existing 12-inch HP pipeline. This pipeline was originally designed and tested for 500 psig MAOP and has only one district regulator located along its length.

Once this pressure increase is completed, the new limit station installed, and the Frederickson gate station rebuilt, inlet pressure to the Dupont LS and to the Fircrest LS would increase significantly. This solution has been determined to be the least-cost solution. It should also be noted that the remaining South Tacoma Distribution Upgrades would also need to be completed in the long-term.

As mentioned the current timing for this project is 2017 construction based on the 2013 10-year plan. So, the need for this portion of the project is based on system modeling of current demand.

Fredrickson Gate Station

In order to accommodate increased demand, in the near term for the Tacoma LNG Facility and in the longer term for general system growth (this is one of the South Tacoma Distribution Upgrades and is also related to the pressure increase), PSE and Williams-Northwest Pipeline ("NWP") will need to expand the Fredrickson Gate Station. NWP will retire its existing heater and regulation (as per a now long-standing policy, NWP relegates regulation and over pressure protection to customers for any new stations or existing stations that are significantly modified). PSE will need to install new regulation, heater, odorization, RTUs and acquire land as needed. See NWP details below.

The Frederickson Gate Station design capacity is currently 2,690,000 scfh at a delivery pressure of 300 psig. The following is required to increase gate station capacity:

- Remove NWP's pressure regulators and relief valve. PSE will be responsible for pressure regulation and over pressure protection of its facilities. NWP facilities will have a 960 MAOP;
- Replace most of the facilities downstream of the regulators: 300-pound flanges, valves, headers, meter runs;
- The existing two 8-inch turbine meters could be reused to achieve a peak capacity of 4,316,000 scfh at a design delivery pressure of 475 psig.

Risks Associated with Distribution Upgrades

Risk	Cause	Probability	Magnitude	Mitigation
Firm route alignment	Routes are preliminary. Multiple railroad crossings and contamination exist	Medium	Low	Routes will be finalized after more detailed analysis, engineering, survey, soils testing and rights review are completed.
Permitting	Permitting conditions may require plan revisions	Medium	Medium	Considerations for method of construction, hours of work, restoration requirements
Environmental	Known contamination sites on the peninsula	High	Medium	Special material handling and HAZWOP training necessary
Restoration	Need secure alignment to determine impacts - major cost impacts (potentially)	Medium	High	Major cost impacts with unknown requirements Negotiate with jurisdictions
Regulatory	Pressure increase and pressure authorizations require approval from the Washington Utilities and Transportation Commission	Low	Low	Further project development and staff review process

Current Schedule

Plan Year	Description
2014	Preliminary pipeline and heater engineering, obtain new limit and gate station sites as needed, preliminary permit work, complete pressure authorization. Perform pressure increase
2015-2016	Complete designs for pipeline, heaters, limit and gate stations and continue permitting.
2016-2017	Obtain final permits and complete construction of all facilities by end of year 2017.

Resource Strategy

Engineering

The pipeline design and engineering will be performed internally by the Gas System Engineering. Consideration will be given to the procurement of engineering and other consulting services to supplement PSE staff in project delivery.

Construction

Project Services will utilize standard PSE contracting methodologies in order to provide best value for the Company. Consideration will be given to schedule and efficiencies. A competitive bidding process will occur.

Washington Utilities and Transportation Commission ("WUTC") Authorizations

PSE will seek, from the WUTC, authorization to operate (i) approximately 5.2 miles of existing HP pipeline at an MAOP of 490 psi (on the existing South Tacoma Supply #2 system), and (ii) approximately one mile of new 12-inch HP pipeline from the intersection of 112th Street East and Golden Givens Road to 96th and Golden Givens Road in Pierce County at an MAOP of 500 psi.

Permitting Assessment

For permitting strategy and risk assessment, please refer to the confidential attorney-client privileged memo from Steve Secrist to the Board of Directors, dated July 2, 2014.

PUGET SOUND ENERGY

Exhibit N.

Gas Peak Day Resource Need and Alternatives Analysis

Contents

Gas Peak Day Resource Need and Alternatives Analysis

This exhibit considers PSE's gas peak-day resource needs and the options available to meet such needs. PSE's resource requirements are determined in the Integrated Resource Plan ("IRP").

PSE conducted two separate analyses to compare the cost of resource alternatives. One analysis uses the Resource Planning department's planning software to simulate total portfolio costs by optimally selecting resources to serve demand. The second analysis uses discounted cash flows ("DCF") to evaluate the present value of the costs and revenues associated with owning and operating the Tacoma LNG Project. The DCF analysis also evaluates the cost of serving growing demand with a smaller peak shaving facility and long-haul interstate pipeline capacity.

A summary of the analyses and their results are discussed in detail below.

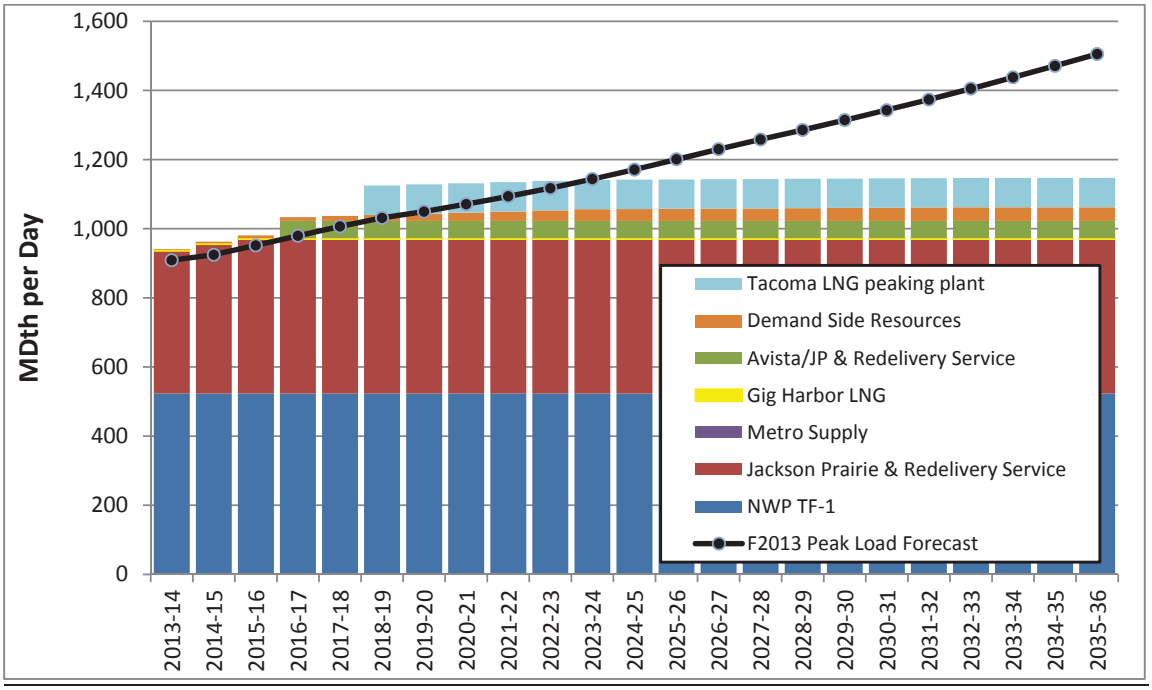
Resource Need

PSE's resource need is defined as the design peak demand of its retail sales customers less the existing portfolio resources available to meet such demand. Each IRP includes an updated long-term forecast of customer demand, based on existing customer count, use per customer trends, temperature response and economic conditions in the service area. Resource need is determined by comparing this forecast to existing resources, including firm pipeline capacity contracts, gas storage and other peaking resources that PSE controls and expects to maintain. Potential new resources, both demand- and supply-side, are then compared to determine the least-cost (adjusted for risk) resources to serve the future needs of the customers. New supply-side resources may be hypothetical or conceptual, and lack specific site-driven or detailed cost estimates, but inclusion of such resources is intended to guide the company toward further evaluation of promising alternatives.

Further analysis of specific resources with known contractual terms or more detailed cost estimates are performed to confirm the cost-effectiveness of the resource prior to an acquisition decision.

Below is the most recent load/resource balance (including the Tacoma LNG Project) presented graphically; the difference between the total projected customer demand and the resources is the resource need.

Figure 1. PSE's load/resource balance



Gas Sales Portfolio Load/Resource Balance

The firm peak-day supply resources and forecasted peak-day loads for the winter peak periods 2013 to 2014 through 2035 to 2036 are shown in Figure 2 below. The F2013 peak-load forecast, net of Demand Side Resources (DSR), is compared with the available supply resources. During the 2013 to 2014 winter period, PSE had 938 MDth/day of supply resources compared to a forecasted peak-load, net of DSR, of 907 MDth/day, resulting in a load/resources surplus of 32 MDth/day. As shown, with the existing and planned resources and F2013 load forecast, the gas sales portfolio has sufficient resources to supply loads until the winter of 2019 to 2020. Even a minor change in projected peak-day load or achieved DSR could result in a shortfall in the gas sales portfolio in winter 2018 to 2019.

Figure 2. Gas sales portfolio peak load/resource balance without Swarr (MDth/day) - 03/31/2014

				On-System					
Winter Period	NWP TF-1	Jackson Prairie & Redelivery Service	Avista/JP & Redelivery Service	Swarr	Metro Supply	Gig Harbor LNG	Total Supply Side Resources	F2013 Load Forecast net of DSR	Load Resource Balance net of DSR
2013-14	523.1	412.1		0	0.5	2.5	938	907	32
2014-15	523.1	432.1		0	0	2.5	958	920	38
2015-16	523.1	447.1		0	0	2.5	973	944	29
2016-17	523.1	447.1	50.0	0	0	2.5	1,023	968	54
2017-18	523.1	447.1	50.0	0	0	2.5	1,023	992	30
2018-19	523.1	447.1	50.0	0	0	2.5	1,023	1,014	9
2019-20	523.1	447.1	50.0	0	0	2.5	1,023	1,029	-6
2020-21	523.1	447.1	50.0	0	0	2.5	1,023	1,047	-25
2021-22	523.1	447.1	50.0	0	0	2.5	1,023	1,067	-44
2022-23	523.1	447.1	50.0	0	0	2.5	1,023	1,087	-64
2023-24	523.1	447.1	50.0	0	0	2.5	1,023	1,110	-88
2024-25	523.1	447.1	50.0	0	0	2.5	1,023	1,137	-114
2025-26	523.1	447.1	50.0	0	0	2.5	1,023	1,166	-143
2026-27	523.1	447.1	50.0	0	0	2.5	1,023	1,195	-172
2027-28	523.1	447.1	50.0	0	0	2.5	1,023	1,222	-199
2028-29	523.1	447.1	50.0	0	0	2.5	1,023	1,249	-226
2029-30	523.1	447.1	50.0	0	0	2.5	1,023	1,277	-255
2030-31	523.1	447.1	50.0	0	0	2.5	1,023	1,305	-282
2031-32	523.1	447.1	50.0	0	0	2.5	1,023	1,335	-312
2032-33	523.1	447.1	50.0	0	0	2.5	1,023	1,366	-343
2033-34	523.1	447.1	50.0	0	0	2.5	1,023	1,398	-376
2034-35	523.1	447.1	50.0	0	0	2.5	1,023	1,432	-409
2035-36	523.1	447.1	50.0	0	0	2.5	1,023	1,466	-443

Notes:
1. Annual peak loads are assumed to be in December of each year

The largest supply resource is firm pipeline capacity on Williams-Northwest Pipeline ("NWP") with a total of 523 MDth/day of capacity to PSE's service territory. This consists of capacity from British Columbia originating at Sumas (261.5 MDth/day) and a similar amount of capacity from Alberta and the Rockies (261.6 MDth/day).

PSE also owns and contracts for Jackson Prairie natural gas storage service, which is delivered to PSE's service territory via firm NWP redelivery pipeline capacity; Jackson Prairie provides peak-supply resources of 447 MDth/day. As reflected in the table, some of the Jackson Prairie capacity has been reserved for PSE's power portfolio through the 2014 to 2015 winter periods. The full capacity will be returned to the natural gas retail sales portfolio in 2015 to 2016.

PSE controls two small, on-system supply resources: an LNG satellite peaking facility located near Gig Harbor with vaporization capacity of 2.5 MDth/day that serves peak-loads in the Gig

Harbor area; and biogas (approximately 0.5 MDth/day) purchased from King County's waste water treatment plant in Renton. The biogas agreement is expected to be terminated prior to the winter of 2014 to 2015.

PSE has entered into an agreement with Avista Utilities for a long-term lease of 50 MDth/day of withdrawal capacity and associated storage capacity from Avista's portion of Jackson Prairie. This agreement will begin in April 2016 and extends through March 31, 2046. This new Jackson Prairie storage supply will be delivered to PSE's service territory with NWP storage redelivery pipeline capacity.

Description of Resource Alternatives Considered

Past IRPs have found that a generic, regional LNG peaking resource may be a cost-effective addition to the company's portfolio. Because there were other lesser-cost resources available at the time of those prior studies, the regional LNG peaking plant was not selected as the least-cost solution. However, the most recent IRP evaluated the Tacoma LNG Project and selected it as a preferred resource in essentially all cases.

As part of the ongoing analysis of the prudency of the Tacoma LNG Project, PSE is considering the following resource options:

Swarr Propane-Air Facility Upgrade. The Swarr propane-air facility has been temporarily removed from service while it awaits upgrades that would improve environmental safety and operational reliability and efficiency. When upgraded, Swarr's capacity will be 30 MDth/day. Before the Swarr upgrade begins, PSE will evaluate the overall risk associated with operating Swarr. While cost estimates are not yet fully developed, project costs are not expected to exceed $10 million; the upgraded facilities could be available as early as 2016.

Tacoma LNG Project. The peaking portion of the proposed Tacoma LNG Project is designed to provide 85 MDth/day of firm delivered gas supply and assumed to be available for the 2018 to 2019 heating season.

Mist Storage and NWP Interstate Pipeline Capacity. PSE has been exploring the possibility of participating in NW Natural Gas Company's proposed expansion of the Mist storage project in northwest Oregon. Recent discussions considered a project that was proposed to be completed and in-service as early as 2017. PSE contemplated service with withdrawal capacity of 50 MDth/day to serve PSE's retail natural gas customers, with firm delivery into NWP via the Kelso-Beaver Pipeline. After analysis of both internal estimates and external consulting studies, NW

Natural provided a detailed cost-estimate of the proposed storage project, including 20-year annualized costs.

In order for the Mist storage service to be considered a firm resource, PSE would also need to acquire additional firm Northwest Pipeline capacity from the Kelso-Beaver Pipeline interconnect with NWP to PSE's distribution system (south to north). Incremental, discounted storage redelivery service is not currently available, so PSE is assuming that NWP capacity would have to be acquired through an NWP expansion project, and carry cost equal to or greater than existing rates.

NWP and Westcoast Energy Pipeline Capacity and Gas Supply. Another resource alternative is PSE acquiring 85 MDth/day of firm NWP pipeline capacity from the Sumas, Washington interconnect with Westcoast Energy's pipeline. Since NWP is generally fully-contracted on a long-term basis, PSE is assuming that such service will require an NWP expansion of its interstate system. PSE has received order-of-magnitude estimates from NWP and has seen the results of recent expansion open seasons, which indicate that expansion pipeline capacity will cost more than existing pipeline capacity. Consistent with PSE's existing supply diversity strategy, PSE would also acquire 43 MDth/day (or 50%) of firm capacity on the Westcoast Energy T-South system. Of course, pipeline capacity does not include a supply resource, so PSE would likely have to purchase a call option or similar product to ensure gas supply is available during peak demand. For purposes of this evaluation, PSE is simply assuming that gas supply will be available at Sumas at a daily index price, and does not include the cost of a peak-day gas supply resource.

SENDOUT Model Portfolio Analysis of Resource Alternatives

PSE's Resource Planning department evaluated the alternatives described above with the SENDOUT model using the existing gas sales portfolio database from the 2013 IRP.

The SENDOUT model considered four alternatives using the following input data:

1) the Tacoma LNG Project cost and performance inputs;

2) the cost and performance inputs for the proposed Mist storage expansion which were updated based on revised data (as of Oct. 1, 2013);

3) the load forecast was updated to the F2013 forecast net of DSR; and

4) the gas price forecast was updated using the forward price marks as of 2/28/2014 (for years 2015 to 2018) and the Wood Mackenzie Fall 2013 Long Term View (2019 to 2035). The time horizon of the SENDOUT analysis was extended from the 20 years (2014 to 2033) used in the IRP to 2043 to include the full 25 years of depreciable life of the Tacoma LNG Facility.

The SENDOUT Software Model

PSE uses the SENDOUT® software model from Ventyx for long-term gas supply portfolio planning. SENDOUT is a widely used model that helps identify the long-term least-cost combination of resources to meet stated loads. The SENDOUT model is used by other regional utilities including Avista, Cascade Natural Gas, and Fortis B.C. The current version of SENDOUT used by PSE (version 12.5.5) incorporates Monte Carlo capabilities, allowing consideration of uncertainties about future prices and weather-driven loads.

SENDOUT is an integrated tool set for gas resource analysis that models the gas supply network and the portfolio of supply, storage, transportation, and demand-side resources (DSR) to meet demand requirements. The Monte Carlo capabilities allow simulation of uncertainties regarding weather and commodity prices. The SENDOUT portfolio is run over many draws (each with different underlining weather and commodity price assumptions) to provide a probabilistic view of the optimal portfolio.

SENDOUT can operate in two different modes: It can be used to determine the optimal set of resources (energy efficiency, supply, storage and transport) to minimize costs over a defined planning period; or, specific portfolios can be defined, and the model will determine the least-cost dispatch to meet demand requirements for each portfolio. SENDOUT solves both problems using a linear program (LP). It determines how a portfolio of resources (energy efficiency, supply, storage, and transport), including associated costs and contractual or physical constraints, should be added and dispatched to meet demand in a least-cost fashion. By using an LP, SENDOUT considers thousands of variables and evaluates tens of thousands of possible solutions in order to generate the least-cost solution. A standard dispatch considers the capacity level of all resources as given, and therefore performs a variable-cost dispatch. A resource-mix dispatch can look at a range of potential capacity and size resources, including their fixed and variable costs.

Summary Results

The deterministic runs use the input load forecast and market gas prices to develop a single set of resources which supply the loads at the least cost. The stochastic (Monte Carlo) analyses include monthly variations or "draws" of input data. Two stochastic runs were made for each case; one run with variations in loads only and the other case with variations in both loads and gas prices. Each stochastic run produces 100 sets of resources that are the least-cost in a particular draw. The numbers included in the table below are the average of 100 draws.

In general, the results for the updated analyses are similar to those from PSE's 2013 IRP. The Tacoma LNG Facility is selected in essentially all cases. The Swarr upgrade project and expansion of NWP between Sumas and PSE's service territory are selected in the years beyond 2021. The Mist storage expansion is only selected in a small number of the stochastic draws. Based on this analysis, PSE concludes that the Tacoma LNG Facility is a least-cost resource option.

Summary of SENDOUT Results

Figure 3. Peak capacity resources added by winter 2021 to 2022 – MDth/day

	Deterministic	Load Only Stochastic Inputs	Load and Price Stochastic Inputs
Swarr	0	1	3
Tacoma LNG Facility	85	85	78
Mist Expansion	0	0	0
NWP + Westcoast	0	3	3
Total	85	89	84

Peak-Day Resource Financial Analysis

This Section considers the costs of the Tacoma LNG Project to PSE gas customers by examining the revenue requirement of the Facility and the supporting gas distribution upgrades along with the revenue contribution from TOTE and other long-term plant customer(s). For the purpose of this analysis other long-term customer(s) are referred to as 'Marketer'. PSE has targeted BP or Shell for this role. Ultimately this capacity could be contracted by one or more parties who intend to market the fuel or use it for their own consumption.

Gas Peak-Day Resource Capacity

The total peak-day capacity of the Tacoma LNG Facility is 85 MDth/day. This includes 66 MDth/day of gas injection from the Facility and 19 MDth/day of diverted gas that can be delivered to any PSE gate station along NWP.

Plant Injection Capacity. The Tacoma LNG Facility will be equipped with vaporizers capable of gasifying and injecting natural gas into PSE's distribution system at a rate 66 MDth/day. Natural gas will be injected directly into PSE's high pressure gas system at the Facility. To supply the vaporized gas, PSE will reserve approximately 4.9 million gallons (or 416 MDth) of the onsite storage tank capacity. This storage will allow the facility to supply 66 MDth/day for more than six days.

Diverted Gas. PSE will procure 19 MDth/day of year-round pipeline capacity for the plant's LNG fuel customers (or in the case of tolling LNG customer, the customer will be required to provide firm natural gas supply to PSE's distribution system). Since the LNG Facility will not liquefy natural gas at the same time it is vaporizing for injection back into the system, PSE will utilize this pipeline capacity and natural gas supply as an additional peaking resource. In order to continue to serve the other LNG customers, PSE will hold 1.4 million gallons (or 122 MDth) of additional tank capacity and serve the customers from this capacity during a vaporization event. This allows PSE to divert the 19 MDth/day allocated to retail customers to peak system use. Note that the LNG customers will be paying for the natural gas and related transportation capacity and will be receiving uninterrupted LNG service. ***Figure 4*** summarizes the peak day resource capacity of the Tacoma LNG Facility.

Figure 4. Peaking resource plant capacity

		MDth	LNG Gallons
	Injection Capacity		
[1]	Dailey Plant Injection Capacity	66	772,807
[2]	Tank Capacity for Plant Injection (6+ Day Period)	416	4,876,126
	Diverted Gas Capacity		
[3]	Retail LNG Customers Dailey Liquefaction	19	225,667
[4]	Tank Capacity for Diverted Gas (6+ Day Period)	122	1,423,874
[5]	**Other**		
[6]	Additional Liquefaction for Gig Harbor	23	270,000
[7]	**Total Peak Day Capacity ([1]+[3])**	85	998,473
[8]	**Total LNG Tank Storage Capacity ([2]+[4])**	561	6,300,000
[9]	**Dailey Liquefaction Capacity ([2]+[4]+[6])/ [270 Days]**	2	24,333

Optimizing Peak Resource Capacity. The tank will be filled over a 270-day period using PSE's reserved liquefaction capacity. During the winter months, PSE's liquefaction capacity can be sold on a short-term basis for the benefit of PSE gas customers. Short-term LNG contracts may command a higher price than long-term contracts. However, even at the long-term contract pricing, PSE's liquefaction capacity over the winter months could be monetized for a benefit of several millions dollars for PSE's customers.

In the event that this resource is not fully called upon over the course of a given winter season, PSE can sell unutilized liquefaction capacity under short-term contracts for the following non-winter period (up to 270 days). This also could add an additional benefit of several million dollars to PSE's core gas customers. The value associated with selling such underutilized LNG capacity is not considered in this analysis.

Revenue Requirement for Tacoma LNG Facility

The revenue requirement for the Tacoma LNG Project consists of Facility costs (return on and of the asset), fixed O&M costs and variable O&M costs related to the Tacoma LNG Facility as well as the cost of the distribution system upgrades. The specific costs in these categories and the assumptions that support them are described in detail in ***Exhibit O***. The cost of the peaking resource to PSE gas customers will be offset by revenue contributions from TOTE and Marketer.

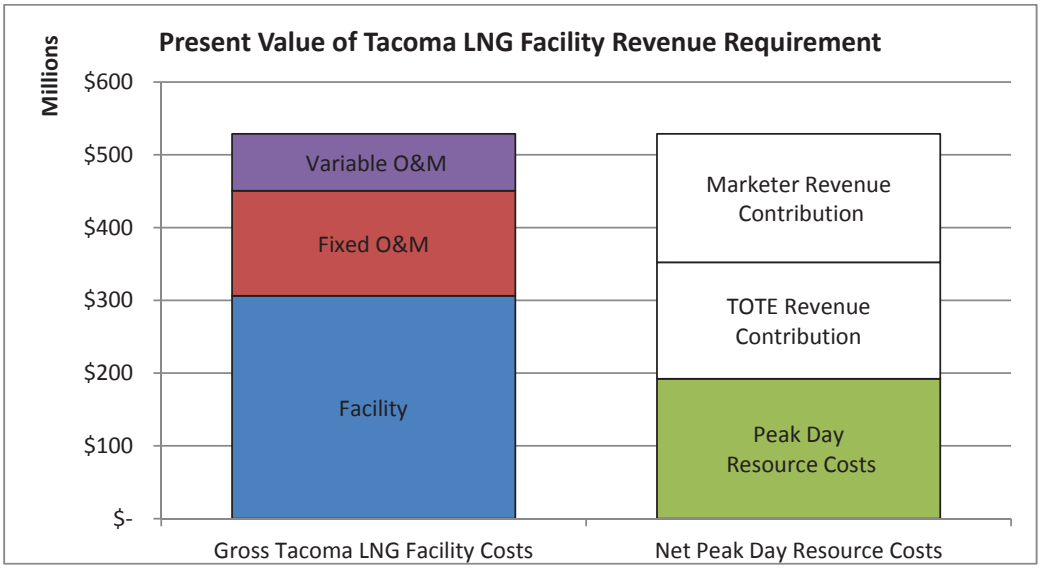
This analysis summarizes the costs and revenues over the 25-year (2019 through 2044) depreciable life of the Project by taking the present value of these costs/revenues. The annual costs for each year are discounted using PSE's after-tax cost of capital of 6.69 percent and summed to reflect 2014 present value. Since revenue taxes will be applied to all revenues generated from PSE gas customers at the same rate, taxes are not considered in this analysis. In considering all scenarios, revenue streams have not been grossed up for state utility tax.

Tacoma LNG Facility Revenue Requirement. The present value of the 25-year revenue requirement of the Tacoma LNG Facility is shown in ***Figure 5***. The first column considers all incremental revenues needed to operate the Tacoma LNG Facility. The entire cost for the facility over the 25-year depreciable life is approximately $529 million.

The second column considers the revenue contributions from TOTE and Marketer. The revenue contributions considered in ***Figure 5*** include only the revenues from TOTE and Marketer that are needed to cover the incremental cost of owning and operating the plant based on the 25-year depreciable life. They do not include additional revenues collected from TOTE and the Marketer related to allocated A&G and premiums for a shorter-term contract. These revenues are considered in ***Figure 6*** as they are additional to incremental revenues needed to own and

operate the Facility. After the revenue contributions, the cost for the Facility to provide 85 MDth/day of supply is estimated to be $192 million; shown as the peak-day resource costs in ***Figure 5***.

Figure 5. Present value of Tacoma LNG revenue requirement

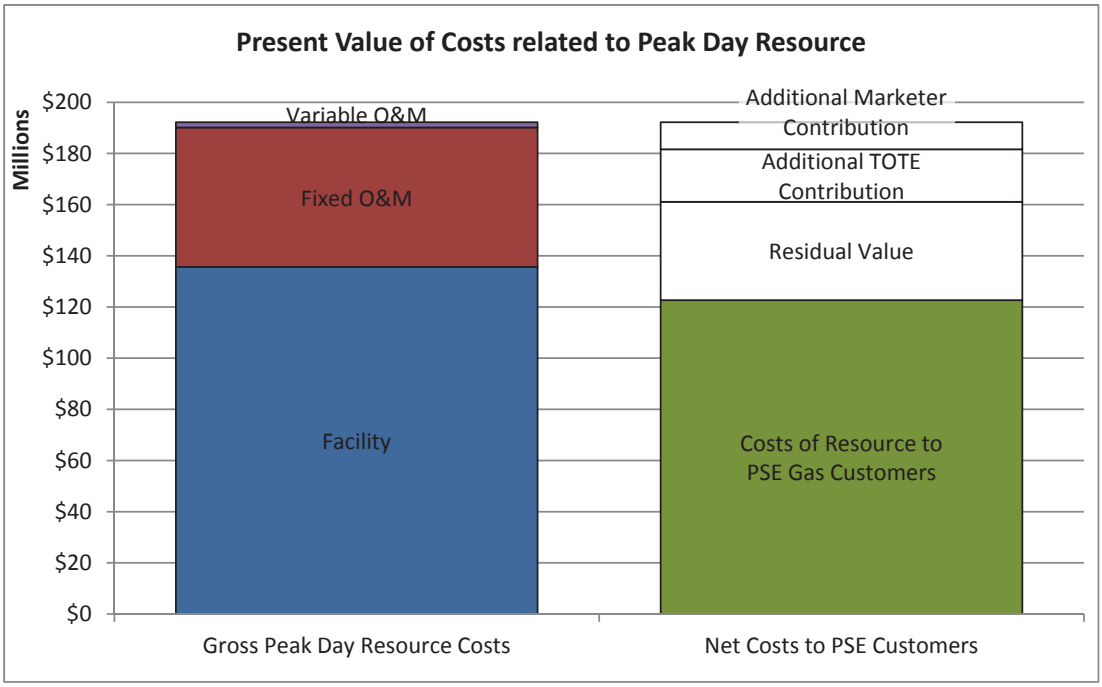


Facility Costs Borne by PSE Gas Customers. The present value of the revenue requirement to PSE gas customers is shown in ***Figure 6***. The first column shows the break out of the estimated $192 million peak-day resource costs by cost components. The second column considers the present value of the additional revenues from TOTE and the Marketer beyond the incremental revenues needed to own and operate the plant as well as the residual value of the plant. The additional revenue contributions include a contribution to PSE's administrative and general costs (A&G costs) as well as a premium for entering into a contract that is less than the depreciable life of the Facility. These components are discussed in more detail in ***Exhibit O***. The costs of the peaking resource are netted against the additional revenue contributions and residual value resulting in a $123 million present value cost to PSE gas customers.

The analysis in this Exhibit assumes that Marketer takes on a long term tolling agreement of 25 years. PSE would not collect a short term premium for the 25 year contract so the only additional revenue contribution is the result of A&G costs. If the Marketer takes an ownership position in the Project, PSE would still collect a small A&G costs from the Marketer (likely equal to 10% of O&M costs attributed to the Marketer). PSE estimates that ownership participation

from the Marketer would reduce the additional revenue contribution by $7.6 million on a present values basis (from $10.5 million to $2.9 million), resulting in a 6% increase in the costs of the resource to PSE gas customers[1] (the green block in figure below). This small increase does not affect the outcome of the analysis as the Tacoma LNG Project is still the least cost resource in all scenarios (see the following section, ***Comparison to Alterative Resources***).

Figure 6. Present value of Facility costs to PSE gas customers



The components of the calculation shown in ***Figure 6*** are described below:

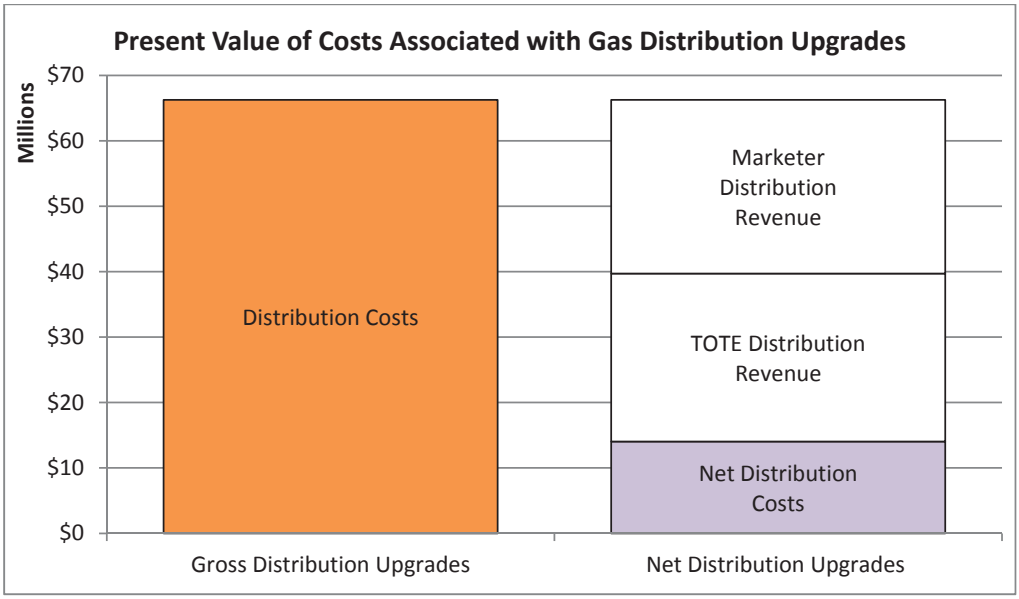
Gross Peak-Day Resource Costs	The total incremental revenues needed to own and operate the Tacoma LNG Facility less the incremental revenue contribution for TOTE and Marketer as shown in ***Figure 5***. This is equivalent to the incremental revenues needed to own and operate the Tacoma LNG facility over the 25-year depreciable life.

[1] While the cost of the resource would increase slightly under a joint ownership scenario, the risk to PSE gas customers would be reduced. As an owner, the Marketer would share in costs risk associated with construction and operations of the Facility.

Net Costs to PSE Customers	The net costs are equal to the gross peak-day resource costs less the additional revenue contributions for TOTE and Marketer and the residual value of the peak-day resource at the end of 25 years. This reflects the actual costs of the Facility to PSE's gas customers.
Additional Marketer and TOTE Contributions	***Figure 5*** considers the revenue contribution from TOTE and Marketer needed for the incremental costs to own and operate the Tacoma LNG Facility. However, TOTE and Marketer will contribute additional revenues beyond the incremental cost-of-service revenue requirement based on a 25-year depreciable life. These addition revenues are the shown in ***Figure 6***.
Residual Value	The residual value considers the present value of the peaking resource assuming the plant continues to operate from years 26 through 50. The Facility will be fully depreciated at the end of year 25. Therefore, PSE core gas customers will only pay for the operating costs and any sustaining capital in years 26 to 50. The residual value is calculated by considering the cost differential between operating the facility in years 26 to 50 and pipeline capacity in that same time period, less a $25million (in 2014 $'s) capital infusion in year 26 to sustain continued operations. The operating life of the Facility is expected to be 50 years (the depreciable life is limited by the primary term of the Port of Tacoma lease). Furthermore, LNG plants have a long history of reliable operations and many have remained in service for up to 50 years with the major components of original equipment intact. Therefore, $25 million of sustaining capital is considered to be a conservative estimate.
Cost of Resource to PSE Gas Customers	This is the net cost of the Tacoma LNG Facility that will be borne by PSE gas customers.

Distribution System Upgrades. The final cost component of the Project is the distribution system upgrades necessary to support the Facility. These upgrades, and their costs, are discussed in detail in ***Exhibit M***. This analysis considers the incremental costs to the gas system and the incremental revenues from TOTE and Marketer for transportation across the distribution system. The gross revenue costs and the incremental revenues are shown in ***Figure 7***.

Figure 7. Present value of gas distribution system upgrade costs



The first column of ***Figure 7*** shows the present value of the incremental costs associated with the gas distribution system upgrades. The second column shows the effect of the incremental gas distribution system revenues from TOTE and Marketer.

The total present value PSE natural gas retail customer cost for the Project ($137 million) is equal to the sum of the present value of the net Facility costs and the net distribution upgrade costs ($123 million and $14 million, respectively).

Comparison to Alternative Resources

Incremental Pipeline Capacity

PSE currently meets approximately half its peak-day gas need through long-haul pipeline capacity and most of the other half through storage redelivery pipeline capacity from the Jackson Prairie underground storage facility. Long-haul pipeline capacity is paid for year-round, but as a peaking resource would be utilized only a few days of the year. Furthermore, pipeline capacity, by itself, does not come with natural gas supply, so additional peak-day natural gas supply arrangements must be made. Nevertheless, due to limited alternatives, it is one of the options that must be considered. Storage redelivery pipeline capacity has historically been significantly cheaper than long-haul pipeline capacity and, therefore, has made acquisition of regional underground storage attractive. However, there is no discounted redelivery service

available, so regional underground storage acquisitions would have to be supported by an interstate pipeline expansion, which is assumed to be equal to long-haul pipeline costs.

Pipeline Assumptions. The assumptions used to create the 25-year revenues requirement for additional pipeline capacity are shown in ***Figure 8***.

Figure 8. Pipeline Assumptions

Northwest Pipeline Cost ($/Dth/day)	$ 0.50
Westcoast Pipeline ($/Dth/day)	$ 0.40
Westcoast Capacity %	50%
Pipeline escalator (annual)	1.25%
Summer/Winter Gas Differential ($/Dth)	$ 0.50

The assumptions are described in more detail below:

NWP Costs	Northwest Pipeline (NWP) year round firm shipping costs. The cost is assumed to be 2014 costs and escalated annually, and assumes the pipeline has to be expanded for the volumes under consideration (recent expansion quotes from NWP have been as high as $0.60, so the $0.50 is considered conservative).
Westcoast Pipeline	Spectra's Westcoast pipeline costs. This pipeline delivers gas from producing fields and processing plants in northern B.C. and delivers it to NWP near Sumas, WA. The cost is a year 2014 estimate and escalates annually.
Westcoast Capacity %	PSE's pipeline acquisition strategy includes purchasing at least 50 percent of its NWP receipt point capacity at Sumas upstream on Westcoast. For example, if PSE were to procure 100 MDth/Day of NWP capacity with a receipt of Sumas, it would also procure 50 MDth/day of Westcoast capacity.
Pipeline Escalator	The annual increase in pipeline tariff rates (commensurate with PSE's IRP analysis).
Summer/Winter Gas Differential	The price differential between summer and winter gas purchases. The supply that is stored at the Tacoma LNG Project will be purchased over the non-winter months and the analysis reflects that benefit for the LNG project. Conversely, the pipeline alternative does not enjoy that benefit and reflects winter gas costs.

Timing of Supply. The Tacoma LNG Facility is expected to be operational in winter 2018 to 2019. PSE typically buys pipeline capacity in large blocks, however this analysis conservatively assumes that capacity is purchased in two smaller blocks: 69 MDth/day in 2020 and the remaining 16 MDth/day capacity in 2023, such that the total capacity modeled is equal to the capacity of the Project.

Revenue Requirement Results. The revenue requirement for pipeline capacity was calculated over the life of the Project using the inputs above. The values were discounted at PSE's after tax cost of capital so that the 2014 present value can be compared with the present value costs of the Tacoma LNG Project.

The results of the analysis are shown in ***Figure 9.*** The cost of addition pipeline capacity, in present value terms, is $78 million greater than the Tacoma LNG Project.

Figure 9. Results of Pipeline Capacity Alternative ($ millions)

Pipeline Capacity Alternative	
PV of Northwest Pipeline Costs	$153
PV of Westcoast Pipeline Costs	$61
PV of Additional Gas Costs[1]	$0.5
TOTAL	$215
Present Value of Tacoma LNG Project	$137
Cost Saving to PSE Customers	$78

[1] Pipeline costs do not include the cost of procuring a peak-day supply of gas (call option or similar product), as SENDOUT simply assumes the gas is available at some daily price.

Standalone LNG Facility

The costs of the Tacoma LNG Project were also compared to those of a small standalone LNG peak shaving facility. This standalone facility has a liquefaction, storage and vaporization capacity equal to that of the peak-day resource component of the Tacoma LNG Project (as described in ***Figure 10***). However, the standalone peaking resource does not serve LNG fuel customers and, therefore, does not benefit from the economies of scale of the Tacoma LNG Project.

Key Assumptions. There were two key cost savings associated with this smaller facility. The standalone facility was assumed to be sited in the Sumner area with a land purchase cost of $6.5 million (approximately the same costs of three years of the Port of Tacoma lease), and the

required gas system upgrades were estimated to be approximately $4 million, which is an order of magnitude less than the Project's distribution system upgrades.

The capital costs of the standalone facility were estimated by CBI at $120 million. With the addition of development costs (similar to the Tacoma Project), land costs, contingency and sales tax, the all-in cost of the standalone facility is estimated to be $174 million.

Results.The results of the analysis (shown in ***Figure 10***) clearly demonstrate the value of developing the Tacoma LNG Project with the economies of scale that are achievable through serving LNG fuel customers:

Figure 10. Standalone LNG Facility and Tacoma LNG Project cost comparison

Project Costs	Standalone LNG Facility	Tacoma LNG Cost to Gas Customers	Tacoma LNG Project Total	TOTE Contribution	Marketer Contribution
Fixed Facility Costs	$183	$136	$306	($79)	($92)
Fixed Operational Costs	$67	$54	$144	($42)	($48)
Variable Operational Costs	$5	$2	$78	($39)	($37)
Net Distribution Costs	$6	$14	$66	($26)	($27)
Total Project Costs	$262	$206	$595		
Project Value					
Residual Value	($33)	($38)			
Addition Contributions Cust.		($31)			
TOTAL Cost to PSE Customers	**$228**	**$137**			

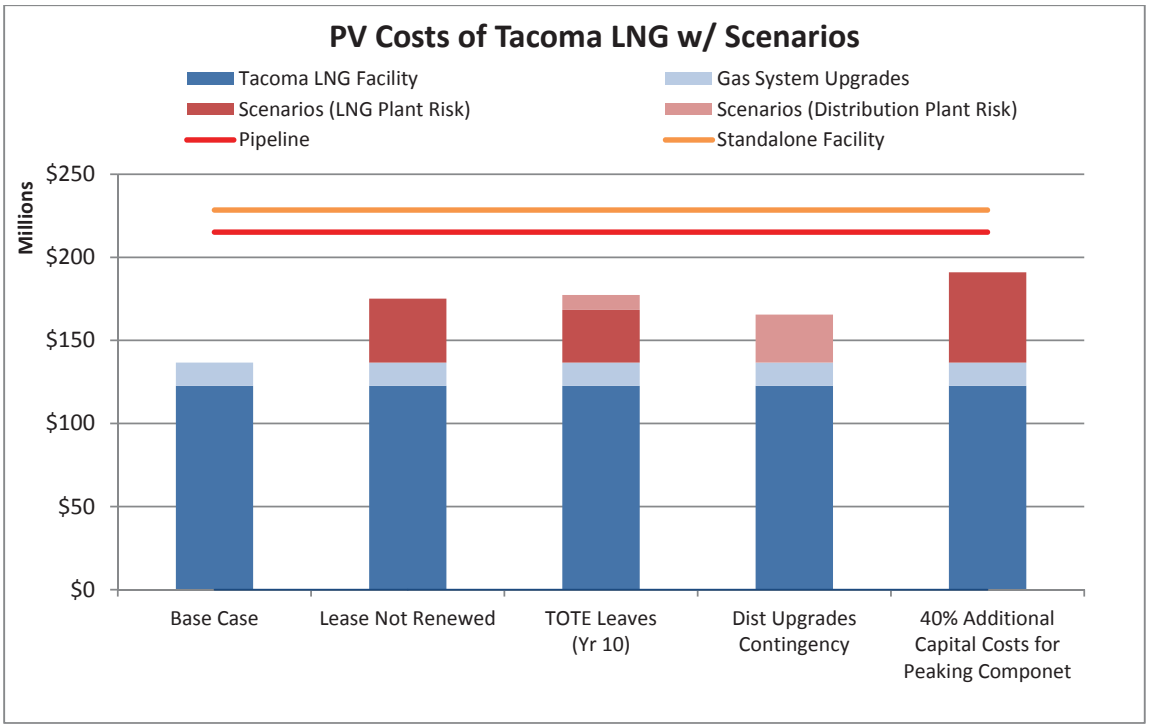
Due to the much greater liquefaction capacity and higher lease costs, Tacoma LNG Project has a much higher level of full-cycle costs than the standalone LNG facility ($595 million as compared to $262 million). However, the revenue contributions from TOTE and Marketer dramatically reduce the cost of the Tacoma LNG Project to PSE natural gas retail customers. Note that each row in the second column of ***Figure 10*** is equal to the sum of columns three through five. This represents the net revenue requirement attributable to PSE's natural gas retail customers to support the Project.

Even before considering the short-term contract premium and allocated A&G paid by LNG customers, the Tacoma LNG Project is substantially cheaper than the standalone facility. After considering those benefits, the total present value revenue requirement attributable to PSE customers is $228 million for the standalone LNG facility and $137 million for the Tacoma LNG Project.

Results and Sensitivities

The present value costs of the Tacoma LNG Project (discussed in the Revenue Requirement section above) are compared to the costs of additional pipeline capacity and the costs of a standalone LNG facility in ***Figure 11***. In this analysis, each red bar represents a different scenario that could raise the costs of the Facility or the distribution upgrades to PSE customers. Clearly, the Tacoma LNG Project brings significant value under any one of these scenarios.

Figure 11. Comparison of alternatives with sensitivities

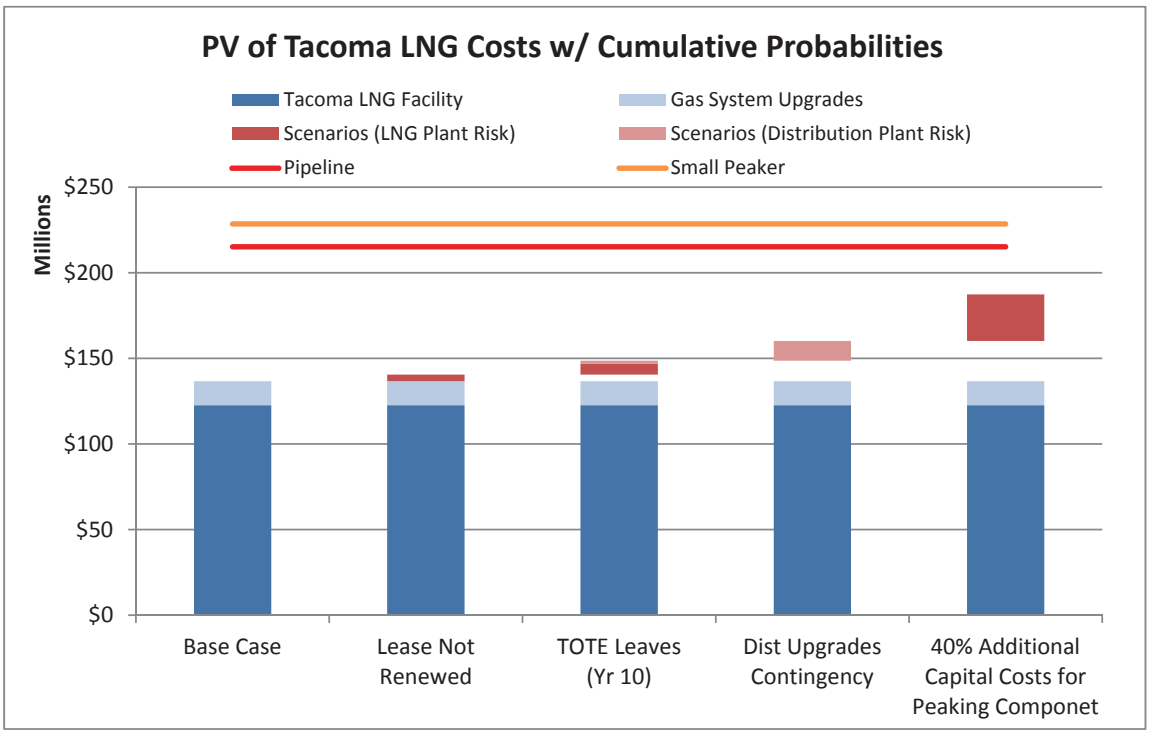


The scenarios in ***Figure 11*** are:

Base Case	The base case represents the cost to PSE gas customers discussed in the ***Peak Day Resource Financial Analysis*** section of this exhibit.
Lease Not Renewed	If the lease cannot be renewed at the Port of Tacoma, then the residual value of the Tacoma LNG project in year 26 becomes zero. The loss of that value is shown in this scenario. PSE anticipates that the probability of this happening is less than 5% percent, since PSE will have the right to extend if a majority of product leaving the facility is serving the marine market. However, even if this requirement is not met, the Port of Tacoma will face significant pressure to renew the lease if the Facility continues to serve PSE gas customers, and PSE agrees to pay then-current market value to the Port for the lease.
TOTE Leaves (Yr 10)	This scenario considers TOTE leaving in year 10 and PSE not being able to resell any of TOTE's volumes. In this scenario there is no additional revenue contribution after year 10. The assumed probability for this scenario is less than 10 percent. TOTE will have operated on LNG for 10 years, and it is unlikely that a competitor could beat PSE's pricing by year 11 of the facility, given the TOTE's renewal pricing. Even if TOTE were to leave, it is likely that the market will have fully developed by 2030, and PSE would be able to generate additional revenues through sales to another customer.
Distribution Upgrades Contingency	This scenario assumes that the costs of the gas system upgrades come in at 10 percent greater than the contingency case. The assumed probability of this scenario occurring is 20 percent.
40% Additional Capital Costs for Peaking Component	This scenario assumes that the facility costs shown in ***Figure 6*** increase by 40 percent. It is highly unlikely that costs for construction come in at 40 percent above expected costs considering a conservative level of contingency. However, if costs come in moderately higher, PSE may not be able to sufficiently raise pricing for TOTE and Marketer, if long-term contract pricing has already been contractually established. Therefore, a 25 percent increase in total plant costs may add an additional 40 percent onto the facility charge covered by PSE. PSE is assuming a conservative probability of 25 percent.

Cumulative Impacts of Scenarios. PSE has weighed the effect of all of these scenarios occurring with the probability that each one might occur. This analysis uses double the assumed probabilities outlined above. When the cumulative impacts are considered the present value costs of the Tacoma LNG project are dramatically lower than the alternative costs for PSE gas customers to obtain peak-day capacity. To illustrate this point, ***Figure 12*** shows the present value costs with the cumulative impact of the sensitivities times twice the probability that each one occurs.

Figure 12. Comparison of alternatives with cumulative probabilistic impacts of sensitivities.



The probabilities used in ***Figure 12*** are:

Scenario	Probability of Occurrence
Lease Not Renewed	10.0%
TOTE Walks (yr 10)	20.0%
Distribution Contingency Reached	40.0%
Plant Capital increase 40%	50.0%

PUGET SOUND ENERGY

Exhibit O.

Pro Forma Financial Statements

Pro Forma Financial Statements

Project Description

The Tacoma LNG Project ("Project") consists of the permits, land lease, other real estate rights, commercial contracts, upgrades to PSE's gas distribution system and other necessary rights, agreements, equipment and work to develop, construct, own and operate an LNG facility ("Facility") at the Port of Tacoma in Pierce County, Washington. The cost to develop and construct the Facility is approximately $274 million and the supporting upgrades to PSE's distribution system are estimated at around $49 million, before AFUDC.

A. Ownership of the Tacoma LNG Facility

As discussed in **Section 3** of the *Report to the Board of Directors*, PSE may enter into a Joint Ownership Agreement with a marketing entity ("Marketer"). Under such an arrangement, PSE and the Marketer would own an undivided but specific percentage of the Facility, based on the facility services (as defined in the next section of this exhibit). During construction, the Marketer would supply capital sufficient to pay for its share of the Facility. PSE will retain full ownership for equipment related to the peaking service and maintain majority ownership of the Facility.

B. Description of the Project

Siting	The Facility will be located at the Port of Tacoma, on the Hylebos waterway, on the corner of East 11th Street and Alexander Avenue East. The 33-acre site is currently a mix of warehouses, vacant offices and support buildings.
Owner	Puget Sound Energy will either fully own the Facility or enter into a Joint Ownership Agreement with a Marketer (likely BP or Shell). PSE will retain fully ownership of the distribution upgrades regardless of the ownership structure of the Facility.
Timing of Project Development	PSE anticipates having all commercial contracts negotiated, a ruling on an LNG tariff and a ground lease by Q1 of 2015. Permit applications will be filed by Q3 2014. Permits are expected in Q3 2015 and a notice to proceed with the EPC contract can be issued at that time following Board approval.

Timing of Project Construction	PSE plans to start demolition once environmental permits are received and final Board approval is obtained; anticipated in Q3 2015. The Facility will be constructed and commissioned over a three-year period with commercial operation expected in late 2018. The financial statements in this exhibit assume the Facility goes into service December 31, 2018.
Full Notice to Proceed	Q3 2015 (estimated)
COD	Late 2018 (estimated). For the purposes of this pro forma COD is assumed to be December 12, 2017 for the distribution upgrades and December 31, 2018 for the Facility. The distribution upgrades need to be in service to support Facility commissioning and startup.
Liquefaction Capacity	250,000 LNG gallons/day (21 MDth/day)
Storage Capacity	8 million LNG gallons (680 MDth)
Peaking Capacity	66 MDth/day (The total peaking resource will be 85 MDth/day, with 66 MDth/day of LNG vaporized and injected into the gas distribution system at the Tacoma LNG Facility and 19 MDth/day of gas intended for liquefaction diverted to other customers on PSE's distribution system).
Real Estate	PSE will lease the 33-acre parcel from the Port of Tacoma. PSE will also acquire easements and property to support the gas distribution system upgrades and for the direct LNG pipeline to TOTE.

Estimated Project Budget and Allocations

The following section outlines the estimated Project budget and LNG Facility customer (and joint owner under a joint ownership scenario) contributions to the revenue requirement of the Facility and gas distribution upgrades.

A. Estimated Project Budget

The breakdown of the total Project budget is shown on the following page. A calendar view of the Project budget as well as a month by month view of the development budget is included in ***Exhibit F***. The budget considers the costs to PSE under two ownership scenarios. In the first scenario, PSE is the sole owner and is responsible for 100% of the capital cost. In the second scenario, PSE retains ownership of approximately 69% of the Facility while the marketing entity would own the remainder. The allocation of the Facility is described in detail in the following section and the percentages are shown in ***Table 2*** on page O-9.

Table 1. Estimated Project Budget ($1,000s)

Development Budget	Total Budget	PSE share under Joint Ownership[2]
PSE Labor and OH	$ 2,193	$ 1,527
Engineering and Analysis	$ 4,474	$ 3,116
Permitting & Legal Support	$ 3,339	$ 2,325
Communications/Outreach	$ 391	$ 272
Distribution Upgrades	$ 1,126	$ 1,126
Commercial and Regulatory[1]	$ 1,100	$ 1,100
Real Estate and Lease	$ 766	$ 533
Contingency	$ 442	$ 308
Project Development Sub-Total	**$ 13,831**	**$ 10,307**
Capital Facility Budget		
Development Budget (Capital)[3]	$ 11,605	$ 8,081
PSE Labor and OH	$ 5,800	$ 4,039
Engineering & Legal	$ 1,400	$ 975
Real Estate and Lease	$ 6,132	$ 4,270
Geotechnical and Demolition	$ 13,000	$ 9,053
In Water Work	$ 4,000	$ 2,600
EPC Contractor Scope		
Site, Civil and Foundations	$ 19,855	$ 13,130
Liquefaction Equipment	$ 45,813	$ 24,809
Storage Tank	$ 57,269	$ 48,679
Vaporization Equipment	$ 7,411	$ 7,411
Truck Loading Equipment	$ 3,592	$ 36
Bunkering Line to TOTE Vessels	$ 8,000	$ 5,200
Balance of Facility	$ 33,810	$ 23,963
Commissioning	$ 6,042	$ 4,123
EPC Contractor Sub-Total	$ 181,792	$ 127,351
Miscellaneous	$ 6,900	$ 4,433
Contingency	$ 22,650	$ 15,440
PSE Construction OH	$ 7,830	$ 5,460
Sales Tax	$ 12,960	$ 8,576
Facility Sub-Total	**$ 274,069**	**$ 190,278**
AFUDC on Development and Plant Construction	*$ 44,279*	*$ 30,699*
Gas System Upgrades Construction Budget		
Gas System Upgrades Development	$ 1,126	$ 1,126
Improvements at the Port of Tacoma	$ 32,647	$ 32,647
Improvements in South Tacoma	$ 15,268	$ 15,268
Gas System Upgrades Sub-Total	**$ 49,041**	**$ 49,041**
AFUDC on Gas System Upgrades Construction	*$ 2,562*	*$ 2,562*
PROJECT O&M COSTS	$ 1,700	$ 1,700
PROJECT CAPITAL COSTS	$ 323,110	$ 239,319
AFUDC	$ 46,841	$ 33,261
GROSS PLANT	**$ 369,951**	**$ 272,580**

[1]*Commerical and Regulatory expenses are not capitalized*
[2]*Assumes Marketer provides equity contribution for their full utilization of plant services (~31% of Plant)*
[3]*Capital development budget for the Facility excludes the work on the gas distribution upgrades and O&M work.*

The budget items are defined as follows:

Development Budget	The development budget shown in ***Table 1*** represents the costs to complete the development phase of the Project. This phase includes all work necessary up to the notice to proceed to begin construction.
PSE Labor and Overhead	PSE labor for this Project includes the PSE project team, other supporting PSE employees as well as their expenses and overheads. All charges from outside firms receive a PSE 3% construction overhead charge. Charges associated with PSE internal costs receive a 17% overhead charge.
Engineering and Analysis	This estimate includes all engineering and analysis work during the development phase, as well as preliminary analyses by engineering and economic firms. It includes work done on a time and materials basis by PSE contractors Chicago Bridge and Iron ("CBI"), Moffat and Nichol, Sanborn Head, Jim Lewis and Geo Engineers.
Permitting and Legal Support	Permitting support is provided primarily by CH2MHill who is responsible for preparing the first draft of the EIS for the City of Tacoma and its consultants. Berger ABAM is also supporting permitting and Stoel Rives has been engaged as environmental and land-use attorneys.
Communications and Outreach	PSE has and will continue to engage outside firms to provide strategy and support with outreach to the local community and other key stakeholders at the Port of Tacoma and in local and state government.
Commercial and Regulatory	PSE has engaged Perkins Coie to assist in regulatory matters related to LNG such as drafting the LNG tariff. Baker Botts have been engaged to assist with the TOTE contract and will likely assist with other commercial arrangements, including the EPC contract. Development dollars spent on legal fees associated with negotiating and executing commercial contracts and regulatory filings cannot be capitalized.
Real Estate and Lease	The ground lease with the Port of Tacoma includes up to 24 months for permitting and due diligence. During this time, the lease payments will be at a reduced rate. The lease payments will increase to 75% of the full lease payment when construction activities begin; the lease provides for a three-year construction period. Lease payments prior to commercial operations will be capitalized.

Development Contingency	There is a 5% contingency on all development estimates other than the Port of Tacoma lease.
Capital Facility Budget	The construction budget includes all capital costs associated with constructing and commissioning the Facility.
PSE Labor and Overhead	PSE labor for construction includes PSE project managers, continued permitting and commercial support and other supporting PSE employees as well as their expenses and overheads.
Engineering and Legal	Non-construction items include engineering analysis, legal review, and communications and outreach after the Project enters the construction phase.
Lease Payments	Lease payments at the Port of Tacoma will increase to $146,000 per month when demolition and site improvements begin. Lease payments during construction will be capitalized.
Geotechnical and Demolition	Significant geotechnical work will need to be done onsite to stabilize the soils. LNG Facilities must meet strict earthquake guidelines and the poor soil conditions at the Port of Tacoma require improvements in order to meet the guidelines.
In-Water Work at TOTE Dock	PSE will be responsible for engineering and constructing marine structures at TOTE's facility to support bunkering operations.
EPC Contractor Scope	The EPC contractor scope includes all facilities used to receive, treat, liquefy, store and deliver the LNG as well as supporting facilities such as the control room and electrical systems. CBI completed a front end engineering design study in late 2013.
Miscellaneous	Miscellaneous items include a substation, capital spares and construction insurance. Tacoma Public Utilities will construct a substation onsite to serve the Facility load which is estimated to be 14.8 MW at peak demand. The Facility will require spares of some critical components.
Contingency	The assumed contingency for the EPC contractor scope is 5% of the FEED estimate provided by CBI. The contingency for other Facility items that are yet to go through detailed engineering design is determined by industry standards. Specifically, there is a 50% contingency on geotechnical work, 20% contingency on the substation, 60% on the direct line to TOTE and 50% on the in-water work.

Construction Overhead	Construction overhead for the Project is assumed to be 3% for non-PSE expenditures.
Sales Tax	PSE has received a manufacturing exemption from sales tax for machinery and equipment used in producing LNG for expenditures made after July 2015. PSE will pay regular sales tax on the machinery and equipment as expenditures are made and receive refunds beginning in 2017.
AFUDC	Allowance for funds used during development and construction for the LNG Facility will be applied at PSE's weighted average cost of capital of 7.8%.
Gas System Upgrades	In order to supply gas to the Facility for liquefaction and receive vaporized gas from the Facility, PSE will upgrade the existing gas distribution system. These upgrades include installing new pipe at the Port of Tacoma, installing pipe and increase operating pressure in the South Tacoma distribution system, upgrading the Frederickson gate station and installing a new limit station. Upgrades in the South Tacoma system are either planned or will be required in the near future to support system growth regardless of the added load of the Facility.
Improvements at the Port of Tacoma	PSE will construct approximately four miles of 16-inch pipeline at the Port of Tacoma. This line will connect the Tacoma LNG Facility to PSE's high pressure gas system.
Improvements in South Tacoma	In order to support the additional load at the Port, PSE will improve the distribution system near the Clover Creek limit station. This work includes increasing the operating pressure in an existing segment of pipe up to 500 psi, adding two limit stations and adding a mile of pipe to connect the north and south Tacoma systems. In addition, PSE will rebuild parts of the Frederickson gate station. The pressure increase and addition of one limit station will be undertaken independent of the Tacoma LNG Project to support customer growth in the area; but the improvements are mentioned here because the Tacoma LNG Project requires the pressure increase to be in place before service can commence.
AFUDC	Allowance for funds used during development and construction of the gas system upgrades will be applied at PSE's weighted average cost of capital of 7.8%.

B. Allocation of Facility Capital and Customer Contributions

The capital used to develop and construct the Facility will be allocated amongst services the Facility provides. The two main services at the Facility are liquefaction and storage. The other services are related to dispensing LNG from the Facility, including vaporization, truck loading and marine vessel bunkering. Facility customers will contribute revenues based on their utilization of these services. ***Table 2*** shows the capital allocated to each service and the contribution from each of the customers for each service. For example, TOTE's volumes will equal 44% of the Facility's liquefaction capacity. Therefore, TOTE will contribute revenues to cover 44% of the cost allocated to the liquefaction service.

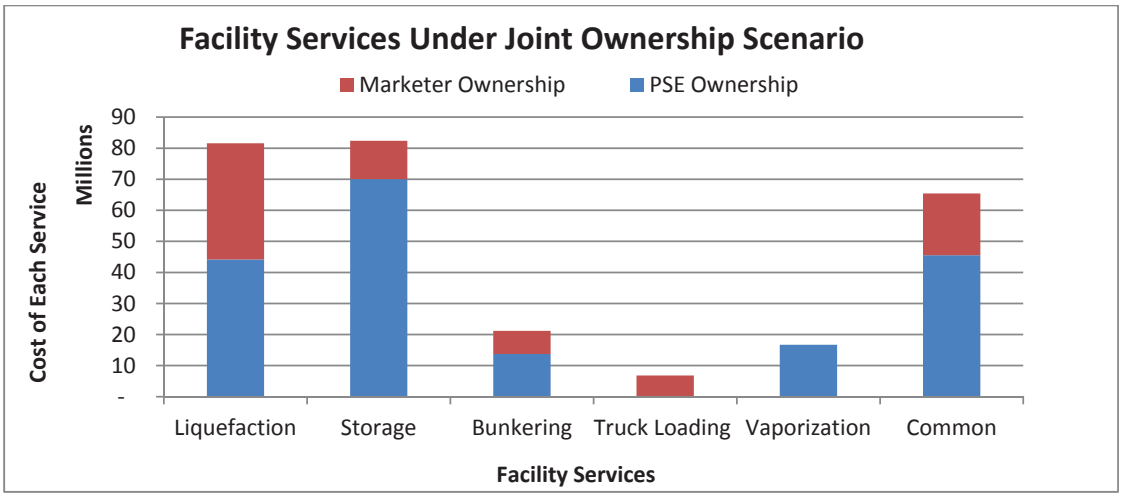
Table 2. Allocation of Facility Capital excluding AFUDC ($1,000)

Facility Services	Capital Allocated to Each Service	Contributions from Customers Towards Services PSE	TOTE	Marketer
Liquefaction	$ 81,591	10%	44%	46%
Storage	$ 82,378	79%	6%	15%
Bunkering	$ 21,165	0%	65%	35%
Truck Loading	$ 6,829	1%	0%	99%
Vaporization	$ 16,700	100%	0%	0%
Common Items	$ 65,406	45%	25%	30%
Gross Facility Contributions	$274,069	$118,610	$71,667	$83,792
Capital Allocation Ratio	100%	43%	26%	31%

The total cost of each service (column 2 of the above table) is calculated by assigning each line item of the capital budget to each service. The full capital budget, along with the percent assignment of each line item, can be found in ***Attachment 1*** of this exhibit.

Under a joint ownership structure, the Marketer would invest equity in part or for all of the Facility reserved for its services. The Marketer may also invest in a portion of the Facility reserved for TOTE's capacity. For the purposes of this exhibit, a joint ownership scenario assumes that the Marketer invests wholly in their share of the Facility as outlined in the table above ($83.8 million). The Marketer would own 46% of the liquefaction, 15% of the storage, etc., resulting in the Marketer supplying 31% of the Facility capital. ***Figure 1*** shows the cost of each facility service and the ownership of that service between PSE and the Marketer.

Figure 1. Cost of Facility services and breakdown of ownership assuming Marketer fully owns the share of the services needed for its capacity allocation.



The allocation of the Facility amongst the services and the Facility services are defined as follows:

Allocation of Facility Capital:	Capital is allocated to Facility services based upon the costs of those services. Customers will contribute revenues to support services based on their utilization of those services.
Facility Services	Facility services are the functions that the Tacoma LNG Facility provides PSE and its customers. The services are specifically: liquefaction, storage, bunkering, truck loading and vaporization.
Liquefaction	Costs that are allocated to liquefaction include the costs of facilities used to receive natural gas, treat the gas, cool the gas below its boiling point and deliver the gas to onsite storage.
Storage	A large portion of Facility costs are attributable to the site-erected full containment cryogenic storage tank. Costs that are allocated to storage include tank costs as well as foundations and other supporting facilities.
Bunkering	Costs allocated to bunkering include facilities used to move the LNG from the onsite storage tank to the marine loading facility, which will be located at TOTE's berthing location. PSE is working with regulators to determine if other vessels can be filled at TOTE's berth when TOTE vessels are not in port.

Truck Loading	Truck loading involves moving LNG from the onsite storage tank to tanker trucks or ISO containers.
Vaporization	Vaporization costs include facilities used to vaporize the gas and inject it into PSE's distribution system. This service and the facilities devoted to it are only utilized by PSE gas customers, so other LNG customers do not pay for vaporization.
Common Items	Approximately 20% of the Facility costs will be common items, which cannot be allocated to any individual service (e.g., Facility development, civil and site work, site utilities, etc.). For pricing or ownership purposes, revenue contributions or ownership of common items are based on the user's weighted average utilization of liquefaction and storage services.
Gross Facility Contributions:	Gross Facility contributions represent the amount of capital investment used to develop customer pricing or ownership percentage and the resultant cost-of-service revenue contribution from each customer or owner.
Capital Ratios	The capital ratio (expressed as a percentage) is the ratio of the capital attributable to each customer's services over the total capital cost of the Tacoma LNG Facility.

C. Estimated Operating Budget

Operating expenses include all of the fixed and variables costs of operating the Tacoma LNG Facility. Fixed expenses are modeled using estimates based on 2013 costs. ***Table 3*** shows a summary of the fixed O&M expenses for the Facility and the allocation of these expenses across the customers (or owners). Under a fuel supply or tolling arrangement PSE will pass through O&M costs to the customers. In a joint ownership arrangement the Marketer would pay for O&M costs associated with their ownership stake in the plant.

Table 3. Estimated Operating Budget and Allocation ($1,000s)

Fixed Expenses	Total Fixed Expense (2013 $'s)	Contribution of Customers to Cover Operating Costs			Escalation Factor
		PSE	TOTE	Marketer	
Plant Consumables	246	10%	44%	46%	2.5%
Maintenance	632	27%	35%	38%	2.5%
Staff	2,542	43%	26%	31%	3%
Incremental Insurance	579	43%	26%	31%	2.5%
Allocated General Costs*	1,989	N/A Based on Rate Dept. Calculation			1.1%
Lease	2,549	43%	26%	31%	2.5%
Fixed Electric Costs	1,186	10%	44%	46%	2.5%
Variable Expenses					
Port Volume Charge	163,508	10%	44%	46%	2.5%
Variable Electric Costs*	6,381	10%	44%	46%	2.9%

**The escalation of Allocated General Costs is formulaic. The factor shown is a cumulative average over the 25-year period. The escalation of variable electric costs is based on the IRP. The factor shown is a cumulative average over the 25-year period.*

Revenue Contributions for Operating Expenses	Charges will be divided amongst Facility customers/owners based on three separate methodologies. Fixed expenses related to liquefaction (mainly fixed electric utilities) will be based on the liquefaction ratio, maintenance expenses will be allocated based on customer utilization of the services requiring maintenance and all other fixed O&M charges will be based on the capital ratio. All variable charges will be based on the liquefaction ratio.
Liquefaction Ratio	The liquefaction ratio is expressed as a percentage and represents each customer's share of liquefaction service as compared to total liquefaction service (as show in ***Table 2***).

Capital Ratio	The capital ratio is expressed as a percentage of the total Facility capital attributable to each customer (as show in ***Table 2***).
Escalation of operational costs	For the purposes of the financial pro forma and cost estimates, all expenses are escalated annually at 2.5% with the exception of labor costs, which are escalated at 3% annually.
Fixed Operating Expenses	Fixed operating expense will be passed through to Facility customers at cost.
Plant Consumables	Consumables include the nitrogen and other compounds used to treat and cool the natural gas. Consumable costs will be charged to customers each month based on their actual liquefaction volumes for that month.
Maintenance	This category encompasses all maintenance cost other than consumables and labor. These costs include replacement parts and paying for outside service providers to perform maintenance on Facility components or Facility grounds. Maintenance that is attributable to equipment that is specifically used for a particular Facility service will be covered in revenues from customers based on their use of that service. Any other maintenance will be allocated to customers using the capital ratio.
Facility Staff	This category includes the salaries and overhead for Facility staff, which are expected to be fulltime PSE employees; PSE has included 16 employees in the financial pro forma. This includes 10 gas operators, and a control technician, which will be union positions. It is possible that the USCG and Dept. of Homeland Security will require manned security at the Facility at all times. PSE will contract with a service provider for security services.
Incremental Insurance	Incremental insurance premiums will be passed on to Facility customers based on the capital ratio.

Allocated General Costs	All PSE facilities and operations are allocated, on a formulaic basis determined by WUTC mandated ratemaking rules, a certain amount of overhead to recover corporate administrative and general expenses. The administrative fee will largely be charged to Facility customers based on their share of the Facility's total O&M expenses for the previous contract year, but a portion will be charged to Facility customers based on gross plant balances at the beginning of the contract year. The administrative fee will be set at the start of each contract year.
Lease	The Tacoma LNG Facility will be located on land that is under a long-term lease with the Port of Tacoma. All Facility customers will pay their allocable share of the lease payments, which are subject to an annual increase equal to the previous year's average CPI-U. For the purposes of the financial pro forma, CPI-U is assumed to be 2.5% annually.
Fixed Electric Costs	Fixed electric charges will be comprised mainly of fixed payments to Tacoma Power for providing transmission wheeling service to the Facility. For the purposes of this pro forma, PSE has conservatively assumed that the fixed electric costs will be at Tacoma's tariffed industrial rates. However, PSE and Tacoma Power have agreed that the preferable model is for PSE to buy power on the wholesale market and wheel through Tacoma's system at their OATT transmission rates, resulting in lower costs for customers.
Variable Expenses	Variable operating costs will be passed through to Facility customers without markup.
Port of Tacoma Volume Charge	The Port of Tacoma charges a fee for any commodity that is sold in the Port. This fee will be assessed at $0.085/volumetric barrel (approximately $0.1573/BOE). This rate is subject to an annual increase by CPI-U. The Port of Tacoma is reserving the right to develop a Port Tariff for LNG that may be substituted in lieu of this charge. This cost will be passed directly to customers based on their actual deliveries.
Variable Electric Costs	Electricity is the largest Facility operating cost. Electricity will be provided at wholesale market prices and wheeled by Tacoma Power. For the purposes of the pro forma, the Mid-C price forecast from PSE's 2013 IRP has been used for estimating wholesale power prices.

D. Fuel Charge

PSE will be offering a bundled service to TOTE, and other potential customers may also subscribe to a bundled service. Bundled service includes the gas commodity and transportation to the Tacoma LNG Facility.

Fuel Charge	The fuel charge includes the cost of natural gas delivered to the Tacoma LNG Facility.
Commodity Charge	The commodity charge is variable and billed each month based on the previous month's usage. The commodity charge will equal the total amount of natural gas used by Facility customers (as measured in MMBtu) including plant fuel multiplied by the Sumas index price plus 3 cents ($0.03) per MMBtu for the month in which the gas was liquefied.
Northwest Pipeline Charges	Northwest Pipeline LLC ("NWP") delivers gas from British Columbia to PSE's city gate via an interstate pipeline system. NWP Charges will be passed through at cost. Current Pricing includes: *Pipeline transportation charges – Pursuant to NWP's then effective FERC Gas Tariff –* • Rate Schedule TF-1 Reservation (Large Customer) System-Wide rate, currently $.41/MMBtu/day; • Rate Schedule TF-1 Volumetric (Large Customer) System-Wide rate, currently $.0318/MMBtu/day; • Rate Schedule TF-1 fuel use reimbursement charge (fuel reimbursed in-kind), currently 1.6%. The reservation and volumetric rates detailed above are expected to be in place until 2017; NWP's rates typically change every 3 to 5 years, oftentimes through settlements negotiated with its customers. The fuel reimbursement factor changes every six months (usually effective October 1 and April 1 each year), and are adjusted to reflect actual activity.
PSE Distribution Charge	PSE distribution charges reflect the cost of moving gas on PSE's distribution system from the interstate pipeline to the Tacoma LNG Facility. These costs will be charged pursuant to PSE's LNG tariff and/or a negotiated special contract. The charges will include a fixed monthly payment and a variable component that will be assessed on a $/MMBtu basis.

The Projection

The following write-up and associated pro forma financials (the "Projection") describes the incremental financial impact the Project will have over the approximately 5-year development and construction timeline and the first 10 years of operations.

This section includes a projection for three items: project revenues, income statement and balance sheet. The first summary table assumes that PSE retains full ownership of the Facility, and the second summary table assumes that the Marketer owns the portion of the Facility used to provide its services. In this example, the Marketer owns 31% of the Facility, investing $83.8 million.

A. Summary of Project Revenues

Project Revenues:	Facility revenues will come from increased customer revenues driven by growth in gas system ratebase and long-term LNG supply contracts. As a regulated asset, the Facility's entire costs will be covered through the revenues generated from customers. LNG customers will subscribe to service through long-term contracts that cover their share of the Facilities costs, distribution costs as described above and an allocable share of A&G expenses.
LNG Facility Revenues	Total revenues collected from LNG customers (TOTE and Marketer) include all revenues needed for Facility operations including return on and of allocated capital and any applicable taxes. In addition to revenues for Facility operations, LNG customers will have revenues associated with allocated A&G and may have a short term contract premium. LNG Facility revenues exclude revenues associated with upgrades to PSE's distribution system.
Short-Term Contract Premium	PSE will collect additional revenues from LNG customers with contracts shorter than 25 years to compensate for potential revenue deficit exposure on the back end of the contract. PSE retail gas customers will accrue the benefit of these revenues.
Allocated A&G	LNG customers will also be charged a portion of administrative and general costs, as discussed above.

LNG Facility Operating Revenues	Operating revenues for the Facility include all revenues needed to support the LNG Facility. Operating revenues do not include short-term contract premiums or allocated A&G as these revenues are passed on to retail gas customers.
Distribution Revenues	LNG customers will pay fees associated with moving natural gas through PSE's distribution system. These fees are expected to be part of the LNG tariff and special contract but will be based on the PSE's transport tariff (Schedule 87).
Contributions to Retail Gas Customers	Contributions to retail gas customers include revenues above and beyond the cost of service associated with the LNG Facility and include the short-term contract premium and allocated A&G.
Distribution Revenues from Retail Gas Customers	Incremental revenues from retail gas customers to support the upgrades to PSE's gas distribution system.

REVENUE SUMMARY

	Operating Year:	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
	Revenues From TOTE										
[1]	LNG Facility Revenues	47,122	47,975	48,676	48,675	49,573	49,604	50,451	51,209	51,506	52,235
[2]	Short Term Contract Premium	(3,815)	(3,815)	(3,815)	(3,815)	(3,815)	(3,815)	(3,815)	(3,815)	(3,815)	(3,815)
[3]	Allocated A&G Revenues	(965)	(962)	(961)	(962)	(964)	(967)	(971)	(976)	(981)	(987)
[4]	LNG Plant Operations Revenues	42,342	43,198	43,900	43,898	44,794	44,822	45,664	46,418	46,710	47,433
[5]	Distribution Transport Revenues	1,914	1,956	1,999	2,043	2,088	2,134	2,181	2,229	2,278	2,328
[6]	TOTE Contribution to Core Gas	(4,673)	(4,671)	(4,670)	(4,670)	(4,672)	(4,676)	(4,680)	(4,684)	(4,689)	(4,695)
	Revenues From Marketer										
[7]	LNG Plant Revenues	22,890	22,455	22,125	21,665	21,343	20,997	20,709	20,468	20,182	19,912
[8]	Short Term Contract Premium	-	-	-	-	-	-	-	-	-	-
[9]	Allocated A&G Revenues	(1,100)	(1,097)	(1,095)	(1,095)	(1,097)	(1,100)	(1,104)	(1,109)	(1,114)	(1,120)
[10]	LNG Plant Operations Revenues	21,789	21,358	21,030	20,570	20,246	19,897	19,605	19,360	19,068	18,792
[11]	Distribution Transport Revenues	1,981	2,024	2,069	2,114	2,161	2,208	2,257	2,307	2,357	2,409
[12]	Marketer Contribution to Core Gas	(1,095)	(1,091)	(1,090)	(1,090)	(1,091)	(1,094)	(1,099)	(1,103)	(1,109)	(1,115)
	Plant Revenue Summary										
[13]	TOTE	47,122	47,975	48,676	48,675	49,573	49,604	50,451	51,209	51,506	52,235
[14]	Marketer	22,890	22,455	22,125	21,665	21,343	20,997	20,709	20,468	20,182	19,912
[15]	Core Gas Customer (LNG Plant)	30,504	30,376	29,797	29,117	28,657	28,059	27,648	27,230	26,722	26,301
[16]	Total Revenues Collected	100,516	100,806	100,598	99,457	99,573	98,660	98,808	98,908	98,410	98,449
[17]	TOTE Contribution to Core Gas	(4,673)	(4,671)	(4,670)	(4,670)	(4,672)	(4,676)	(4,680)	(4,684)	(4,689)	(4,695)
[18]	Marketer Contribution to Core Gas	(1,095)	(1,091)	(1,090)	(1,090)	(1,091)	(1,094)	(1,099)	(1,103)	(1,109)	(1,115)
[19]	Revenues from Plant Operations	94,748	95,044	94,838	93,697	93,809	92,890	93,030	93,120	92,612	92,639
[20]	Distribution Transport Revenues	3,895	3,980	4,068	4,157	4,249	4,342	4,438	4,535	4,635	4,737
[21]	Distribution Revenues from Core Gas	3,537	3,245	2,961	3,674	4,084	3,766	3,456	3,151	2,846	2,541
[22]	Incremental Revenues from Distribution	7,432	7,225	7,028	7,831	8,333	8,108	7,894	7,686	7,481	7,278
[23]	**TOTAL Revenues**	**102,180**	**102,268**	**101,866**	**101,528**	**102,142**	**100,999**	**100,924**	**100,807**	**100,093**	**99,917**

REVENUE SUMMARY (UNDER JOINT OWNERSHIP SCENARIO)

	Operating Year:	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
	Revenues From TOTE										
[1]	LNG Facility Revenues	47,122	47,975	48,676	48,675	49,573	49,604	50,451	51,209	51,506	52,235
[2]	Short Term Contract Premium	(3,815)	(3,815)	(3,815)	(3,815)	(3,815)	(3,815)	(3,815)	(3,815)	(3,815)	(3,815)
[3]	Allocated A&G Revenues	(965)	(962)	(961)	(962)	(964)	(967)	(971)	(976)	(981)	(987)
[4]	LNG Plant Operations Revenues	42,342	43,198	43,900	43,898	44,794	44,822	45,664	46,418	46,710	47,433
[5]	Distribution Transport Revenues	1,914	1,956	1,999	2,043	2,088	2,134	2,181	2,229	2,278	2,328
[6]	TOTE Contribution to Core Gas	(4,673)	(4,671)	(4,670)	(4,670)	(4,672)	(4,676)	(4,680)	(4,684)	(4,689)	(4,695)
	Revenues From Marketer										
[7]	LNG Plant Revenues	242	249	255	262	269	277	284	292	300	308
[8]	Short Term Contract Premium	-	-	-	-	-	-	-	-	-	-
[9]	Allocated A&G Revenues	(242)	(249)	(255)	(262)	(269)	(277)	(284)	(292)	(300)	(308)
[10]	LNG Plant Operations Revenues	-	-	-	-	-	-	-	-	-	-
[11]	Distribution Transport Revenues	1,981	2,024	2,069	2,114	2,161	2,208	2,257	2,307	2,357	2,409
[12]	Marketer Contribution to Core Gas	(241)	(248)	(254)	(261)	(268)	(275)	(283)	(290)	(298)	(306)
	Plant Revenue Summary										
[13]	TOTE	47,122	47,975	48,676	48,675	49,573	49,604	50,451	51,209	51,506	52,235
[14]	Marketer	242	249	255	262	269	277	284	292	300	308
[15]	Core Gas Customer (LNG Plant)	30,504	30,376	29,797	29,117	28,657	28,059	27,648	27,230	26,722	26,301
[16]	Total Revenues Collected	77,869	78,600	78,728	78,054	78,500	77,940	78,383	78,732	78,528	78,844
[17]	TOTE Contribution to Core Gas	(4,673)	(4,671)	(4,670)	(4,670)	(4,672)	(4,676)	(4,680)	(4,684)	(4,689)	(4,695)
[18]	Marketer Contribution to Core Gas	(241)	(248)	(254)	(261)	(268)	(275)	(283)	(290)	(298)	(306)
[19]	Revenues from Plant Operations	72,955	73,681	73,804	73,123	73,560	72,989	73,421	73,757	73,540	73,843
[20]	Distribution Transport Revenues	3,895	3,980	4,068	4,157	4,249	4,342	4,438	4,535	4,635	4,737
[21]	Distribution Revenues from Core Gas	3,537	3,245	2,961	3,674	4,084	3,766	3,456	3,151	2,846	2,541
[22]	Incremental Revenues from Distribution	7,432	7,225	7,028	7,831	8,333	8,108	7,894	7,686	7,481	7,278
[23]	**TOTAL Revenues**	**80,386**	**80,906**	**80,832**	**80,954**	**81,893**	**81,097**	**81,315**	**81,443**	**81,021**	**81,121**

B. Income Statement

The income statements on the following pages consider the incremental revenues and costs associated with the operation of the Tacoma LNG Facility and associated distribution system upgrades. It assumes perfect ratemaking and does not include any excess revenues collected from LNG fuel customers as a contract premium or as a portion of allocated A&G.

Revenues	Revenues include the incremental revenues required to support the operation of the LNG Facility and associated distribution upgrades. Revenues do not include short-term contract premiums or allocated A&G as those revenues are passed back to retail gas customers.
Expenses	Operating expenses include the incremental costs to operate the LNG Facility and associated distribution upgrades. The gas feedstock and electric costs to power the Facility are the largest operating expenses. These expenses are categorized as 'Energy Costs' on the income statement.
Ratebase	The LNG Facility is depreciated on a 25-year schedule that is determined by the initial term of the Port of Tacoma lease. Distribution plant is depreciated on a 50-year schedule.

INCOME STATEMENT

	Operating Year:	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
[1]	Revenues	102,180	102,268	101,866	101,528	102,142	100,999	100,924	100,807	100,093	99,917
	Expenses										
[2]	Plant Operational Expenses	7,721	7,923	8,130	8,343	8,562	8,787	9,017	9,254	9,498	9,748
[3]	Energy Costs	33,446	34,943	36,497	37,046	38,694	39,272	40,794	42,249	43,126	44,505
[4]	Depreciation and Amortization	15,402	15,402	15,402	15,672	15,672	15,672	15,672	15,672	15,672	15,672
[5]	Property Tax	5,251	5,251	5,251	5,251	5,251	5,251	5,251	5,251	5,251	5,251
[6]	Sales Tax	2,663	2,666	2,649	2,656	2,679	2,645	2,638	2,629	2,606	2,596
[7]	Income Tax	9,258	8,862	8,335	7,997	7,683	7,214	6,766	6,325	5,880	5,439
[8]	Operating Expenses	73,742	75,047	76,265	76,965	78,542	78,841	80,140	81,381	82,033	83,211
	Income										
[9]	Operating Income	28,438	27,221	25,601	24,563	23,600	22,157	20,784	19,426	18,060	16,706
[10]	Interest Expense	(11,244)	(10,763)	(10,122)	(9,712)	(9,331)	(8,761)	(8,218)	(7,681)	(7,141)	(6,606)
[11]	Net Income	17,194	16,458	15,479	14,851	14,269	13,397	12,566	11,745	10,919	10,100
[12]	EBITDA	53,098	51,485	49,338	48,232	46,956	45,043	43,223	41,423	39,612	37,817
	Ratebase										
[13]	LNG Plant Ratebase	317,013	303,263	284,236	266,035	248,984	232,491	216,801	201,250	185,570	170,023
[14]	Distribution System Ratebase	49,233	47,309	45,479	50,311	54,967	52,875	50,881	48,948	47,036	45,144
[15]	Total Ratebase	366,246	350,572	329,715	316,346	303,951	285,366	267,682	250,198	232,607	215,167
[16]	Equity Capitalization of Ratebase	175,798	168,275	158,263	151,846	145,897	136,976	128,488	120,095	111,651	103,280
[17]	Return on Equity	9.78%	9.78%	9.78%	9.78%	9.78%	9.78%	9.78%	9.78%	9.78%	9.78%

INCOME STATEMENT (UNDER JOINT OWNERSHIP SCENARIO)

	Operating Year:	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
[1]	Revenues	80,386	80,906	80,832	80,954	81,893	81,097	81,315	81,443	81,021	81,121
	Expenses										
[2]	Plant Operational Expenses	5,310	5,447	5,588	5,732	5,880	6,033	6,189	6,350	6,515	6,685
[3]	Energy Costs	29,890	31,337	32,678	33,178	34,673	35,150	36,535	37,814	38,563	39,800
[4]	Depreciation and Amortization	11,007	11,007	11,007	11,277	11,277	11,277	11,277	11,277	11,277	11,277
[5]	Property Tax	3,869	3,869	3,869	3,869	3,869	3,869	3,869	3,869	3,869	3,869
[6]	Sales Tax	2,554	2,559	2,544	2,553	2,578	2,546	2,540	2,532	2,510	2,501
[7]	Income Tax	6,817	6,554	6,176	5,979	5,800	5,458	5,134	4,814	4,492	4,173
[8]	Operating Expenses	59,446	60,773	61,861	62,588	64,077	64,332	65,544	66,656	67,225	68,305
	Income										
[9]	Operating Income	20,940	20,133	18,971	18,366	17,816	16,765	15,771	14,787	13,796	12,816
[10]	Interest Expense	(8,279)	(7,960)	(7,501)	(7,262)	(7,044)	(6,629)	(6,236)	(5,847)	(5,455)	(5,068)
[11]	Net Income	12,661	12,173	11,470	11,105	10,772	10,136	9,535	8,941	8,341	7,748
[12]	EBITDA	38,763	37,694	36,154	35,622	34,892	33,500	32,182	30,878	29,564	28,265
	Ratebase										
[13]	LNG Plant Ratebase	220,441	211,980	198,844	186,227	174,482	163,042	152,232	141,505	130,648	119,923
[14]	Distribution System Ratebase	49,233	47,309	45,479	50,311	54,967	52,875	50,881	48,948	47,036	45,144
[15]	Total Ratebase	269,674	259,289	244,323	236,538	229,449	215,917	203,113	190,453	177,685	165,067
[16]	Equity Capitalization of Ratebase	129,444	124,459	117,275	113,538	110,135	103,640	97,494	91,418	85,289	79,232
[17]	Return on Equity	9.78%	9.78%	9.78%	9.78%	9.78%	9.78%	9.78%	9.78%	9.78%	9.78%

C. Balance Sheet

The balance sheet includes all assets of the Tacoma LNG Project including the LNG Facility and the upgrades to the distribution system that are required to serve the Facility. The distribution system upgrades are required to be in place prior to Facility operations in order to support Facility commissioning, start up and testing. In the following table, the distribution system upgrades go into service in year 0 and the LNG Facility begins service in year one.

BALANCE SHEET

	Year:	-6	-5	-4	-3	-2	-1	0	1	2	3	4
	Assets											
[1]	Gross Plant	-	-	-	-	-	-	51,603	369,951	369,951	369,951	369,951
[2]	Accumulated Depreciation	-	-	-	-	-	-	(1,031)	(16,433)	(31,836)	(47,238)	(62,910)
[3]	CWIP	1,379	3,526	10,328	42,959	139,750	296,277	318,348	-	-	-	-
[4]	Net Plant	1,379	3,526	10,328	42,959	139,750	296,277	368,920	353,518	338,116	322,714	307,041
[5]	Gas Inventory	-	-	-	-	-	-	-	3,286	3,473	3,620	3,677
[6]	Working Capital	-	-	-	-	-	-	10	2,779	2,854	2,931	3,010
[7]	**Total Assets**	**2,757**	**7,052**	**20,655**	**85,918**	**279,499**	**592,553**	**687,278**	**359,583**	**344,443**	**329,264**	**313,728**
	Liabilities											
[8]	Deferred Tax	-	-	-	-	-	-	316	1,799	8,199	13,450	17,751
	Capitalization											
[9]	Debt	717	1,833	5,370	22,339	72,670	154,064	191,679	186,048	174,847	164,224	153,908
[10]	Equity	662	1,692	4,957	20,620	67,080	142,213	176,935	171,736	161,397	151,591	142,069
[11]	**Total Capitalization**	1,379	3,526	10,328	42,959	139,750	296,277	368,614	357,784	336,244	315,815	295,977
[12]	**Total Liabilities and Equity**	**1,379**	**3,526**	**10,328**	**42,959**	**139,750**	**296,277**	**368,930**	**359,583**	**344,443**	**329,264**	**313,728**

BALANCE SHEET (UNDER JOINT OWNERSHIP SCENARIO)

	Year:	-6	-5	-4	-3	-2	-1	0	1	2	3	4
	Assets											
[1]	Gross Plant	-	-	-	-	-	-	51,603	272,580	272,580	272,580	272,580
[2]	Accumulated Depreciation	-	-	-	-	-	-	(1,031)	(12,038)	(23,044)	(34,051)	(45,327)
[3]	CWIP	971	2,527	7,477	30,207	99,204	221,439	220,976	-	-	-	-
[4]	Net Plant	971	2,527	7,477	30,207	99,204	221,439	271,548	260,542	249,535	238,529	227,252
[5]	Gas Inventory	-	-	-	-	-	-	-	3,286	3,473	3,620	3,677
[6]	Working Capital	-	-	-	-	-	-	10	1,299	1,334	1,370	1,406
[7]	**Total Assets**	**1,942**	**5,054**	**14,953**	**60,414**	**198,409**	**442,879**	**492,534**	**265,126**	**254,342**	**243,518**	**232,335**
	Liabilities											
[8]	Deferred Tax	-	-	-	-	-	-	316	1,633	6,334	10,210	13,426
	Capitalization											
[9]	Debt	505	1,314	3,888	15,708	51,586	115,148	141,046	137,016	128,964	121,320	113,833
[10]	Equity	466	1,213	3,589	14,499	47,618	106,291	130,196	126,477	119,044	111,988	105,077
[11]	**Total Capitalization**	971	2,527	7,477	30,207	99,204	221,439	271,242	263,493	248,008	233,309	218,910
[12]	**Total Liabilities and Equity**	**971**	**2,527**	**7,477**	**30,207**	**99,204**	**221,439**	**271,558**	**265,126**	**254,342**	**243,518**	**232,335**

Attachment 1. Capital Cost Allocation Table

Item	Sub-Total	TOTAL	Liquefaction	Storage	Bunkering	Truck Loading	Vaporization	Common
Development	*$ 11,072,093*							
Engineering		$ 4,403,515	0%	0%	0%	0%	0%	100%
Permitting/Legal		$ 3,333,094	0%	0%	0%	0%	0%	100%
Site/Real Estate		$ 766,934	0%	0%	0%	0%	0%	100%
PSE Labor		$ 2,178,807	0%	0%	0%	0%	0%	100%
Communication/Outreach		$ 389,743	0%	0%	0%	0%	0%	100%
Development Contingency		$ 444,769	0%	0%	0%	0%	0%	100%
Contingency and OH's	*$ 25,762,547*							
Contingency: EPC Initial Scope of Work [3]	5%	$ 8,749,646	39%	43%	0%	3%	9%	5%
Contingency: Civil/In water/Direct Pipeline/Sub [3]	50%	$ 13,900,000	4%	0%	49%	0%	0%	47%
Construction OH	3%	$ 7,830,237	35%	37%	6%	3%	7%	12%
NON Construction During Execution Phase	*$ 13,333,193*							
1). PSE Labor		$ 5,801,193	0%	0%	0%	0%	0%	100%
2). Construction/Legal Support		$ 1,400,000	0%	0%	0%	0%	0%	100%
3). Rent - Lease		$ 6,132,000	0%	0%	0%	0%	0%	100%
Site, Civil, Foundations, Buildings & Structural [4]	*$ 19,854,833*							
1). All Foundations		$ 6,857,538	40%	20%	0%	10%	15%	15%
2). Buildings (includes PDC)		$ 4,268,449	30%	30%	0%	10%	15%	15%
3). Earthworks		$ 2,742,098	20%	20%	0%	10%	10%	40%
4). Structural		$ 5,986,748	40%	30%	0%	5%	10%	15%
Receiving Equipment [4]	*$ 7,343,566*							
1). Feed Gas Compressor		$ 6,133,504	100%	0%	0%	0%	0%	0%
2). Plant Inlet Filter Separator		$ 220,438	100%	0%	0%	0%	0%	0%
3). Feed Gas Compressor Aftercooler		$ 237,026	100%	0%	0%	0%	0%	0%
4). Gas Chromatograph		$ 752,597	100%	0%	0%	0%	0%	0%

Item	Sub-Total	TOTAL	Liquefaction	Storage	Bunkering	Truck Loading	Vaporization	Common
Pretreatment System [4]	*$ 17,999,831*							
1). Amine Pretreatment System		$ 17,587,988	100%	0%	0%	0%	0%	0%
2). Piping		$ 411,843	100%	0%	0%	0%	0%	0%
LNG Liquefaction Train & Compressors [4]	*$ 20,469,372*							
1). Liquefaction HX		$ 4,342,168	100%	0%	0%	0%	0%	0%
2). MRL Compressor		$ 13,227,501	100%	0%	0%	0%	0%	0%
3). MRL Condenser		$ 1,521,162	100%	0%	0%	0%	0%	0%
4). MRL Storage Vessel		$ 1,378,540	100%	0%	0%	0%	0%	0%
LNG Tank Storage and Boil Off Gas System [4]	*$ 57,269,136*							
1). Tank Concrete (double, wall, rf)		$ 35,426,322	0%	100%	0%	0%	0%	0%
2). Tank Seismic Isolators		$ 1,025,255	0%	100%	0%	0%	0%	0%
3). LTC Tank		$ 14,270,648	0%	100%	0%	0%	0%	0%
4). BOG Compressor		$ 5,219,482	0%	100%	0%	0%	0%	0%
5). Storage Piping		$ 476,847	0%	100%	0%	0%	0%	0%
6). BOG Piping		$ 850,582	0%	100%	0%	0%	0%	0%
Vaporization Train [4]	*$ 7,411,794*							
1). LNG Vaporizer		$ 4,008,318	0%	0%	0%	0%	100%	0%
2). LNG IN-tank Loading Pumps		$ 1,733,637	0%	0%	0%	0%	100%	0%
3). Vaporization Pumps		$ 734,466	0%	0%	0%	0%	100%	0%
4). Piping		$ 935,373	0%	0%	0%	0%	100%	0%
Truck Loading System [4]	*$ 3,591,792*							
1). Loading Station		$ 934,746	0%	0%	0%	100%	0%	0%
2). Truck Weigh Scale		$ 934,746	0%	0%	0%	100%	0%	0%
3). Piping		$ 1,722,301	0%	0%	0%	100%	0%	0%
Electrical, Instrumentation and Control Systems [4]	*$ 22,147,283*							
1). Instrumentation		$ 6,522,132	30%	25%	5%	5%	25%	10%
2). Electrical		$ 15,425,152	50%	25%	0%	0%	15%	10%
3). Electrical to Facilities		$ 200,000	0%	0%	0%	0%	0%	100%

Item	Sub-Total	TOTAL	Liquefaction	Storage	Bunkering	Truck Loading	Vaporization	Common
Balance of Plant (Utilities, Safety, Security and Telecom) [4]	*$ 11,663,081*							
1). Essential Generator		$ 2,440,053	0%	35%	5%	5%	25%	30%
2). Flare		$ 1,879,847	50%	50%	0%	0%	0%	0%
3). Flare Piping		$ 6,105,306	50%	50%	0%	0%	0%	0%
4). WPG Cooling Exchanger		$ 686,271	70%	30%	0%	0%	0%	0%
5). Instrument Air System		$ 265,223	25%	25%	5%	20%	20%	5%
6). Water Treatment Unit		$ 286,382	100%	0%	0%	0%	0%	0%
Start Up and Commissioning [4]		$ 6,042,235	20%	25%	5%	5%	5%	40%
Capital Spares (based off of Yankee Gas Comp) [5]		$ 1,200,000	0%	0%	0%	0%	0%	100%
Demo and Civil Work (Soil Stabilization) [5]		$ 13,000,000	0%	0%	0%	0%	0%	100%
Substation [5]		$ 3,000,000	90%	10%	0%	0%	0%	0%
Direct Line to TOTE [5]		$ 8,000,000	0%	0%	100%	0%	0%	0%
In water Work at TOTE Site [5]		$ 4,000,000	0%	0%	100%	0%	0%	0%
Balance of Plant (Utilities, Safety, Security and Telecom) [4]	*$ 2,700,000*							
Builders Risk Insurance [6]		$ 1,200,000	0%	0%	0%	0%	0%	100%
Pollution Insurance [6]		$ 1,500,000	0%	0%	0%	0%	0%	100%
Plant Sales Tax	*$ 12,953,772*							
Sales Tax [2]		$ 8,960,494	41%	11%	12%	2%	6%	28%
Additional $4 Million to City of Tacoma [1]		$ 4,000,000	0%	0%	0%	0%	0%	100%

Sources

[1] Draft Tax Agreement with City of Tacoma

[2] Sales Tax Exemptions from Section 303 of SB 6440.

[3] Contingencies Based on Project Management Estimates

[4] Plant Capital Costs Estimates from CBI FEED Study

[5] Miscellaneous Capital Costs Estimates Compiled by Project Management

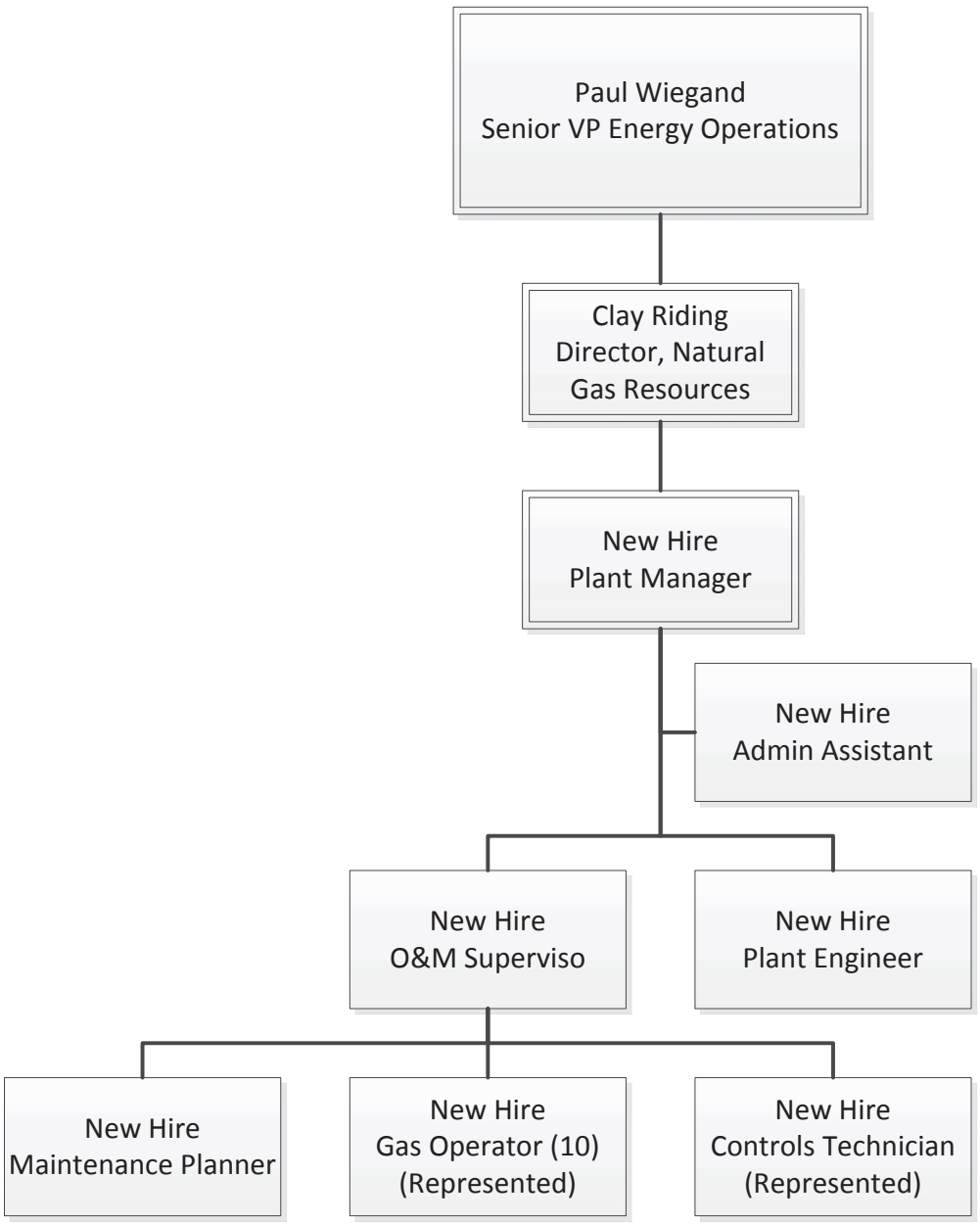
[6] Preliminary Insurance Estimates from Insurance Department

PUGET SOUND ENERGY

Exhibit P.

Operations Organization

Operations Organization



PUGET SOUND ENERGY

Exhibit Q.

Market Assessment of LNG as a Distributed Fuel in Washington State

Prepared by Concentric Energy Advisors

MARKET ASSESSMENT OF LIQUEFIED NATURAL GAS AS A DISTRIBUTED FUEL IN WASHINGTON STATE

DRAFT

Prepared for

Puget Sound Energy

September 19, 2012

I. EXECUTIVE SUMMARY

Puget Sound Energy ("PSE") is evaluating liquefied natural gas ("LNG") as a fuel option for certain markets in the Pacific Northwest, specifically the state of Washington and the western Columbia River Port ("market area"). PSE retained Concentric Energy Advisors, Inc. ("Concentric") to provide a market assessment for several potential LNG markets including heavy duty on-road transportation, marine, rail, and industrial conversion markets.[1] In addition, PSE requested that Concentric assess the market for LNG to compressed natural gas ("CNG") in on-road and off-road fleet applications. Last, Concentric considered PSE's strategic advantages and the roles of potential competitors and/or partners to PSE in serving these markets.

Concentric provides this report to supplement PSE's decision criteria regarding LNG market demand and strategic positioning. Major price and supply assumptions and certain of Concentric's findings are summarized as follows:

- Basing oil prices on the Energy Information Administration ("EIA") Long Term Energy Outlook ("AEO") dated June 2012, Reference Case oil prices, the resulting Ultra Low Sulfur Diesel ("ULSD") prices in the market area will remain significantly above the expected cost of LNG from PSE's proposed greenfield LNG facility to allow customers to payback investments for conversion of engines and related equipment. The EIA's Reference Case Long Term Energy Outlook, August 2012 forecasts crude oil prices to rise to 170 USD per barrel by 2025. ULSD, which sells at a premium to crude prices, is currently used in the heavy duty trucking market, and its price will drive economic considerations for future industry conversions. Beginning in 2015, marine vessels operating in the North American Emission Control Area or ECA [2] must use marine oil that contains only 0.1% sulfur. For purposes of this report, the forecast assumes on-road ULSD and 0.1% sulfur marine fuel are equal in price.

- While there is LNG production in Washington and northern Oregon, this LNG supply is generally part of the integrated resource portfolio of the local distribution companies serving the region, including PSE. These LNG facilities could be used to provide bridging supply for the new, distributed LNG markets that develop until a new LNG facility is built. PSE has collaborated with potential bridge suppliers of LNG, notably Fortis BC in Vancouver, BC, as sources of LNG supply in the event demand for LNG from new markets precedes the availability of LNG from a new liquefaction facility in the market area.

- Only two markets, marine and heavy duty trucking, will contribute measurably to distributed LNG demand in PSE's market area:

[1] Initially, Concentric was retained to consider electric and gas peak shaving markets, microgrid markets and LNG supply context and alternatives associated with serving potential markets. Through mutual agreement with PSE, in early July 2012, PSE and Concentric reduced the work scope to consider only the stated markets.

[2] The ECA is any area within 200 nautical miles of the North American coastline.

- Marine customers in the market area that must comply with ECA regulations are numerous. Excluding ocean traffic (vessels that operate internationally and largely outside the ECA), Concentric estimates that the ECA-compliant shipping market could consume as much as 1,000,000 LNG gallons per day[3] of fuel if 100% of the vessels operating in the market area converted to LNG. PSE is advantaged to possibly serve marine LNG markets that are significantly more active than elsewhere in the United States. Specifically, LNG as a marine fuel has been publically endorsed by two major marine customers in PSE's market area, Washington State Ferries ("WSF") and Totem Ocean Trailers Express ("TOTE"). Both potential customers have implementation plans and, to a large degree, have regulatory support to convert a portion of all of their marine-based fleets to LNG over the next few years. In addition, several other large marine customers could convert to LNG based on LNG's availability in the Puget Sound area, emulating conversion activities of WSF and TOTE. By 2020, Concentric forecasts demand in the marine market to exceed 170,000 LNG gallons per day or a market penetration level of about 20%.[4]

- Based on Concentric's analysis, demand for LNG in the heavy duty truck (Class 7&8) transportation market could to grow over the next several years from its current level to over 100,000 LNG gallons per day by 2020. The majority of demand comes from national and interstate long-haul fleets and assumes an adaption rate of between 5-8% in these two segments. Overall, Concentric forecasts a 2020 market area adoption rate in the Class 7&8 segment of approximately 7%.

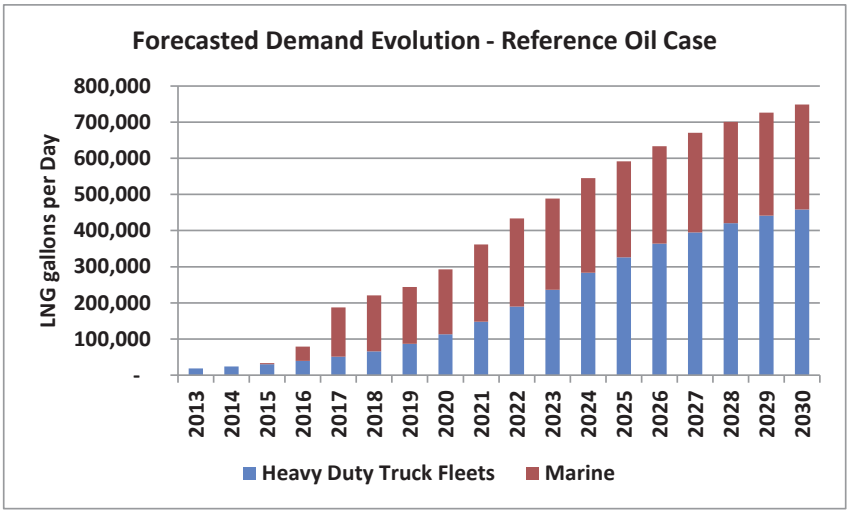
	LNG gallons per day	
EIA on-highway diesel use - 2010	2,838,873	
Est. diesel use in western Washington	2,129,155	
Class 7&8 use in western Washington	1,596,866	
Concentric forecasted market penetration by 2020	113,399	7.1%

- The trucking market demand, when combined with marine demand, could total 300,000 LNG gallons per day by 2020 and provide PSE with enough market demand to construct and operate a LNG production facility with a capacity of up to 300,000 LNG gallons per day.

[3] This includes the summer-only cruise ship market of approximately 500,000 LNG gallons per day.

[4] Since cruise ships provide summer-only demand, average daily demand on a 365-day basis is about 750,000 LNG gallons per day.

Figure 1



- Demand for LNG in the thermal conversion market is extremely limited. Most industrial customers in the market area currently use gas or, if not gas, then self-provided biomass. Only 1-2 larger industrial customers in the market area could be targets for on-site LNG as a fuel option.

- Demand for LNG in the rail segment could be viable in later years (2025+) but will not be developed in the short or medium term due to slower developing dual fuel (gas and diesel) locomotive engine technology. The rail industry needs high horsepower engines and LNG fueling along major rail routes in order to become a significant market for PSE's LNG.

- There is demand for CNG in the market area consisting of lighter duty vehicle applications and return to base/slow fill heavier duty applications (transit buses, garbage trucks). LNG to CNG does not appear to compete favorably against pipeline CNG and therefore does not contribute significantly to LNG demand unless CNG is produced at an existing LNG fueling stations (the LNG is already on-site; CNG is produced from the on-site LNG). In addition, if fleets commit to CNG under medium to long term contracts prior to the in-service date of PSE's LNG facility, it will be difficult for PSE to capture market share. Concentric has not included CNG demand from LNG in its LNG demand evolution.

- Regulatory oversight and permitting of LNG are critical factors in the success of LNG as a distributed fuel. Regulations for LNG use as a vehicle fuel are developed and known; National Fire Protection Association ("NFPA") 57 and 59A are currently used by the industry and its regulators. Rules and procedures for LNG as a marine fuel are still being developed. It is in PSE's interest to understand existing regulations for LNG as well as participate in the development of any new requirements.

- Federal, state and local tax and other incentives that encourage the use of LNG as a distributed fuel are currently very limited with the majority of federal tax incentives for fueling infrastructure and fuel tax having expired at the end of 2011. Of note, LNG as a transportation fuel currently suffers from two tax *penalties* – a) a penalty associated with the lower energy content of an LNG gallon versus a diesel gallon yet both are taxed equally on a volumetric basis ("gallon tax penalty") and b) a second penalty associated with the excise taxes on the higher gross cost of LNG engines versus diesel engines ("excise tax penalty"). While Concentric believes that the gallon tax penalty will be resolved in early 2013, it believes the excise tax penalty will remain. In summary, tax and funding incentives could materialize but currently do not play a significant role in expected LNG demand evolution.

II. RESEARCH AND ANALYSIS

Purpose of the Report

PSE retained Concentric to assist PSE with the evaluation of certain distributed LNG and LNG to CNG markets. The report contains the following five sections:

1. **Market Context –** This section identifies the relative competitiveness of LNG and LNG to CNG as a competing fuel against diesel and ULSD in the market area.
2. **Evolution of demand –** This section will quantify the demand forecast and certain scenarios for each of the following markets:
    a. **LNG as a transportation fuel in the marine segment**
    b. **LNG as a transportation fuel in the heavy duty truck segment**
    c. **LNG in the rail segment**
    d. **LNG industrial thermal conversion segment**
    e. **LNG to CNG for use as a transportation fuel primarily in lighter duty fleets**

    Each market analysis will contain methodology for establishing the fleet inventories, expected annual fuel use of vessels/vehicles in the fleet, and projected evolution for LNG to capture market share under three price scenarios. In addition, factors that PSE can successfully influence in this demand evolution will be discussed.
3. **Competition and partners –** This section provides a high level summary of major competitors or partners for PSE to consider to profitably capture market share for LNG in the market area.
4. **Conclusion** – This section provides a summary of conclusions and findings based upon the research and market analysis conducted for this assignment.
5. **Appendix A-E** – This section provides price scenarios and information regarding the data and models that underlie the analysis. All data and models will be provided to PSE.

III. MARKET CONTEXT

There are two major factors driving expected demand for LNG as an alternative to oil-based fuels such as on-highway diesel oil, marine diesel and residual oil, and propane.

Economic

Demand for LNG as a distributed fuel in the market area is largely being driven by the price spread between natural gas products including LNG and CNG and refined oil products including marine fuels and on-road diesel.

Concentric and PSE collaborated in determining the long range price forecast for ULSD, the expected primary fuel used in the heavy duty transportation market and a proxy for marine fuel after 2015. The process was as follows:

- To forecast crude oil prices, for the period from 2012 and 2013, Concentric used the July 2012 EIA Short Term Energy Outlook oil price forecast; for 2014, Concentric extrapolated the oil price between EIA's short and long term outlooks. For 2015 and beyond, Concentric relied on the AEO 2012 Reference forecast for Low Sulfur Light Crude Oil ("LSLCO").

    - In order to approximate a forecast for the Washington state wholesale price for ULSD, Concentric reviewed historical spreads between EIA-reported historical LSLCO prices and North Slope Crude Oil prices. North Slope Crude is the feedstock for refiners in the market area that produce ULSD. Historical data shows little spread between LSLCO and North Slope Crude. As such, Concentric adopted the EIA short and long term forecasts for LSLCO as a proxy for North Slope Crude.

    - Based on market intelligence provided by PSE, given existing refining capacity in the Seattle-Tacoma area combined with higher demand from marine markets beginning in 2012 and tightening again in 2015, ULSD prices were set at 25% above North Slope Crude prices (red line in Figure 2 below). This price is at, or close to, the forecast for US transportation diesel fuel published by the EIA[5] (green line in Figure 2 below). Concentric and PSE also considered i) ULSD price forecasts produced by WSF in their late 2011 analysis of fleet conversion to LNG,[6] ii) TOTE's assumed ULSD price forecasts (not explicitly provided to PSE) which are much higher than the WSF forecast and iii) the potential for increased ULSD refining capacity in the Puget Sound area[7] which could decrease the relative ULSD price premium versus LSLCO. After considering several alternatives, Concentric and PSE agreed to use LSLCO AEO 2012 Reference prices at the 25% premium as the basis for the market

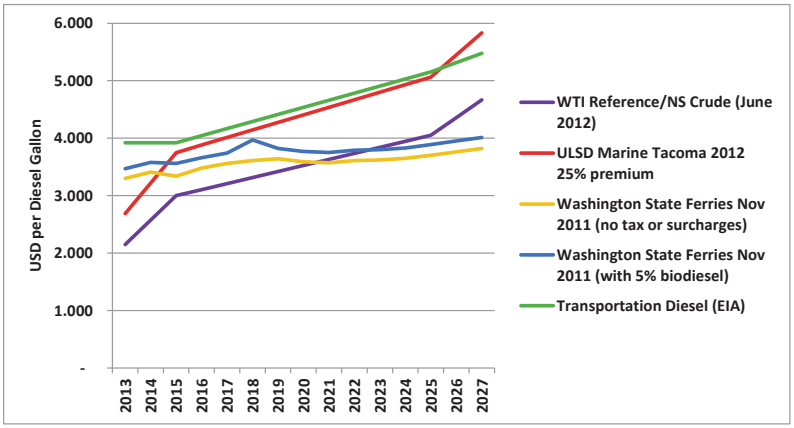
5 AEO 2012

6 Evaluating the Use of Liquefied Natural Gas in Washington State Ferries, Washington Joint Transportation Committee, January 2012, Exhibit 7

7 Incremental ULSD refining capacity is very expensive to build and very complex to operate. This adds significant risk to refiners who may be considering increasing ULSD capacity in the Puget Sound area. Refiners will try to recover these large investments through increased margins but there is no guarantee of investment recovery.

area ULSD price forecast ("ULSD Reference"). This forecast is shown in red in Figure 2 below.

Figure 2

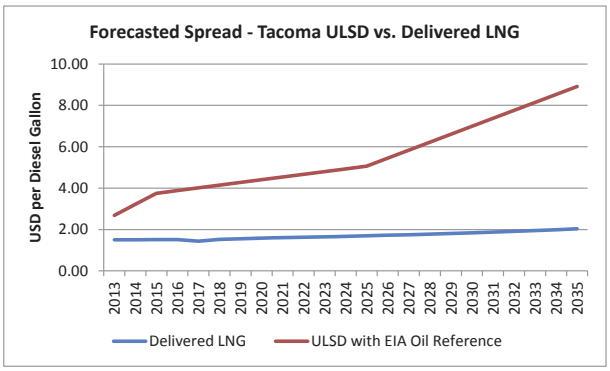


- Natural gas and LNG price forecasts were provided by PSE.

- The forecast used by Concentric also assumes that distributed LNG customer will be able to purchase LNG from existing LNG sources at a price of 10.00 USD per MMBtu for the period 2013 through Q3 2016, prior to the expected start date for new proposed liquefaction facility.

Figure 3

The forecasted spread between ULSD Reference and PSE LNG ("Reference Case Spread"), as expressed in USD per diesel gallon equivalent ("DGE"), is significant and can support investment in engine conversion and LNG fueling infrastructure in the heavy duty trucking, and as explained below, the marine markets.



- The marine market currently uses slightly heavier and therefore slightly less expensive grades of marine fuel oil than ULSD. This is expected to change in 2015 when local and coastal marine fleets must use fuels that emit <0.1% sulfur content when burned. Beginning in 2015, the forecast assumes that the price of 0.1% marine fuel equals the price of ULSD Reference. The spread between marine fuel and LNG and ULSD Reference and LNG will be significant enough to support conversion of vessels to LNG.[8]

- Forecasted price spreads between LNG and ULSD under the AEO2012 EIA "High Oil" and "Low Oil" cases are shown in Appendix A.

Environmental

- In the marine and heavy duty trucking markets, in addition to economic advantages of natural gas as a fuel, environmental regulations are also driving the move towards cleaner fuels such as natural gas.

- For the marine market, the US Environmental Protection Agency ("EPA") sets air emission standards under MARPOL Annex VI rules. These rules provide for limits for emissions of sulfur oxides ("SOx"), nitrogen oxides ("NOx") and particulate matter ("PM") applicable to US-flagged ships and foreign-flagged ships operating in US waters.[9]

- For the trucking market, as of December 2010, all heavy duty tractors are required by the EPA to use ULSD in order to comply with EPA standards. Some states further restrict air emissions, requiring national and interstate fleets to comply with the most restrictive standards in their operating area.[10]

- The reliance on higher grade fuels in these two markets puts upward pressure on cleaner diesel, such as ULSD. While crude oil and natural gas have strong price spreads, refined oil products, particularly ULSD command an additional premium above the crude price as refining costs are factored into the price and demand for ultra-light diesel grows. As such, stricter environmental regulations further expand the price spread between oil and natural gas-based transportation fuels.

- Both the marine and trucking market must rely on cleaner fuels such as natural gas to meet future sulfur and nitrogen oxide emission standards or they must rely on add-on technology, such as exhaust gas scrubbers, along with lighter grades of diesel fuel, to comply with the standards. These clean air standards, combined with the price spread between oil based fuels and natural gas based fuels, make conversion to LNG and CNG (for lighter transportation vehicles such as cars and light duty trucks) very attractive to reduce emissions and costs as compared to other alternatives to meet emissions requirements.

---

8 See Figure 4 and Figure 6 below

9 As of August 1, 2012, the maximum sulfur content of fuel oil used within the Emissions Control Area ("ECA") around North America (generally 200 miles from the coast) will be limited to 1%. As of January 1, 2015, this falls to 0.1%. NOx emissions will be further restricted as of January 1, 2016.

10 For example, trucks operating in California must comply with California standards for reduction in particulate matter that are slightly more restrictive than in other states. Given that the major transportation corridor leaving the market area is interstate highway I-5, heavy duty long-haul trucks leaving the market area will likely have to comply with California air emissions standards.

IV. EVOLUTION OF DEMAND

a. Marine market

Factors influencing evolution

The evolution of demand for LNG in the marine sector is driven by several factors including:

- The forecasted sustainable price spread between oil-based clean marine fuel and LNG.
    - This includes a pricing structure between buyer (fleet owner) and seller (PSE) that allows, under multiple oil and gas price scenarios, recovery of invested capital costs of both parties over a reasonable payback period.
- PSE's willingness and ability to produce LNG for use in the market area.
    - The partnership and risk balance that is evolving between PSE, in contemplating the construction of LNG production capacity, and the potential marine customer base is a key driver in this sector's market evolution. The marine market is relatively concentrated, with few major players dominating the potential LNG conversion market (as compared to trucking fleet markets which are disaggregated). Both parties (PSE and the marine customer) must invest significant capital in infrastructure – PSE in liquefaction and storage, the customer in delivery methods, on-board engine retrofit and storage – for LNG to be considered a reliable, available alternative to oil-based marine fuel.
- The implementation of more restrictive EPA emissions requirements
    - Fleets will have several choices to make regarding compliance including the cost of installing emissions reducing equipment on-board the vessel. Maritime Executive recently reported that emission reduction equipment has technological and other challenges (deck space, increased fuel consumption) that may make LNG a better compliance alternative.
    - PSE's LNG plan is important to marine vessel owners to provide evidence to EPA and United States Coast Guard ("USCG") that implementation of LNG fueling is a viable option for compliance. In TOTE's case, an LNG implementation plan was an important factor for TOTE to gain approval from the EPA and USCG for a small but important delay in ECA compliance. This delay could give vessel owners the necessary permitting, engineering, design and construction window to convert to LNG versus install emissions reduction equipment.

- PSE's support of vessel owners in any EPA or USCG regulatory review of LNG conversion plans will help PSE gain market share in this sector.

- The ability for the converted fleet to find sources of LNG in expected trade routes and in the aftermarket.

    - Similar to truck fleets that travel outside the market area, marine fleets must have refueling options in the expected trade where fleet is or may be deployed. If LNG is not widely available in North America and around the world, vessels reliant on LNG fueling may have lower portfolio value[11] and resale value than vessels relying on traditional oil-based marine fuels. The development or lack of development of LNG fueling in other global markets will also affect the re-sale value of LNG ships.

- Marine fleet owners must account for the incremental cost of conversion including the capital cost of LNG engine and on-board fueling system and/or the incremental cost of new builds

Fleet owners must take into account all expected capital and expense-related costs associated with conversion to LNG and weigh those against fuel and technology costs associated with burning an oil-based fuel. Costs for LNG conversion include i) capital costs for LNG storage and fuel systems, ii) expense costs associated with any reduction in ship commercial space resulting from on board storage, fuel and environmental compliance systems, iii) the commercial time lost during the conversion process (either loss of incremental sailing time during conversion or time spent in a shipyard), iv) training time for mariners and fuel handlers, and v) incremental costs associated with regulatory oversight of new fueling or compliance systems. In looking at fleet conversion costs, Concentric has not estimated costs for items (ii) through (v) as there is little or no publically available information associated with such costs and each fleet and vessel will consider these costs differently[12] and review them against similar costs they will alternatively incur to install and operate exhaust gas scrubbers and Selective Catalytic Reduction ("SCR") on-board the vessels. As such, Concentric does not believe these other factors will substantially diminish forecasted LNG demand in this sector.

11 Fleet owners rely on the flexibility within their fleet to meet financial goals. If parts of the fleet cannot be used in multiple locations due to fuel availability restrictions, the overall value of the fleet is reduced.

12 This will be information that PSE will likely gather in conversations with its customers.

PSE's Role

- The demand for LNG as a marine fuel resides in a very concentrated set of customers. It is therefore important for PSE to understand the unique needs and wants of each potential customer.

- Capital investment by the customer and by PSE must be tightly coordinated. Given the demand from individual vessels once converted to LNG and the impact this demand can have on PSE's expected return from the proposed LNG facility, PSE and its potential marine customer must work in tandem to ensure LNG supply and LNG demand are as closely coordinated as possible.

- PSE should take an active role in the operational requirements associated with fueling marine vessels. Rules and regulations regarding marine fueling using LNG are under review with formal and informal stakeholders such as USCG, classification societies such as DNV and ABS, the International Maritime Organization ("IMO"), ship owners, fuel providers, LNG suppliers, equipment manufacturers, and consultants. Although PSE may ultimately play the role of LNG supplier and leave others technically, operationally and legally responsible for the custody transfer of LNG onto vessels, during this stage of LNG adoption, PSE must understand the requirements of LNG fueling and on-board storage of LNG. This is important in the timing of a customer's requirements for LNG; such timing will affect the demand growth served and economics of PSE's proposed LNG production facility.

- PSE can also work with other regional and national LNG suppliers that may provide LNG outside PSE's market area. Certain fleets need assurance that LNG will be available to vessels at multiple locations in their forecasted trade. For example, Horizon operates its fleet out of multiple locations along the Pacific coastline including Tacoma, Oakland, and Los Angeles as well as in Alaska and Hawaii. PSE can work with other utilities and LNG marine fuel providers to promote the development of marine fuel infrastructure in major ports within the ECA of the western US, Alaska and Hawaii. In addition, cruise ships operating within the ECA on the US west coast are also interested in converting to LNG but cannot do so unless LNG as a port fuel is developed in both the PSE market area (for Seattle/Vancouver to Alaska voyages in the winter) and the Southern California and Mexico markets (for winter voyages).

Determining inventory and expected fuel use of potential conversion fleets

Concentric relied on multiple sources to determine an inventory of marine fleets and vessels in the market area[13] including:

[13] Detailed marine fleet inventories, characteristics, owners, annual mileage estimates and evolution calculations will be provided to PSE in an Excel workbook. Data is summarized in Appendix C.

- Puget Sound Maritime Emissions Survey, 2007
- Washington Legislature Joint Transportation Committee report, 2012
- Washington State Ferries – Glosten Associates reports and presentations dated 2010, 2011 and 2012
- US Army Corps of Engineers Waterborne Statistics
- American Association of Port Authorities – Port Industry Statistics
- Northwest Ports Association
- Company websites

Vessels were then cross-referenced via United States Coast Guard (USCG) Vessel Documentation Database and Marine Traffic Database

Concentric then determined annual fuel requirement of certain vessels operating in the market area using multiple forecast methodologies and references including:

- Horsepower and annual mileage of vessel[14]
- Estimates from various industry reports including American Clean Skies Natural Gas for Marine Vessels, April 2012
- Route and schedule of vessel
- Multiple industry websites and presentations

Concentric then assumed that that any net incremental investments[15] in on-board LNG engine and fuel systems equipment would be recovered over a ten year period at a discount rate of 15% based on the annual estimated mileage for the vessel. Based on forecasted Reference Case Spread, [16]annual diesel use should be at or above the breakeven annual DGE threshold in order for the investment to make economic sense.

Figure 4 shows the approximate annual diesel gallon equivalent ("DGE") consumption that is necessary to break even on the conversion investment. Investment period is assumed to be ten years with IRR of 15%. This assumed IRR represents a relatively conservative assumption with regard to the break-even analysis.

Figure 4

		Reference Oil Case	
	Investment	Breakeven Annual DGEs	Breakeven Annual LNG Gallons
Tugs	$7.2M	239,679	402,660
Ferries	$12M	399,464	671,100
Ships	$20M	665,774	1,118,500
	$30M	998,661	1,677,751
	$40M	1,331,548	2,237,001

14 Information provided in the Puget Sound Maritimes Inventory report is based on 2005 reported figures. An updated report and inventory should be available in late 2012 but was not yet available for this assessment.

15 Investment estimates based on industry sources including American Clean Skies Foundation, Natural Gas for Marine Vessels, April 2012

16 Since marine vessels in North America must comply with a 0.1% sulfur cap starting in January 2015, the analysis assumes that 0.1% marine fuel and ULSD have the same commodity price in the market area for the period 2015 forward.

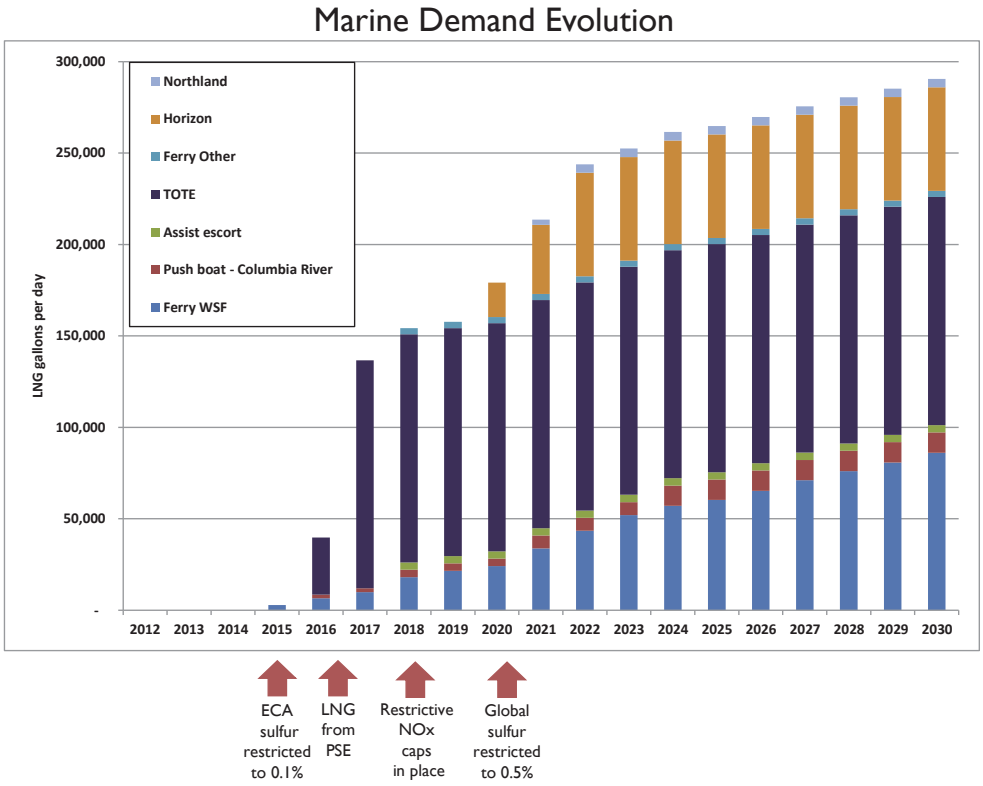
Of the vessels meeting annual estimated mileage needed to cover conversion investment costs, conversion dates for fleets and vessels are then estimated based on:

- Public information regarding intent to convert (WSF and TOTE)
- Environmental regulation drivers
- Regulatory or technical considerations associated with the use of LNG
- Availability of LNG from PSE or other market sources in vessel's anticipated trade route

Reference Case Evolution - Marine

- As shown in Figure 5 below, the LNG marine fuel market could exceed 170,000 LNG gallons per day by 2020.
- Cruise, ocean going, and other vessel conversions (designated "not active" below) may take place after 2020, but the location of LNG fueling alternatives in North America and around the world is currently the limiting factor.

Figure 5



b. Heavy duty trucking market

Factors influencing evolution

The evolution of demand for LNG in the heavy duty trucking sector is driven by the following primary factors:

- The forecasted sustainable price spread between ULSD and LNG
    - This includes a pricing structure between buyer (fleet or fueling station owner) and seller that allows, under multiple oil and gas price scenarios, recovery of invested capital costs of both parties over a reasonable payback period.
- In addition to the availability of LNG for use as a distributed fuel in the market area, the development of LNG fueling infrastructure outside the market area to support conversion of national and interstate fleets.
    - There is a certain amount of risk sharing that must take place among the LNG producer, the LNG distributor, and the LNG customer for the LNG truck transportation market to develop in the market area. The availability of LNG along major transportation routes outside the market area will have strong influence on demand evolution.
    - As shown later in this document, national fleets show the highest initial and overall potential for conversion to LNG. This is largely because of their ability to absorb financial and operating risks associated with LNG conversion, technology and training synergies among national operating fleets, and cost benefits of large scale conversion to a more economic fuel supply. In order to serve the needs of the national fleets, PSE should consider becoming part of a larger network of LNG suppliers to the market. Cooperation among LNG suppliers and distributors is necessary to build up the regional infrastructure that will support demand for LNG. This may result in PSE's role in the LNG fueling supply chain to be either more or less than originally expected.[17]
- The incremental cost of LNG engines/vehicles and LNG fueling station
    - LNG tractors currently cost approximately 30% more, or approximately $75,000 (including excise tax), than diesel tractors.
        - The analysis assumes that the incremental cost (and excise tax) of the LNG tractors is borne entirely by the customer

[17] PSE could simply play the role of LNG supplier or, in order to stimulate market adoption, PSE may have to work with partners or the customers themselves to develop fueling infrastructure to serve potential marine and transportation customers.

- The analysis also assumes that the tax "penalty" (LNG engines/fuel systems cost more than diesel; excise tax is paid on the total cost of the LNG system) continues throughout the forecast period.

- The analysis projects that there is no "salvage penalty" for the LNG tractor aftermarket. Given the LNG tractor market is in the early stages of development, there is the risk that the aftermarket for LNG tractors (primarily resale to overseas trucking companies) does not develop. Concentric believes that this aftermarket issue is offset by the industry expectation that LNG tractors will have a longer useful fleet life in North America.[18]

- As shown in Figure 6 below, using ULSD Reference prices, fleet owners could recoup their incremental investment (IRR would be greater than 0%) if the tractor averaged between 20,000 and 40,000 miles annually over a five-year period.

Figure 6

IRR	Annual Mileage					
	20,000	40,000	60,000	80,000	100,000	120,000
Low Case	(49.27%)	(36.43%)	(26.62%)	(18.13%)	(10.35%)	(2.98%)
Reference Case	(1.41%)	46.74%	113.38%	241.55%	679.17%	NA
High Case	40.73%	215.18%	NA	NA	NA	NA

- Assumes public fueling station charges minimum of $0.10 per LNG gallon[19] to recover the investment of the public fueling facility
- Low Case Breakeven at 170,000 miles

- A private, single fleet LNG fueling station can cost as much as 1-2 MUSD.
  - A fleet customer absorbing this cost must have significant centralized diesel requirements (either multiple trucks or multiples of miles per truck (as shown above in Figure 6) or combinations of the two as shown in Figure 7) in order to pay off the cost of the fueling station.
  - Figure 7 below provides indicative IRR on investment to gauge whether fleets can support the cost of private, centralized fueling

[18] In August 2011, Chuck Gordon, President and Chief Operating Officer of Heckmann Resources, stated that their expectation is that an LNG tractor purchased by Heckmann Resources in 2011 will have a useful life of over seven years versus a diesel tractor that has a useful life of only five years.

[19] The 2012 NACS Retail Fuels Report stated that retail fuel distributors have a 5-year average mark-up of 15.8 cents per gallon. This equates to approximately 10 cents per LNG gallon.

Figure 7

IRR	Annual Mileage					
Number of Trucks in Fleet	30,000	55,000	80,000	105,000	130,000	155,000
5	(42.64%)	(29.30%)	(18.42%)	(8.56%)	0.86%	10.15%
10	(30.80%)	(12.41%)	3.91%	20.07%	37.07%	55.73%
15	(23.27%)	(0.83%)	20.48%	43.28%	69.53%	101.73%
20	(17.81%)	8.06%	34.09%	63.92%	101.43%	153.12%
25	(13.60%)	15.27%	45.77%	83.00%	133.98%	213.57%
30	(10.22%)	21.28%	56.05%	100.98%	167.88%	287.41%
35	(7.43%)	26.42%	65.22%	118.12%	203.61%	380.82%
40	(5.09%)	30.87%	73.51%	134.57%	241.60%	503.65%
45	(3.09%)	34.78%	81.06%	150.45%	282.24%	673.16%
50	(1.35%)	38.24%	87.98%	165.82%	325.96%	922.86%

Based on fueling station cost of $1.5 M, payback period of 5 years, Reference Case Oil

- Availability of public LNG fueling stations

  - Availability of LNG along high-traffic trucking routes is essential to the development of the heavy-duty trucking market. LNG tractors can currently travel approximately 200-600 miles per LNG fill-up using currently available LNG tractor equipment. Most national and long haul fleets will want a network of LNG refueling stations every 100-200 miles in order to ensure adequate refueling capability.

- Availability of Original Equipment Manufacturer ("OEM") heavy duty LNG truck engines

  - The analysis assumes that demand in the LNG trucking market will be stimulated by the availability of high performance, mass-produced LNG OEM engines beginning in late 2013 and early 2014 from Westport, Cummins, Navistar and Volvo.

  - Mass production of LNG engines and tractors should serve to drive down incremental costs of LNG tractors. Concentric has not assumed such a benefit in this analysis.

- Cost and availability of compliance options regarding EPA clean fuel requirements

  - Concentric does not explicitly quantify the implementation of tighter clean air standards as they relate to the demand evolution for heavy duty trucking. However, the impact of the clean air standards is accounted for in the ULSD Reference price premium expectation and therefore, a larger spread between ULSD and LNG.

- DGE tax penalty for LNG

  - Since an LNG gallon has energy density 40% lower than diesel yet is taxed on a per volumetric gallon basis, LNG currently has an effective federal tax penalty as compared to diesel.

- The analysis assumes this will be resolved in 2013 making the tax applicable to both diesel and LNG on an energy (versus volumetric gallon) equivalent basis. This serves to slightly increase the spread between ULSD and LNG.

While a sustained price advantage of LNG over ULSD is the most important determining factor in the evolution of demand in the trucking sector, Concentric also identified other key events that will influence the timing and magnitude of demand growth. PSE requested Concentric estimate the evolution of demand over the ten year period starting in 2015 (beginning with demand prior to the in-service date of a proposed liquefaction facility in late 2016 and including demand during the first 8-10 years of the investment cycle), Concentric focused on short and medium term key events that will influence market growth.

2012:	National fleets (UPS, Ryder, FedEx) start adopting LNG technology creating more public and fleet awareness of price benefits, technology advancements and LNG availability
2013:	The elimination of the LNG gallon tax penalty creates more economic incentive for fleets to convert
2014:	New widely mass-produced engines and technology improvements in performance could make the switch to LNG more realistic for longer haul trucking fleets
2015:	New emission regulations will increase the demand and consequently the cost of ULSD in the Puget Sound area, making LNG more economical for many fleets
2017:	Supply from a proposed new LNG facility could be available (the analysis assumes LNG is available from existing sources of supply prior to 2017). This stimulates growth in all segments but, in particular, local fleets
2018:	The dispersion and spacing of on-highway LNG refueling stations will encourage more fleets to consider LNG (dissipating fear of running out of fuel while on a run). This can also eliminate fueling facility capital costs for smaller customers interested in converting.

PSE's Role

By developing local LNG production capacity, PSE could facilitate the market development of fleet use of LNG. Since fleet owners identified "lack of LNG infrastructure" as the most critical factor they consider in conversion to LNG, providing LNG to the market and/or supplying LNG to fuel distributors sends a critical positive signal.

Effort put forth by PSE to support LNG as a vehicle and marine fuel infrastructure in the market area as well as on a regional and national basis is a key factor in helping develop LNG as a transportation fuel. This support can take the form of:

1) coordination among utilities in Washington, Oregon, Northern California and southern British Columbia to supply LNG and/or build LNG fueling infrastructure,

2) providing LNG supply to developers of LNG fueling infrastructure such as Shell, Clean Energy, Linde and others.[20]

Supporting federal, state and local economic and environmental incentives for fleet owners and infrastructure providers is also an important role for PSE.

1) On a national level, PSE can establish and maintain contacts with industry organizations that promote the use of natural gas as a transportation fuel such as NGVAmerica, American Clean Skies Foundation, and the National Petroleum Council.

2) On a state and local level, PSE can work with governmental and environmental organizations such as Washington's Joint Transportation Committee and other industry organizations to promote market adoption of LNG.

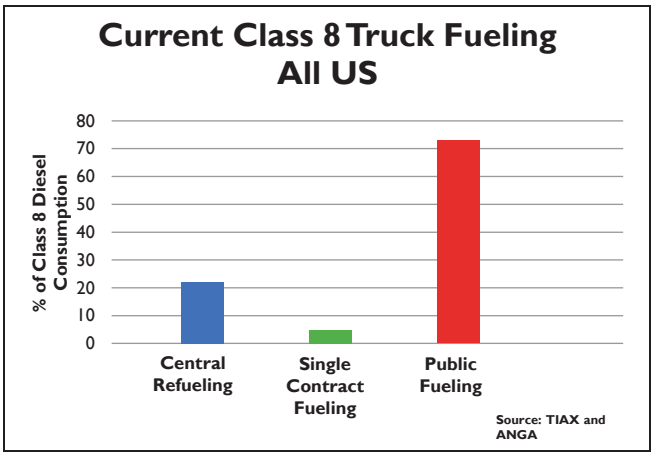
PSE can also work to ensure LNG safety and security is a perceived benefit, not a deterrent, to large scale adoption of the fuel. LNG has low market penetration and is widely perceived by the general public as a dangerous fuel. Large scale LNG import and export facilities proposed in the Pacific Northwest have received significant negative publicity, with safety and security driving local opposition to these facilities. PSE and its customers and partners must work jointly to ensure the public is well informed about LNG safety and security.

Last, the existing diesel fuel supply distribution chain is important in understanding customer behavior and preferences. The majority of heavy duty fleets refuel at public diesel fueling stations. While private fueling may be PSE's preferred distribution method – return to based fleets with on-site private LNG fueling infrastructure – the market's existing preferences for public fueling will likely drive demand.

[20] Clean Energy is developing "America's Natural Gas Highway" and plans to install up to 150 LNG fueling stations in the United States by the end of 2013. Shell has developed a partnership to provide LNG fueling at Pilot Flying J facilities across Canada.

Figure 8

PSE must consider existing fleet refueling habits in order to understand potential demand. As shown in Figure 8, most fleets refuel at public stations. As such, PSE may consider partnerships with current fuel distributors, national gasoline companies, and natural gas and diesel distributors like Shell and Clean Energy.



Determining inventory and expected fuel use of potential conversion fleets

Concentric relied on various local and national fleet databases, government references and industry sources to compile an inventory of fleets in PSE's market area. Included in this information is source data from.

- U.S. Department of Transportation, Federal Motor Carrier Safety Administration
- Department of Transportation, Washington State
- Washington Trucking Association
- EIA
- TIAX report for America's Natural Gas Alliance, "Liquefied Natural Gas Infrastructure"
- Clean Energy Fuels 2011 Annual Report; Clean Energy website information on America's Natural Gas Highway ("ANGH")
- CenterPoint Energy, "Building a Business Case for NGV's"
- National Petroleum Council, "Advancing Technology for America's Transportation Future." August 2012
- PLS Logistic Service, "Use of LNG-Powered Vehicles for Industrial Freight"
- National Energy Policy Institute, "What set of Conditions Would Make the Business Case to Convert Heavy Trucks to Natural Gas? – A Case Study", November 2010
- University of Chicago, "Natural Gas and the Transformation of the U.S. Class 8 Trucking Fleet." May 2012

The summary data provides fleet name, location and estimated or actual size of fleets doing business in the market area based. Size of national fleets doing business in the market area is based on per capita income of Washington versus other US states. In addition, interstate and intrastate fleet data

is used to estimate market growth based on location, number of tractors per company,[21] estimated annual miles driven per tractor,[22] percentage of fleet owned versus leased, the type of cargo carried,[23]

Concentric divided the fleet data into the five categories below and assessed the evolution of demand in each of the categories separately.

Figure 9

Fleet	Characteristics	Impact on Demand Evolution
National	Overall size determined for national fleets, fleet size per state estimated/researched	More total tractors, could rely on internal network of fueling stations for long range trips/not necessarily reliant on NGHW, converting to LNG has marketing appeal
Interstate long range	Interstate fleets with majority of trips greater than 100 miles, DOT	Needs NGHW to convert, but will convert quickly once it is established because of economics/ # of tractors
Interstate short range	Interstate fleets with majority of trips less than 100 miles, DOT	Needs NGHW to convert, not as economical as long range fleets due to lower mileage, slower adoption rate
Intrastate long range	Intrastate fleets with majority of trips greater than 100 miles, DOT	Hesitant without NGHW, but higher mileage makes converting more economical
Intrastate short range	Intrastate fleets with majority of trips less than 100 miles, DOT	No broad scale LNG infrastructure required, but less mileage and generally smaller fleets make adoption less economical and therefore much slower

Reference Case Evolution – Heavy Duty Trucking

Based on the economics of conversion (total cost, miles driven) combined with the key milestones shown in Figure 9 Concentric estimated market demand for LNG from the heavy duty transportation market to reach over 100,000 LNG gallons per day by 2020 and over 520,000 LNG

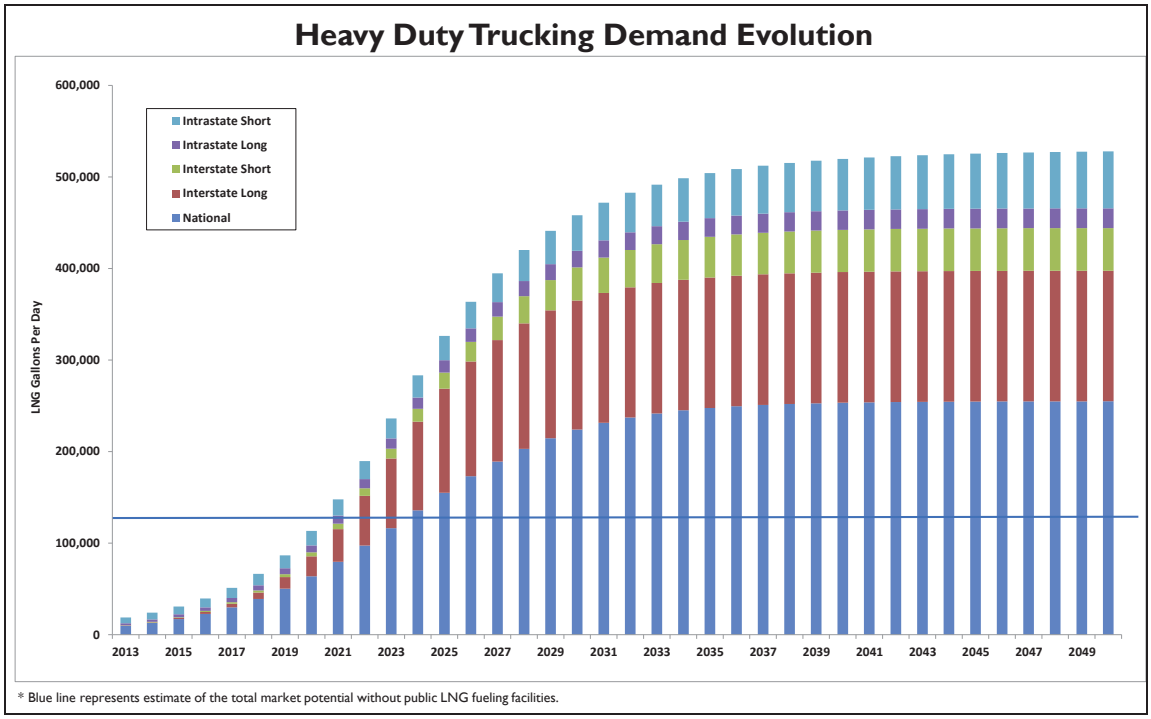
21 Tractors per company location is an important metric to determine the financial viability of on-site LNG fueling. Since the cost of an LNG fueling station is between 1-2 MUSD, there must be sufficient fleet size (and miles per tractor) to pay for the cost of the fueling station. The analysis assumes the fueling station capital investment must be paid back over 5 years to coincide with the life of the LNG tractor(s).

22 Miles driven per tractor is also an important metric to determine the financial viability of the higher cost of LNG tractor.

23 Type of cargo carried can help PSE determine whether the fleet is return-to-base and/or has fueling characteristics that may allow for overnight refill such as CNG slow fill.

gallons per day by 2050. The majority of this demand occurs in the national and interstate long haul fleet categories.

Figure 10

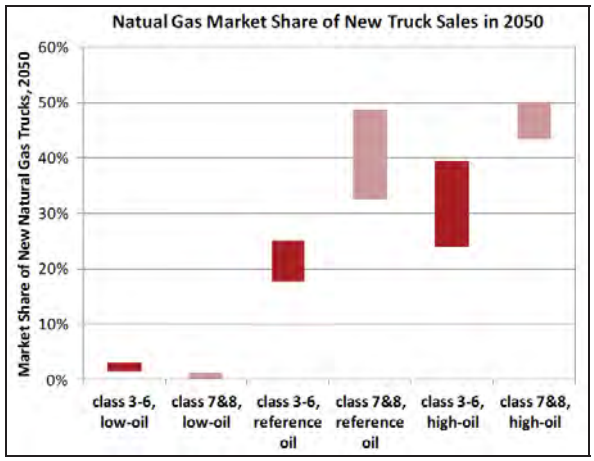


Concentric believes that the establishment of regional and national fueling infrastructure is a key element for successful adoption of LNG by the trucking industry. If demand were limited to fleets dependent **only** on on-site fueling, demand growth is probably limited to approximately 120,000 LNG gallons per day as shown by the blue line in Figure 10 above.

In its recent study,[24] the National Petroleum Council ("NPC") estimates that natural gas (mostly in the form of LNG) will capture between 32 and 49% of the heavy duty truck transportation new truck sales by 2050.[25]

24 Advancing Technology for America's Transportation Future dated August 1, 2012
25 Using EIA Reference Price Scenario oil prices

Figure 11



Source: National Petroleum Council

Based on current diesel use for on-road transportation in Washington State of 1.7 million diesel gallons per day[26] or 2.8 million LNG gallons per day, and assuming 65% of this consumption occurs in PSE's market area, Concentric's projection for 2050 of approximately 520,000 LNG gallons per day of demand (approximately 28% of the 2010 consumption) falls under the low end of the NPC Reference Case forecast.[27]

26 EIA Independent Statistics and Analysis, On-Highway Diesel Use 2010

27 The analysis assumes that increases in heavy duty truck miles driven in the market area through 2050 are offset by fuel efficiency improvements

c. Rail market

Factors influencing evolution

The evolution of demand for LNG in the rail sector is driven by several factors including:

- The forecasted sustainable price spread between ULSD and LNG (see above)
- Available LNG in the market area but also along major rail routes serving the Pacific Northwest and to the east and south
- Stricter EPA rules regulating air emissions for rail locomotives
- Development of rail engine technology
    - Advancements in LNG locomotive engine technology remain in the pilot stage. A good example of this is in eastern Canada where GazMetro and Canadian National Railroad will develop a prototype hybrid locomotive (diesel and LNG) that *could* begin operation in 2013. The project proponents believe pilot testing is far in advance of commercial use of LNG as a locomotive fuel.
    - GE and Shell have also formed a research project to develop dual-fuel rail locomotives but no commercial development timelines have been publically announced
    - No commercially available dedicated LNG or dual fuel engines are at commercial stages of development at this time

Determining inventory and expected fuel use of potential conversion fleets

Concentric assessed the railroad demand for diesel use in Washington. BNSF is the primary rail service provider in western Washington; Union Pacific operates mostly in the eastern half of the state.

Concentric estimates demand for LNG in the market area could be as high as 50,000 LNG gallons per day[28] if LNG replaced diesel fuel on major rail routes.[29]

Figure 12

Rail service provider	Route	Miles	Freight train frequency	Passenger train frequency	Total Miles	High Level Estimate LNG Gallons per Day	Per Train
BNSF	Seattle-Everett	30	40	8	1,440	4,608	96
BNSF	Everett-Spokane	300	25		7,500	24,000	960
BNSF	Seattle-Portland	177	50		8,850	28,320	566

Rail demand has not been included as part of the demand evolution for PSE. Current technology limitations cannot be overcome in the short term. Demand could start to develop after 2020 but in limited form.

Last, rail transportation of goods competes directly with over-the-road trucking. To the extent LNG is widely adopted as a transportation fuel in the heavy duty trucking market, any development of LNG use in rail could indirectly reduce demand for LNG as a trucking fuel.

[28] Based on an average mile per gallon of diesel at 0.5.

[29] Major rail routes in western Washington are Seattle to Everett, Everett to Spokane and Seattle to Portland. BNSF is the operator of all conversion routes studied.

d. Industrial thermal conversion market

Factors influencing evolution

The evolution of demand for LNG in the industrial thermal conversion sector is driven by several factors including:

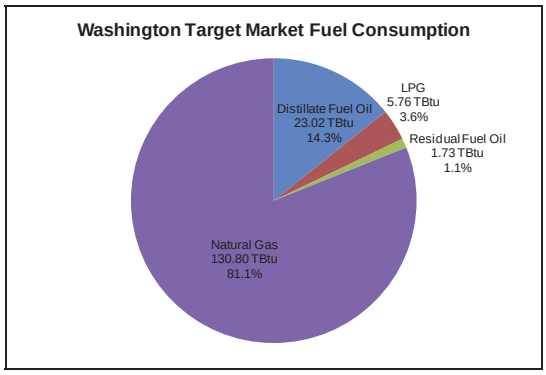
- The forecasted sustainable price spread between oil based stationary fuels such as distillate oil and propane, and natural gas. Natural gas can take the form of pipeline gas, distributed LNG or distributed CNG depending on the customers distance from the natural gas source and the annual load of the customer.
- Ability of customer or fuel supplier to change out on site equipment and provide site space for LNG or CNG equipment.

Determining inventory and expected fuel use of industrial conversion customers

Concentric assessed the industrial thermal conversion demand by reviewing PSE's market area. In that effort, Concentric:

Figure 13

- Assessed natural gas market share relative to other fuels consumed in Washington. Natural gas consumption is relatively high as a total percentage compared to other US states.



Source: EIA

- Gathered a comprehensive list of fuel burning facilities in the PSE market area based on air emissions

- Eliminated certain facilities based on pre-determined filters:
  - Companies located in an existing LDC service territory
  - Companies located within 10 miles of the LDC territory or a natural gas pipeline
  - Low energy intensive industries such as financial services, retail
  - Companies using self-provided biomass to generate energy (paper, lumber)

- Inventory remaining consisted of only two potential customers - Nippon Paper Industries in Port Angeles and TransAlta Centralia Mining in Centralia (currently not operating)

- Industrial conversion does not present a viable LNG demand source for PSE at this time

e. LNG to CNG

Factors influencing evolution

In the light duty vehicle market, there is demand for CNG in the PSE market area. Lighter duty trucks (Class 3-6), car fleets, and small vehicles such as forklifts and other operating equipment do not need the range or density of LNG in order to use natural gas as a fuel

CNG made from LNG saves power costs associated with compression. However, producing LNG at a central location, trucking it to an off-site fueling facility, then converting the LNG back to CNG is not economical as compared to producing CNG from pipeline gas.

Determining inventory and expected fuel use of potential conversion fleets

Concentric considered potential CNG demand for trucking. Certain short range truck and bus fleets could find CNG to be an acceptable transportation fuel as compared to LNG if the vehicles make short trips, return to base each day, and spend off-hours at slow-fill CNG fueling stations. As stated above, CNG from LNG may not initially compete with CNG from pipeline gas. Concentric has not included demand from this segment in forecasted LNG demand growth.

Concentric also surveyed yard vehicles in ports – forklifts, yard tractors, and cranes – as potential CNG conversion targets. Currently, there is only one commercially available CNG forklift available in the market. However, to the extent LNG and CNG become more readily available in ports, manufacturers may look at this market for potential development. Most port vehicles have long lives (over 10 years); as such, Concentric does not believe this market provides for growth opportunity for at least 10-15 years.

Other considerations

Clean Energy operates five public CNG fueling facilities in the Seattle-Tacoma area, with current delivered prices between 1.80 and 2.25 per CNG gallon

Although the CNG produced on-site at an LNG fueling facility could be competitive as compared to CNG produced from pipeline gas, Clean Energy and other CNG providers have already established contractual and locational relationships with existing and potential CNG fleet customers

There is opportunity to provide LNG to CNG as an additional on-site fuel to the extent PSE or its downstream partners are successful in capturing fleet markets served via on-site LNG fueling infrastructure; however, this on-site market is very limited.

While there may be some LNG to CNG demand that evolves over time, Concentric conservatively assumes that LNG to CNG is not a source of incremental LNG demand in the demand evolution projections.

V. COMPETITION AND PARTNERS

PSE is working to provide a source of LNG for use in the market area. Given the potential demand for LNG and the public announcements of both TOTE and Washington State Ferries regarding their intention to convert to LNG, PSE should expect significant competitive and cooperative interests from LNG and other fuel suppliers both regionally and nationally. Below is a summary of potential parties:

Shell
Shell is very active in distributed LNG applications, forming partnerships with potential LNG supply chain participants to develop and market the necessary equipment and infrastructure that supports LNG market growth. Shell recently acquired Gasnor, a provider of LNG and related services to the marine and trucking markets in Europe. Additionally, Shell announced a partnership with Pilot Flying J to develop LNG fueling infrastructure in Canada. Additionally, Shell has formed infrastructure partnerships with Westport Cummins for LNG truck engines, Wartsila for LNG marine applications and GE for LNG locomotive applications.

Shell owns and operates the Puget Sound Refinery in Anacortes, Washington and supplies refined oil products, including ULSD, to the region.

Shell could be a major competitor to PSE in the event Shell develops LNG production infrastructure in the market area. In the alternative, Shell could be a customer of PSE in the development of public LNG fueling stations in southern British Columbia and/or Western Washington.

BP
Although BP has not yet publically announced plans for distributed LNG demand and infrastructure development, BP is internally studying distributed LNG markets. BP owns the Cherry Point refinery located in Whatcom County. BP provides the majority of marine fuel to customers in the Puget Sound area.

BP has a long history in large scale LNG projects. Given the potential for BP to give up marine and trucking diesel market share to PSE's LNG, BP might attempt to develop LNG capabilities themselves. BP may also contract for PSE's plant capacity and distribute the LNG to end users in the area.

Both BP and Shell have large international energy portfolios and are both actively pursuing LNG export opportunities in Canada and Alaska. In order for PSE and its customers to ensure the spread between LNG and ULSD/low sulfur marine oil is sufficient, companies like BP and Shell may be able to take the risk of spread maintenance into these large financial portfolios. Smaller companies like PSE, Clean Energy, LNG customers and motor fuel distributors may not have the creditworthiness or risk tolerance to take such positions.

Clean Energy
Clean Energy is the US's largest developer of LNG and CNG infrastructure. Clean Energy owns multiple public CNG fueling stations in the market area and is considering developing at least two LNG fueling stations as part of the ANGH effort.

Clean Energy should be considered both a competitor (Clean Energy owns and operates LNG liquefaction capacity in Boron, California) and a partner/customer. It is likely that Clean Energy will not develop LNG production capacity in the PSE market area. Instead, it is likely that Clean Energy could develop on-highway LNG fueling infrastructure and rely on PSE for LNG supply.

As of 2011, Clean Energy received and continues to receive significant funding from Chesapeake Energy to develop natural gas demand. As such, most of Clean Energy's recent LNG fueling station investments have been in gas producing regions in the Marcellus, Utica, Eagle Ford and Haynesville.

Motor fuels providers in the market area

There are multiple diesel providers operating the market area including Love's Truck Stops, Union 76, Chevron, and Texaco, as well as petroleum distributors such as Associated Petroleum and SC Fuels. It is possible that any of these current motor fuels providers could finance LNG fuelling infrastructure and distribute LNG to fleets.

Given the reliance by heavy duty truck fleets on the availability of fuel from public fueling stations (see Figure 8 above), PSE's ability to reach the on-highway trucking market via distributors is important to consider. Developing relationships with current motor fuels distributors could be important to PSE in accelerating the rate of market evolution in the heavy duty trucking markets.

Marine fuel distributors

Although marine fueling infrastructure could remain between PSE and the handful of potential LNG customers in the market area, marine fuel distributors such as ChemOil could be interested in playing a role in the marine LNG distribution chain.

VI. CONCLUSIONS

As stated above, projected costs of LNG versus oil-based fuels like ULSD and low-sulfur marine fuel, environmental initiatives, and LNG engine and storage technology advancements, all contribute to the potential for significant market growth of distributed LNG in PSE's market area.

Since availability of LNG infrastructure is viewed by the market as the largest factor preventing wide scale adoption of LNG as a distributed fuel, especially as it relates to the marine and heavy duty trucking market, PSE's proposed LNG production facility could provide the market with the promise of future regional LNG supply.

The timing of the in-service date of PSE's proposed LNG facility is critical since

1) the spread between oil and gas-based fuels is currently at a high level; interest in natural gas as a transportation fuel is building rapidly,

2) large marine customers interested in converting to comply with ECA emission requirements must begin permitting, capital allocation, engineering, design and fleet planning to begin using LNG three to five years from now, and

3) distributors interested in investing in LNG fueling infrastructure for the on-road transportation market can be assured of a local source of LNG supply in a little over four years.

PSE's coordination efforts with other regional LNG suppliers can provide a network of LNG supply, adding to the reliability of the fuel and reducing risks for both customers and suppliers.

The demand for LNG in PSE's market area should be sufficient by 2020 to absorb the LNG production capacity contemplated by PSE.

Although not part of Concentric's scope of work, Concentric makes additional observations as follows:

- Regulatory jurisdiction of the LNG facility is an important consideration for PSE given the accelerated market expectations for development and commercial operations. This must be weighed against the future flexibility PSE may want in supplying LNG to markets that may require the proposed LNG facility to fall under FERC jurisdiction.

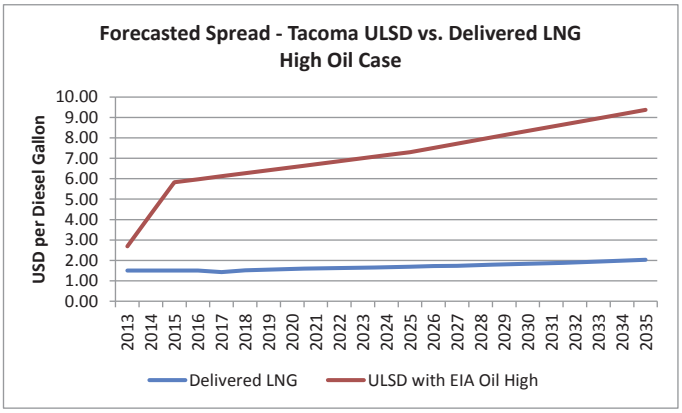
- Community outreach on a local and state level is important with regard to the siting of any energy facility. Given the history of LNG siting and past perception of the fuel as a safety and security threat, PSE may consider a comprehensive strategy to inform the public and government stakeholders that could support or oppose construction of the LNG production facility.

Appendix A – Alternative Price Scenarios

EIA High Oil

The high oil scenario shows a rapidly increasing the spread between gas and oil, especially during the period 2013 to 2015. In EIA high oil scenario, domestic natural gas prices remain decoupled from global oil prices. This is primarily due to North American supply dynamics - associated gas is abundantly available due to high levels of domestic oil drilling activity.

Figure 14

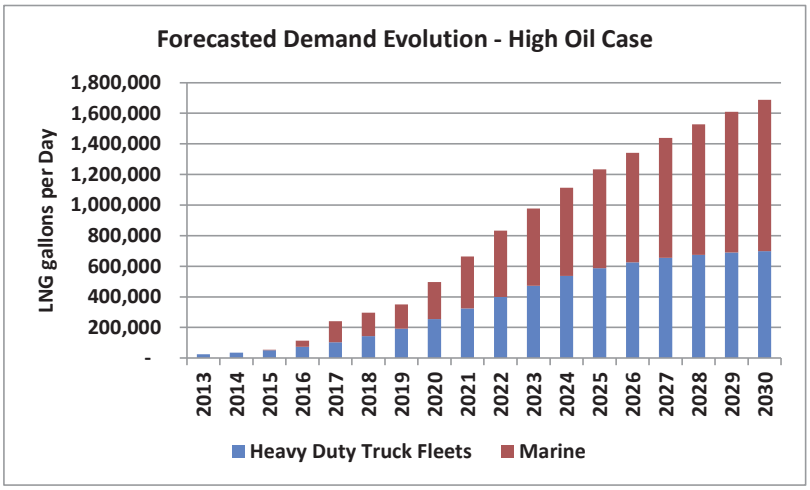


The increased spread leads to accelerated marine and heavy duty trucking adoption rates.

The forecast assumes the cruise sector begins conversion of fleets in 2020 as LNG as a marine fuel becomes available across North America. Global fleet conversion to LNG still lags as *global oil*, not *US natural gas*, drives LNG prices abroad.

The forecast also assumes trucking demand accelerates and increases as LNG becomes more available nationally and the spread widens.

Figure 15



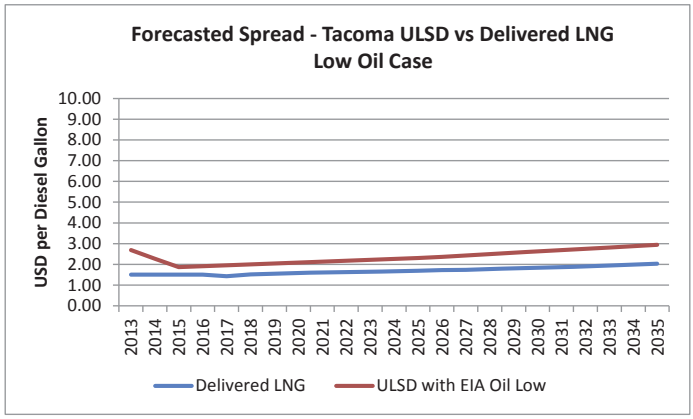
Appendix A – Alternative Price Scenarios (continued)

EIA Low Oil

The low oil scenario assumes the price of oil stabilizes at or below current levels and the spread between oil and gas remains at only an 8 USD per MMBtu level.

This spread slows significantly the wide adoption of LNG as a fuel as, in the trucking sector, the payback periods for incremental tractor costs are extended beyond the useful life of the tractor (5-7 years).

Figure 16



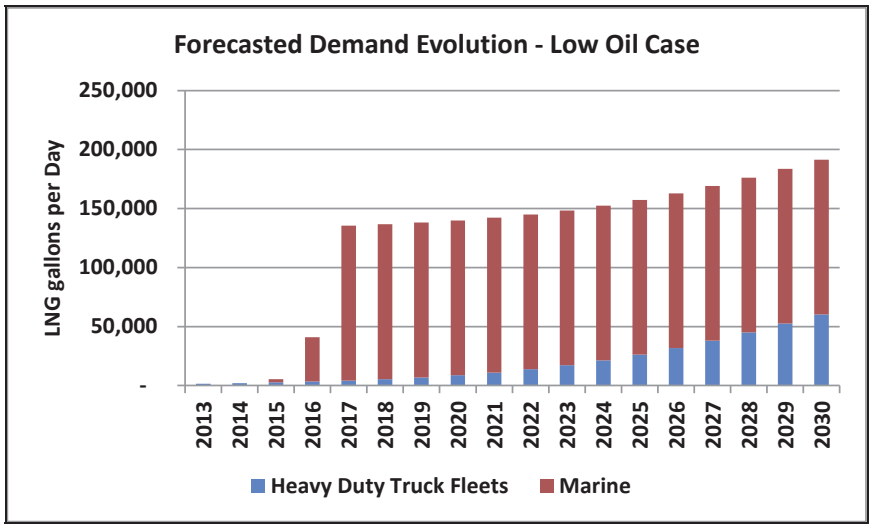
The decreased spread leads to very low marine and heavy duty trucking adoption rates.

The forecast assumes conversion of certain national fleets will continue but it is limited to 3-4 fleets in PSE's market area.

The forecast assumes TOTE completes its conversion to LNG and WSF converts two ferries. No additional marine demand transpires as options to meet clean air requirements can more economically be met by scrubbers and other technologies.

In this scenario, PSE's proposed LNG facility could be significantly underutilized.

Figure 17



Appendix B – Summary of Trucking Fleet Database

This database has multiple uses for PSE. First, the model includes all potential local and national fleets expected to do business in the market area. Expected demand from customers along with assumptions about market penetration of LNG, creates a market evolution forecasts for PSE. The evolution model can easily be adjusted if specific segments (national, interstate long haul etc) grow more rapidly or more slowly based on market information PSE is able to gather or scenarios PSE wishes to consider.

The tool also provides a comprehensive list of potential conversion customers including:

- Fleet size
- Location of fleet including relative to existing CNG infrastructure
- Cargo carried (trash, lumber etc)
- Estimated annual miles per tractor in the fleet
- Interstate or intrastate use of the fleet
- Number of tractors, buses/vans and other power units on site
- Lease or ownership of the equipment

The fleet model allows for sorting of the data - size, location, and type of goods, determination of IRR metrics for fleets, payback periods, and the impact of ULSD-LNG spread on conversion economics.

The fleet model provides the PSE sales team with specific information on each potential customer and can allow for scenario testing on each market segment or each fleet.

Inventory example

Legal Name	IRR	Tractors	Trucks, Vans, Buses	Total Power Units	Owned	Leased	% Leased	Miles/Tract	Miles/Van	Diesel Gallons	LNG Per Day	Miles/Vehicle
PACCAR INC		66	23	89	89	0	0.0%	50,000	50,000	733,333	3,375	10,494
RALPH'S CONCRETE PUMPING INC		64	11	75	75	0	0.0%	50,000	50,000	711,111	3,273	10,667
WASHINGTON TRUCKING INC		57	0	57	57	0	0.0%	130,000	50,000	1,140,000	5,247	58,683
TRIPLE B CORPORATION		56	88	144	144	0	0.0%	50,000	50,000	622,222	2,864	28,115
KING COUNTY SOLID WASTE DIVISION		55	10	67	65	0	0.0%	50,000	40,000	611,111	2,813	55,522
GARY MERLINO CONSTRUCTION CO INC		52	92	144	144	0	0.0%	50,000	50,000	577,778	2,659	10,861
M & M TRANSPORT INC		50	0	59	50	9	15.3%	80,000	50,000	727,273	3,347	76,446

Cargo	D&B #	Country	Street	City	County	State	Service Area?	ZIP	Shipper Type
General Freight	48341267	US	777 106TH AVE NE	BELLEVUE	33	WA	YES	98004	Carrier Interstate
Machinery, Large Objects	9504499	US	1529 RAINIER AVE SOUTH	SEATTLE	33	WA	YES	98144	Carrier Interstate
General Freight		US	2810 34TH ST	EVERETT	61	WA	YES	98201	Carrier Interstate
General Freight	173823147	US	4103 2ND AVE S	SEATTLE	33	WA	YES	98134	Carrier Interstate
Building Material	47848122	US	201 SOUTH JACKSON STREET SUITE 701	SEATTLE	33	WA	YES	98104	Carrier Intra/HazMat
General Freight	27452689	US	9125 10TH AVE SOUTH	SEATTLE	33	WA	YES	98108	Carrier Interstate
Logs, Poles, Beams		US	170 STATE HIGHWAY 508	CHEHALIS	41	WA	YES	98532	Carrier Interstate

Appendix B – Summary of Trucking Fleet Database (continued)

Scenario testing example

	Min # of Tractors	*Probability of Converison* 2013	2015	2016	2018	2020
Intrastate SR	11	10%	15%	20%	25%	30%
Interstate SR	8	0%	0%	0%	10%	15%
Intrastate LR	6	0%	10%	15%	20%	25%
Interstate LR	5	0%	0%	0%	0%	15%

Out of Top 200 National Fleets (# of Fleets Converting)					
Top Percentile (#)	0	0	0	0	1
Avg National (#)	5	10	15	50	75

	Tax Penalty Ends ISR Begin to Convert	Tech Improves ILR Convert	New Regs	Rough NGHW XSR Convert	Better NGHW XLR Convert

Appendix C – Summary of Marine Fleet Database

The information provided can be useful to PSE in determining overall market demand for marine LNG. In addition, when talking to companies who are considering conversion to marine LNG, PSE has a good understanding of fleet size, characteristics, and requirements for fuel.

Types and Companies

- Assist and Escort Vessels
- Harbor Tugs
- Pilot Boats
- Ocean Tugs
- Columbia River Ports – Tidewater Pushboats
- Columbia River Ports – Sause Brothers Shipping
- Washington State Ferries, other Puget Sound area ferries
- Cruise Vessels calling on Seattle
- Horizon Shipping
- TOTEM Shipping
- Northland Shipping

Information

- Name, vessel type, and USCG Vessel ID
- Owner
- Horsepower
- Hours in service per year
- Estimated diesel and LNG gallons per year
- Equipment age

Example

Vessel ID	Type	Hours	Age	HP	EPA Category	Propulsion Engines	Pounds of fuel per year	Diesel gallons of fuel per year	LNG gallons of fuel per year	With Engine Load Factor of 68%	Conversion Liklihood	Owner
559404	Ocean Tug	1500	1976	3500	1	2	2,625,000	330,189	554,717	377,208		Crowley
PSOTS	Ocean Tug	1423	1981	3070	1	2	2,184,305	274,755	461,589	313,881	*working on identifying owner*	
256829	Ocean Tug	5000	1974	850	1	2	2,125,000	267,296	449,057	305,358		Dunlap
567630	Ocean Tug	1620	1975	2150	1	2	1,741,500	219,057	368,015	250,250		Kirby
500126	Ocean Tug	3325	1980	900	1	2	1,496,250	188,208	316,189	215,008		Kirby
569517	Ocean Tug	1041	1986	1710	1	2	890,055	111,957	188,087	127,899		Dunlap
566082	Ocean Tug	1331	1975	1125	1	2	748,688	94,175	158,213	107,585		Dunlap

Appendix D – Summary of Rail and Industrial Database

The rail database summarizes the owner, routes traveled, and frequency of trips in order to estimate potential market demand for LNG. Although this market is not likely to generate measurable LNG demand in the market area in the immediate future, if engine technology advances and LNG fueling is more readily available along rail routes, there is potential for rail use of LNG in the next decade.

Example

Rail service provider	Route	Miles	Freight train frequency	Passenger train frequency	Total Miles	High Level Estimate LNG Gallons per Day	Per Train
BNSF	Seattle-Everett	30	40	8	1,440	4,608	96
BNSF	Everett-Spokane	300	25		7,500	24,000	960
BNSF	Seattle-Portland	177	50		8,850	28,320	566
BNSF	Portland-Pasco	233	31		7,223	23,114	
BNSF	Auburn-Pasco	227	6		1,362	4,358	
BNSF	Pasco-Spokane	147	33		4,851	15,523	
BNSF	Spokane-Sandpoint	69	46		3,174	10,157	
BNSF	Everett-Vancouver	155	24	4	4,340	13,888	
UP	Hinkle-Spokane	171	11		1,881	6,019	
UP	Spokane-Sandpoint	74	7		518	1,658	
					41,139		
			Diesel Gallons of Fuel per Day		82,278		
			LNG Gallons of Fuel per Day		131,645		

The industrial database provides customer listings, primary fuels and estimated load. Although this market is not likely to generate measurable LNG demand in the market area, the data is available for PSE's other research efforts.

Example

							EU1		
Facility Name	**Location**	**Industry**	**SIC**	**NAICS**	**Issuing Body**	**Permit**	**Primary Fuel**	**Secondary Fuels**	**MMBtu/HR**
Nippon Paper Industries	Port Angeles	Paper Products	2621		ORCAA	http://www.orcaa.org/	#6		236
TransAlta Centralia Mining, LLC	Centralia	Coal Mining Operations	1221	212111	SWCAA	http://www.swcleanai	Fuel Oil		NA
City of Spokane - Northside Landfill	Spokane	Landfill	4953		SRCAA	http://www.spokanecl	Landfill Gas	Propane	NA
City of Spokane - Spokane Regional Solid Wa	Spokane	Solid Waste Combustion	4953		SRCAA	http://www.spokanecl	Solid Waste	Natural Gas	183.33
KC Natl Resources Wastewater Treatment	Seattle	Municipal Wastewater Treatment	4952		PSCAA	http://www.pscleanair	Digester Gas	Propane	25.7

Appendix E – Summary of Port Vehicles Database

The port vehicle database provides information related to the potential for CNG to be used in various lighter duty equipment and vehicles that are part of port operations. Concentric relied on the Puget Sound Maritimes Emissions Survey 2007 to compile the data. Currently, CNG port vehicles are very limited in availability; only Toyota manufacturers an OEM natural gas forklift. Concentric does not yet consider the port vehicle market as immediately impacting the demand for LNG in the market area.

Example

Port	Terminal Number	High Use Vehicle	High Use Number in Port	Gallons per hour	Average annual hours	Average Annual Diesel Consumption per Vehicle (in gallons)	Annual CNG Consumption (in therms)	Annual CNG Consumption per Vehicle (in therms)	Annual CNG Consumption per Day in Port (in therms)
Everett	PSE020	Wheelloader	6			5,083	41,172	6,862	
	PSE020	Log Shovel	2			3,750	10,125	5,063	
									140.54
Tacoma									
	PST010	Forklift	2			1,900	5,130	2,565	
	PST010	Straddle carrier	4			2,130	11,502	2,876	
	PST010	Straddle carrier	13			10,749	188,645	14,511	
	PST020	Forklift	8	2.2	880	1,936	20,909	2,614	
	PST020	SidePick	5	2.8	1,850	5,180	34,965	6,993	
	PST020	Straddle Carrier	59	6.0	1,850	11,100	884,115	14,985	
	PST020	Yard Tractor	3	2.4	1,500	3,600	14,580	4,860	

PUGET SOUND ENERGY

Exhibit R.

Economic Impacts Assessment

Prepared by ECONorthwest

Economic Impact Analysis of a Natural Gas Fuels Facility in Tacoma

May 12, 2013

Prepared for:

Puget Sound Energy

ECONorthwest
ECONOMICS • FINANCE • PLANNING

The KOIN Tower
222 SW Columbia Street
Suite 1600
Portland OR 97201
503-222-6060

www.econw.com

Contact Information

This report was prepared by Robert Whelan of ECONorthwest, which is solely responsible for its content.

ECONorthwest specializes in economics, planning, and finance. Founded in 1974, we're one of the oldest independent economic consulting firms in the Pacific Northwest. ECONorthwest has extensive experience applying rigorous analytical methods to examine the benefits, costs, and other economic effects of environmental and natural resource topics for a diverse array of public and private clients throughout the United States and across the globe.

For more information about ECONorthwest, visit our website at www.econw.com.

For more information about this report, please contact:

ECONorthwest
222 SW Columbia Street
Portland, OR 97201
503-222-6060

1 Introduction and Background

PUGET SOUND ENERGY

Headquartered in Bellevue, Washington, Puget Sound Energy serves over 1 million electricity customers and over 760,000 natural gas customers in 11 counties in northwest Washington. A subsidiary of Puget Energy, PSE is the state's oldest local energy company.

Puget Sound Energy's 2,800 employees are dedicated to providing high quality customer service and delivering safe, dependable and efficient energy.

Summary of Economic Impacts

Construction
(annual average):

Output:
$93.1 million

Labor Income:
$33.7 million

Jobs: 505

Operations
(annual):

Output:
$61.2 million

Labor Income:
$9.2 million

Jobs: 125

Puget Sound Energy (PSE) is an electric and natural gas utility serving a 6,000 square-mile area, primarily in the Puget Sound region of Washington State. In 2012, PSE delivered 112,934,400 decatherms (Dth)[1] of energy to its natural gas customers. PSE is regulated by the Washington Utilities and Transportation Commission, which is charged with ensuring that utility services are fairly priced, available, reliable, and safe.[2]

PSE engaged ECONorthwest to estimate the economic impacts of building and operating a liquefied natural gas (LNG) storage plant at the Port of Tacoma. Like many such storage plants around the county, PSE's plant would provide standby supply while also reducing natural gas costs for its utility customers. Unlike other storage plants, PSE's plant will also produce natural gas fuel for marine and truck transportation, which will cost less and pollute less than traditional fuel.

The plant will serve the marine and trucking transportation markets with LNG to be used as fuel. The plant will also have vaporization capacity to inject vaporized natural gas back into the utility distribution system.

Planning for this development is at an early stages. Assumptions about the size and costs of the plant may change as planning progresses. For the purpose of estimating impacts, ECONorthwest assumes that the plant will use a mixed refrigerant LNG cycle and have a liquefaction capacity of 250,000 gallons a day. Allowing for periods of peak gas demand from utility customers and routine maintenance, the plant will operate at an average 93.3 percent of annual capacity and produce about 85.1 million gallons of LNG at full production. The onsite, field-erected, full-containment storage tank will hold up to 8 million gallons of LNG, which will leave the facility by:

- Truck tanker via onsite truck loading racks;
- Marine bunker barge or vessel, which will be loaded over the pier facilities;
- Through a pipeline that delivers LNG directly to a Port of Tacoma marine customer;
- Through a pipeline as vaporized natural gas to support the Tacoma gas distribution system.

This study measures the impacts of a three-year construction period for the facility, and for an operating year at full production. ECONorthwest used an economic impact model for the Puget Sound Region based on the local spending patterns of businesses and workers. The model mathmatically traces such spending as it flows through the local economy affecting other businesses, households, and employment. ECONorthwest also measured the social value to the region from reduced air emissions.

[1] A decatherm is ten therms or one million Btus. A Btu is a unit of measure for the heat content of a fuel and stands for British thermal unit.

[2] Washington Utilities and Transportation Commission website accessed March 15, 2013 at http://www.utc.wa.gov/aboutUs/Pages/overview.aspx

About Natural Gas Storage

Natural gas demand fluctuates predictably by the time of day and day of the week, and in less predictable ways, such as during cold weather snaps when heating demand surges. As a utility, PSE is obligated to meet peak demand, which they do by purchasing extra capacity on large interstate pipelines that deliver gas to their service territory. However, this type of capacity is expensive, and prohibitively so if it is only used infrequently to meet peak demand.

Puget Sound Energy will design the plant to cost-effectively meet the region's peak energy demand, and at the same time, produce low-cost, low-emissions transportation fuel.

The project will create economic, environmental and social benefits for the Puget Sound and beyond.

Developing the capacity to store natural gas is an alternative method of assuring reliable supply. Utilities can buy natural gas when supplies are abundant and prices are low, store it locally, and then release it back into their delivery system when demand peaks. This can reduce the utility's cost for purchasing gas from their suppliers, as well as the cost of meeting peak demand, and these savings are passed on to consumers through lower rates.

PSE's Current Storage Methods

PSE currently uses two methods to store natural gas: underground reservoirs and peak shaving plants. Between the two, underground storage offers the highest capacity and lowest cost. The utility pumps natural gas into underground reservoirs, often in the summer when demand for heating fuel is low, and withdraws it when demand is high. This method works well for addressing seasonal demand swings on the interstate pipeline system, but it can only be used in places with suitable geologic formations. PSE owns underground storage capacity at Jackson Prairie (Southwestern Washington) and contracts for capacity at Clay Basin (Utah).

To meet short-notice demand for brief periods of time, some utilities use peak shaving plants, which convert natural gas to its liquid form or have fuel delivered (in the forms of LNG or propane). The plants store the fuel on-site. When consumer demand peaks, plant operators convert the LNG or propane back into gas and add it to the distribution system. Utilities operate more than a hundred such plants in the United States, which are typically located in cities and towns close to their customers.

PSE operates one LNG peak shaving plant, in Gig Harbor, which is connected to the distribution system that delivers gas to homes and businesses its service territory. PSE uses this plant as standby supply for its local natural gas customers. PSE also contracts for a share of a large peak shaving plant in Plymouth, Washington (250 miles east of its service territory) that provides back-up supply to the interstate pipeline system.

About Liquefied Natural Gas

LNG is pipeline gas that has been cooled to -160° C or below, the temperature at which it transforms to its liquid state. Liquefying the gas reduces its volume by about 600-fold (one gallon of LNG contains over 80 cubic feet of natural gas), allowing it to be stored more affordably. When local demand rises unexpectedly, the utility can quickly vaporize the LNG and add it to the customer distribution system.

Pipeline natural gas consists of 95 to 99 percent methane and one to five percent other compounds. As the temperature drops during the liquefaction process, the constituent compounds begin to liquefy or solidify. Solid compounds, such as water and carbon dioxide, are removed, along with sulfur and other harmful trace compounds. Hydrocarbons heavier than methane, such as propane, are usually left in the gas system and methane remains to become LNG.

LNG as a Transportation Fuel

Recent developments in natural gas production technology have resulted in large reserves and lower prices. Because of this, LNG has become a more affordable transportation fuel and is expected to remain price-competitive with liquid fuels such as gasoline, diesel, and ethanol for the foreseeable future.

Like most industrial plants, larger-capacity peak shaving plants have lower unit production costs than smaller ones, so building a large peak shaving facility will allow PSE to reduce its unit costs for its customers. However, the utility only needs 3.75 million gallons per year of LNG for peak shaving, which is a relatively small amount. To acheive economies of scale, PSE will build a larger plant that could produce over 85.1 million gallons per year, selling the additional output as fuel. By doing so, PSE could lower utility customers' costs even further. ECONorthwest estimates that the utility savings just from peak shaving will amount to $5.1 million in the first year of production, rising past $10 million after seven years. The lower unit cost resulting from increased plant capacity would improve the price-competitiveness of LNG compared to other fuels.

As a fuel, LNG has slightly higher energy density (82,644 Btus per gallon) compared to corn-based ethanol (76,000 Btus per gallon), but less than other common liquid fuels. Diesel fuel contains about 139,000 Btus per gallon. This means a truck using a gallon of LNG would get about 60 percent of the fuel mileage it would get using a gallon of diesel. Table 1 shows the approximate energy densities of common transportation fuels.

Although LNG is less energy-dense, it has three advantages over other transportation fuels: it is relatively cheap, abundant in the U.S., and cleaner than petroleum-based fuels. At current market prices, a million Btus of crude oil costs $16.20, compared to $3.88 for natural gas.[3]

Table 1: Energy Content of LNG and Other Transportation Fuels

Fuel	Btus per Gallon
Ethanol	76,000
LNG	82,644
Propane	92,500
Biodiesel	120,000
Gasoline	125,000
Diesel	139,000
Marine HFO	149,700

[3] Bloomberg, prices on March 18, 2013, WTI crude at $94.00 a Bbl and NYMEX natural gas at $3.88.

PSE's planned facility will sell LNG as a replacement for marine heavy fuel oil (HFO) used in large marine vessels (HFO is also known as bunker or residual fuel). The company will also sell LNG as a replacement for the type of diesel commonly used by large trucks, offroad equipment, and some marine vessels as well.

While there is an emerging market for LNG for these purposes, it is still relatively small and its growth has been limited by high equipment costs. Over time, however, more companies will shift to LNG to capture the long-term benefits of lower fuel costs and the secure, stable and abundant supply of domestic natural gas. Also, tougher environmental regulations may accelerate the adoption of LNG as companies look for cost-effective alternatives to more polluting diesel and HFO.

At full production, PSE expects to produce 28.4 million gallons of LNG to replace 16.9 million gallons of diesel fuel, and another 53.0 million gallons of LNG to replace 29.3 million gallons of marine HFO (Table 2).

Table 2: LNG Facility Annual Production

Annual LNG Production	Gallons of LNG	Dekatherms	Gallons of Petroleum Products Replaced
Peak shaving	3,750,000	309,915	none
Diesel fuel replacement	28,400,000	2,347,090	16,885,537
HFO marine fuel replacement	52,990,000	4,379,306	29,253,878
Total Annual Production	85,140,000	7,036,310	-

Marine Heavy Fuel Oil

ECONorthwest estimates that by using the facility's LNG instead of heavy fuel oil, marine shippers will spend about 33 percent less per Btu.

New regulations limiting emissions for marine vessels may hasten the transition from petroleum fuel to LNG. The United States, under federal regulation 40 CFR 1043, sets forth fuel sulfur limits for Emission Control Areas (ECAs). By 2015, marine vessels must use fuel with a maximum sulfur content of 0.1 percent in North American ECAs and by 2020 globally. While the International Maritime Organization estimates that heavy fuel oil contains about 2.7 percent sulfur[4], LNG produces virtually no sulfur emissions. Puget Sound is part of an ECA that extends 200 miles offshore along the entire West Coast and much of Alaska.

Diesel Fuel

LNG is less costly than truck diesel—about 29 percent less per Btu, according to ECONortwest's analysis—and it is less polluting.

[4] International Maritime Organization, 2009, Second IMO GHG Study, accessed March 20, 2013 at http://www.imo.org/blast/blastDataHelper.asp?data_id=27795&filename=GHGStudyFINAL.pdf.

Federal regulation 40 CFR 80 required the on-road trucking industry to phase in ultra-low-sulfur diesel (0.0015 percent sulfur) between 2006 and 2010. The EPA is still phasing in regulations for low-sulfur diesel some marine and port purposes. This creates an incentive to switch to LNG.

Environmental and Health Benefits

Emissions from burning fuels have environmental and health impacts. This section describes the impacts associated with carbon dioxide (CO_2,) nitrogen oxides (NOx), sulfur (SOx), and particulate (PM_{10}) emissions both generally and in the context of Pierce County and PSE's market area.

General Environmental Impacts of Emissions

Researchers have linked emissions to a number of negative environmental impacts, all of which are mitigated by reducing emissions:

- Climate change from greenhouse gasses, specifically CO_2;
- Increased ground-level ozone and smog from NOx and CO_2;
- Acidification of lakes and streams from the reaction of SO_2 and NOx emissions;
- Acid rain damage to forest ecosystems;
- Degraded coastal water quality from nitrogen deposits;
- Higher particulate levels from SOx and NOx emissions; and
- Haze and impaired visibility from particulate matter.[5]

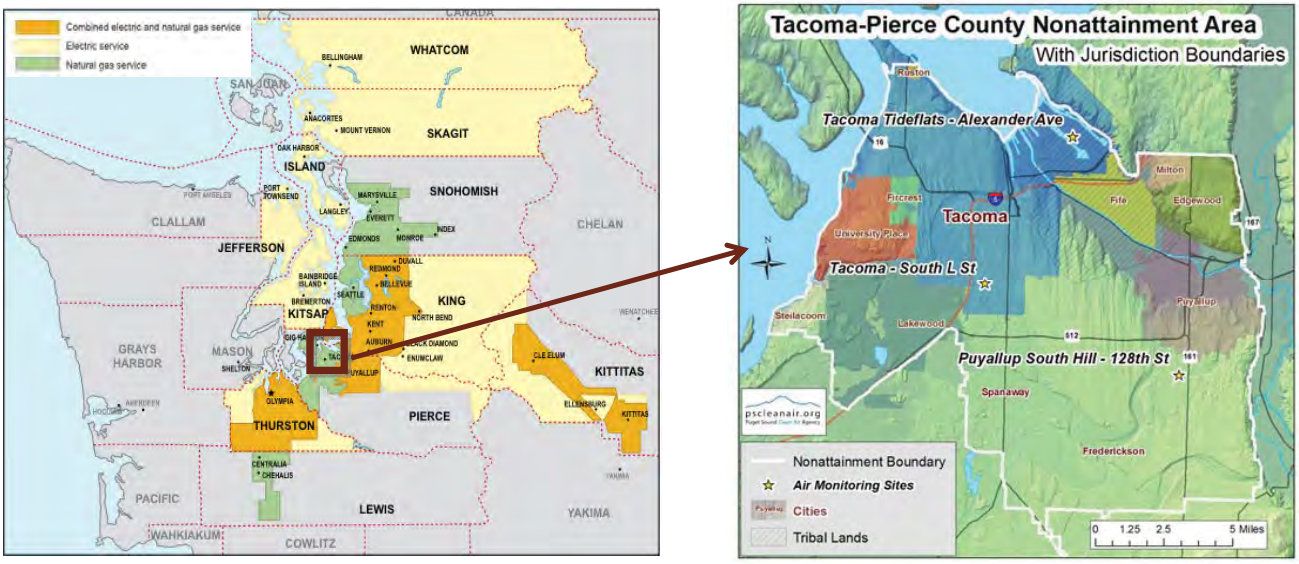
By reducing emissions across the board, LNG can limit the harmful impacts described above. The precise value of the emissions reduction from LNG depends on several factors, including how customers use LNG, where the fuel is used, engine type, operating conditions, and what fuel it replaces.

Emissions Impacts in a Regional Context

In 2009, the Environmental Protection Agency (EPA) designated the Wapato Hills-Puyallup River Valley area as a Nonattainment Area for fine particulate matter ($PM_{2.5}$). This area is also known as the Tacoma-Pierce County Nonattainment Area. Since that time, the area has attained the EPA's standards, but the Washington State Department of Ecology must submit a maintenance plan to the EPA for how it will ensure ongoing compliance.

[5] ASME, 2009, ASME General Position Statement on Technology and Policy Recommendations and Goals for Reducing Carbon Dioxide Emissions in the Energy Sector, accessed March 27, 2013 at http://files.asme.org/asmeorg/NewsPublicPolicy/GovRelations/PositionStatements/17971.pdf; U.S. Environmental Protection Agency, Human Health and Environmental Effects of Emissions from Power Generation, accessed March 27, 2013 at http://www.epa.gov/captrade/documents/power.pdf.

Figure 1: Puget Sound Energy Service Area and the Tacoma-Pierce County Non-Attainment Area



(Source: PSE and the Washington State Department of Ecology)

Fine particulate pollution is highest in the winter months, when households burn wood for heating and the fine particles are trapped close to the ground by weather conditions. Based on monitoring between 2000 and 2010, about half of Pierce County's fall and wintertime fine particulates come from wood smoke, 20 percent comes from gasoline vehicles, 5 percent comes from diesel vehicles, and another 4 percent comes from ships[6].

In 2011, the Tacoma-Pierce County Clean Air Task Force made a set of recommendations to the Department of Ecology for reducing fine particulate matter in the area. The first two recommendations are for enhanced enforcement of air quality burn bans, and requiring the removal of uncertified wood stoves and inserts.

The Task Force recommends continued implementation of rules and support for programs and initiatives that target pollution reductions from transportation and industrial sources. Approximately one-quarter to one-third of the emission reductions needed will be accomplished from new federal regulations and local initiatives for more efficient engines, cleaner fuels, and improved industrial practices.[7]

[6] Tacoma-Pierce County Clean Air Task Force. Report and Recommendations to Puget Sound Clean Air Agency. December 2011. http://www.cleanairpiercecounty.org/taskforce/CleanAirTaskForceReport_FullReport.pdf

[7] Better Air in Tacoma and Pierce County: Recommendation of the Clean Air Task Force. http://www.cleanairpiercecounty.org/taskforce/CleanAirTaskForceReport_RecOverview.pdf

Based on the emmissions goals for the nonattainment area, the Clean Air Task Force estimates that reductions from gas, diesel, ship and industrial sources will make up 50 percent of the total reductions in emmissions by 2014. The absolute amount of reductions in these sources will grow slightly by 2019, although their share of the total reductions will fall to about 27 percent as other recommendations are fully enacted.

The Tacoma-Pierce County Nonattainment Area falls in an area where Puget Sound Energy provides natural gas service, and because natural gas generates almost no particulate matter when it burns, PSE is poised to be a key player in maintaining the area's attainment status. PSE's plan to create a market for LNG transportation fuel is well aligned with the Task Force's call for cleaner fuels (Figure 1).

ECONorthwest calculated the changes in emissions from the transportation sector if shipping companies use the facility's LNG instead of heavy fuel oil and diesel (Table 3). We assume the plant will sell all its annual LNG production, other than the 3.75 million gallons needed for peak shaving. The first year in which PSE achieves such a sales level would depend on market conditions and how quickly shipping companies adopt the fuel. Actual emissions can vary widely depending on the specific types of engines used, operating conditions, and composition of fuel.

Table 3: Annual Emissions from Use of LNG as a Replacement for Diesel and Marine HFO, Pounds at Full Operations

Source Added or (Removed)	Decatherms	Air Emissions in Pounds per Year			
		CO2	SO2	Nitrogen Oxides	Particulates
LNG as a fuel	6,726,395	786,772,518	-	1,209,286	49,680
(Diesel replaced)	(2,347,090)	(377,729,456)	(3,733)	(337,711)	(33,771)
(Marine HFO replaced)	(4,379,306)	(760,600,832)	(453,092)	(1,374,932)	(280,691)
Net Change	-	(351,557,769)	(456,825)	(503,357)	(264,782)

The analysis shows that the LNG sold as fuel by PSE would reduce annual CO_2 emissions by 351 million pounds per year. (Sulfur dioixde emissions would decrease by 456,825 pounds, even assuming that LNG would displace only ultra-low-sulfur diesel and low-sulfur marine fuel. Reflecting the comparatively low carbon content of LNG, replacing diesel and HFO with LNG lowers particulates by 264,782 pounds a year.

Substititing LNG for diesel and marine fuels will reduce emissions. Because trucks and vessels powered by LNG may travel outside the region, we do not have sufficient information to estimate the local and non-local shares of emissions reductions. Regardless, reduced emissions do result in lower social costs overall.

Economists use the "social cost of carbon" to estimate the value of changes in greenhouse gas emissions. The social cost of carbon represents "the full global cost today of emitting an incremental unit of carbon at some point of time in the future, and it includes the sum of the global cost of the damage it imposes on the entire time it is in the atmosphere."[8] There are currently over 200 different estimates of the social cost of carbon. One review of the literature found values ranging from about $7 to $60 per metric tonne of carbon.[9]

For our analysis, we apply a middle value of $42 per metric tonne of carbon (about $11.45 cents per tonne of CO_2) to estimate the social cost of emissions. Studies on the annual value of pollutant removal for PM_{10}, SO_2, and NOx also vary widely. For purposes of estimating the social benefits of emissions reductions at the Port of Tacoma and its environs, ECONorthwest used mid-point values developed for the City of Portland by Entrix.[10] The values per tonne of annual emissions are $6,593 for PM_{10}; $5,982 for SO_2; and $6,957 for NOx.

Based on the costs associated with these pollutants and the expected amount of reduction, ECONorthwest estimated the annual value of emissions reductions at approximately $5.4 million, as shown in Table 4.

Table 4: Annual Quantity and Value of Emissions Reductions from Use of LNG as a Replacement for Diesel and Marine HFO

Pollutant	Annual Value per Metric Tonne	Tonnes of Emmissions Reduction	Reduction in Social Cost
CO2	$11.45	(159,509)	($1,826,378)
SO2	$5,982	(207)	($1,239,894)
Nox	$6,957	(228)	($1,588,863)
Particulates	$6,593	(120)	($792,064)
Total			($5,447,199)

[8] Shaw, M., L. Pendleton, et al. 2009. The Impact of Climate Change on California's Ecosystem Services. California Climate Change Center. CEC-500-2009-025-F.

[9] Shaw, R. et al, 2009. The Impact of Climate Change on California's Ecosystem Services. August.

[10] Entrix. 2010. "WHI Environmental Foundation Study." City of Portland Bureau of Planning and Sustainability. Portland, Oregon. July.

2 Economic Impacts

Upstream and Downstream Economic Impacts

This analysis distinguishes between direct, upstream, and downstream impacts. In this case, the terms refer to the economic relationships between the PSE LNG plant and the regional economy. Activities at the plant itself, including its construction and production, count as direct impacts. Using an input-output model, we can then follow the subsequent impacts going upstream and downstream. Figure 2 summarizes the types of impacts included in this analysis.

Economic Impacts

ECONorthwest estimates that the plant will create the following economic impacts:

Construction
(annual average over 3 years):

Output: $93.1 million

Labor Income: $33.7 million

Jobs: 505

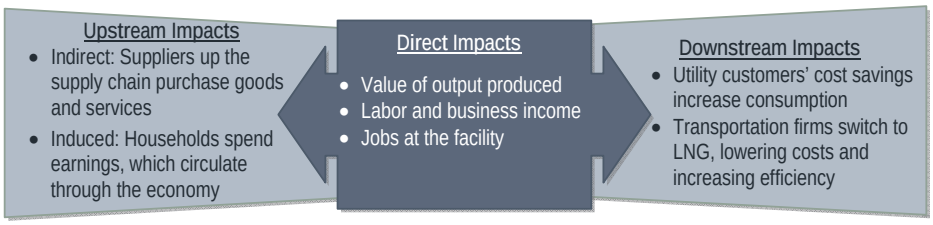
Annual Operations

Output: $61.2 million

Labor Income: $9.2 million

Jobs: 125

Figure 2: Types of Economic Impacts for Tacoma Future Fuels



Most commonly, economists follow the upstream impacts, which result from the plant's spending on all the goods and services it buys locally and on the payroll for its workers. Impacts continue moving upstream as suppliers and employee households spend money, triggering more spending and employment in the local economy.

LNG production at the facility could have many types of downstream impacts, and we consider two in this analysis. First, we estimate the economic impacts of the savings that accrue to local utility customers who will pay lower rates. These customers will spend their savings in other ways, causing a ripple effect of spending in the economy.

Second, we consider community-wide downstream impacts resulting from increased efficiency and reduced emissions. For example, the LNG produced by the facility will reduce natural gas utility bills throughout the region because it lowers natural gas supply costs. Sold as a transportation fuel, LNG is less expensive than marine HFO and diesel. These savings allow the local economy produce more with less, resulting in higher economic activity. Furthermore, lower CO_2 emissions lead to lower social costs, which is another downstream impact.

Economic impacts measure relationships between industry sectors, households and communities. While it may be tempting to sum the upstream, downstream, and direct impacts impacts, and call it the "total impact", such an assertion would overstate the impacts and be misleading. Impacts are not necessarily additive; rather, they indivudually describe the relationships between economic activities.

Upstream Impacts

ECONorthwest used an input-output modeling software program called IMPLAN® to estimate the direct, indirect and induced impacts of the proposed peak shaving facility on the Puget Sound economy, including King, Snohomish, Pierce, Thurston, Kitsap, Mason, Skagit, and Island Counties.

Economic impacts are classified by their relationship to the activity in question. For this analysis, the three types of impacts are defined, with regard to the plant, as follows:

- **Direct impacts** of the plant include its production, the wages and benefits it pays, and the people it employs.
- **Indirect impacts** come from spending between businesses. They start with the plant's purchases from its supliers and propagate throughout the economy *via* subsequent business-to-business spending.
- **Induced impacts,** also known as "consumption-driven" impacts, occur first when plant employees' households spend their earnings. The impacts continue to accrue as other households, whose incomes also rise, spend more money locally.

For this analysis, we measure and describe impacts in three ways:

- **Output** is the value of the plant's annual production. In measuring the economic impacts of construction, output is the cost of the construction project, including engineering, equipment purchases, and various fees. Business revenues are counted as indirect and induced output for other sectors. For retail and wholesale businesses, output is the value of sales minus their cost of goods sold.
- **Labor Income** equals employee payroll costs, including wages, benefits and employer-paid payroll taxes, plus the earnings of any self-employed persons.
- **Jobs** are the number full-year-equivalent jobs. IMPLAN uses the official definition of a job from the U.S. Bureau of Labor Statistics, which counts one job as 12 months of work, including payroll jobs, self-employment or farm work. For example, two jobs that each last six months count as one job in IMPLAN. A job is counted based on the number of months of employment, and not the number of hours worked; a job can be full or part time.

Upstream Construction Impacts

PSE provided estimates of the capital costs for building the facility. Construction costs include upgrades to PSE's existing distribution system and laying new pipe[11]. These estimates formed the basis of the construction impacts analysis.

PSE estimates that the entire cost of the plant, from pre-development through opening, will amount to $196,877,772. Pre-development activities, such as planning and engineering, began in 2012. On-site construction will take place from 2014 to 2016, and total expenditures over that three-year period will be $170,447,281.

[11] Email from Mr. Charles Daitch of Puget Sound Energy to ECONorthwest. March 4, 2013.

Over the entire course of the contruction project (2012 through 2016), PSE expects to incur about $19.9 million in financing costs. According to convention in the field of economics, these are excluded from the economic impact analysis.

Table 5 shows the upstream impacts for the on-site construction phase (2014 through 2016.)

Table 5: Upstream Construction Impacts (2012 dollars)

Impact Measure	Type	2014	2015	2016	Average
Output	Direct	$33,779,535	$68,026,856	$68,670,891	$56,825,760
	Indirect	16,601,885	33,239,927	33,565,812	27,802,541
	Induced	5,519,267	9,800,467	10,071,214	8,463,649
	Total	$55,900,687	$111,067,249	$112,307,917	$93,091,951
Labor Income	Direct	$9,931,276	$19,387,947	$19,337,947	$16,219,057
	Indirect	6,013,000	11,929,710	12,053,163	9,998,624
	Induced	4,677,777	8,783,440	8,866,663	7,442,627
	Total	$20,622,053	$40,101,097	$40,257,772	$33,660,307
Jobs	Direct	117	229	229	191
	Indirect	97	191	193	160
	Induced	96	181	183	153
	Total	310	601	604	505

From 2014 to 2016, the project will produce an average of $56.8 million per year in direct output. It will also generate an average of $36.3 million in indirect and induced output each year. Total output will amount to an average of $93.1 million each year.

During construction, the project will support an average of 191 direct construction jobs per year, and another 160 indirect and 153 induced jobs, for an average of 505 total jobs per year.

Labor income paid to the project's workers will amount to an average of $16.2 million each year. Adding the indirect and induced effects, total labor income in the study area will average $33.7 million per year.

Upstream Operating Impacts

Puget Sound Energy expects to begin operations at the plant in 2017. PSE projected its fuel sales, the value of peak shaving to its utility operations, and the plant's operating costs for the first year of production. The plant will produce 250,000 gallons of LNG per day, operating about 341 days per year, for an average capacity utilization rate of 93.3 percent. At this level of production, the plant will employ 18 workers at an average annual cost of $130,791 per worker, which includes all benefits, payroll costs, and employment taxes.

After natural gas and labor, the plant's largest expenses are electric power from local utilities, and docking, wharfage, and land lease fees to the Port of Tacoma. This spending is included in the impact analysis, as are spending on regular maintenance and repairs.

ECONorthwest estimated the annual impacts of this spending on the regional economy (Table 6). The plant will produce $42.7 million in direct output per year, and another $18.5 million in indirect and induced output, for a total of $61.2 million in output per year. Operations at the plant will support 18 jobs that will pay $2.4 million in labor income. Adding the indirect and induced impacts, the plant will support a total of 125 jobs paying $9.2 million in labor income.

Table 6: Upstream Annual Operating Impacts (in 2017)

Impact Measure	Type	Amount
Output	Direct	$42,650,175
	Indirect	13,046,038
	Induced	5,503,179
	Total	$61,199,393
Labor Income	Direct	$2,354,234
	Indirect	4,874,305
	Induced	1,968,802
	Total	$9,197,341
Jobs	Direct	18
	Indirect	66
	Induced	41
	Total	125

ECONorthwest assumes the market will absorb the LNG produced as fuel as forecast by PSE. It is possible the market will not demand all the production from the plant operating at 93.3 percent of capacity in 2017. It is also possible that demand could exceed PSE's forecast.

Downstream Impacts

Puget Sound Energy will sell LNG to marine and truck transportation companies, which will reduce their fuel costs. In addition, the low-cost peak shaving capacity from the plant will improve PSE's operational efficiency. ECONorthwest used IMPLAN to estimate the annual economic impacts of these downstream effects.

Each year, PSE expects to sell 45.9 million gallons of LNG directly to marine transportation companies and 7.1 million gallons to wholesalers . The total, 53.0 million gallons of LNG will displace 29.3 million gallons of low-sulfur marine HFO, for a net savings of $23.7 million. PSE also expects to sell 28.4 million gallons of LNG each year for use in truck transportation. This will reduce the trucking industry's diesel consumption by almost 16.9 million gallons, amounting to $18.8 million in savings.

The reductions in marine HFO and diesel use would also have a negative downstream impact on fuel wholesalers. While some will likely sell LNG, in net terms they will lose some market share. Fuel wholesalers would see their output (the difference between sales and cost of goods sold) decline about $4.6 million. The loss is counted as a downstream impact in this analysis.

For regular gas utility customers, the new peak shaving capacity at the plant would generate savings in utility costs. ECONorthwest assumes those savings are distributed among PSE's residential, commercial, and industrial natural gas customers in proportion to their consumption. In 2017, the savings to ratepayers would amount to over $5.1 million, and by 2024, it would exceed $10.1 million.

Table 7: Savings from LNG Use (in 2017)

Savings Resulting from LNG Use	Amount
Savings From Peak Shaving	
Households	$3,467,381
Commercial Businesses	1,348,572
Industrial Businesses	326,709
Savings From Using LNG as Fuel	
Marine Transportation	23,730,419
Truck Transportation	18,772,098
Wholesaling	(4,563,904)
Total	$43,081,276

Table 7 shows the expected sources of downstream impacts for natural gas utility and LNG fuel consumers in the Puget Sound Area, and the savings (or costs) for each group. ECONorthwest estimated the economic impacts of these savings as they ripple through the local economy.

For this analysis, we assumed that households would use their savings to purchase other goods and services, rather than investing or saving them. We also assumed that businesses using natural gas would increase production by an amount equivalent to their savings, which would increase their spending on goods and services, raising incomes and employment downstream.

Although many transportation topics have been well researched, we found little information about the effect of lower fuel prices on Washington's transportation industries that is applicable to the emerging LNG market. The relevant questions for this analysis include whether transportation volumes would increase, and how the savings would be distributed between the transportation companies and their customers.

In lieu of this information, we relied on the following assumptions for calculating the economic impacts of the downstream effects in IMPLAN:

- Marine and truck transportation companies' LNG-related savings would be distributed evenly between the companies and their customers. Half of these companies and customers would be located outside the Puget Sound region, so those savings would not generate economic impacts inside the region.

- Half of the savings realized by local transportation companies would be either retained by companies to offset capital costs of acquiring or converting equipment for LNG fuel or distributed as profits. Our analysis does not consider potential economic impacts resulting from these savings because we cannot accurately estimate where the recipients reside.

- All lost wholesaling revenues would occur within the study area.

- To convert vehicles and ships to LNG, companies must make capital investments in new engines and fuel tanks, and this will take time. Trucks that run on LNG are now available from manufacturers.[12] The changeover from petroleum-based fuels to LNG will spark economic actity. However, the degree that it does and how much of the spending on new equipment would occur in the Puget Sound area is uncertain. Thus, ECONorthwest did not include it in this analysis as a downstream impact. Further, we assume that the facility will have sufficient demand for the 81.4 million gallons of LNG it produces in 2017.

- The social value of reduced pollution, estimated at $5.4 million per year (see Table 4), is a type of downstream impact. However, this was not included in the economic impact analysis because we cannot determine the distribution of these values by economic sector and geography.

As shown in Table 7, the plant will save PSE's ratepayers and LNG consumers $43.1 million per year. Using IMPLAN, we estimate that the annual economic impact of those savings for the Puget Sound Region will total $17.8 million in output annually, supporting $5.8 million in labor income for 103 jobs (Table 8).

Table 8: Downstream Economic Impacts (in 2017)

Impact Measure	Amount
Output	$17,848,089
Labor Income	$5,822,603
Jobs	103

[12] Cardwell, S and Krauss, "Trucking industry is set to expand use of natural gas." The New York Times. April 22, 2013.

PUGET SOUND ENERGY

Exhibit S.

Natural Gas, ULSD and Fuel Oil Dynamics Study

Prepared by Wood Mackenzie

Wood Mackenzie

March 2014

Natural Gas, ULSD and Fuel Oil Dynamics Study

Background

Puget Sound Energy (PSE) is requesting a discussion on the price spreads of ULSD and IFO-380 to Sumas natural gas. The intent is to support the appropriate oil pricing outlook for considering future price spreads in the Puget Sound region to be used for contracting purposes. In particular, PSE has asked for an analysis detailing the probable ceiling price on Sumas natural gas and probable floor price on ULSD and IFO-380, drivers behind the current spread, and what factors could lead to a degradation of the spread in the study period (2013-2030) and the likelihood of such circumstances occurring.

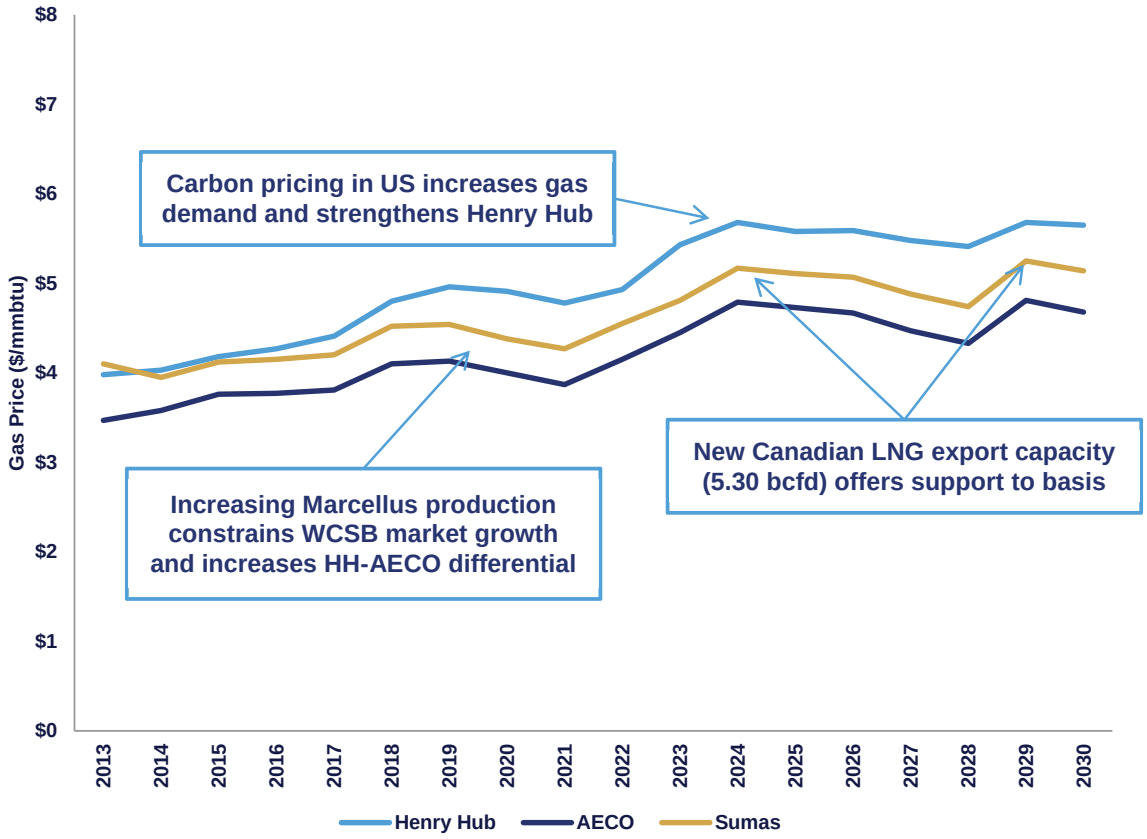
The ULSD and IFO-380 price spread to Sumas natural gas will be driven by regional supply/demand dynamics in US PADD V and Western Canada (Figure 1). PADD V covers the US West Coast and consists of Alaska, Arizona, California, Hawaii, Nevada, Oregon, and Washington. Western Canada is defined as the provinces of British Columbia and Alberta for the purposes of this study.

Figure 1: Map of US PADD V and Western Canada

Sumas Gas Price Dynamics

Natural Gas Hub Prices

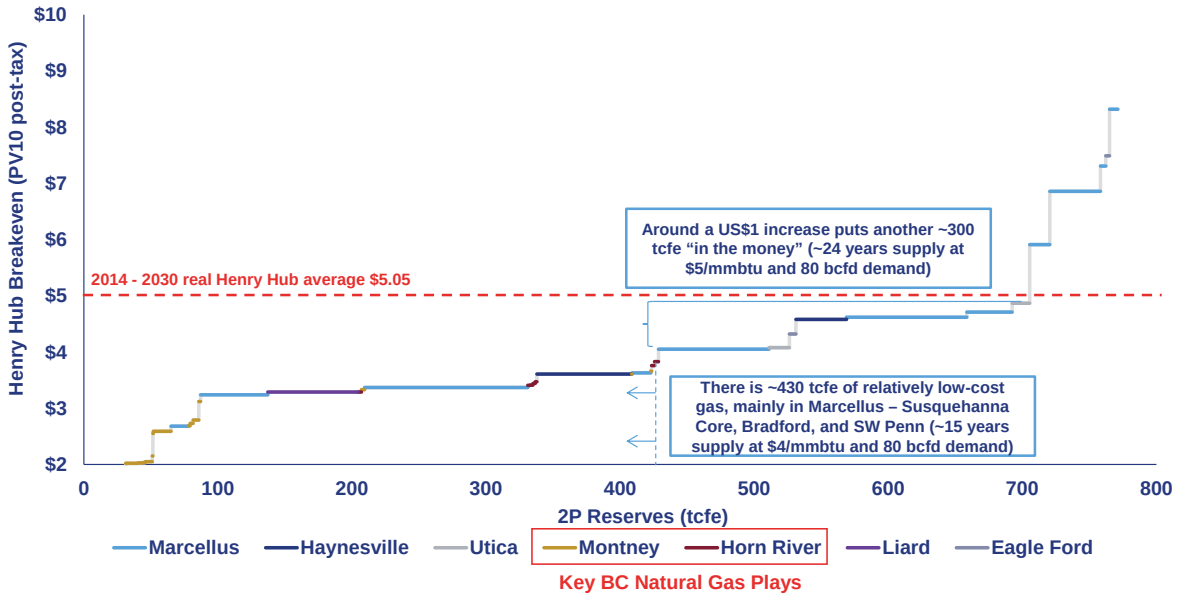
Figure 2: North American Natural Gas Prices



Wood Mackenzie does not forecast a significant recovery of gas prices and expects Sumas gas price to remain in the $4.00-$5.25/mmbtu range throughout the study period (Figure 2). Despite price support to Henry Hub due to LNG exports coming online in the Gulf Coast as well as robust industrial demand growth, Sumas sources the majority of its natural gas from British Columbia, which prices its volumes off of AECO. At the AECO hub, price increases are constrained due to limited demand access as well as increasing competition from sources of supply in North America flowing into current end markets (i.e. Marcellus). Consequently, upside to Sumas gas price is limited, and Sumas gas price is not expected to cause the price spread to ULSD/fuel oil to collapse.

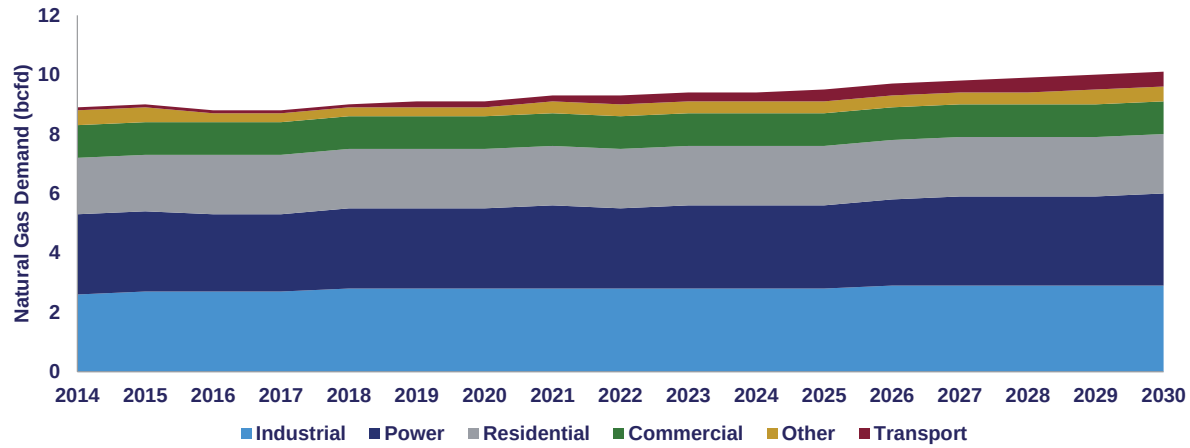
Natural Gas Supply/Demand Dynamics

Figure 3: PV10 Breakeven Gas Price by Sub-Play



Natural gas price dynamics are driven by the rise of North American unconventionals and the associated increase in volumes of relatively low-cost gas. At prices of $4/mmbtu, there is ~430 tcf of economic reserves in unconventional plays alone with another ~300 tcf of gas available with just a $1/mmbtu increase, enough to supply North America for another 24 years at current demand levels (Figure 3).

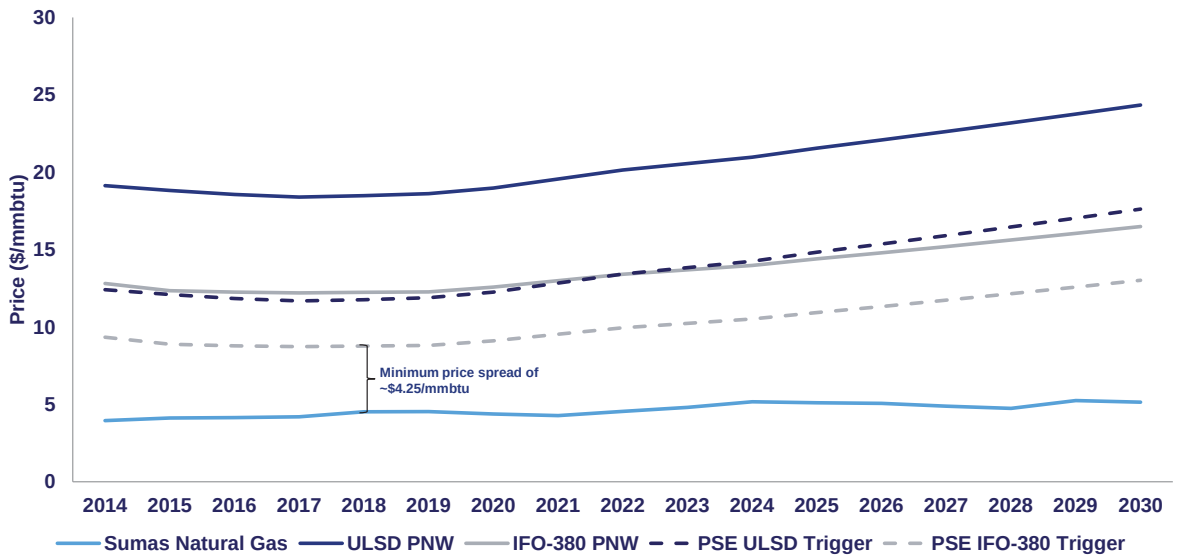
Figure 4: North American Pacific Coast Natural Gas Demand



North American gas demand is expected to grow through the study period, driven by increases in the power generation sector and LNG export facilities coming online. However, the North American Pacific Coast is expected to contribute very little of this growth, with only an increase of ~1 bcfd of demand by 2030 (Figure 4). Industrial growth demand is forecast to be negligible due to a dearth of established industrial projects in the pipeline. NGV penetration is also expected to have little effect as the lack of re-fuelling infrastructure has constrained NGV uptake and competition with hybrid / electric vehicles has further eroded their market share. Opportunity for long-term upside in British Columbia LNG (BCLNG) exists, but high deliverability risk makes the timing and cost of these projects very uncertain. A number of issues must be resolved on technical, political, and fiscal aspects for these projects to move forward. Most tellingly, a large number of these concerns are dependent on regulation and thus are high-risk projects.

ULSD and IFO-380 Price Dynamics

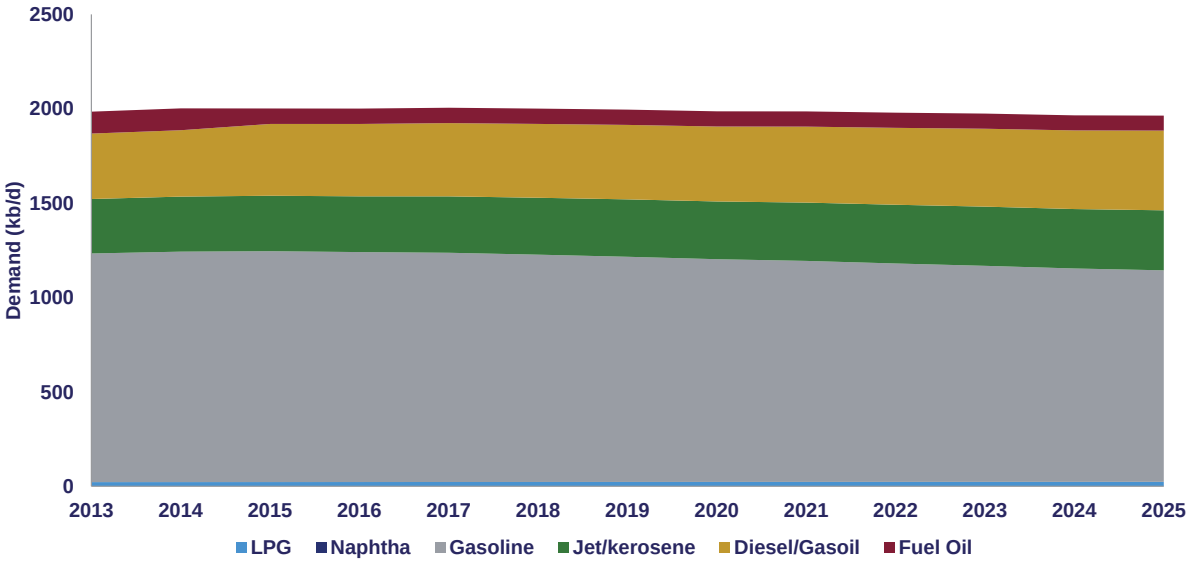
Figure 5: PNW Price Forecast for Sumas Natural Gas, ULSD and IFO-380



Wood Mackenzie expects the basis spreads between natural gas to ULSD and IFO-380 to be sustained throughout the study period due to crude price support and decreased ULSD and IFO-380 price in PNW. Even taking into account the PSE Price Triggers as defined by the PSE contracts, Wood Mackenzie expects a minimum price spread of $4.25/mmbtu occurring in 2018 before the differential reverses trend and widens through the end of the study period (Figure 5).

ULSD and IFO-380 Supply/Demand Dynamics

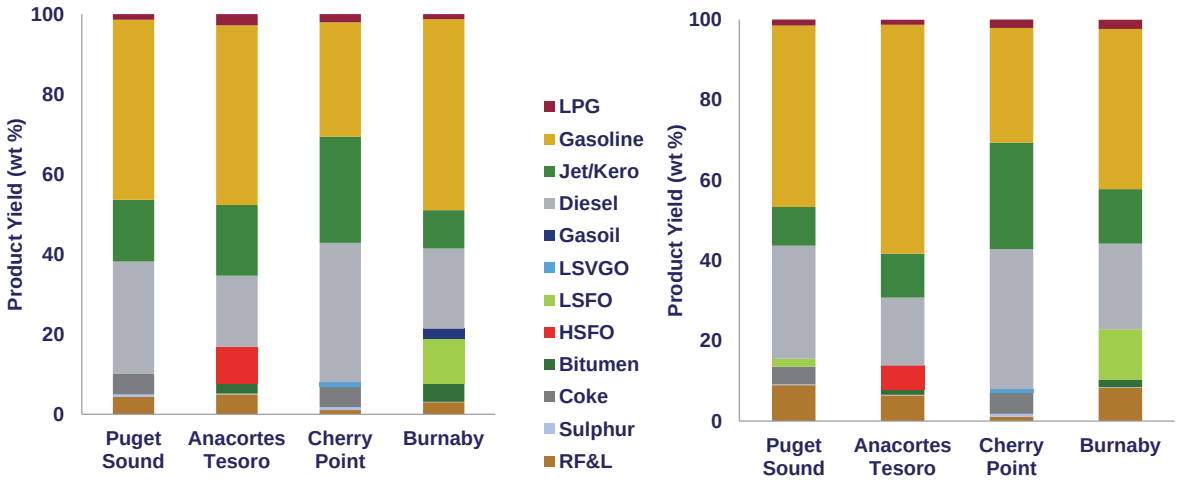
Figure 6: PNW Petroleum Product Demand Forecast



Petroleum product dynamics are not expected to change significantly through 2030 (Figure 6). Demand is forecast to

decrease slightly from ~2000 kb/d in 2014 to ~1960 kb/d in 2030, with diesel demand increasing and fuel oil demand decreasing to small extents over the same timeframe.

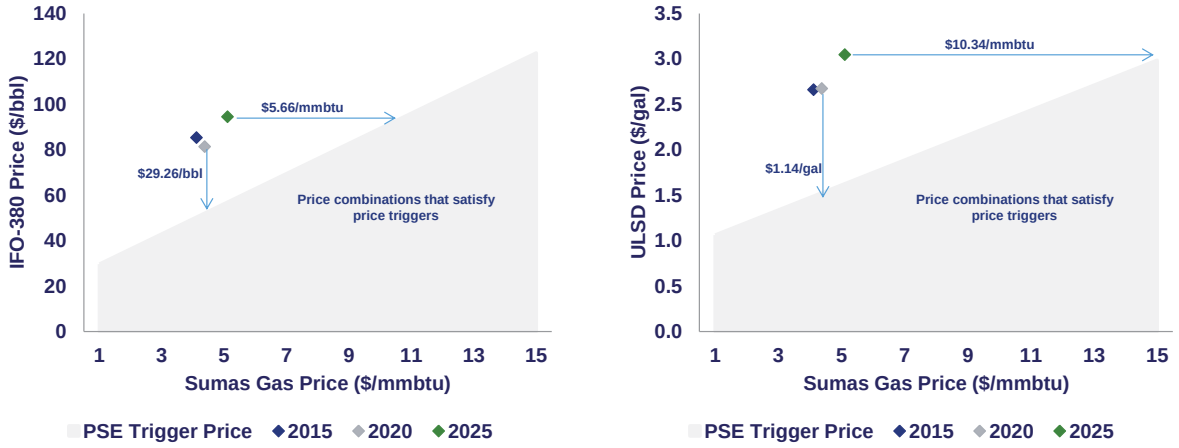
Figure 7: 2012 and 2020 Snapshots of PNW Refinery Yields



Refinery yields in the region are expected to remain relatively consistent with minor changes resulting from increased light, tight oil (LTO) production from the Bakken. However, these changes provide favourable price increases as refining of LTO shifts yields towards the lighter end of the product barrel and decreases supply of ULSD and IFO-380. Further price upside exists as current rail offloading capacity in California and PNW is currently underutilized; should rail buildout occur there is available capability to handle increased volumes of Bakken crude.

Conclusions and Risk Factors

Figure 8: IFO-380 and ULSD Trigger Prices



Wood Mackenzie expects ULSD and IFO-380 price spreads to Sumas gas to be sustained throughout the study period. Production of ULSD and IFO-380 will decrease due to lightening of the crude slate, while product demand in PNW will remain relatively constant through 2030. Natural gas price growth is expected to remain muted due to the ability to access significant volumes of economic reserves; Sumas will grow even less due to AECO-priced volumes struggling to find end markets.

Wood Mackenzie has identified a number of risk factors to the study, but even in the event of a "perfect storm" scenario, a substantial price spread will still be sustained. Wood Mackenzie's forecast currently includes four BCLNG facilities coming online; even if all projects proposed in the queue were to be constructed, price upside to Sumas natural gas is limited. Therefore, NGV demand would need to increase by an extreme amount (greater than current North American diesel demand) before prices begin to approach trigger prices due to substitution for long-haul trucks and potentially rail. However, the narrowing of the ULSD-Sumas gas spread would impair substitution economics, since increased gas price increased cost of NGV use, making it unlikely a large enough volume swap will occur to drive prices towards each other. On the product side, price support from oil project breakevens keep product prices at a premium to gas. In addition, market forces are able to adjust to worst case scenarios in a span of months to push them back towards the base case.

Natural Gas, ULSD and Fuel Oil Dynamics Study

Full Report

April 2014

Strategy with substance

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PUGET SOUND ENERGY

Background and Objectives

Background

Puget Sound Energy is requesting a discussion on the price spread between Sumas natural gas and ULSD as well as Sumas natural gas and IFO-380. The intent is to support the appropriate oil pricing outlook for considering future price spreads in the Puget Sound region to be used for contracting purposes.

Key objectives of this study

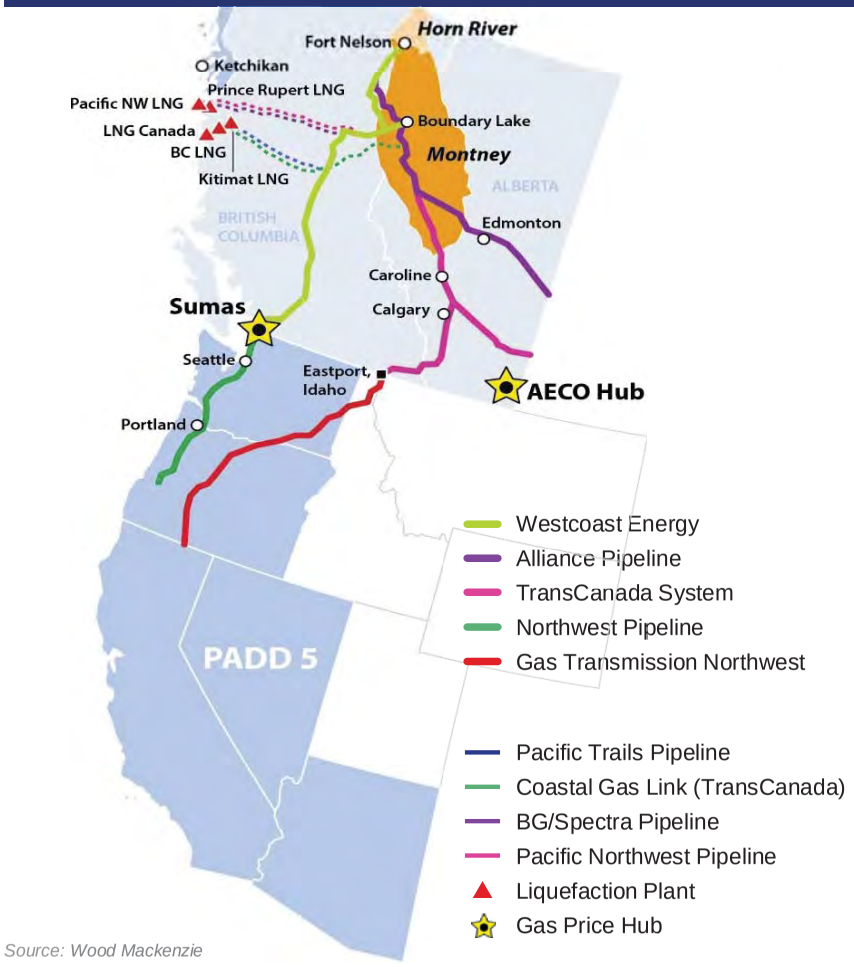
- Understand the minimum spread by examining a probable ceiling price on Sumas natural gas and a probable floor price on ULSD and IFO-380
- Understand what factors and drivers have led to the current spread as well as the sustainability of such factors
- Understand any factors that could lead to a degradation of the spread in the study period (2013-2030) and the likelihood of such circumstances occurring

Agenda

1. **Executive Summary**
2. Sumas Gas Price Dynamics and Risks
3. ULSD and IFO-380 Price Dynamics and Risks
4. Conclusions
5. Appendix

The ULSD and IFO-380 price spread to Sumas natural gas will be driven by regional dynamics in US PADD V and Western Canada

US PADD V and Western Canada



Source: Wood Mackenzie

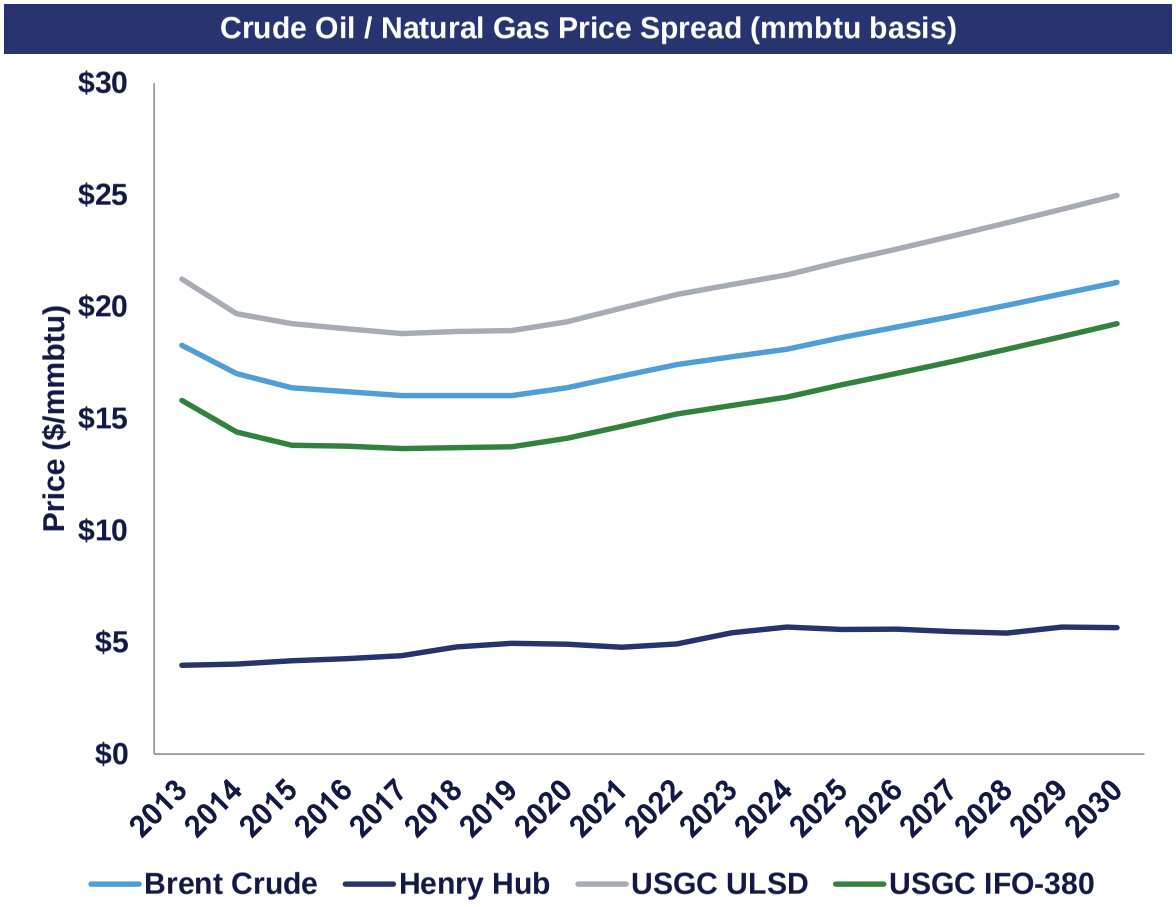
- PADD V covers the US West coast and consists of Alaska, Arizona, California, Hawaii, Nevada, Oregon, and Washington
- Western Canada is commonly defined as the four provinces west of Ontario, but for the purposes of this study refer to British Columbia and Alberta
- Supply/demand dynamics in these two regions are key to the ULSD and IFO-380 forecast price spread to Sumas natural gas

Executive Summary

- **Wood Mackenzie forecasts Sumas to remain in the $4.00-$5.25/mmbtu range and does not expect significant sustained price increases**
  - » There is already ample recoverable gas supply with ~430 tcfe economic under current prices
    - » Additional ~300 tcfe of reserves with just a $1/mmbtu increase in price
  - » Demand is forecast to grow at a slower pace from ~80 bcfd (~29 tcf/yr) to ~125 bcfd (~46 tcf/yr), with growth driven by increases in the power sector and LNG exports
- **ULSD and IFO-380 prices are expected to be sustained at a considerable premium to Sumas gas prices**
  - » Overall product demand on the North American Pacific Coast is forecast to remain relatively constant, with ULSD demand increasing ~76 kb/d and IFO-380 demand decreasing ~37 kb/d
  - » Supply is skewed towards the lighter end of the barrel due to PNW refineries running higher volumes of Bakken crude (LTO)
- **Wood Mackenzie has identified potential risk factors to our forecast but expects the price spread to persist even in a "perfect storm" worst case scenario**
  - » Sumas gas price has potential upside from LNG exports, NGV demand, and US carbon policy regulations, but these factors are all dependent upon regulatory policy
  - » ULSD and IFO-380 demand will be affected by regulations such as LCFS and MARPOL as well as refinery crude slates but prices are supported by breakevens for new oil projects needed to meet projected demand
  - » ***Circumstances approaching PSE's "price triggers" would be extreme market imbalances and would resolve as the market reacts – this would occur in months, not years***

EXECUTIVE SUMMARY

Supply increases driven by shale production in North America will drive further expansions of the crude products/gas price spread



- Henry Hub price remains significantly lower than crude prices as accessibility to reserves is more than sufficient to meet forecast demand growth
- Crude pricing is forecast to soften in the short to medium term due to demand risks in OECD markets
  - » In the long-term, crude pricing is strengthened by increasing demand and breakeven economics for marginal projects
- Increased LTO production skews refinery output towards the lighter end of the barrel, limiting supply of ULSD and IFO-380

Source: Wood Mackenzie

Agenda

1 Executive Summary

2 **Sumas Gas Price Dynamics and Risks**

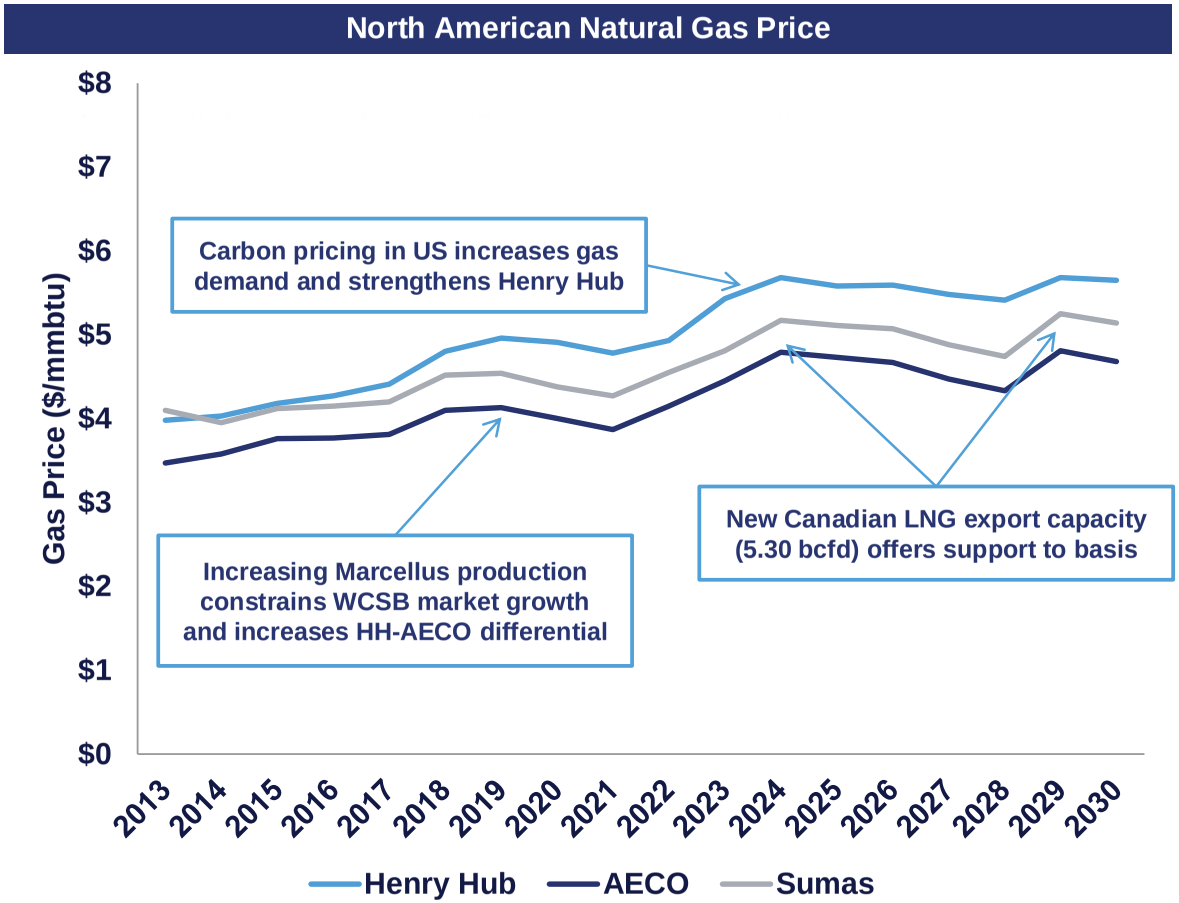
3 ULSD and IFO-380 Price Dynamics and Risks

4 Conclusions

5 Appendix

SUMAS GAS PRICE DYNAMICS AND RISKS

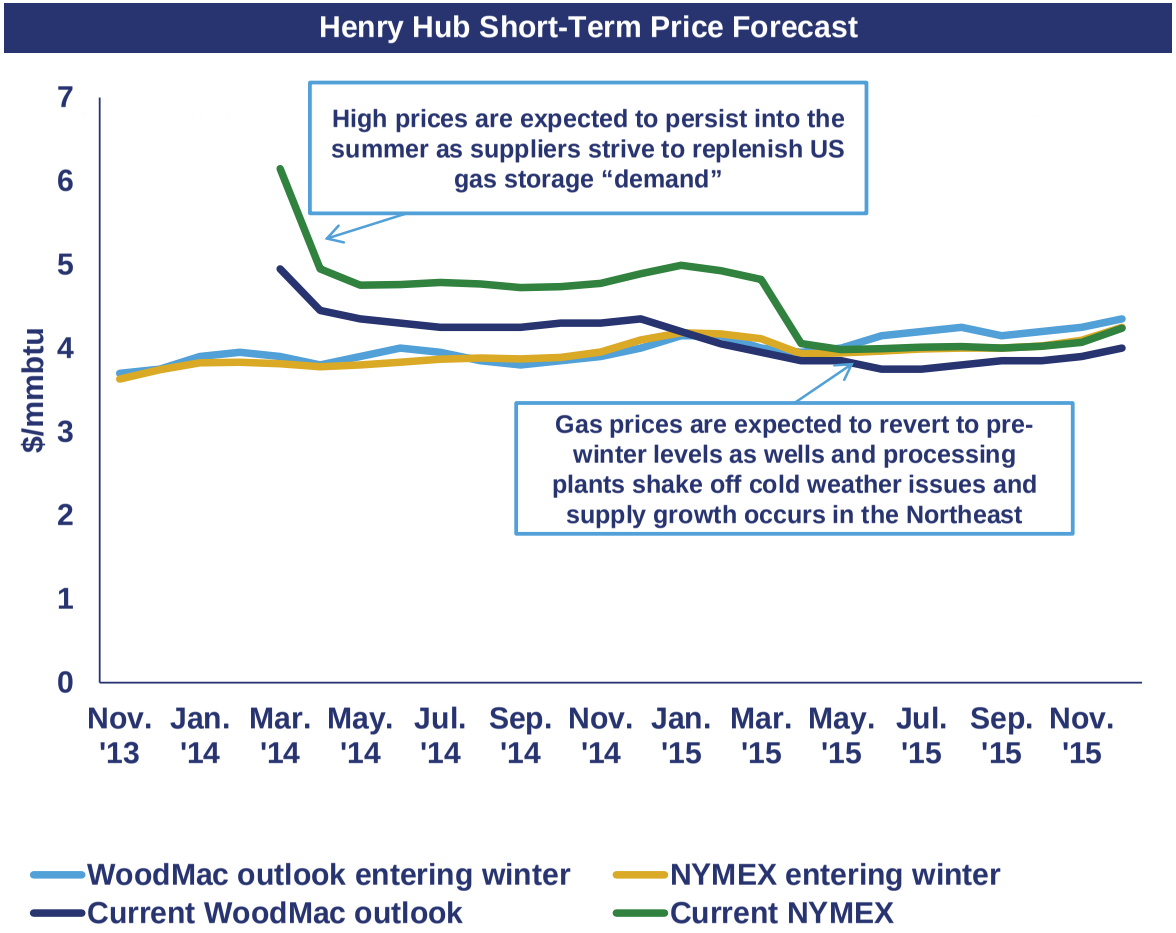
Wood Mackenzie does not forecast a significant recovery of gas prices, despite increased demand driven by regulatory policies and LNG exports



- Henry Hub is largely strengthened by LNG exports and industrial demand growth along the Gulf Coast region
- Price increases at AECO are constrained by limited demand access as well as increasing production from competing sources of supply in North America
- Sumas sources the majority of its natural gas from British Columbia which is priced off AECO, causing it to remain at a premium due to transport cost

Source: Wood Mackenzie

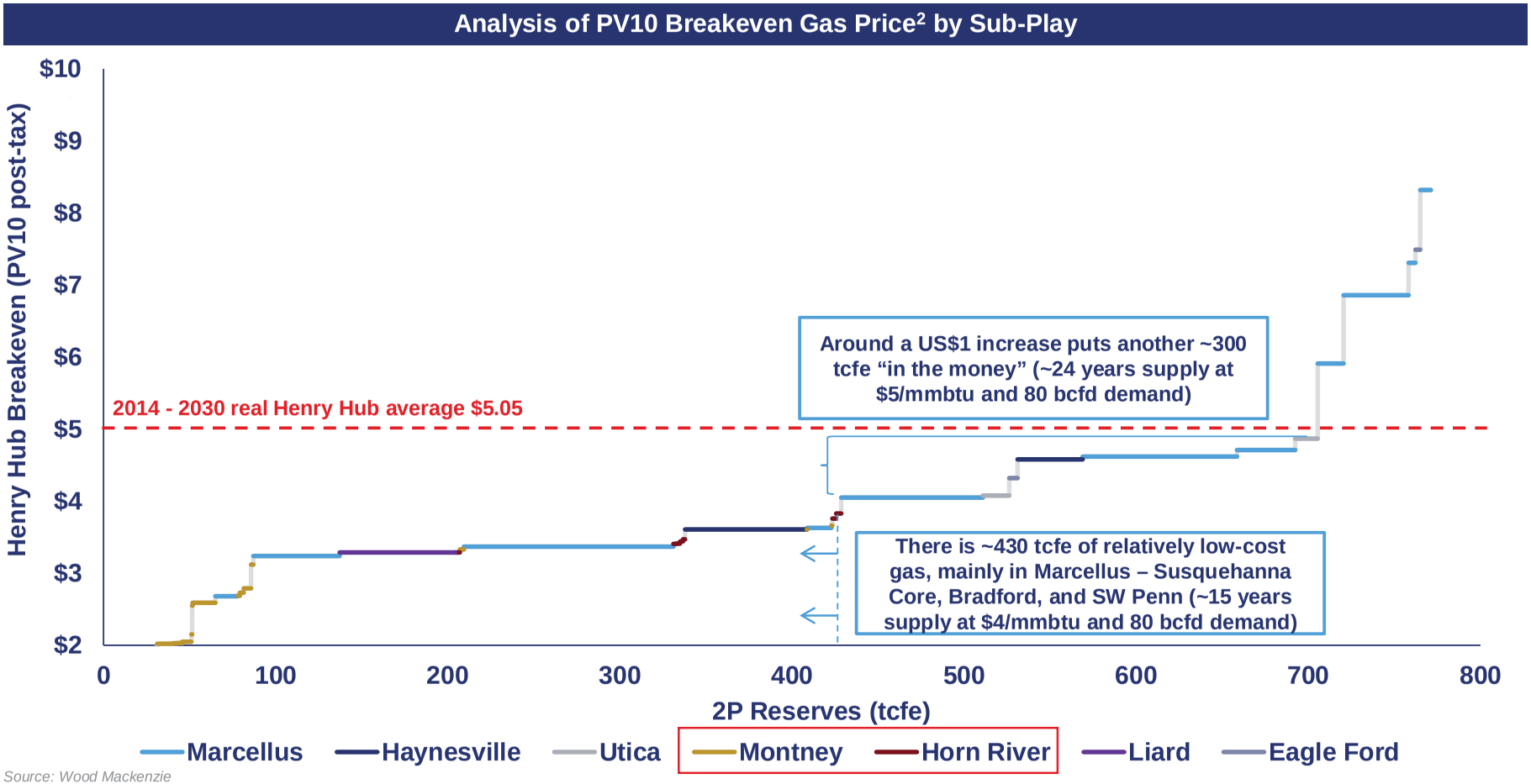
Recent gas prices have been driven by colder than normal weather in several regions, but fundamentals return to the norm in the long-term



- **This winter has been the coldest since 2000-2001, causing increased gas-fired generation, and withdrawals from US storage have been well above average levels drawn historically**
  - » Prices will be sustained in the short-term as suppliers strive to refill US storage "demand"
- **However, Wood Mackenzie expects this to be a short-lived phenomenon as temperatures revert to the norm**
  - As demand falls back to normal levels, supply will increase driven by relief of cold-weather issues (plant shutdowns, well freeze-offs) and increased production from the Northeast

Source: Wood Mackenzie

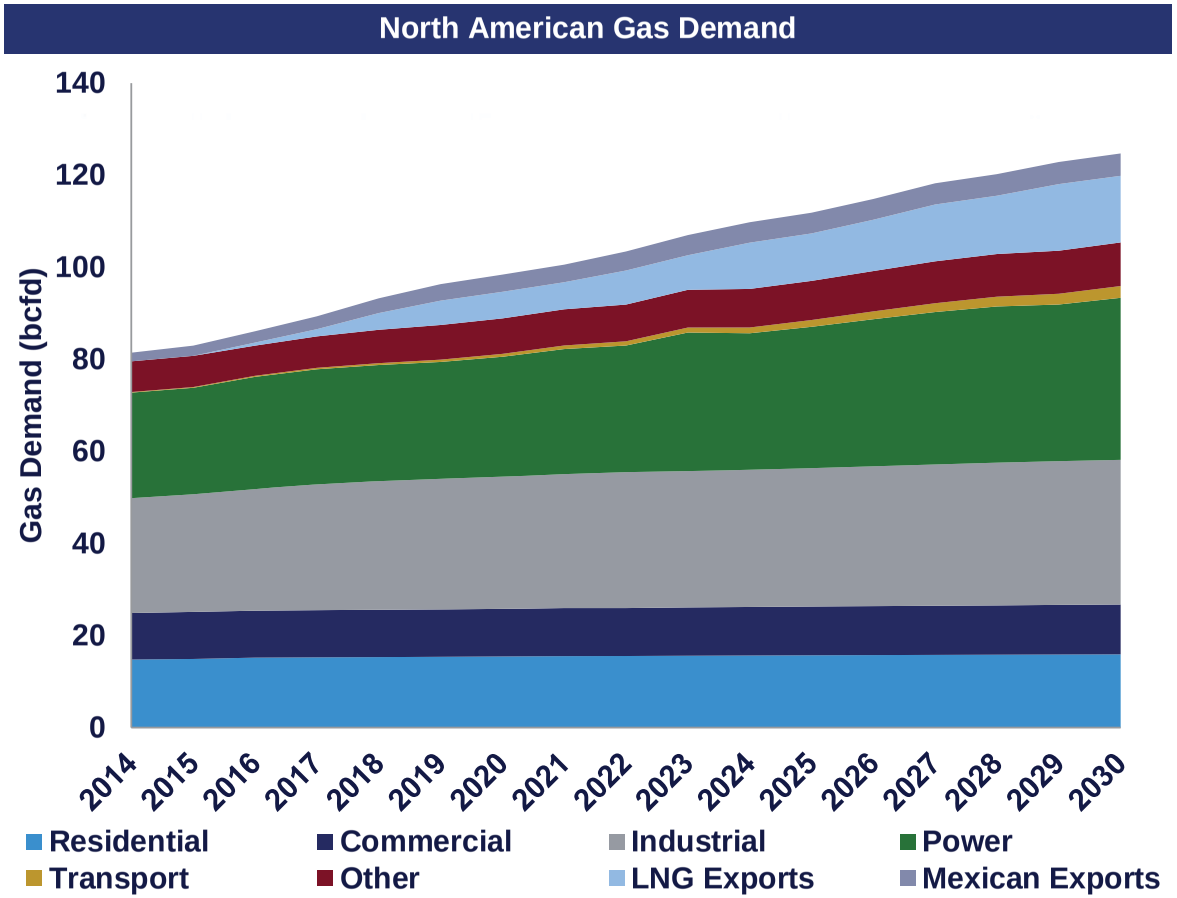
North American unconventionals have provided access to significant volumes[1] of relatively low cost gas



Source: Wood Mackenzie

Notes:
1. **2P Reserves are defined as Proven + Probable** reserves, which analysis of geologic and engineering data suggest are likely to be recoverable under reasonable economic, technical and operating conditions
2. Breakeven analysis includes current views of typical drilling & completion costs, per-well infrastructure Capex, operating expenses and fiscal take; excludes lease acquisition and E&A

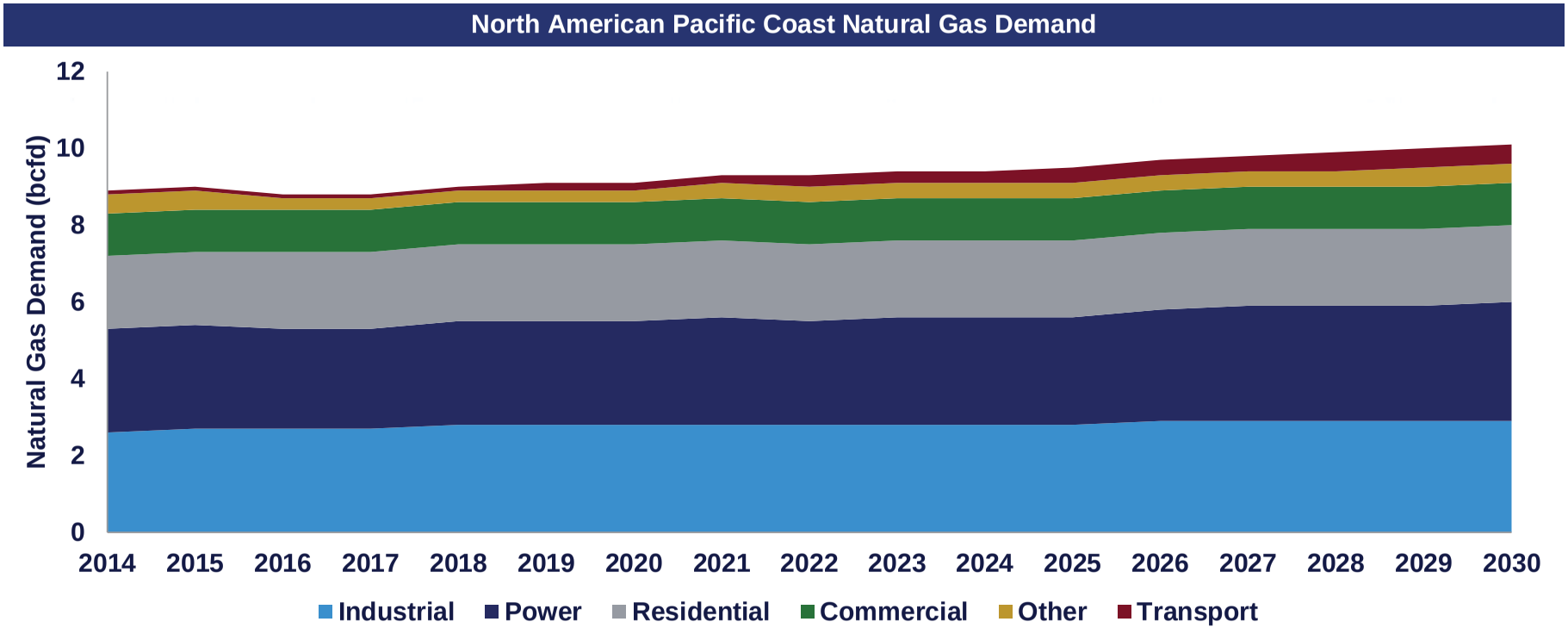
North American gas demand is expected to grow through the study period, driven mainly by the power sector and LNG exports



- The power sector is forecast to grow from 23 bcfd in 2014 to 35 bcfd in 2030 due to additional gas-fired generation addressing mandated retirements of coal-fired power plants in the US
- LNG exports are expected to add another 15 bcfd (5 bcfd from BCLNG) to demand by 2030 and compete strongly with other global sources into the Asian markets
- Economic growth supports an additional 7 bcfd of industrial demand by 2030 as low gas prices lead to increasing competiveness and investment in additional industrial capacity

Source: Wood Mackenzie

Gas demand on the North American Pacific Coast contributes very little of this growth, with only an increase of ~1 bcfd of demand by 2030

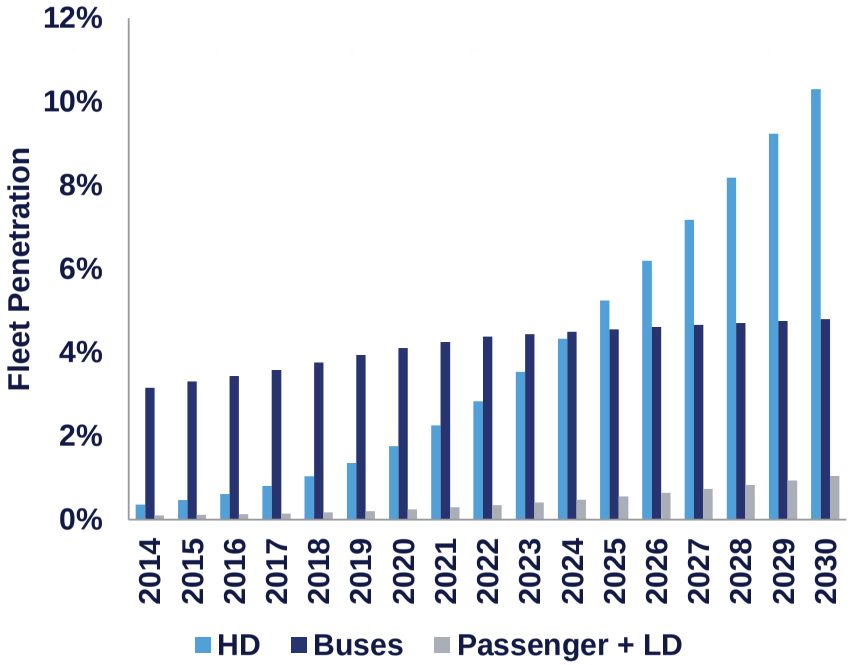


- The power sector provides the majority of growth in the region as natural gas displaces other sources due to environmental regulations coming into effect
- Industrial demand is not forecast to increase significantly due to a lack of industrial projects; Canada Methanol Corporation's plant in British Columbia is still early in the planning stage and must resolve offloading issues

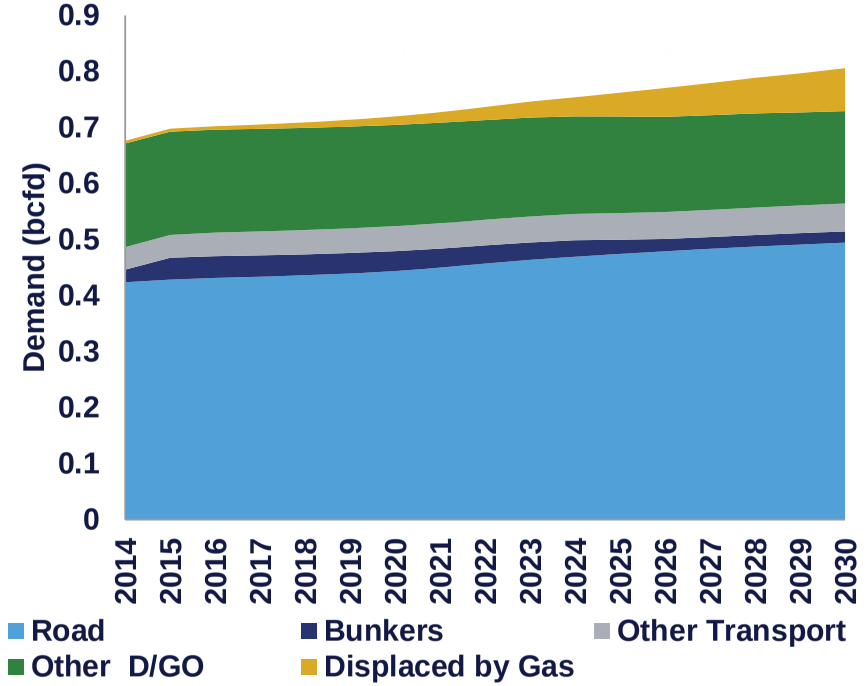
Source: Wood Mackenzie

Despite clean air initiatives and incentives, Wood Mackenzie does not forecast significant demand growth for NGVs in the US

NGV Vehicle Fleet Penetration



US Diesel / Gasoil Demand



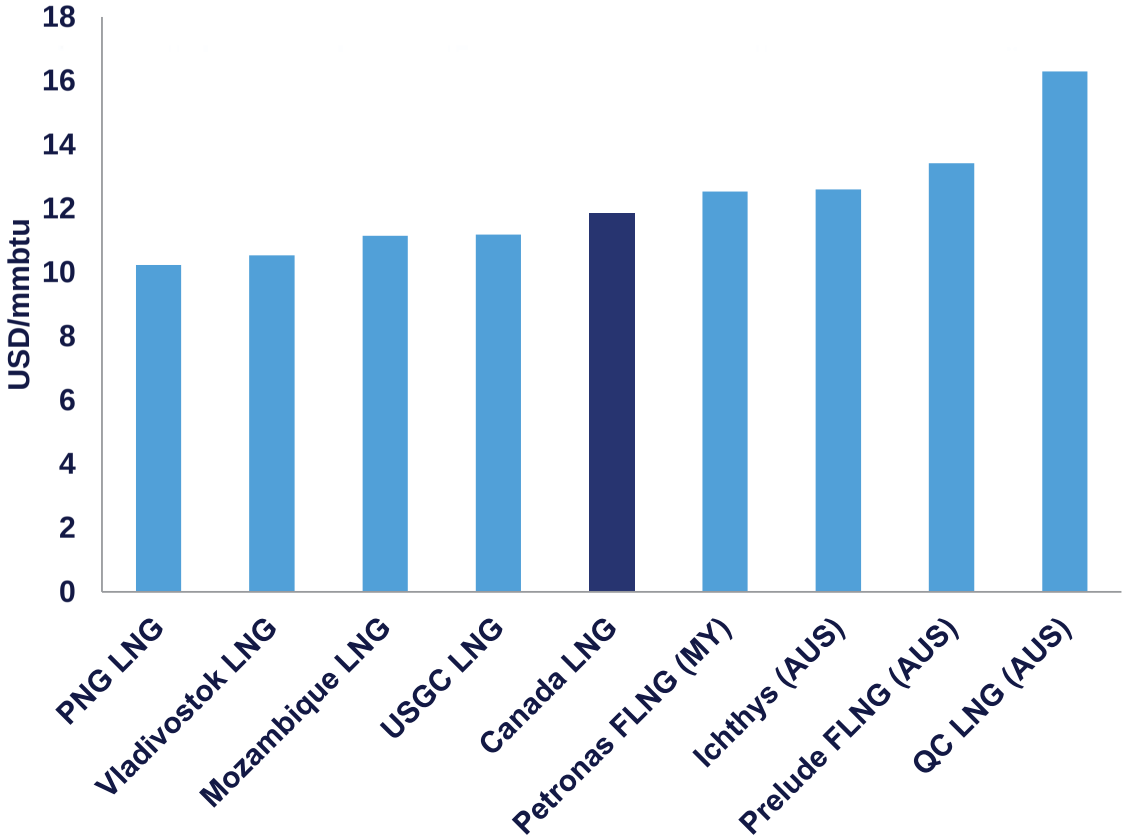
- The lack of re-fuelling infrastructure has constrained NGV uptake, with only ~1,300 CNG stations (~50% open to public) and 70 LNG stations (c.f. 5,000 diesel stops)
- In addition, NGVs face stiff competition in the market from alternative vehicle technologies, notably hybrid / electric vehicles

Source: Wood Mackenzie

Notes:
1. HD = heavy duty truck, LD = light duty truck. Based on gross vehicle weight rating (GVWR)

North American LNG export projects are expected to be competitive into Asian markets, but a race is on to build capacity and secure commitments

2020 Est. Delivered Cost[1] Comparison with Competing Projects into Asia



- **The potential LNG projects in North America, East Africa and Australia are competing to supply a "limited re-gas market"**
  - » Proposed liquefaction capacity greatly exceeds forecast LNG appetite
- **LNG exports from Western Canada are intriguing due to proximity to Asian markets, but face a number of challenges:**
  - » Remote location of source gas plays (Montney and Horn River)
  - » Regulatory hurdles to secure right-of-ways and approvals (including First Nations)
  - » High costs due largely to labor force competition with oil sands

Source: Wood Mackenzie

Notes:
1. Includes gas feedstock, liquefaction costs, and shipping costs to Japan
2. PNG = Papua New Guinea

There is opportunity for long-term upside in Canadian LNG but high deliverability risk makes timing and costs very uncertain

Project (Partners)	NEB export license status	Proposed Capacity (1st phase, mmtpa/bcfd)	Location
Kitimat LNG (Apache, Chevron)	Received	10.0 / 1.3	Kitimat
BC LNG Export Co-op (LNG Partners, Haisla First Nation, Golar)	Received	0.9 / 0.1	Kitimat
LNG Canada (Shell, PetroChina, KOGAS, Mitsubishi)	Received	12.0 / 1.6	Kitimat
Pacific Northwest LNG (PETRONAS, JAPEX)	Approved	12.0 / 1.6	Prince Rupert
WCC LNG (Exxon Mobil, Imperial)	Approved	30.0 / 3.9 (NEB Application Total)	Not finalized
Prince Rupert LNG (BG Group)	Approved	14.0 / 1.8	Prince Rupert
Woodfibre LNG (Pacific Oil & Gas)	Approved	2.1 / 0.3	Squamish
Jordan Cove[1] (Veresen)	Approved	6.0 / 0.8	Coos Bay, Oregon
Triton LNG (AltaGas, Idemitsu)	Applied	2.3 / 0.3	Not finalized (Kitimat or Prince Rupert proposed)
Aurora LNG (Nexen, INPEX, JGC)	Applied	24.0 / 3.1	Prince Rupert
Kitsault LNG (Kitsault Energy)	Applied	20.0 / 2.6	Kitsault
Oregon LNG[2] (Leucadia)	Applied	9.6 / 1.3	Warrenton, Oregon

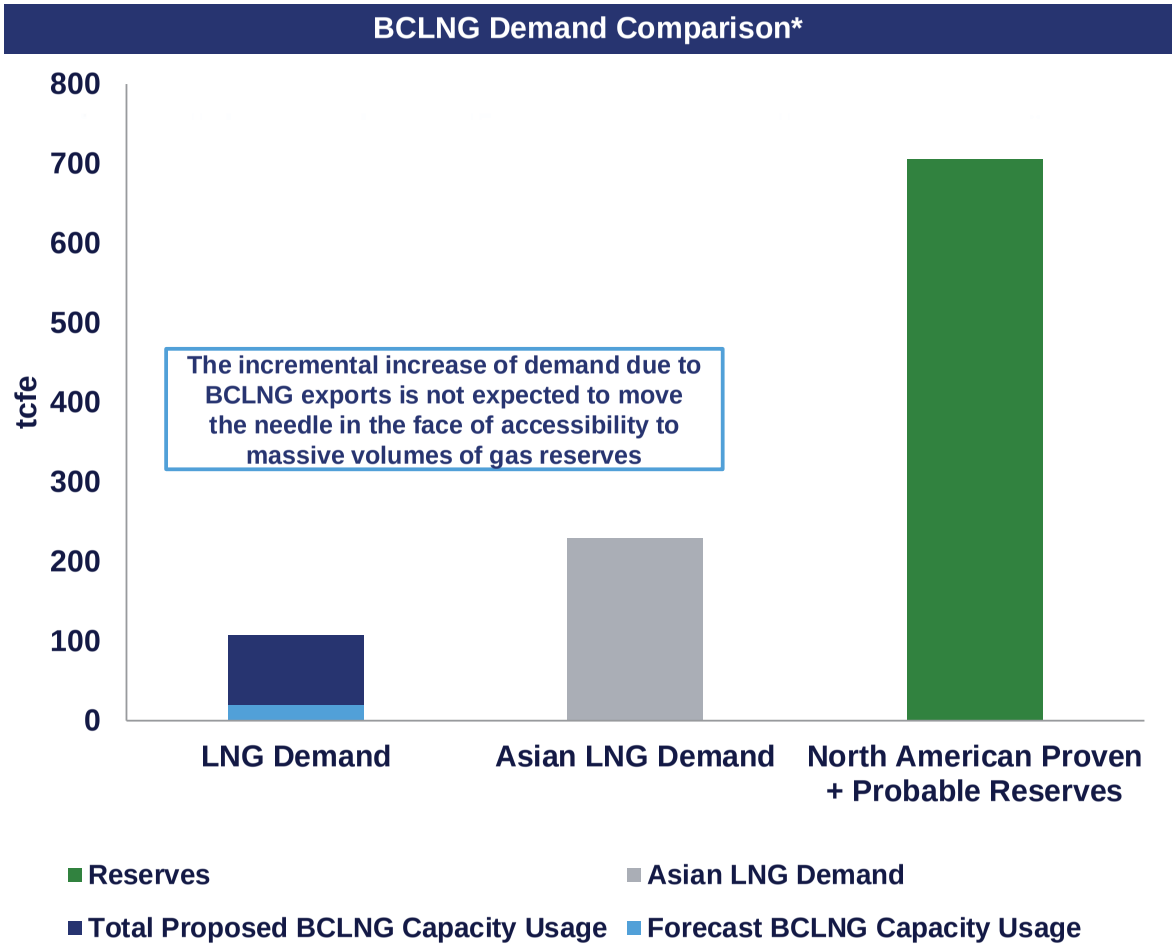
Included in WM Forecast

- **Technical challenges:**
  - » Greenfield construction with limited labor and resources
  - » Aggressive drilling campaigns necessary to achieve sufficient feed gas
  - » Infrastructure buildout is necessary to support proposed LNG volumes
- **Political/fiscal challenges:**
  - » Local stakeholder support must be secured; First Nations have protested use of their land in the past
  - » Concerns that LNG fiscal policy might burden competitiveness (i.e. proposed LNG tax)
  - » Possibility of NEB scrutinizing future approvals
- **Corporate appetite:**
  - » Major developers seeking to lower exposure (PETRONAS, KOGAS farm-downs) may indicate a "wait-and-watch" approach

Source: Wood Mackenzie

Notes:
1. Jordan Cove is proposed in the US but plans to source feedgas from Canada
2. Oregon LNG is proposed in the US but plans to source feedgas from Canada

Even if additional LNG projects come online, British Columbia LNG is expected to have a negligible effect on Sumas gas price



- Wood Mackenzie's current forecast assumes four Canadian projects come online within the study period: BC LNG, LNG Canada, Pacific NW LNG, and Prince Rupert LNG
- As LNG capacity comes online and flows increase, Sumas gas price receives support and strengthens ~2021
- However, this effect is limited as the increased price along with LNG stakeholder interests encourage access to stranded Horn River gas

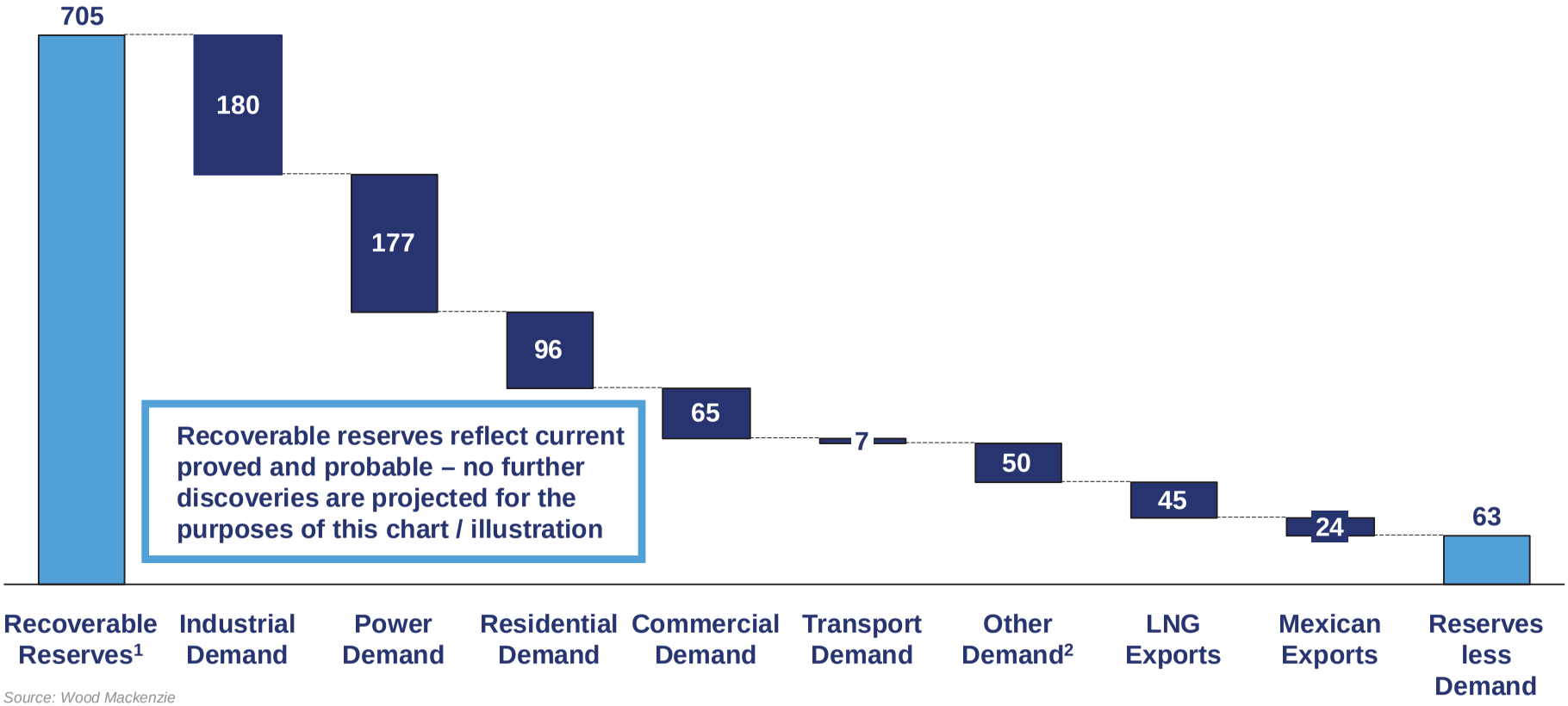
Source: Wood Mackenzie

**Forecast and Total Proposed BCLNG Capacity Usage assumes 100% capacity utilization. 2P reserves based on $5/mmbtu Henry Hub price. Demand and LNG usage estimated out to 2030.*

Current recoverable reserves are more than sufficient to supply projected demand and exports for the next 15 years, keeping gas prices low

North American Supply / Demand Breakdown (2014-2030, Gas Price $5/mmbtu)

Units: tcfe



Source: Wood Mackenzie

Notes:
1. Recoverable Reserves does not include conventional or offshore fields
2. Other Demand includes pipeline and fuel usage

SUMAS GAS PRICE DYNAMICS AND RISKS

There is more downside than upside price risk to the Sumas price forecast as many strengthening factors are dependent on regulatory policy

Risk Factor	Consequences	Effect on Sumas Gas Price	Impact
LNG Exports	• Several LNG projects are in various stages of the approval process for LNG exports into Asian markets • Canadian and US West Coast LNG exports will use source gas from British Columbia	Price Increase: Increase in demand and linking to Asian gas prices	Low
NGV Usage Growth	• The US DoE Clean Cities Coalition is incentivizing the use of alternative and renewable fuels to reduce petroleum consumption • Ongoing initiatives to increase NGV re-fuelling infrastructure improves accessibility to CNG and increases natural gas demand	Price Increase: Increased gas demand from higher NGV penetration into the vehicle fleet	Low
US Carbon Policy Regulations	• Previous proposals for carbon regulations (Bingman-Specter, Kerry-Lieberman) have garnered political backing in the past, and rising emissions levels are expected to produce increased political pressure • A tightening of carbon emissions causes the power sector to switch from coal to natural gas for its energy source, increasing gas demand	Price Increase: Increased gas demand for the power sector	Medium
Shale Gas Supply / Production Growth	• Continued delineation and improvements in operational efficiencies increases natural gas reserves and production, providing additional supply	Price Decrease: Increased gas supply from available economic reserves	High

Price Decrease Price Increase No Price Effect

Source: Wood Mackenzie

Sumas Gas Price Dynamics Overview

- **Wood Mackenzie forecasts Sumas gas price to remain in the $4.00-$5.25/mmbtu range throughout the study period and does not expect price to increase significantly**
  - » Recent temperature patterns have resulted in price spikes for natural gas, but Wood Mackenzie does not expect these trends to sustain gas prices in the long-term
- **North American unconventionals have provided access to considerable volumes of low-cost shale gas, far outpacing forecasted demand growth**
- **Demand growth resulting from NGVs is not expected to be significant due to re-fuelling infrastructure constraints and competition from alternative vehicle technology**
- **Despite long-term opportunity for exports from BCLNG, these projects face a number of technical, political, and fiscal challenges that must be overcome**

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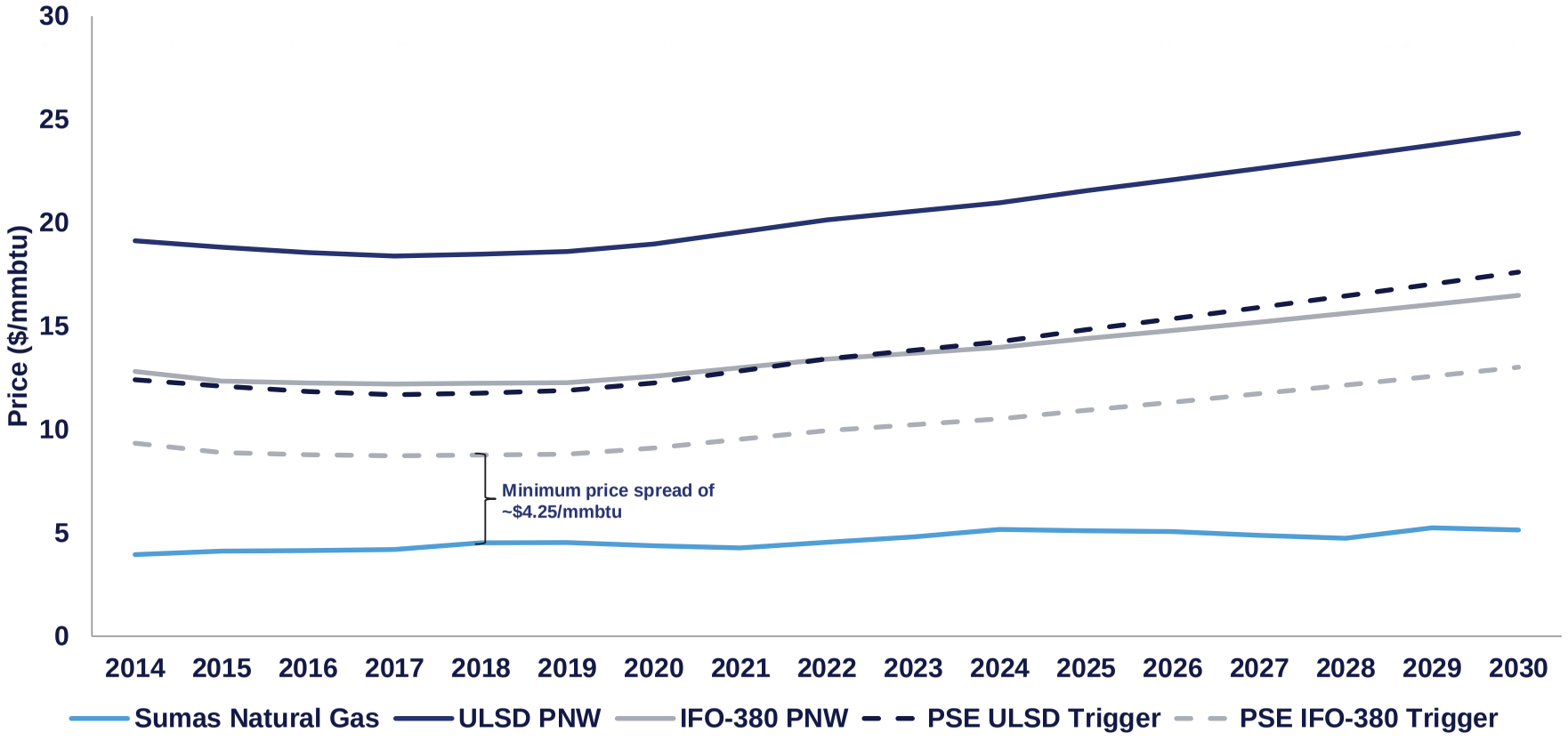
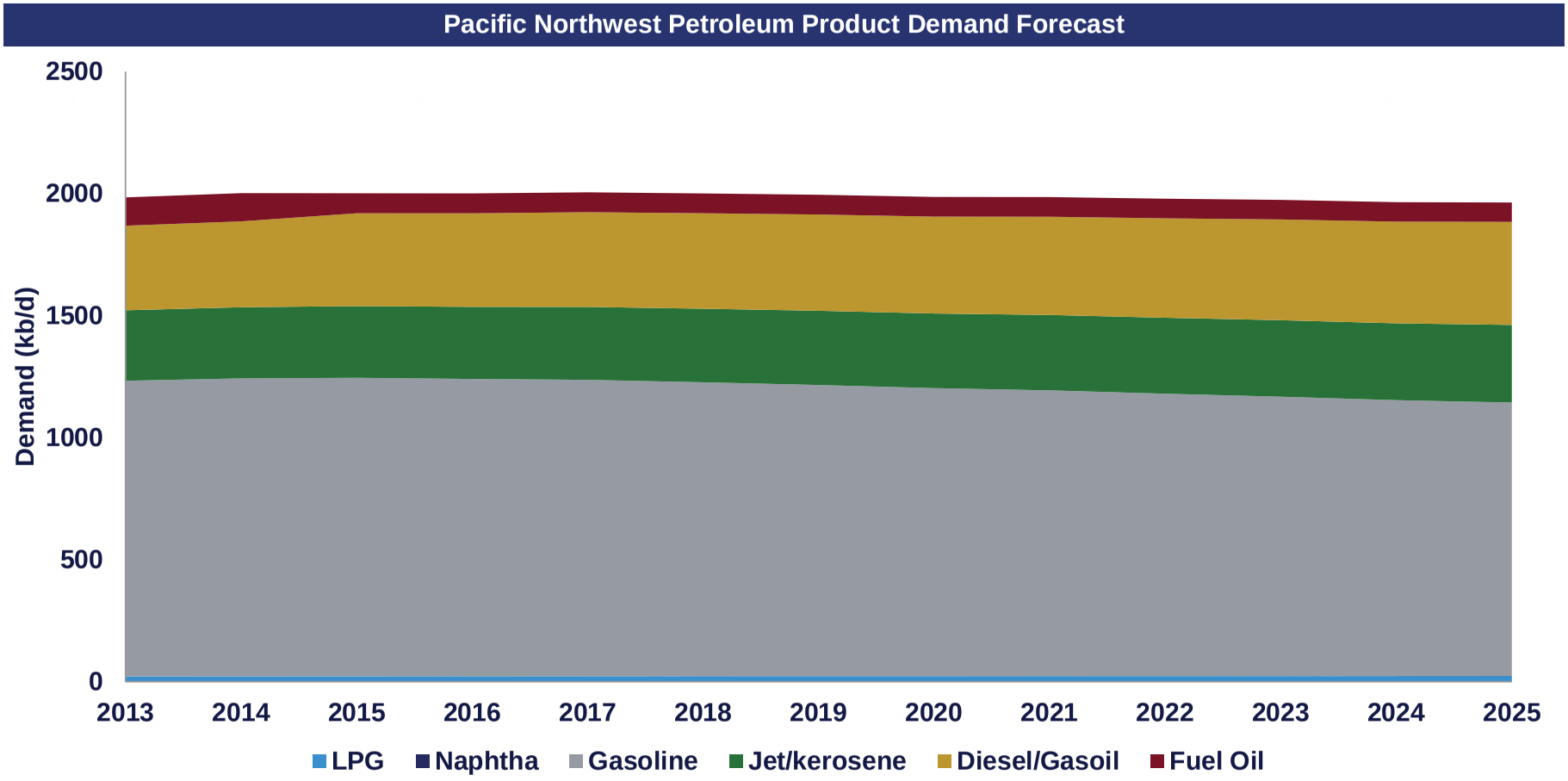
Wood Mackenzie expects the basis spread between natural gas to ULSD and IFO-380 to be sustained throughout the study period

Pacific Northwest Price Forecast for Sumas Natural Gas, ULSD, and IFO-380



Source: Wood Mackenzie

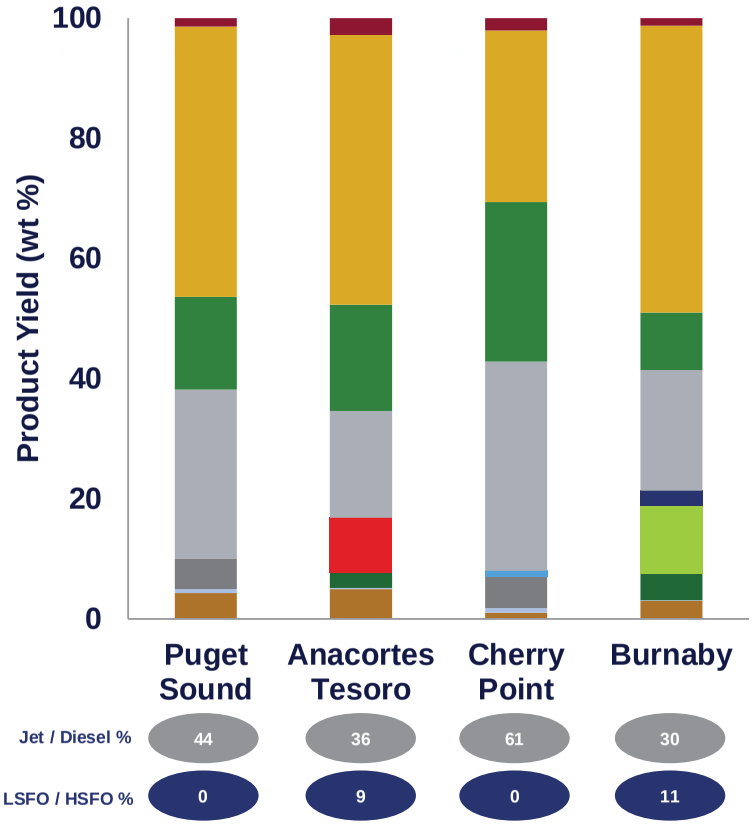
Petroleum product dynamics in the Pacific Northwest are not expected to change significantly through the study period



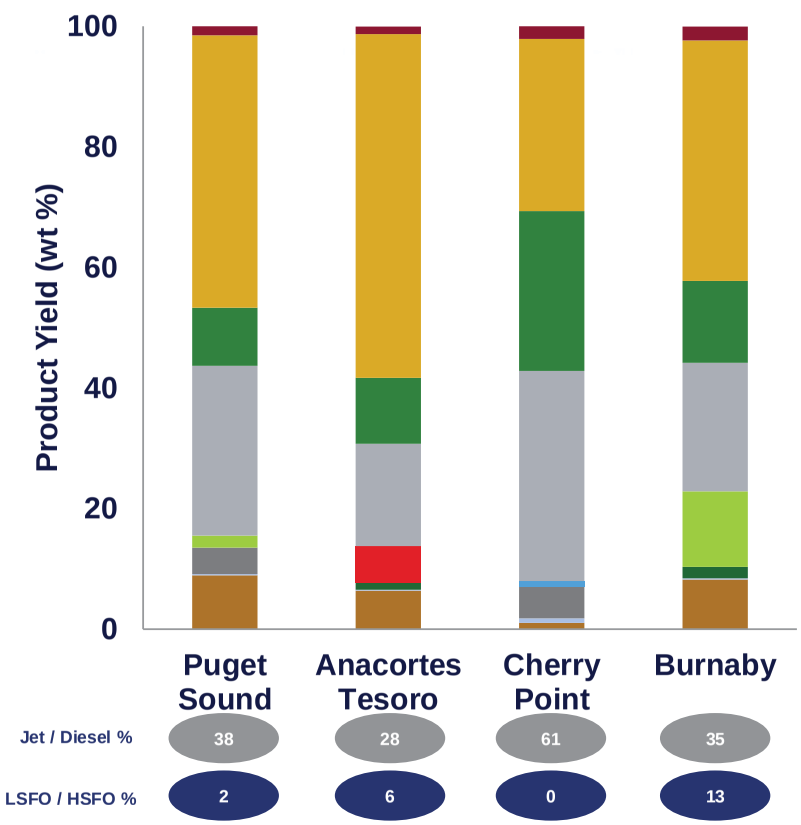
Source: Wood Mackenzie

Consequently, refinery yields remain relatively consistent, with minor changes resulting from increased LTO production

2012 Snapshot of PNW Refinery Yields

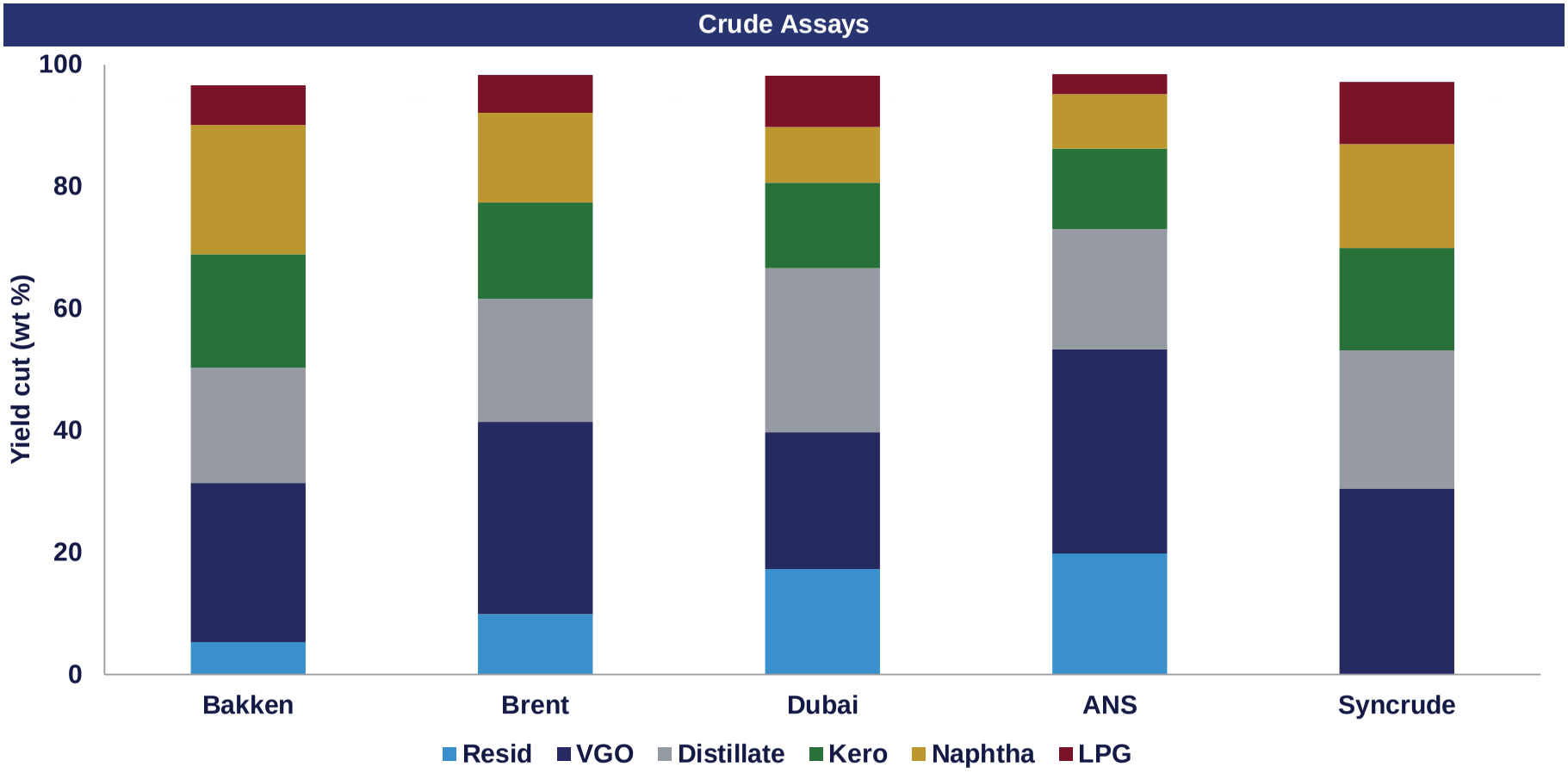


2020 Snapshot of PNW Refinery Yields



Source: Wood Mackenzie

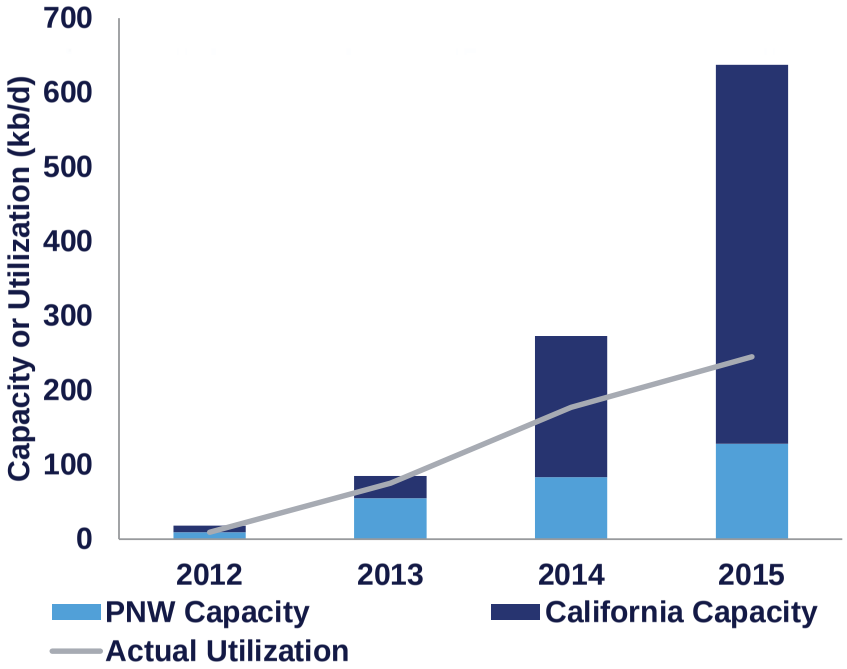
Relative to conventional grades, LTO produces less residue and more LPG and naphtha, shifting yields toward the lighter end of the product barrel



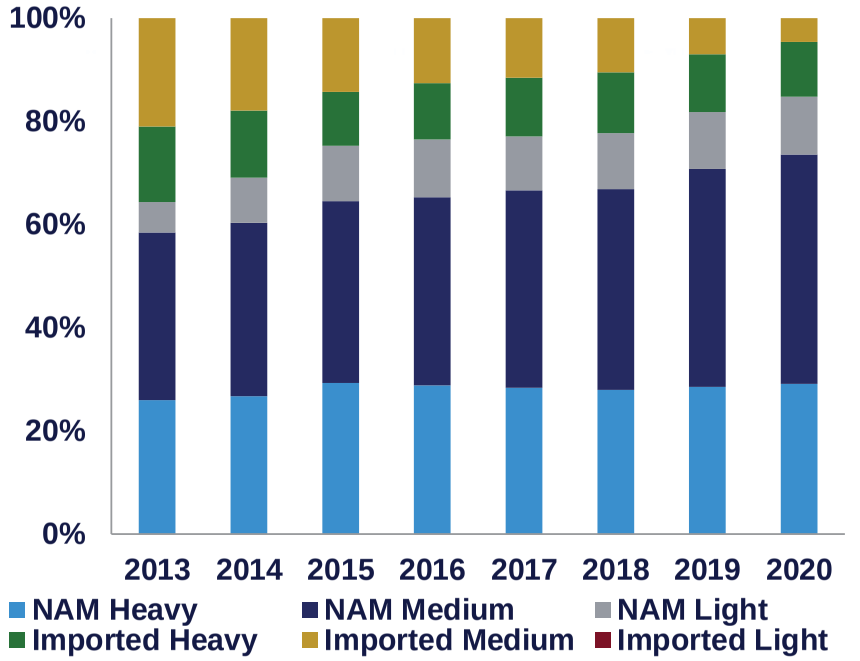
Source: Wood Mackenzie

Upward product (ULSD, IFO) price pressure as North American supply (including LTO) enters PADD V, with negative yield impact on heavier cuts

Light/Medium Rail Offloading Capacity[1]



PADD V Crude Slate



- LTO penetration will largely be confined to PNW as there is limited crude by rail into California; the PNW is expected to continue running as many Bakken volumes as possible

Source: Wood Mackenzie

Notes:
1. Assumes rail offloading capacity is 75% of maximum daily rate

Wood Mackenzie has identified a number of possible risk factors to our ULSD and IFO-380 price forecast

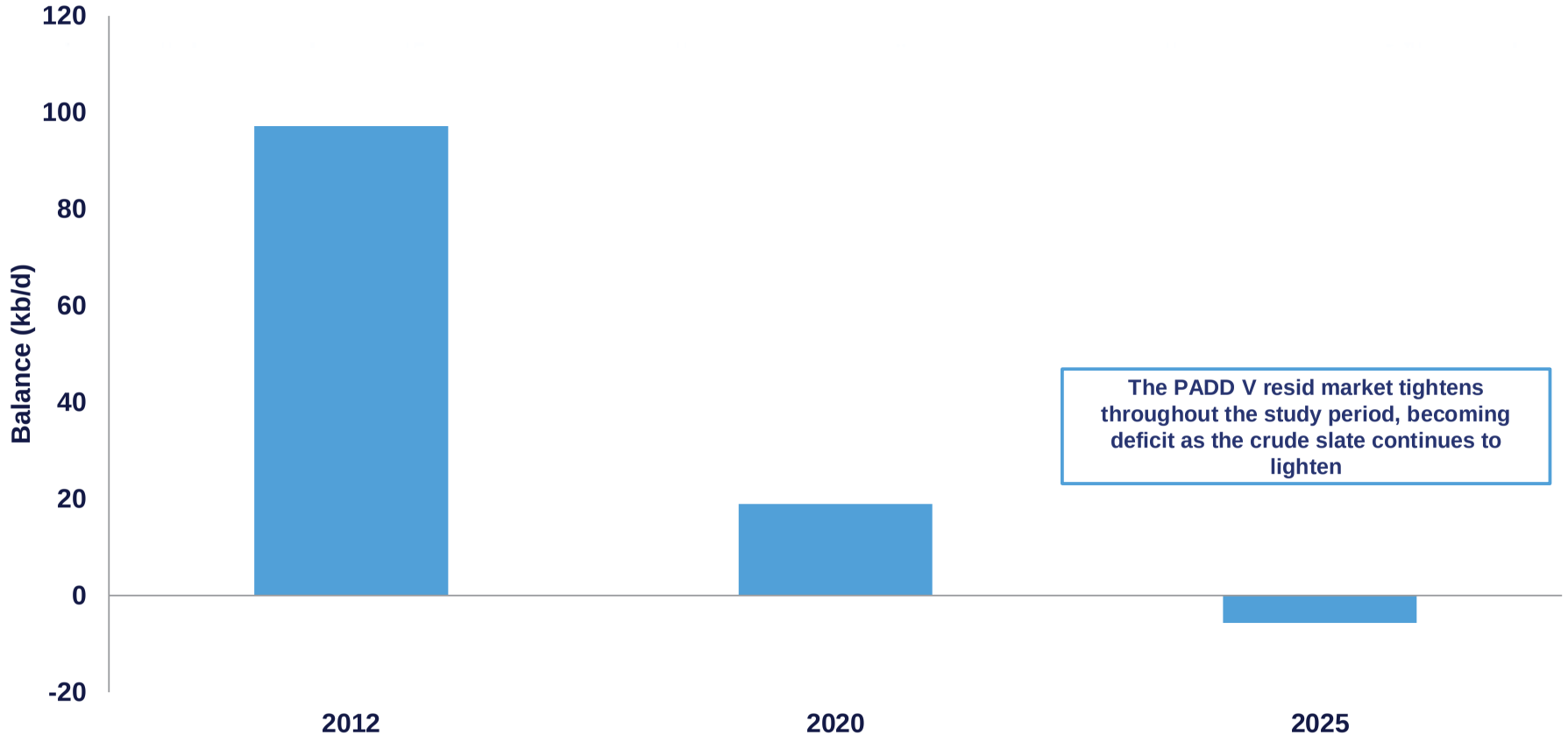
Risk Factor	Consequences	Effect on ULSD Price	Effect on IFO-380 Price
California LCFS Regulations	• Due to inability of PNW refineries to make LCFS diesel, PNW diesel surplus is exported to Japan • California exports of non-LCFS diesel find a new market in Asia (Singapore) • Due to the more stringent diesel specifications, hydrotreating finishing becomes more valuable	Price Decrease: decreased demand and exports to Asian markets	No Price Effect: the price spread increases due to hydrotreating becoming more valuable in the face of more stringent diesel specifications
MARPOL Regulations	• MARPOL regulations cause gasoil to be substituted for fuel oil, increasing diesel demand • Fuel oil is pushed out of the bunker market, increasing gasoil price and decreasing resid price	Price Increase: increased diesel demand	Price Decrease: decreased IFO-380 demand, though tempered by the corresponding increase in gasoil price
Heavy Crude Supply/Demand Balance	• A short balance of heavy crude increases the value of heavy crude, which in turn increases the value of resid	No Price Effect	Price Increase: increased value of resid causes processing cost of IFO-380 to increase
Tight Oil (LTO) Production	• Reduced distillate yield reduces the supply of ULSD • Reduced resid yield increases the price of residuals which are used to blend fuel oil	Price Increase: reduction in ULSD supply	Price Increase: decreased supply of resid increases their price, causing cost of IFO-380 processing to increase as well

Price Increase Price Decrease No Price Effect

Notes:
1. LCFS = Low Carbon Fuel Standard. Compliant fuels are a separate commodity from standard ULSD.

Price downside is limited as IFO-380 becomes deficit, implying import price parity as the price-setting mechanism and providing upward price pressure

PADD V Resid Supply/Demand Balance Snapshots



Source: Wood Mackenzie

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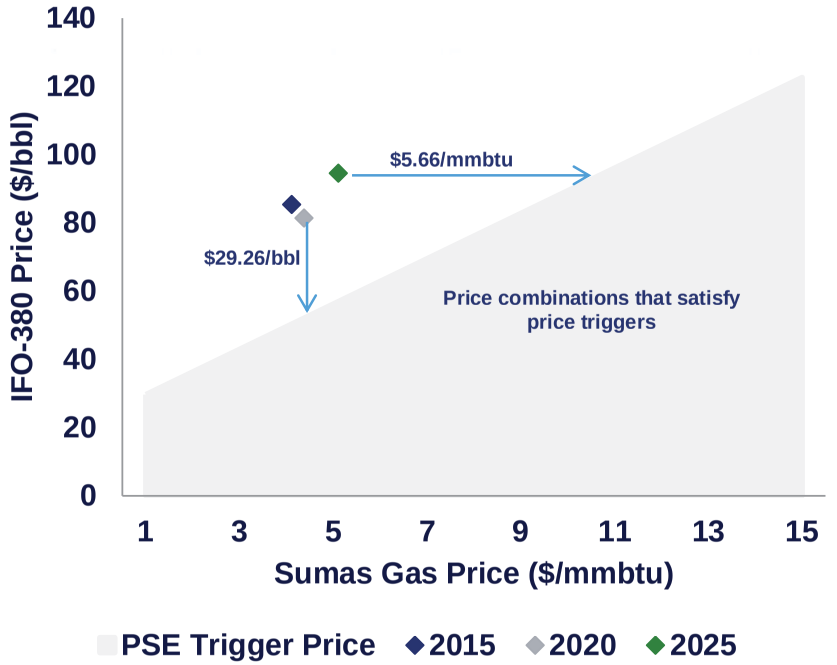
CONCLUSIONS

Key Conclusions

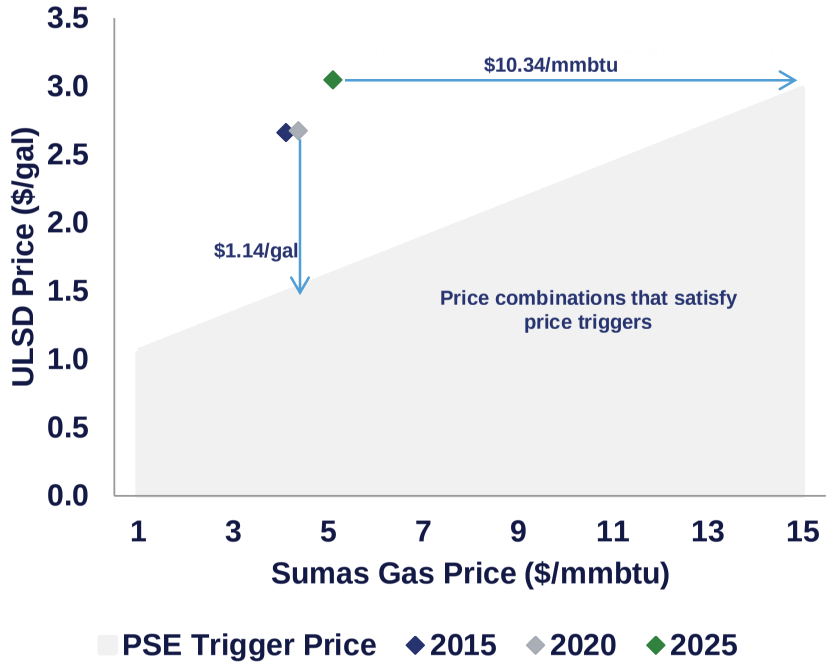
- **Even in the event of a "perfect storm", a substantial price spread will emerge and be sustained**
  - » Gas demand (e.g. LNG, NGV) needs to increase by an extreme amount before prices begin to approach trigger prices
  - » Decreasing supply from increased LTO and price support from oil project breakevens keep product prices at a premium versus gas
  - » Market forces are able to adjust to worst case scenarios in a span of months to push them back towards the base case
- **ULSD and IFO-380 price spreads to Sumas gas are sustained throughout the study period as crude supply shifts towards lighter products**
  - » Production of ULSD and IFO-380 will decrease due to lightening of the crude slate, while overall product demand in PNW is forecast to remain relatively constant through 2030
  - » PNW is a net importer of ULSD and net exporter of IFO-380 so price-setting mechanisms do not change
  - » IFO-380 price has the potential to strengthen due to local resid market deficit with lighter USWC crude slate
- **Wood Mackenzie does not expect Sumas gas price to increase significantly, remaining in the $4.00-$5.25/mmbtu range**
  - » Currently existing 2P reserves are sufficient to supply forecast demand through at least 2030
  - » Even a doubling of LNG demand and NGV penetration does not materially change production cost

Price risk factors would need to manifest in the extreme in order to collapse the price spread

IFO-380 Trigger Prices (Base Case)



ULSD Trigger Prices (Base Case)

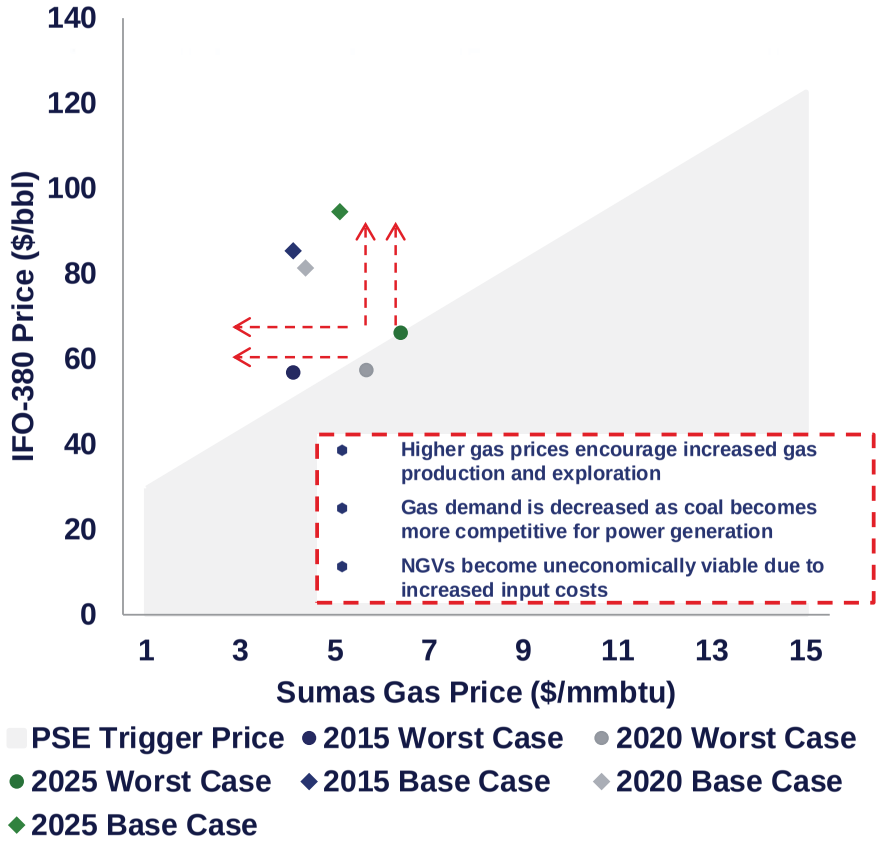


- Not only would all proposed BCLNG capacity need to be fully utilized, but NGV demand would also have to grow by an enormous amount (*more than all forecast North American diesel demand*)
- For IFO-380 and ULSD prices to drop below the trigger line, LTO production would need to drop by a significant amount and be replaced by heavy crudes from Canadian oil sands in the North American crude slate

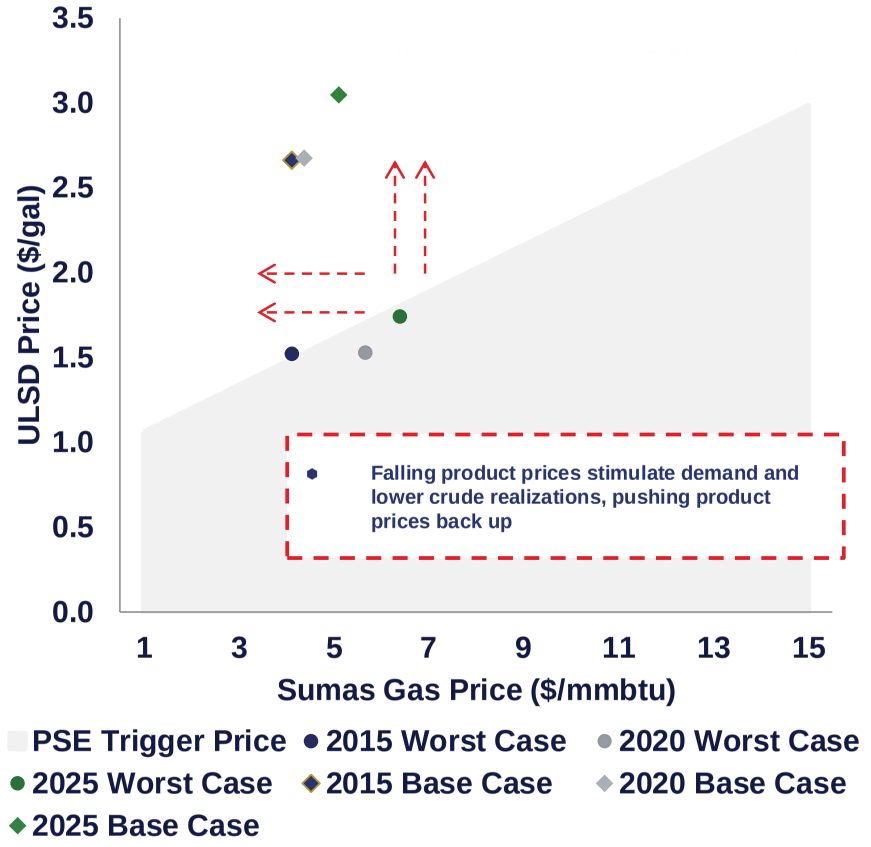
Source: Wood Mackenzie

Even if the spread does collapse for a short time, market forces will push prices back towards the base case and away from the trigger line

IFO-380 Trigger Prices (Worst Case)



ULSD Trigger Prices (Worst Case)



Source: Wood Mackenzie

Agenda

1 Executive Summary

2 Sumas Gas Price Dynamics and Risks

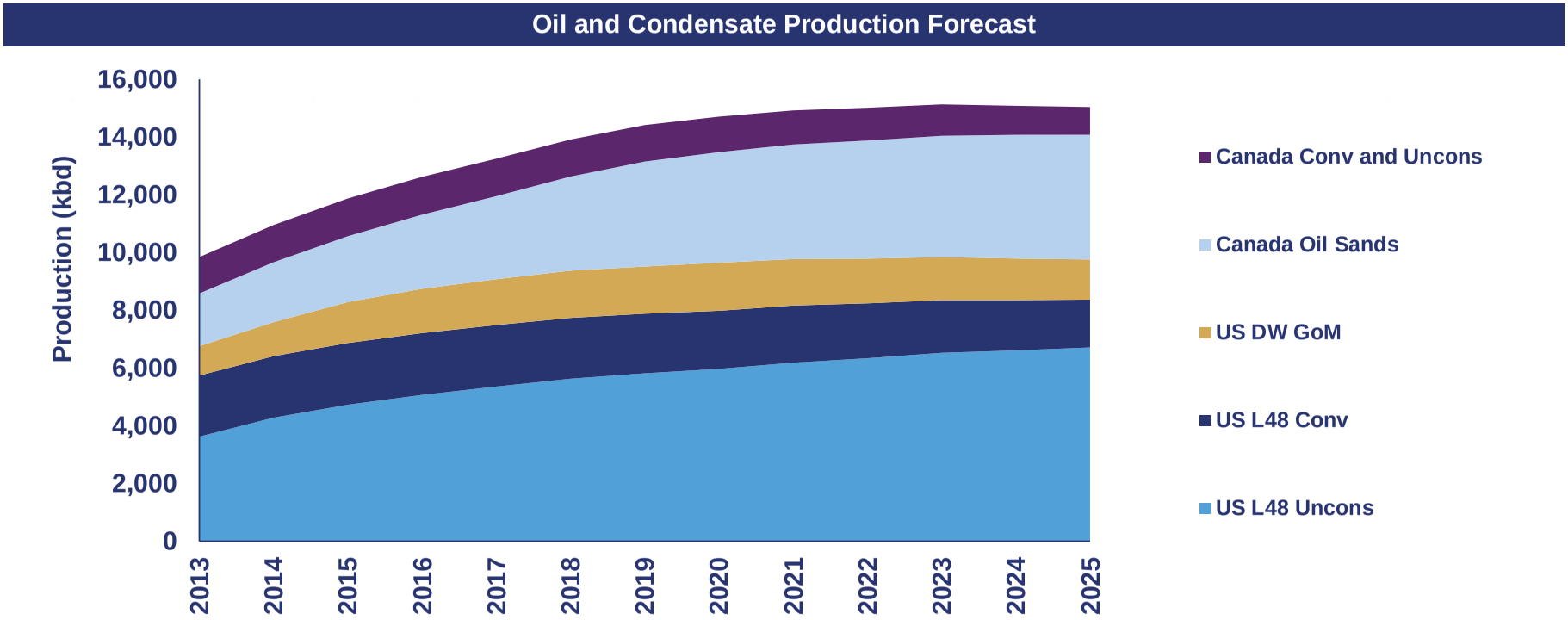
3 ULSD and IFO-380 Price Dynamics and Risks

4 Conclusions

5 **Appendix**

APPENDIX

Total North American production is forecast to increase to ~16 million barrels by 2025, driven by growth in US uncons and Canada oil sands



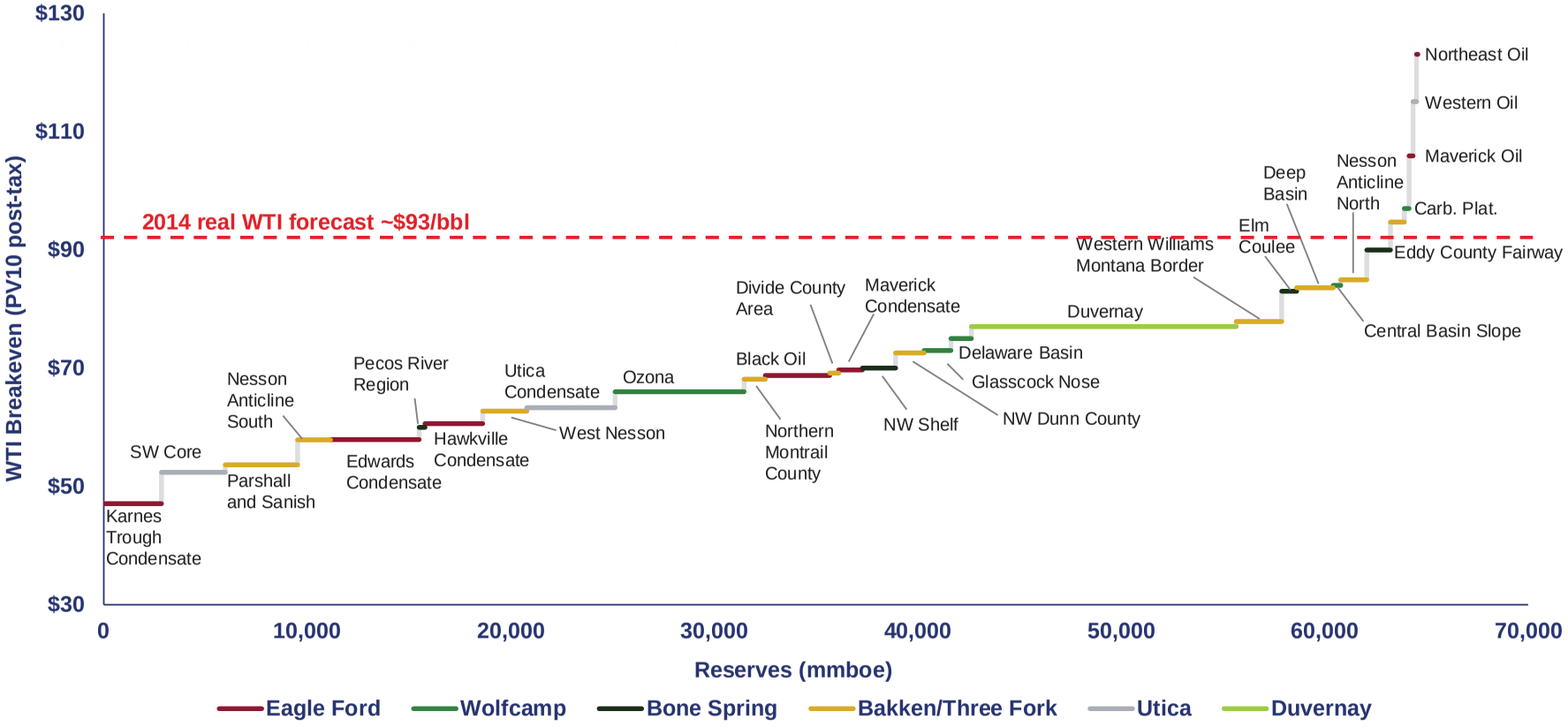
- Production growth is most aggressively forecast from US tight oil and Canadian bitumen projects, which will create a "barbell" of API quality grades skewed towards the light and heavy ends of the spectrum

Source: Wood Mackenzie

APPENDIX

Significant tight oil reserves have been identified, with much of the available supply base comfortably economic at current US oil prices

Analysis of PV10 Breakeven Oil Price[1] by Sub-Play[2]



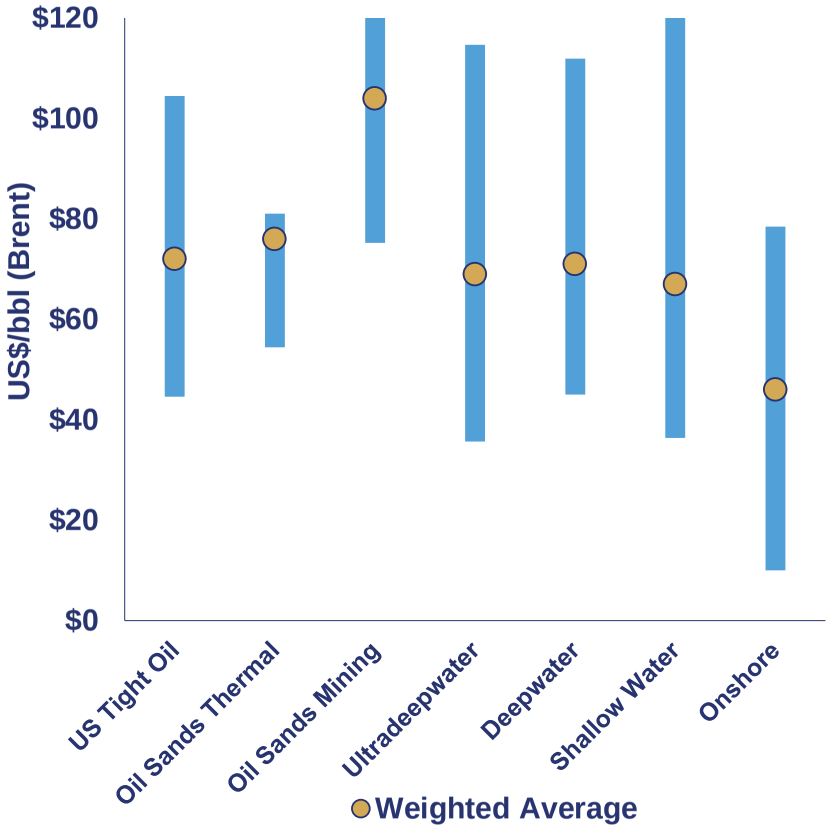
Source: Wood Mackenzie

Notes:
1. Breakeven analysis includes current views of typical drilling & completion costs, per-well infrastructure Capex, operating expenses and fiscal take; excludes lease acquisition and E&A
2. These are sub-plays recognized by Wood Mackenzie and reflect different well performances and economics

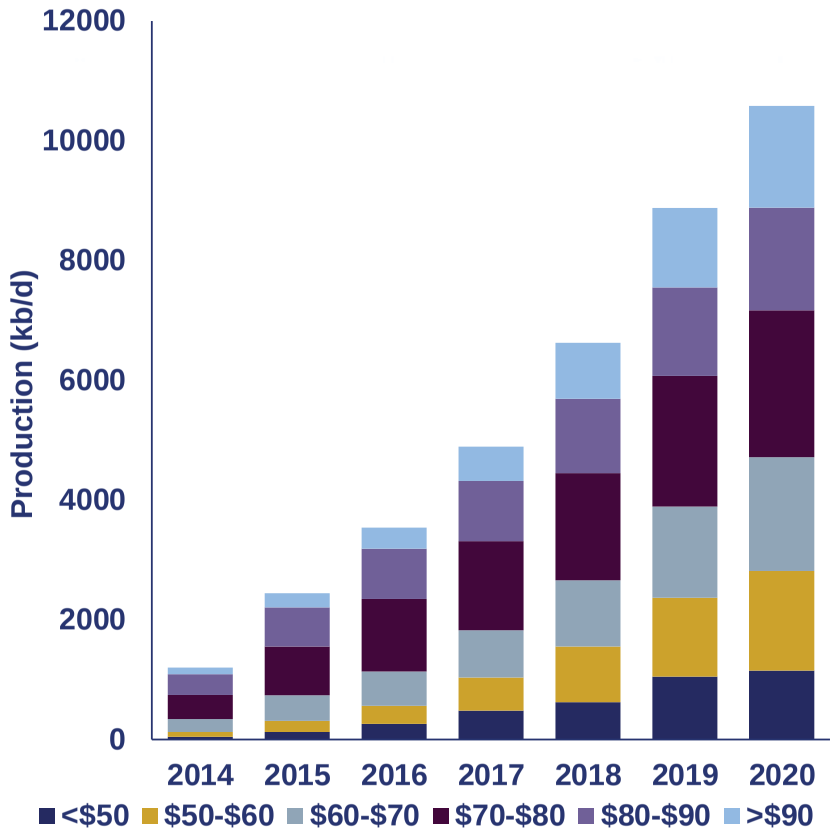
APPENDIX

Breakevens for new projects provide some support for prices, as a third of new oil developments requires more than $80 per barrel to breakeven

Breakevens for New Oil Developments



Production from New Oil Developments by Breakeven

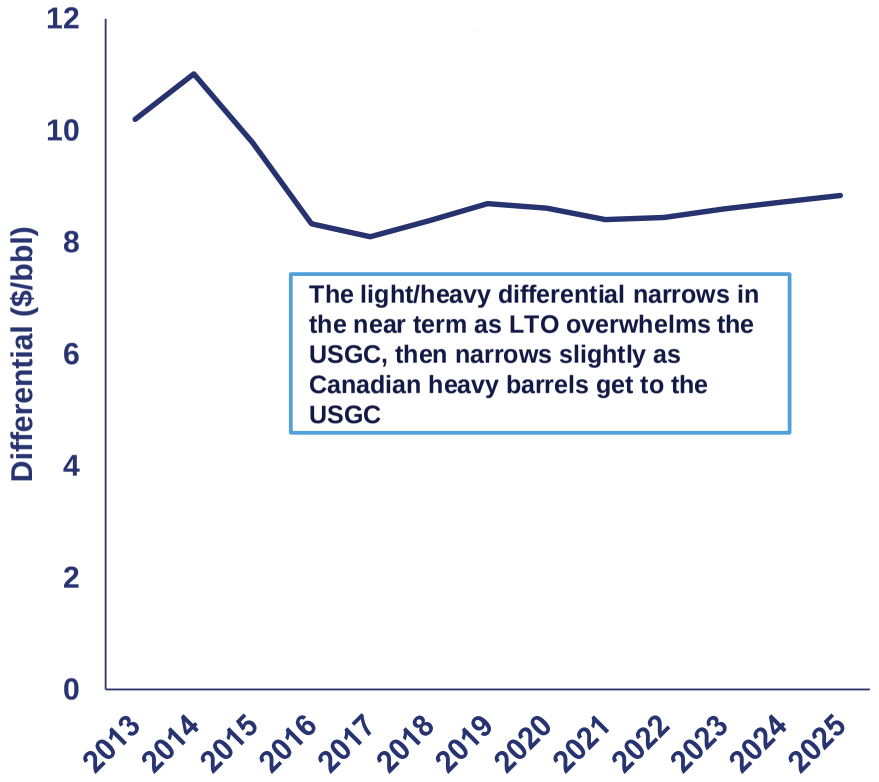


Source: Wood Mackenzie

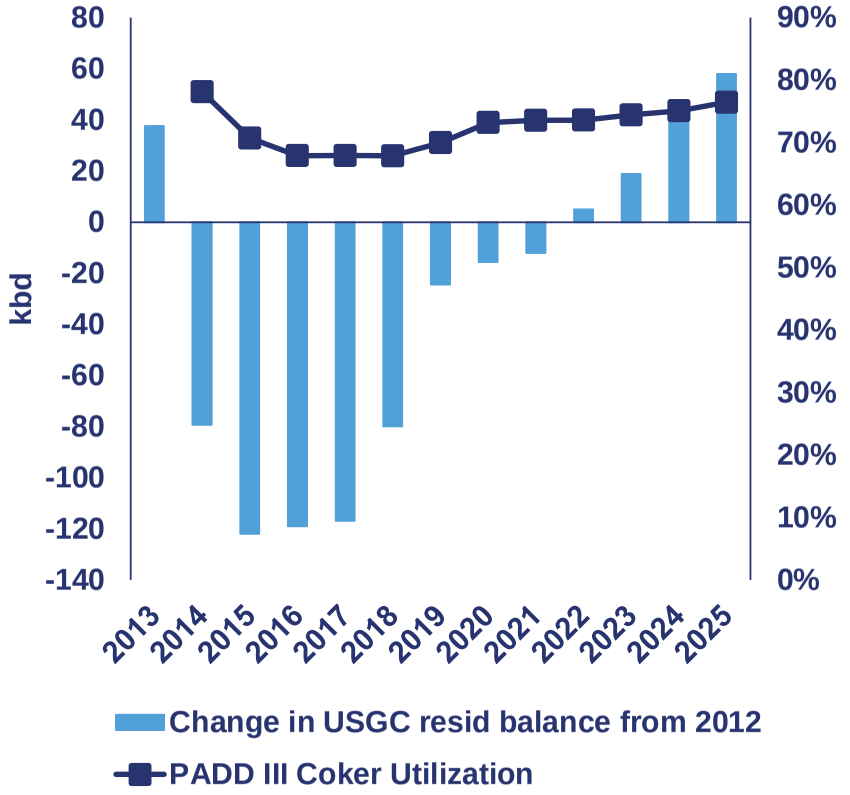
APPENDIX

Heavy crude is expected to remain in short supply with tight oil dominating much of North American supply

LLS – Maya Differential



PADD III Coker Feed Supply Change



Source: Wood Mackenzie

Contacts

Iain McAlpine
Head of Americas Downstream
T +44 (0)131 243 4509
E iain.mcalpine@woodmac.com

Harold “Skip” York, PhD
Principal Analyst - Downstream, Midstream & Chemicals
T +1 713 470 1667
E skip.york@woodmac.com

Erich Linder
Managing Consultant, Downstream
T +1 713 470 1806
E erich.linder@woodmac.com

Jason Pan
Consultant
T +1 713 470 1689
E jason.pan@woodmac.com

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Europe +44 131 243 4400
Americas +1 713 470 1600
Asia Pacific +65 6518 0800

Email contactus@woodmac.com
Website www.woodmac.com

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PUGET SOUND ENERGY Wood Mackenzie

Report to the Board of Directors:

Tacoma LNG Project

PSE PUGET SOUND ENERGY

July 2, 2014

Project Description

PSE is developing an LNG facility to serve as a peaking resource for its core natural gas customers and to provide fuel to marine and on-road transportation markets.

Site: Port of Tacoma at corner of E. 11 St. and Alexander Ave. E.

Project In-service Date: January 1, 2019

LNG liquefaction capability: 250,000 gallons/day

On-site storage: 8 million gallons

Vaporized gas injection capability (into PSE's system)[1]: 66,000 Dth/day

Gas delivery to PSE's system: Northwest Pipeline

Electricity for facility: Procured at Mid-C market prices; wheeled via Tacoma Power's 115 kV system

Total Project Cost: $323 million

Tacoma LNG Facility in Tacoma, Washington

PUGET SOUND ENERGY

[1]To meet peak-day demand of PSE retail gas customers

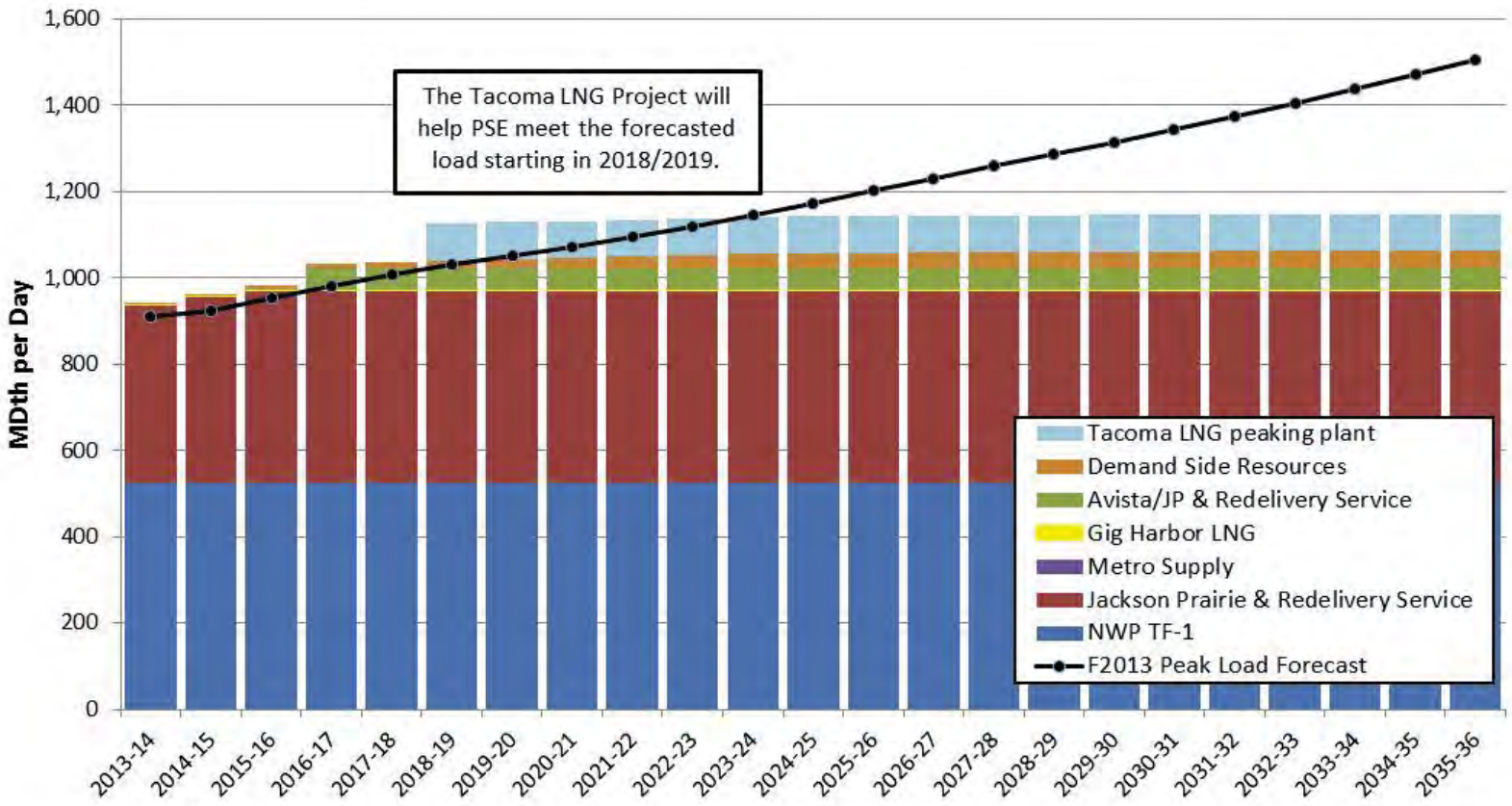
LNG Facility – Comparison to Recent Acquisitions

($ millions)	LSR	Ferndale	LNG
Total Capex	$ 848	$ 88	$ 370
First Full Year Revenue	$ 84	$ 31	$ 102
First Full Year EBITDA	$ 57	$ 12	$ 53
First Full Year Net Income	$ 25	$ 4	$ 17
ROE	9.8%	9.8%	9.8%

Tacoma LNG Project – Key Message and Risks

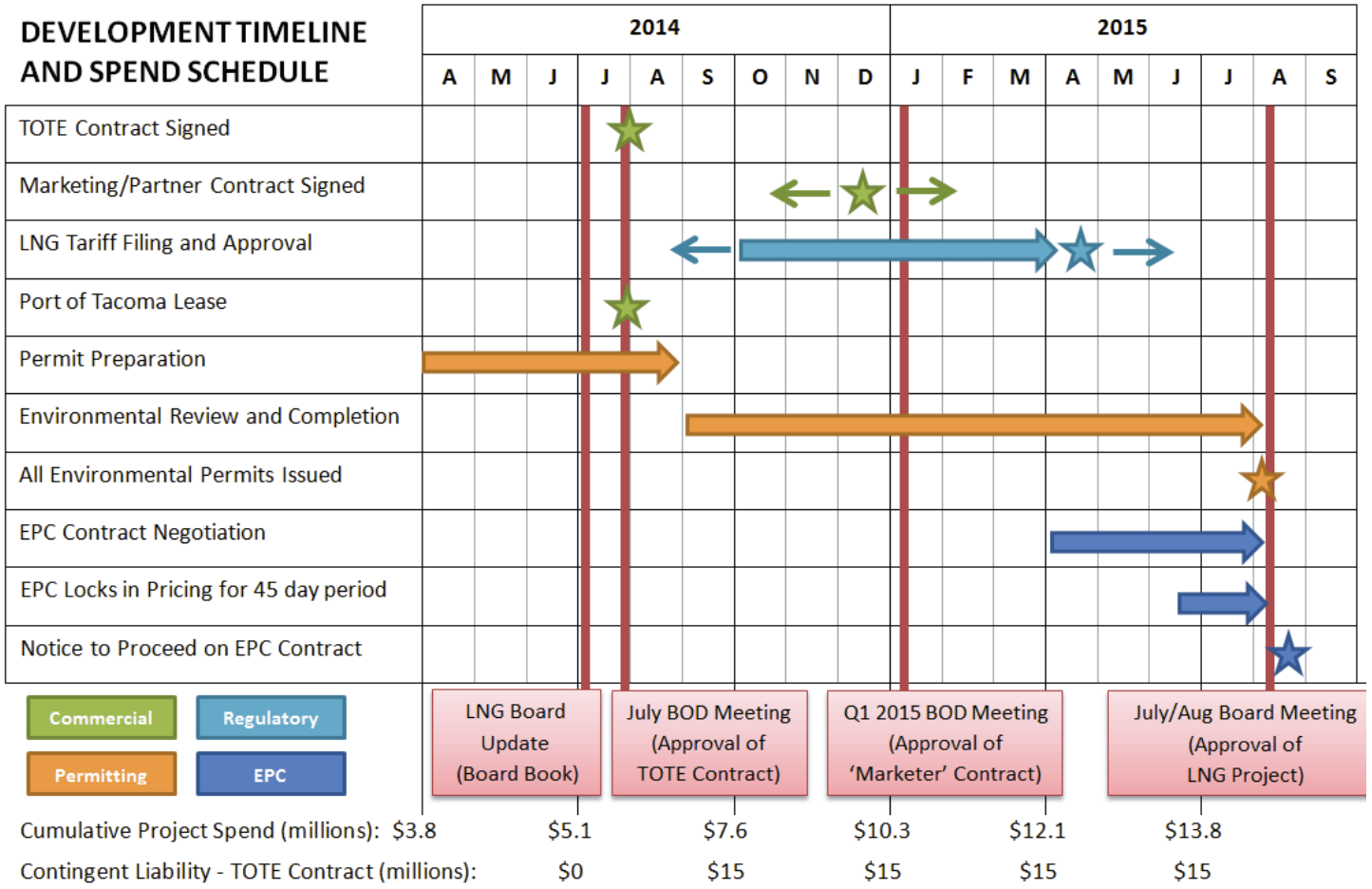
- LNG Project will be fully regulated
- Key Risks (worst-case magnitude; likelihood):
  - Permitting ($30 million; unlikely)
  - TOTE contract ($30 million; unlikely)
  - Regulatory ($55 million; possible)
  - Reputational
- Why regulated?
  - Complimentary uses result in lower cost peaking resource for LNG customers
  - Regulated facility consistent with state policy support for LNG as transportation fuel

PSE Natural Gas Resource Need



PUGET SOUND ENERGY

Development Schedule



July 30, 2014 Board Recommendation

Based on the determination of need, the analysis of alternatives, and the benefits of the proposed transaction, PSE Management recommends that the Board of Directors approve the continued development of the Tacoma LNG Project. Specifically, approval will authorize PSE to:

- ***Enter into a long-term Fuel Supply Agreement*** to sell to Totem Ocean Trailers Express ("TOTE") LNG supplied from the Tacoma LNG Facility.
- ***Enter into an Interim Supply Agreement*** to sell to TOTE LNG procured by the Company from third parties until completion of the Tacoma LNG Facility.
- ***Enter into a long-term lease with the Port of Tacoma*** for the land upon which the Facility will be sited.

Facility Siting

Selected Site

- 33-acre site at the Port of Tacoma.
- Inside PSE's gas system.
- Situated on waterway.
- Located adjacent to TOTE.

Siting Requirements

- **PSE Resource Need:** Capable of supporting PSE peak-day needs.
- **Market Access**: Safe, efficient and dependable supply to LNG fuel customers.
- **Compliance:** Comply with setbacks and exclusion zones as defined in federal codes and national safety standards.

PUGET SOUND ENERGY

Port of Tacoma Lease

Lease terms have been negotiated with the Port of Tacoma for a 33-acre site adjacent to TOTE's facility.

- **Term:** 25 years from date of first commercial operations.
  - 25-year renewal option, unilateral if 45% of capacity is used for marine purposes.
  - **Termination:** Anytime during the 2-year due diligence and permitting phase with notice and $50,000 termination fee; termination fee not applicable, if due to existing environmental contamination.
- **Pricing:** Varies by phase; requires security deposit of $2.9 million (one year's rent).
  - **Due diligence period:** $49,725 per month.[1]
  - **Construction period:** $146,000 per month.
  - **Operating period:** $212,445 per month.
  - **Volumetric charge:** $0.085/barrel for volumes sold; Port reserves right to establish LNG or other tariffs (but will collaborate with PSE and give 10-years' notice).
  - **Escalation:** Lease pricing components escalate annually at CPI.
- **Indemnification:** PSE must indemnify Port, if activities adversely inhibit normal Port operations.
- **Removal of Improvements:** Upon lease termination, Port reserves right to retain or have PSE remove leasehold improvements.

PUGET SOUND ENERGY

[1]*Increases $7,000 each month of extended due diligence (beyond initial 12 month period)*

LNG Fuel Customers

TOTE's Orca-class Midnight Sun

Totem Ocean Trailers Express

- Shipping company fully owned by Saltchuk Resources Inc., a privately held investment group based in Seattle.
- Transports 30% of consumer goods shipped to Alaska.
- Operates two Orca class ships between Port of Tacoma and Anchorage; sailings from Tacoma Wednesdays and Fridays.
- Will consume more than 39 million gallons of LNG annually (approx. 44% of the LNG produced at the Tacoma LNG Facility).
- Fuel supply agreement negotiated; to be executed upon Board approval.

Targeted Marketing Partner

Likely an equity investment or tolling arrangement

- **BP**
- **Shell**

Other LNG Marketers Considered

- **Blu** – Joint venture of Transfuels, an SLC-based alternative fuels company and ENN, a large Chinese utility.
- **Clean Energy** – NG fuel provider.
- **Tenaska** – Independent energy company.
- **Linde –** Cryogenics company.
- **LNG America** – NG fuel provider.

TOTE Fuel Supply Agreement

- **Guaranteed Completion** with penalties after January 1, 2019; plant must be in place by January 1, 2021.
- **Capped Maximum Price** on plant and fixed O&M charges.
- **First Option Right** with similar terms and pricing for TOTE and affiliates.
- **Deficiency Payments,** if TOTE fails to purchase at least 95% of contract volumes.
- **Conditions precedent:**
  - All permits and regulatory approvals received.
  - WUTC approval.
  - Board approval to execute the EPC contract.
  - Binding site lease with Port of Tacoma.
- **Interim supply agreement** will contain damages if the plant is late or PSE cancels the project (estimated ~ $15 million if PSE cancels the project).
- **Damages:**
  - No damages on failure to deliver due to Force Majeure.
  - Limited damages on non-Force Majeure event: TOTE is asking for up to $10 million in any contract year (low probability event).
  - No limit to damages on willful failure to deliver.
  - Damage to TOTE's property if PSE provides off-spec LNG - TOTE asking for up to $15 million in any contract year (low probability event; will be insurable).

Interim Supply for TOTE

Risk Management: Interim Supply Contract risks will be passed through to counterparties.

Current Proposed Supply Chain

Alternate Plans

- LNG could be moved by trucks to temporary storage for TOTE.
- Storage could be onshore tanks, or an LNG barge.
- LNG could be trucked from:
  - Vancouver, BC (Fortis BC)
  - Plymouth, WA (Northwest Pipeline)
  - Reno, NV (Colony – *Proposed*)

Marketing Partners

PSE is working towards a joint ownership or long-term tolling agreement with Shell or BP for the remain liquefaction capacity:

- Strong balance sheets
- Existing marketing presence for transportation fuels
- Natural gas resources
- Strong strategic partners

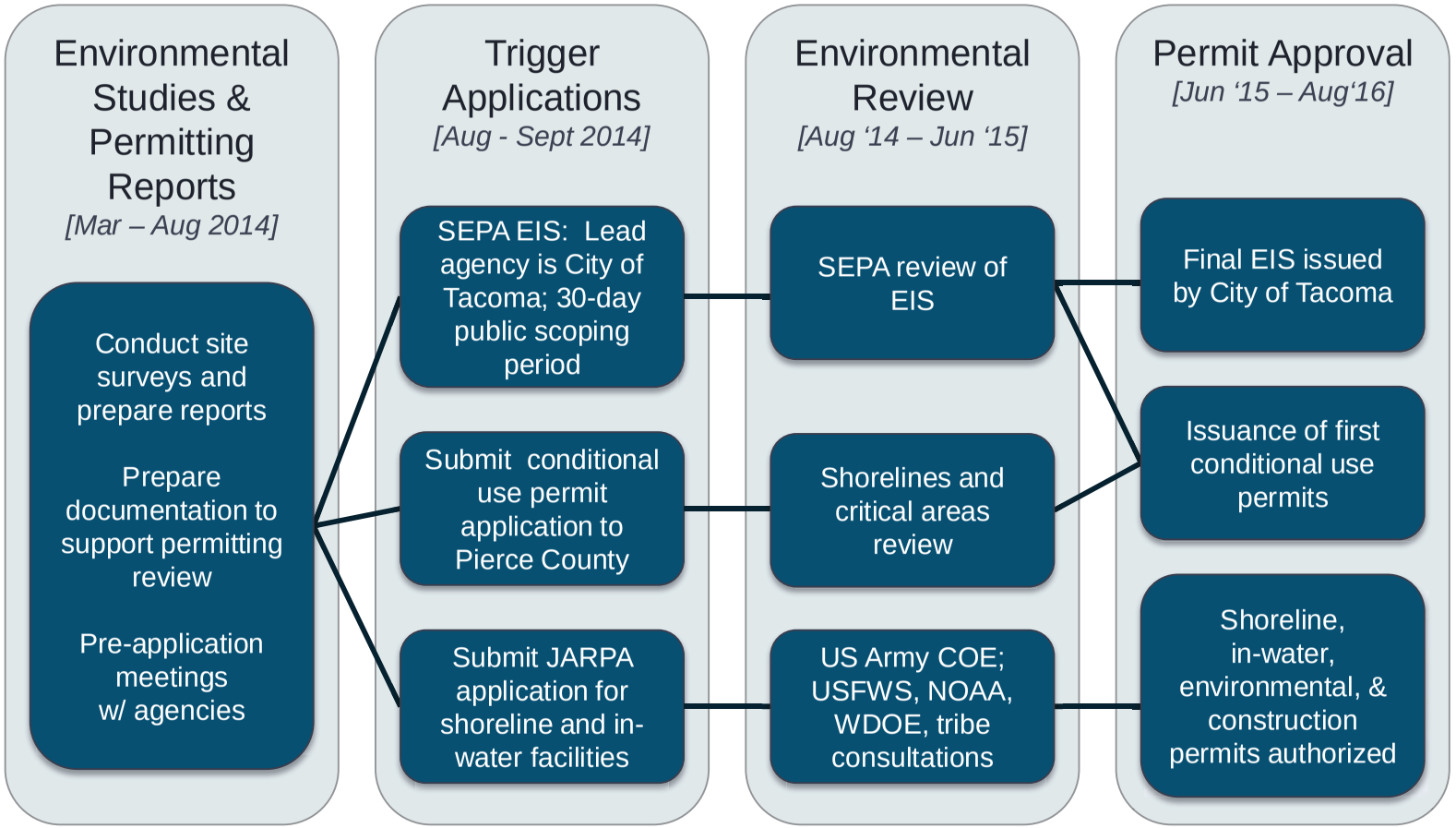
BP:

- PSE has shared indicative pricing and BP is interested in participating in the project.
- BP has expressed a desire to take an equity position.
- BP may require part of the TOTE capacity and contract to participate.

Shell:

- Currently working to develop a separate LNG facility at the Port of Tacoma.
- Current maritime fuel supplier in Port of Tacoma and strategically focused on LNG as transportation fuel.
- Minority ownership stake may run counter to corporate culture.

Permitting Timeline



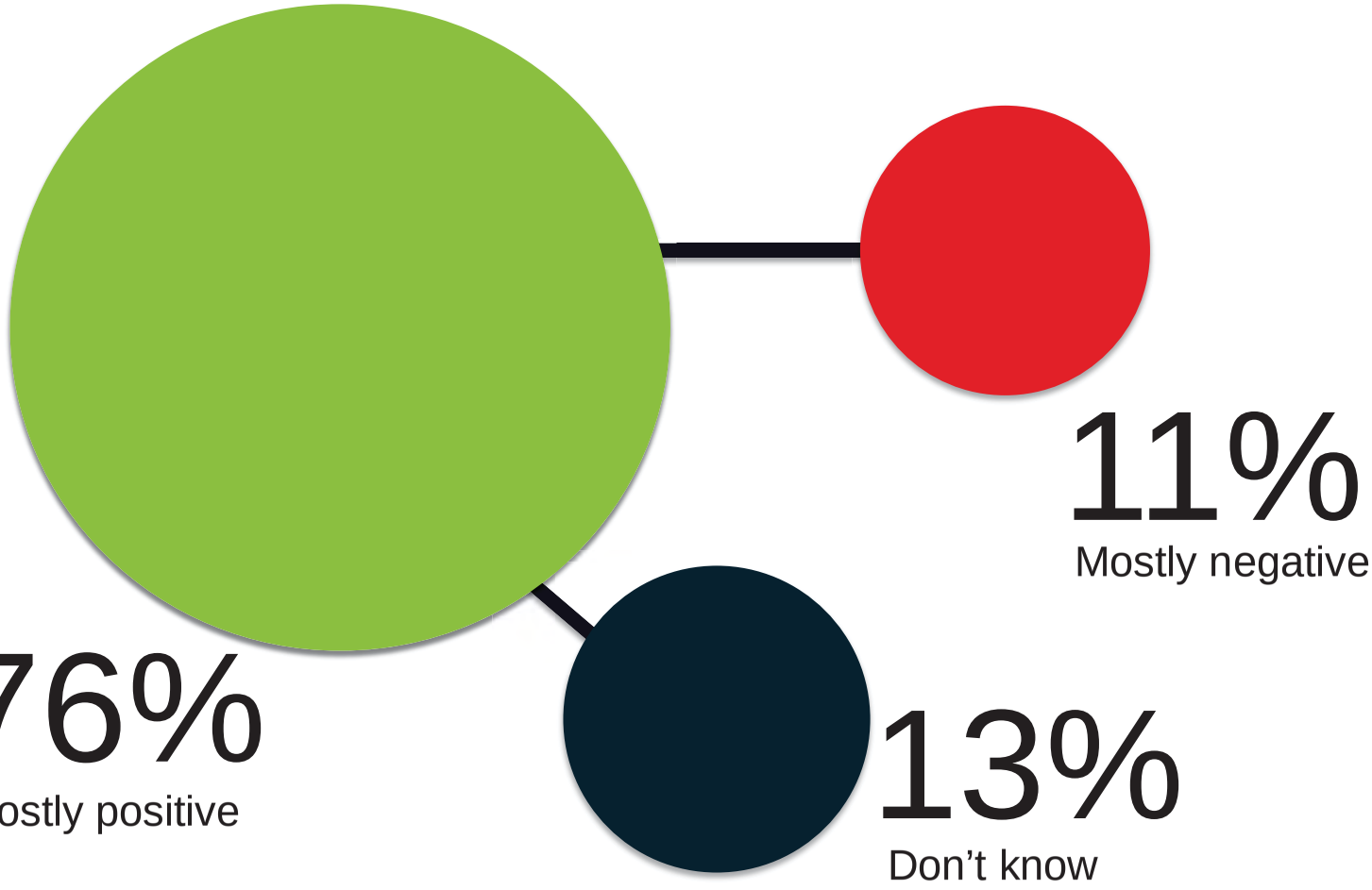
Outreach Strategy

Primary Objective: Enable the siting and permitting of the LNG Facility.

Secondary Objective: Develop strong key constituency support for the LNG Project.

- **Local Outreach –** Includes local public officials, business and community organizations, Port of Tacoma and neighborhood stakeholders.
- **State Outreach –** Includes Governor's office, key Senate and House members/staff and State Agencies.
- **Federal Outreach –** Includes Senators Murray and Cantwell, Congressmen Smith, Heck, Kilmer and Larsen, and Federal Agencies.

Reaction to LNG development



Communications Strategy

Key Messages

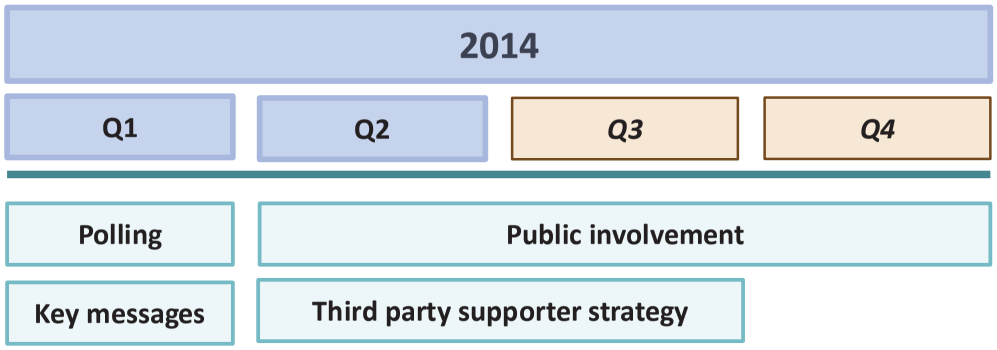
- Greater reliability for Tacoma/Pierce NG customers
- Local jobs and economic opportunity
- Environmental benefits (local air quality, marine and global)
- Safe, proven use of a domestically-sourced fuel

Key Risks

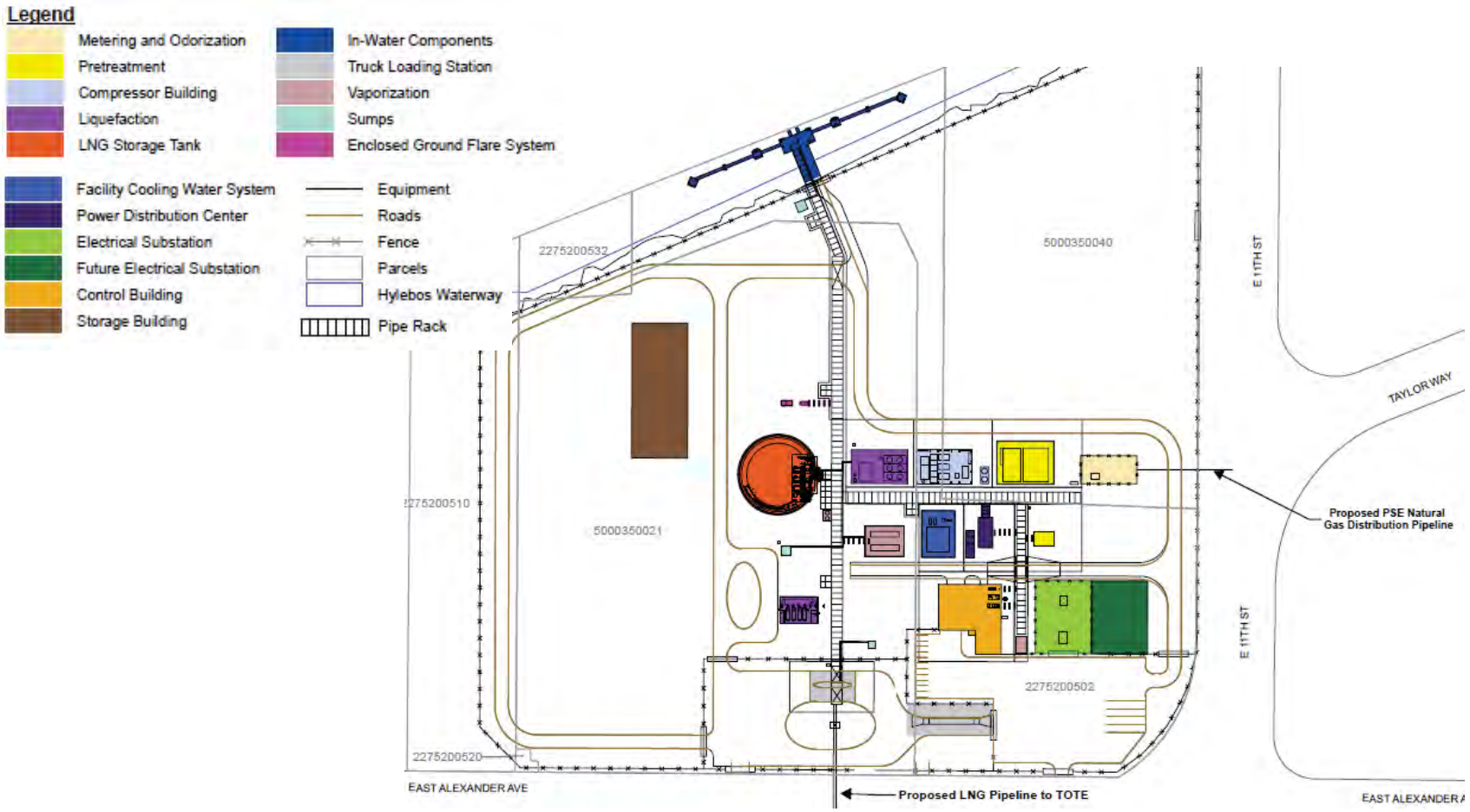
- Neighborhood group opposition (safety)
- Confusion with other Port NG projects (exports)
- Special interest group intervention (fracking)

Mitigation

- Process modeled after Thurston County effort
- Emphasis on local benefits (system reliability, economy, environment)
- Careful differentiation from other proposed facilities
- Communications focus on messaging, large audiences



Proposed Layout



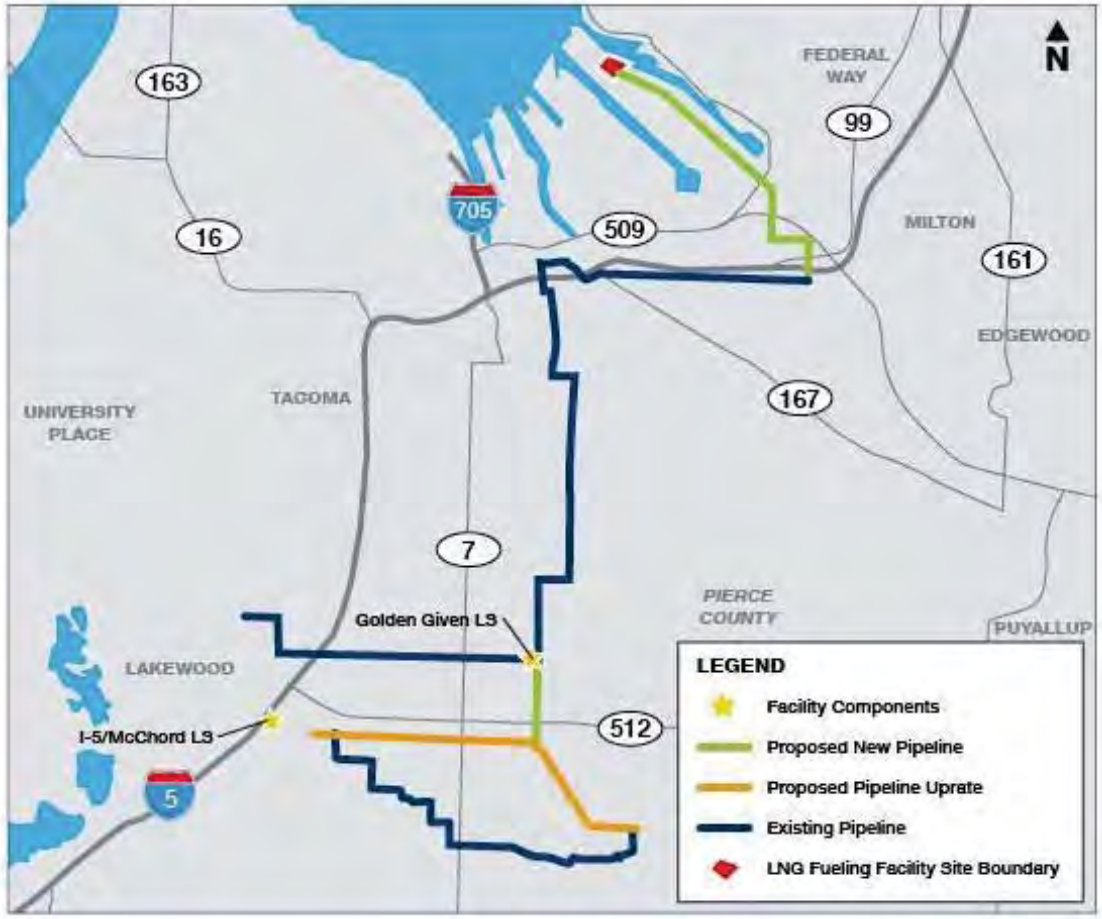
EPC Contract

EPC contractor takes most of the construction risk

- **Chicago Bridge & Iron** proposed contract format as part of FEED study deliverables in fall 2013.
  - **Pricing:** Firm, fixed-price, lump sum includes all engineering, materials, construction, overhead, contingency, and markup, subject to exclusions.[1]
  - **Payment:** According to an agreed-upon milestone schedule based upon actual work completion.
  - **Performance guarantees and penalties:** For completion delay, liquefaction, vaporization, utilities consumption, power factor, LNG tank volume, truck loading rate and marine loading rate.
  - **Warranty:** 12 months.
  - PSE to provide utilities, consumables, feed stock and plant personnel at specified times.
- PSE to engage **Black & Veatch** for an independent FEED study and competing contract proposal.

[1] *See Exhibit L of the Report to the* Board of Directors: Tacoma LNG Project *for specific exclusions*

Gas Distribution System Upgrades



Regulatory Strategy

Phase 1: Commences in 2014

WUTC Approval of LNG Fuel Supply Service Tariff Schedule and Agreements.

PSE will demonstrate:

1. Rates recover all costs to provide LNG fuel supply service and contribute to other Facility fixed costs.
2. Need for and nature of the Facility.
3. Satisfactory commercial terms and conditions of LNG fuel supply service.
4. Agreements do not impose unreasonable preference for/rate discrimination to the counterparties.

Phase 2: General Rate Case in Q3/Q4 2018[1]

WUTC Prudence Determination and Rate Recovery of the Tacoma LNG Facility.

PSE will demonstrate:

1. Need for the Facility.
2. Facility is cost-effective.
3. Alternatives considered and analysis conducted.
4. Contemporaneous information used by the Board to make acquisition decision.
5. Contemporaneous records kept by PSE.

[1]PSE may also file an accounting petition with the WUTC to request a cost deferral mechanism for fixed and variable costs of the Tacoma LNG Facility, if the Facility is placed in service in advance of the effective date for rates.

Regulatory Timing

PSE is weighing the benefits and risks of filing the LNG Tariff:

- After Board Approval (Aug 2014); or
- When contracting with the marketing partner (as late as Feb 2015)

Filing Trigger:	July Board Approval	Marketing Partner Onboard
Filing Elements:	• TOTE Contract • Pro Forma Tolling Agreement • Peaking Prudence • Distribution Upgrades	• TOTE Contract • Equity Investor or Tolling Agreement • Peaking Prudence • Distribution Upgrades
Benefits:	Regulatory risk is reduced earlier in the development process.	Commission is more likely to react favorably to having contracts to support full plant capacity (non-peaking portion).
Risks:	Staff capacity limited in 2014. Lower chance of approval without contracts to support full plant capacity.	Tariff approval may not come until late in Q2 2015.

Project Budget

Development Budget		
PSE Labor and OH	$	2,193
Engineering and Analysis	$	4,474
Permitting & Legal Support	$	3,339
Communications/Outreach	$	391
Distribution Upgrades	$	1,126
Commercial and Regulatory[1]	$	1,100
Real Estate and Lease	$	766
Contingency	$	442
Project Development Sub-Total	**$**	**13,831**

[1]Commerical and Regulatory expenses are not capitalized

Budget assumes NO equity investment by marketing partner.

PROJECT BUDGET		
O&M Total	**$**	**1,700**
Development Budget (Capital)	$	11,605
PSE Labor and OH	$	5,800
Engineering & Legal	$	1,400
Real Estate and Lease	$	6,132
Geotechnical and Demolition	$	13,000
In Water Work	$	4,000
EPC Scope	$	181,792
Miscellaneous	$	6,900
Contingency	$	22,650
PSE Construction OH	$	7,830
Sales Tax	$	12,960
Tacoma LNG Facility Sub-Total	$	274,069
Gas Distribution Upgrades	$	49,041
Project Capital Total	**$**	**323,110**
AFUDC	$	46,841
GROSS PLANT	**$**	**369,951**

PUGET SOUND ENERGY

Financial Summary

Puget Sound Energy
2014 Financial Plan Update for July 2nd, 2014 Board of Directors Meeting
Liquefied Natural Gas Project (LNG)

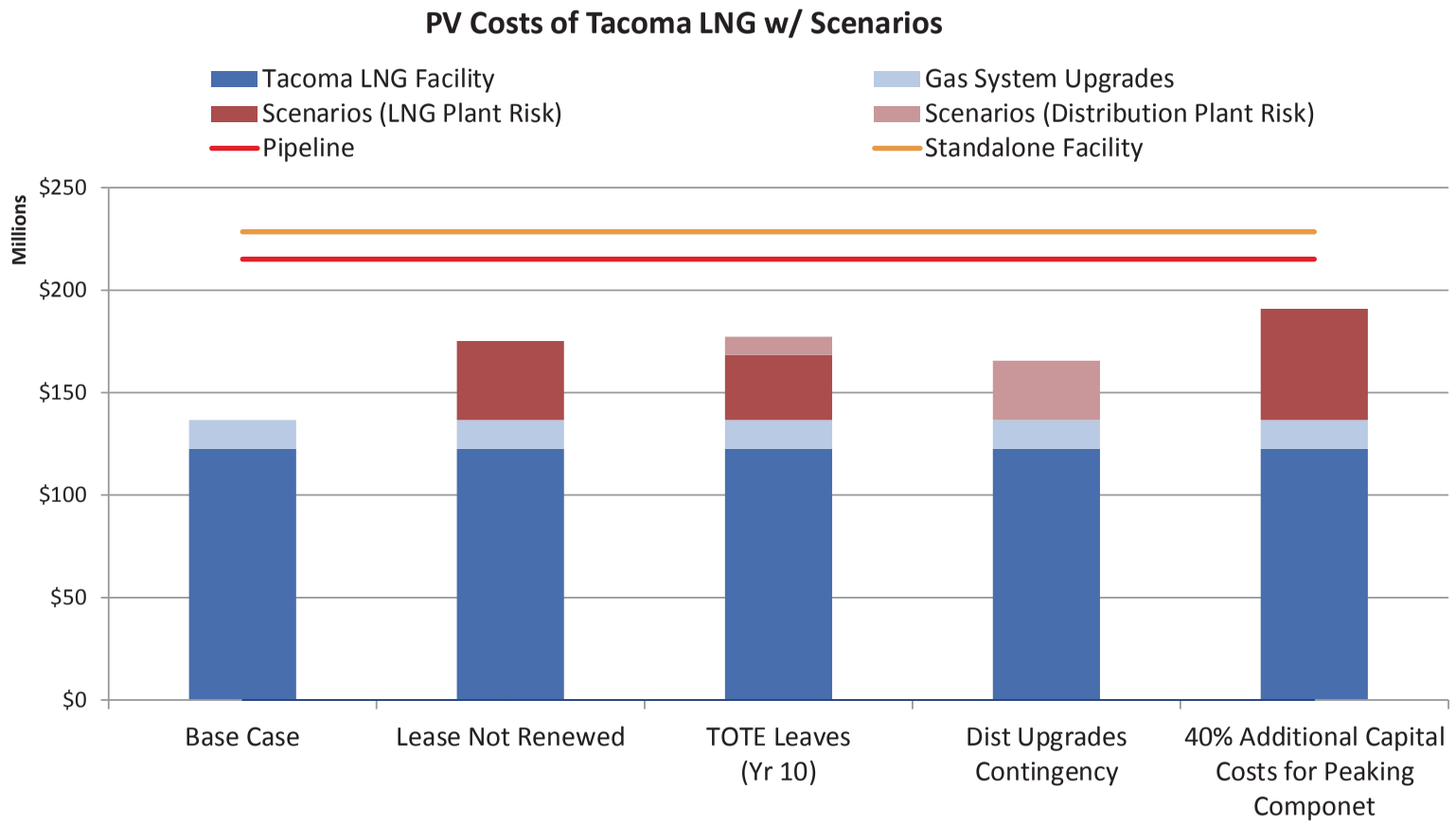
Line	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	
1	$ in millions	2013	2014	2015	2016	2017	2018	2019	2020-2023	2024-2028	2029-2033	2013-2033
2	Capital Expenditures	$2	$6	$31	$90	$140	$53	$0	$0	$0	$0	$322
3	AFUDC	0	1	2	7	16	21	-	-	-	-	47
4	**Total Capex (including AFUDC)**	**$2**	**$7**	**$33**	**$97**	**$157**	**$74**	**$0**	**$0**	**$0**	**$0**	**$369**
5												
6	Income Statement Impacts											
7	Revenue	$0	$0	$0	$0	$0	$0	$68	$408	$503	$499	$1,477
8	Operating Expenses	0	-1	0	0	0	-1	-49	-212	-296	-336	-896
9	**EBITDA**	**$0**	**($1)**	**$0**	**$0**	**$0**	**($1)**	**$19**	**$196**	**$207**	**$162**	**$582**
10	AFUDC	0	1	2	7	16	21	-	-	-	-	47
11	Interest Expense	0	0	-1	-2	-5	-6	-11	-40	-38	-25	-129
12	Depreciation & Amortization	-	-	-	-	-	-1	-15	-62	-78	-78	-235
13	Taxes	0	0	0	1	2	0	-9	-33	-32	-21	-91
14	**Net Income**	**$0**	**$0**	**$1**	**$5**	**$13**	**$13**	**($17)**	**$61**	**$59**	**$38**	**$174**

Assumption Owners: Garratt, Riding, Wiegand

[1]Assumes no equity investment by marketing partner. Also note that 2012 capital costs have been omitted from the 5-year plan resulting in a small discrepancy from the project budget.

[2]The 5-year plan does not assume a GRC between now and 2019 so revenues attributed to PSE peaking resource are not shown, resulting in a negative net income in 2019. The project pro forma in Exhibit O of the report assumes perfect ratemaking.

Comparison of Resource Alternatives



Assumes no equity investment by marketing partner.

Key Risks and Mitigations

Risk	What	Probability	Magnitude	Mitigation Plan
Permitting	Permits are appealed; delays ensue	Low	High	Preparing an EIS that incorporates baseline information from the existing Port of Tacoma EIS. Work closely with permitting agencies to mitigate environmental challenges. Talk early and often to stakeholders.
Regulatory	WUTC could deny regulated rate-base treatment	Medium	High	Working with WUTC commissioners, staff and Governor's office to demonstrate cost effective supply for PSE customers and espouse clean energy and economic regional benefits.
Reputational	LNG facilities attract NIMBYs and environmental activists	Medium	Low	Develop public outreach programs, engage stakeholders, and build network of supporting community organizations. PSE builds and operates many NIMBY-attracting facilities.
Financial	Customer credit	Low	Medium	Saltchuk parental guaranty to support TOTE supply agreement. Will require marketing partner to provide appropriate credit consistent with ultimate deal structure.
	Merchant Risk	Low	High	PSE will need to show merchant risk is managed and overall arrangement is prudent to put plant in ratebase. Strong marketing partner who invests equity in plant can mitigate merchant, credit, and regulatory risk.
	Project costs	Medium	Low	Contract pricing will be established with EPC guaranteed pricing.
	Fuel oil price trigger	Low	Low	Termination fees will recover much of TOTE's allocated plant cost in the first five years.

Tacoma LNG Project Benefits

A cost-effective way to meet the capacity needs of PSE's retail gas customers

- Least cost peak-day supply resource option to meet demonstrated capacity needs of PSE gas customers.
- Improves gas system reliability.
- Diversifies peak-day resources for PSE customers (on-system resource) and eliminates the need for long-haul interstate pipeline capacity.
- Supports WA's statutory goals to reduce carbon emissions from the state's transportation sector.
- Supports economic development at the Port of Tacoma.
- Supplies LNG fuel to region, which when compared to petroleum-based fuels:
  - Reduces harmful emissions that effect local air quality.
  - Emits less carbon dioxide.
  - Costs less, allowing operators to invest in conversion and new builds.
  - Complies with new maritime regulations.
  - Complies with California's Low Carbon Fuel Standard.

July 30, 2014 Board Recommendation

Based on the determination of need, the analysis of alternatives, and the benefits of the proposed transaction, PSE Management recommends that the Board of Directors approve the continued development of the Tacoma LNG Project. Specifically, approval will authorize PSE to:

- ***Enter into a long-term Fuel Supply Agreement*** to sell to Totem Ocean Trailers Express ("TOTE") LNG supplied from the Tacoma LNG Facility.
- ***Enter into an Interim Supply Agreement*** to sell to TOTE LNG procured by the Company from third parties until completion of the Tacoma LNG Facility.
- ***Enter into a long-term lease with the Port of Tacoma*** for the land upon which the Facility will be sited.

Future Board Decisions

Decision	When
PSE Management will recommend approval of the TOTE Fuel Supply Agreement, Interim Supply Agreement and enter into a long-term lease with the Port of Tacoma.	July 30, 2014
Execution of Joint Ownership Agreement or Tolling Agreement with Marketing Partner	Upon completion of a marketing or co-ownership agreement with a third-party fuel marketer
Final project approval; execute all project construction agreements including requisite engineering, procurement and construction ("EPC") agreement with the lead contractor; and issue Notice to Proceed	Upon receipt of a final non-appealable EIS, Section 10/404 Permits, Shoreline and Pierce County CUP;[1] execution-ready construction contracts and all required real-estate rights.

[1]Permits yet to be obtained, such as a Building Permit, will require final design.

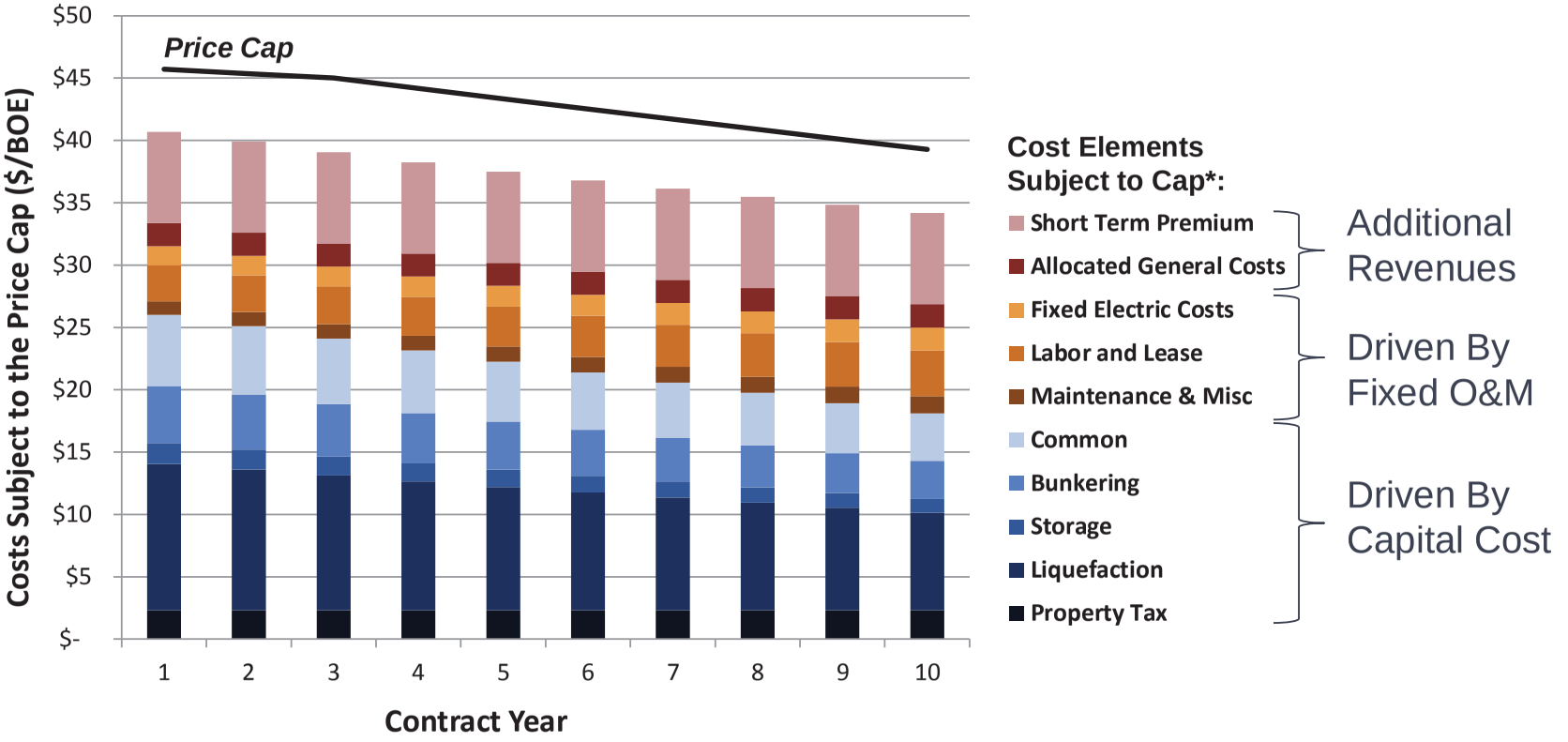
Next Steps

- **Commercial**: Ensure that the LNG facility is fully contracted by PSE customers, TOTE and a third-party marketer (i.e., BP, Shell, or others).
- **Permitting**: Submit permit applications and continue to educate and work with permitting agencies (City of Tacoma as lead agency).
- **Regulatory**: Demonstrate full prudency for LNG facility by validating resource need and regional resource benefits (e.g., economic, environmental).
- **Community Outreach**: Engage community and political leaders to garner support for the LNG project by emphasizing project benefits to customers and the region.
- **Engineering and Construction:** Black & Veatch FEED study and finalize site infrastructure designs.

Appendix

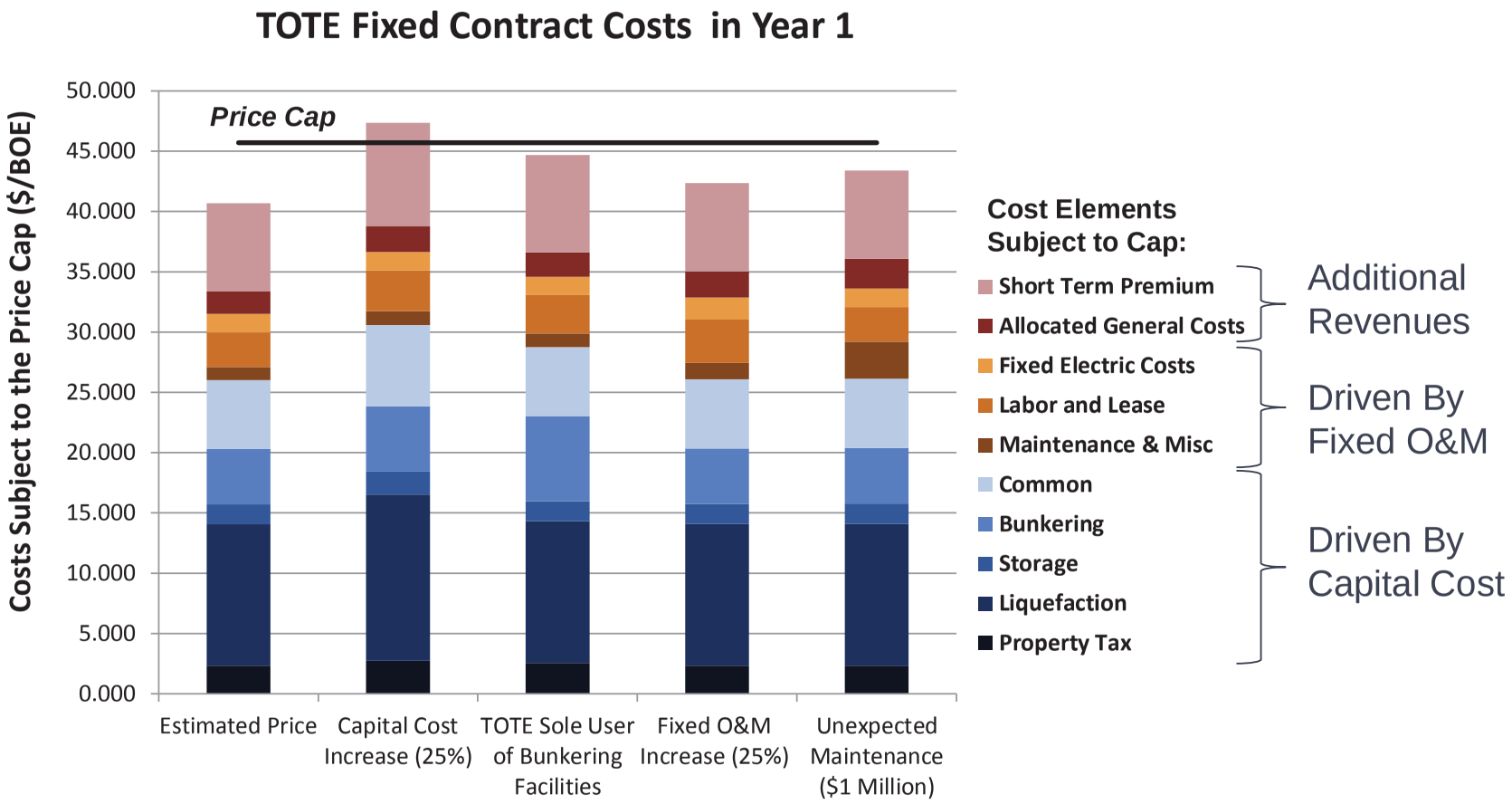
- TOTE contract price cap for capital and fixed O&M
- Potential marketing partner agreement forms
- Permitting and approvals
- Contractual relationships charts: development, and design and construction
- PSE's Operations organization
- Additional quantitative analysis
- Additional financial details
- Market drivers
- Summary of Wood-Mackenzie report on the price spread between gas and oil
- Examples of public outreach communications materials

TOTE Price Cap



* **Capital and Fixed O&M** are subject to a price cap.
Costs related to gas commodity and transport, electric commodity, and port volumetric charges are NOT subject to a cap and are passed through at costs.

TOTE Price Cap Scenarios



LNG Marketing Partner Agreement

Potential marketing partner agreement forms:

- **Joint Ownership Agreement:**
  - Structured as tenancy-in-common; owners own an undivided but specified % of plant.
  - Defines owner roles and responsibilities (e.g., PSE develops ,constructs and operates plant; counterparty invests equity, assumes pro rata share of development and operating costs).
  - Defines allocation of output, and payments for future capital infusions and ongoing O&M.
- **Tolling Agreement:**
  - Generally the same as Fuel Supply Agreement, but customer delivers natural gas to PSE's distribution system.
  - Customer required to make its gas available to PSE during peak periods.[2]
- **Fuel Supply Agreement:**
  - PSE procures and transports natural gas to Facility; sells LNG to customer.
  - Pricing based on standard cost-of-service principles, with capital costs generally recovered during initial primary term (PSE seeking minimum of 10 years).[1]
  - Customers pay demand charges for fixed-price components (capital recovery and fixed O&M), and volumetrically for natural gas costs (Sumas), electricity (Mid-C) and consumables.

[1]Any contract less than 25 years (the initial lease term with Port of Tacoma) will include a short-term contract premium.
[2]Facility will have adequate on-site storage to serve the tolling customer's needs during such peak periods.

Permitting and Approvals

Federal

- **U.S. Dept. of Transportation:** Consult with WUTC on Federal Safety Standards governing design, installation, etc.
- **U.S. Dept. of the Army Corps of Engineers:** Conduct NEPA review in support of Rivers and Harbors Act Section 10 Permit, Clean Water Act 404 Permit, Section 106 consultation with DAHP and applicable tribes.
- **U.S. Fish & Wildlife Service:** Section 7 Endangered Species Act Consultation.
- **National Marine Fisheries Service :** Sec 7 ESA Consultation; Magnuson-Stevenson Management and Conservation Act review re: Essential Fish Habitat and Marine Mammal Protection Act re: underwater noise and incidental harassment.
- **U.S. Coast Guard:** Issues Letter of Recommendation and develops OPLAN for sea ports, waterway suitability analysis, grants permission to establish *Aids to Navigation.*

Local

- **City of Tacoma:** As SEPA lead agency conducts environmental review in support of local and state permits including Shoreline Substantial Development, Critical Areas, Clearing and Demolition, Building Permit, Street/Right-of–Way Use.
- **Pierce County:** Reviews and issues permits for Street Use/Right-of-Way Use, Conditional Use for the Limit Station, Clear and grade, Building Permit, and Critical Areas.
- **City of Fife:** Reviews and issues permits for Right-of-Way/Utility, Flood Ways, and Critical Areas review.

State

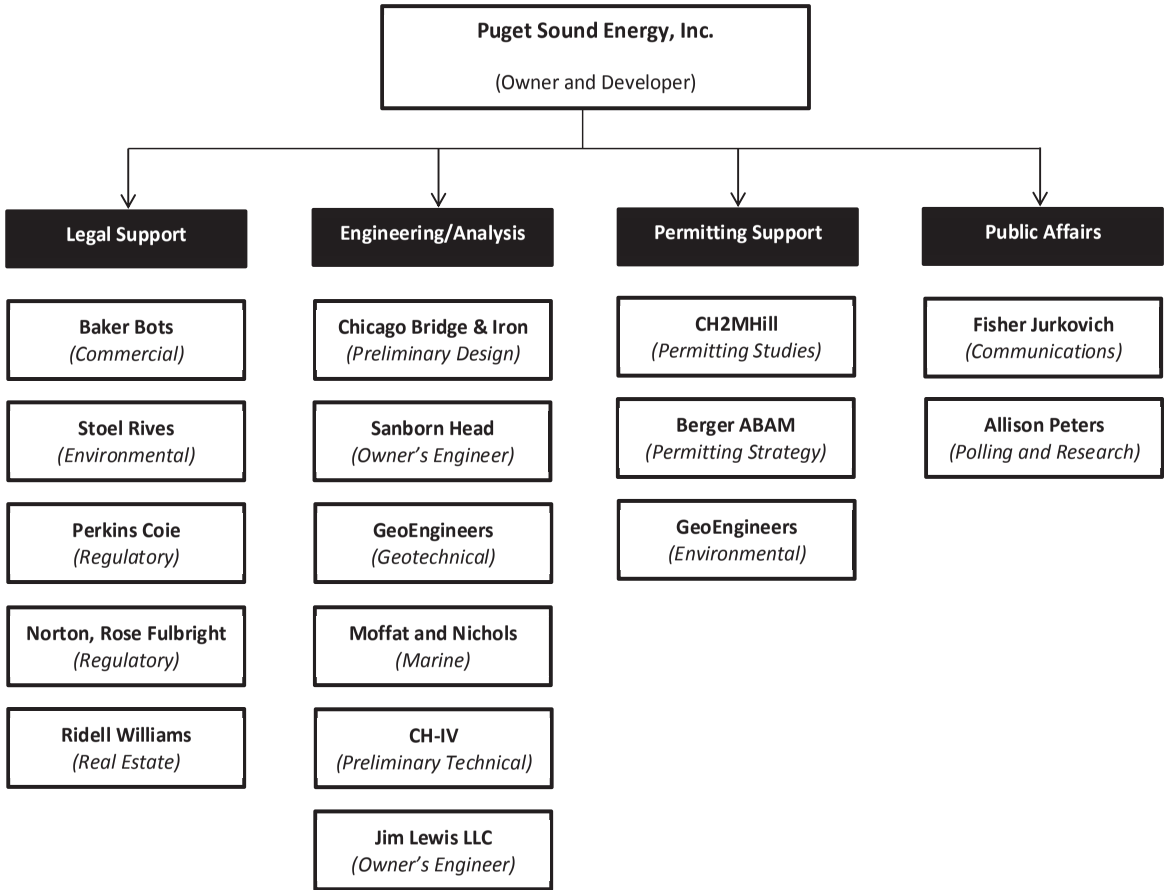
- **Department of Ecology**: Reviews and issues NPDES permits for Stormwater and Waste Discharge, Coastal Zone Consistency Determination, Water Quality Certification, Hazardous Chemical Inventory reporting requirements.
- **Utilities and Transportation Commission Office of Pipeline Safety:** Compliance with federal pipeline safety and LNG siting and development regulations.
- **Department of Fish and Wildlife:** Hydraulic Project Approval.
- **Department of Transportation:** State Highway Crossing Permit (right-of-way).
- **Department of Archaeology and Historic Preservation:** Corps of Engineers will consult with tribes under Section 106 of the National Historic Preservation Act and may issue an Archaeological Excavation Permit if required.

Other entities

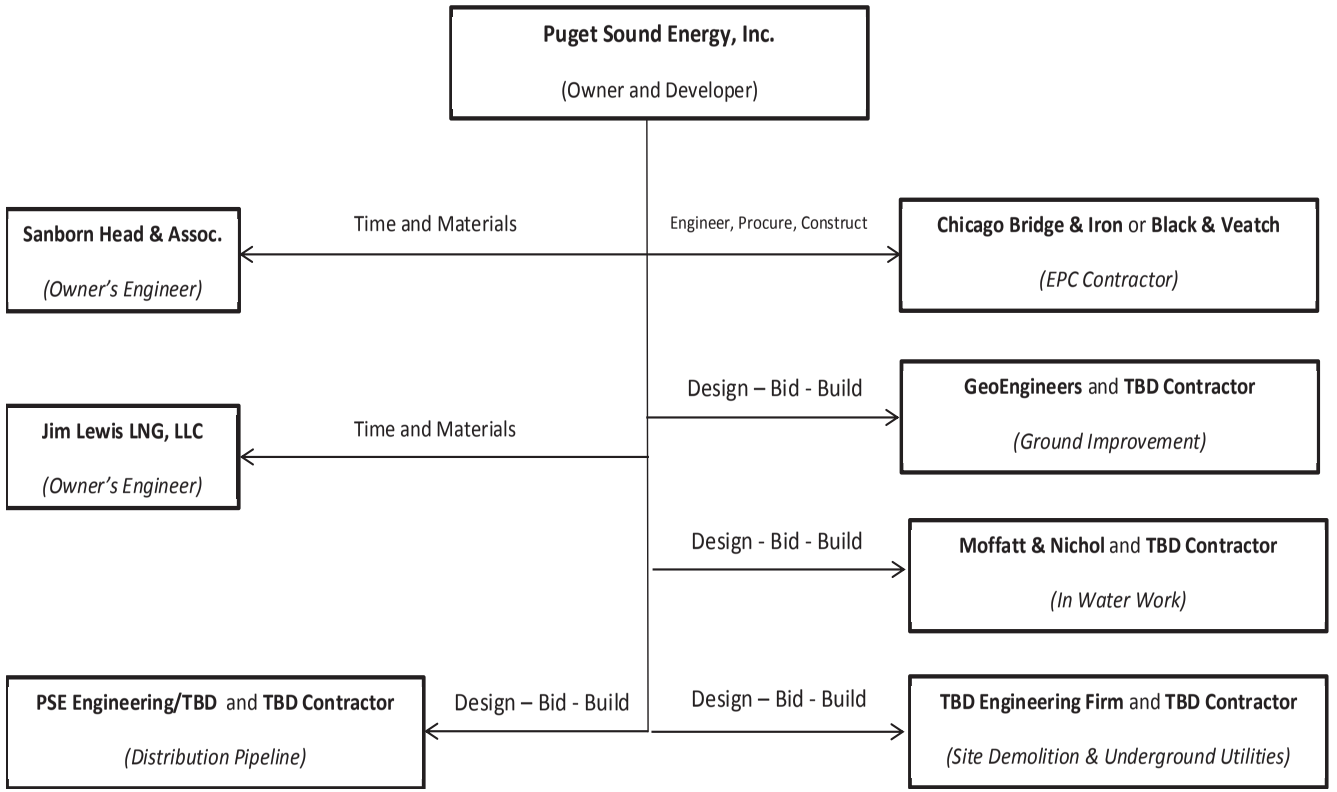
- **Port of Tacoma:** Tenant Improvement Procedure for site.
- **Puyallup Tribe:** Informal coordination; no action required.

For a more detailed list of required permits and approvals and a discussion of PSE's permitting plan, refer to the confidential attorney-client privileged memo from Steve Secrist to the Board of Directors, dated July 2, 2014.

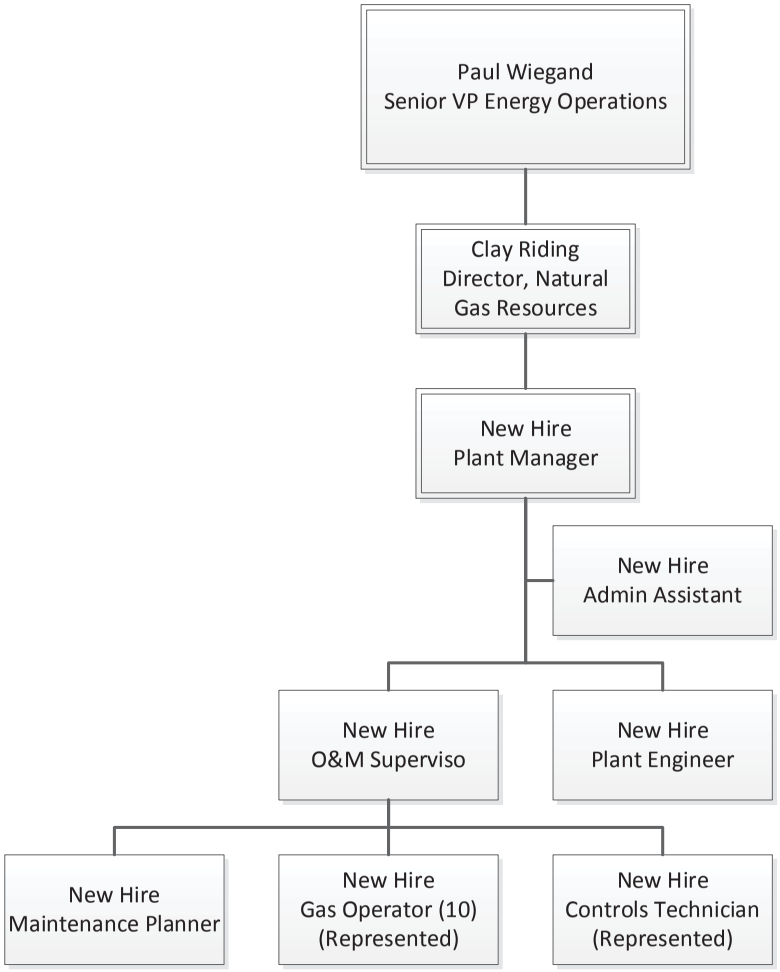
Development Contractual Relationships



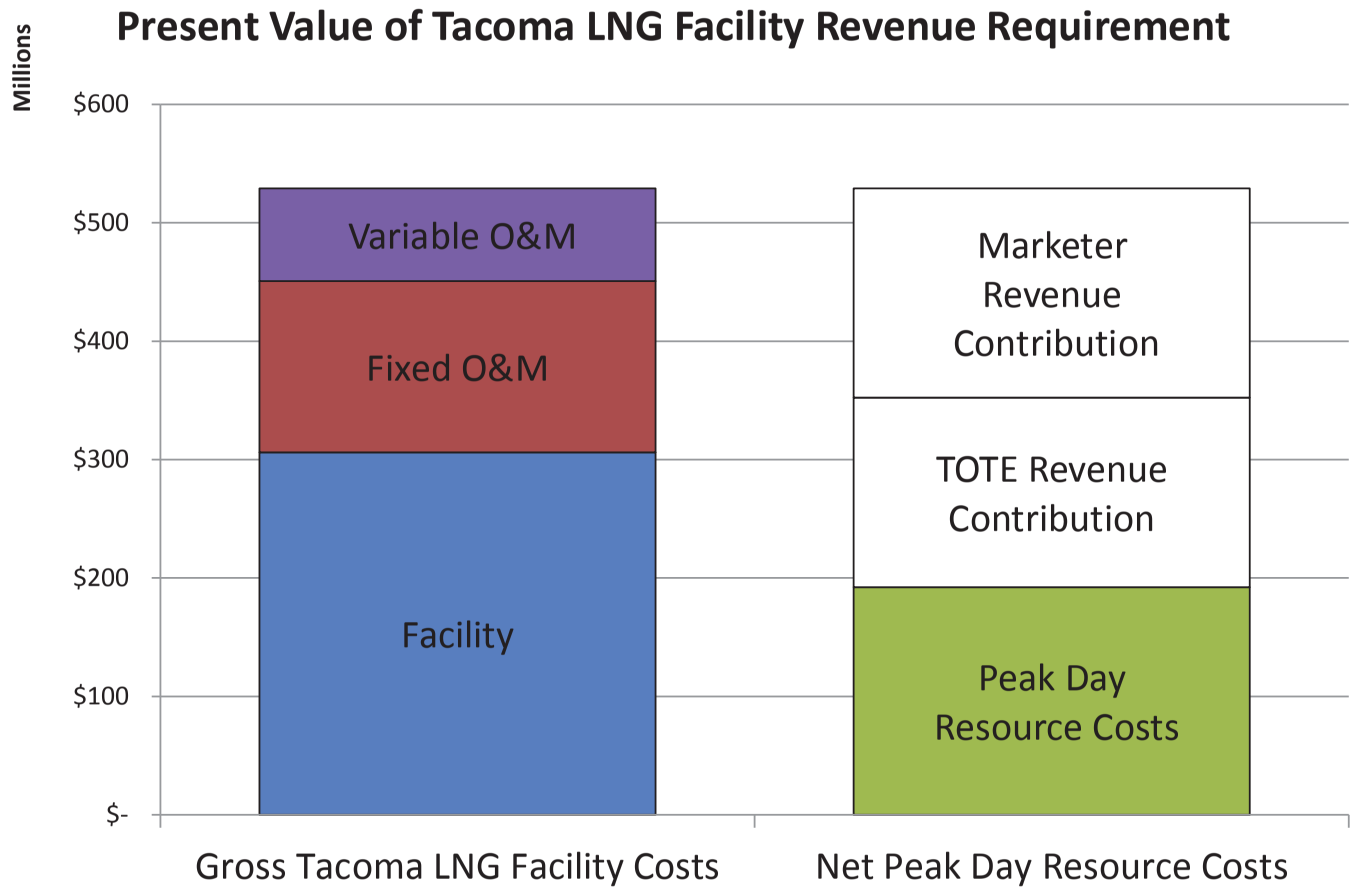
Design and Construction Relationships



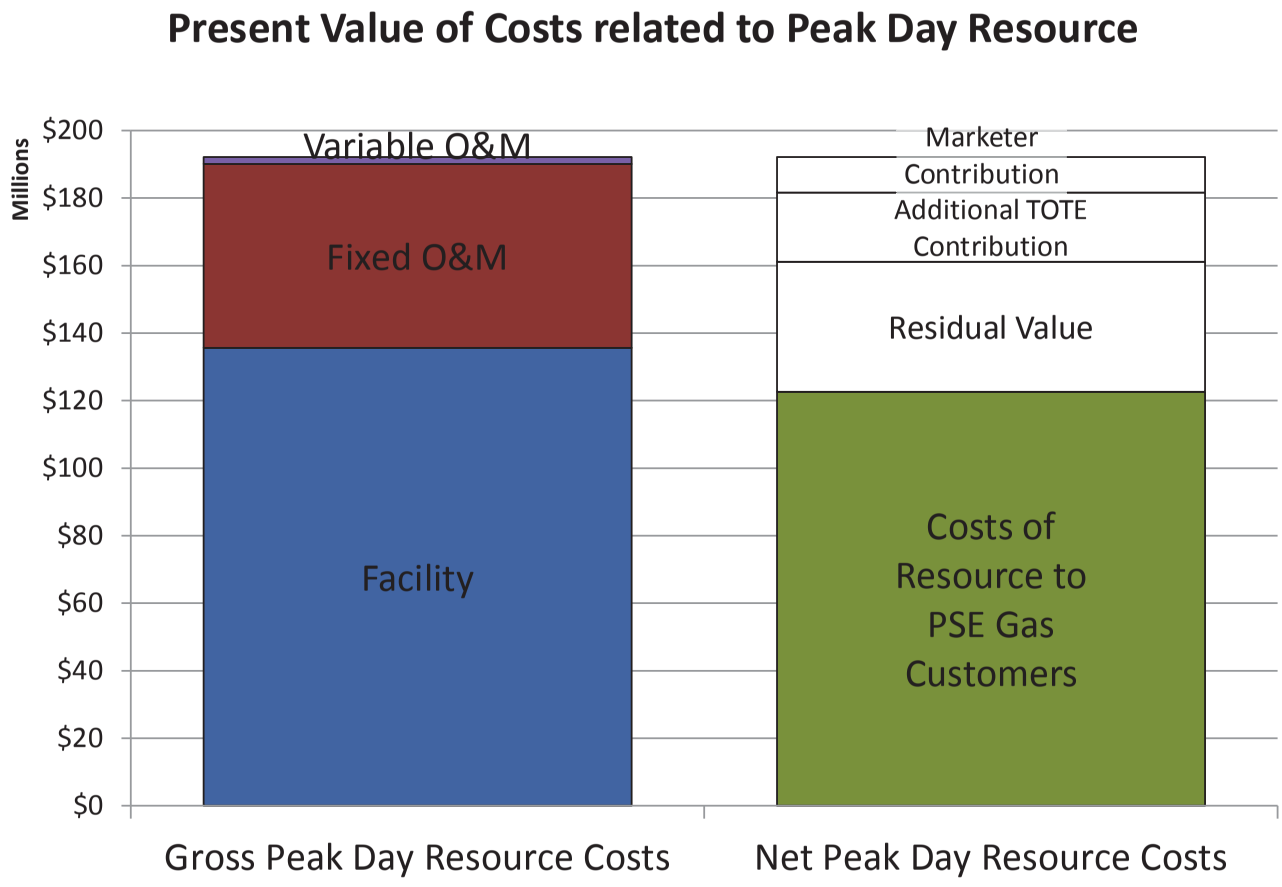
PSE Operations Organization Diagram



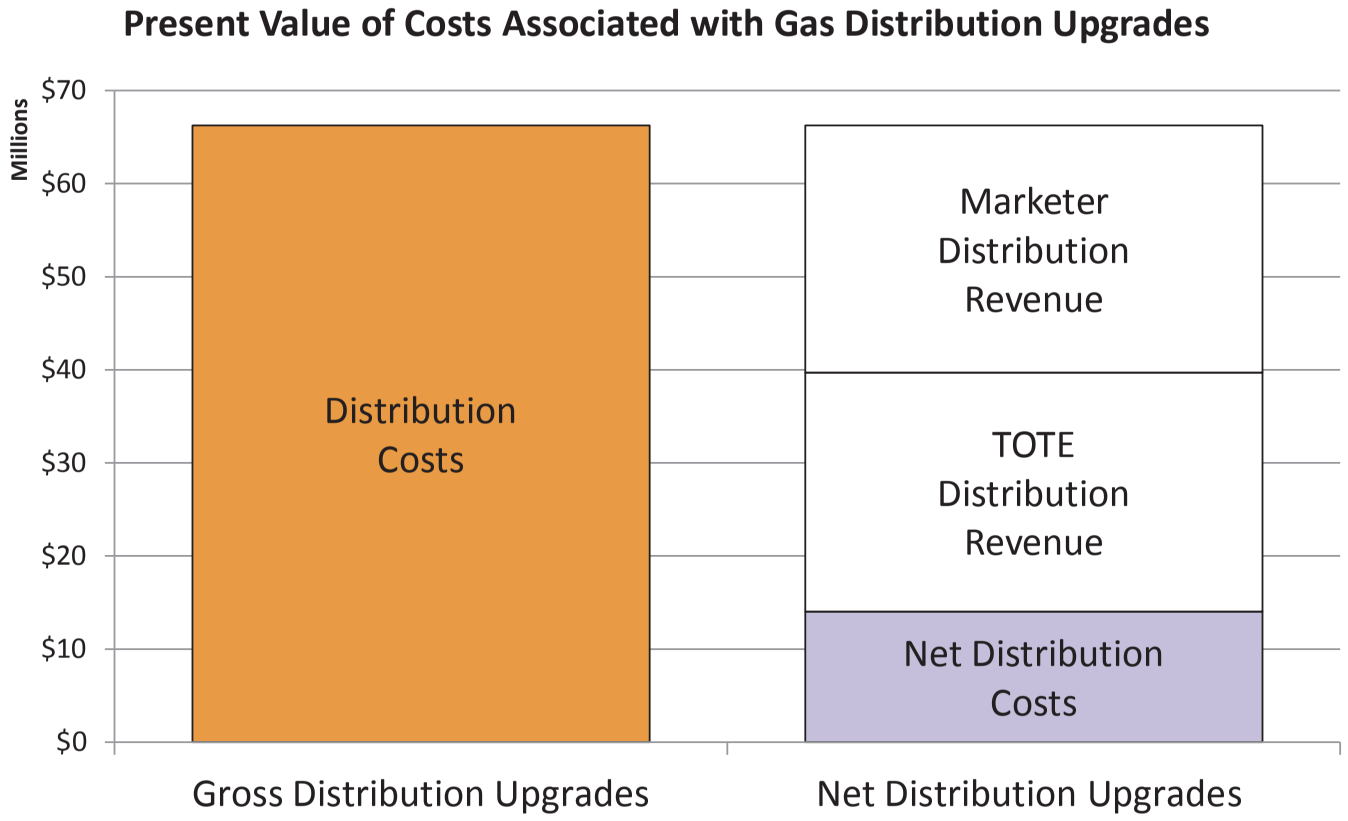
Project Revenue Requirement



Costs Related to Peak Day Resource



Gas Distribution Upgrades Costs



Allocation of LNG Plant

Facility Services	Capital Allocated to Each Service	Contributions from Customers Towards Services		
		PSE	TOTE	Marketer
Liquefaction	$81,591	10%	44%	46%
Storage	$82,378	79%	6%	15%
Bunkering	$21,165	0%	65%	35%
Truck Loading	$6,829	1%	0%	99%
Vaporization	$16,700	100%	0%	0%
Common Items	$65,406	45%	25%	30%
Gross Facility Contributions	$274,069	$118,610	$71,667	$83,792
Capital Allocation Ratio	100%	43%	26%	31%

CONFIDENTIAL per Protective Order in WUTC Docket No. UG-151663

PUGET SOUND ENERGY

Development Budget by Quarter

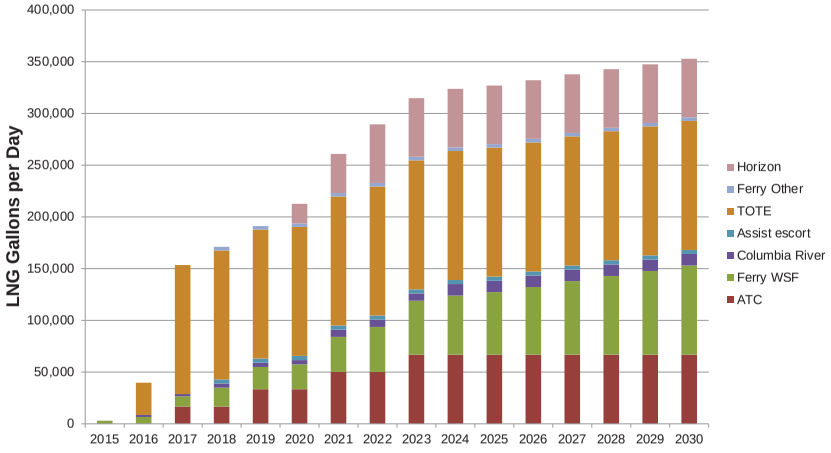
Development Budget	2012		2013				2014				2015		
($1,000's)	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	**TOTAL**
PSE Labor and OH	21	133	152	114	81	73	165	276	300	305	289	284	**2,193**
Engineering and Analysis	31	761	398	575	13	-	15	320	582	911	473	395	**4,474**
Permitting & Legal Support	23	271	262	22	(2)	-	49	299	835	635	525	420	**3,339**
Communications/Outreach	-	4	35	4	0	-	18	40	80	90	30	90	**391**
Distribution Upgrades	3	42	168	26	7	1	16	57	304	322	90	90	**1,126**
Commercial and Regulatory[1]	-	-	8	74	67	-	111	180	90	150	210	210	**1,100**
Real Estate and Lease	-	39	4	28	3	-	5	71	169	149	149	149	**766**
Contingency	-	-	-	-	-	-	-	26	118	128	88	82	**442**
Development Subtotal	78	1,250	1,027	843	169	74	379	1,269	2,478	2,690	1,854	1,720	**13,831**
Development Cumulative	78	1,328	2,355	3,198	3,367	3,441	3,820	5,089	7,567	10,257	12,111	13,831	

[1]*Commerical and Regulatory expenses are not capitalized (O&M expense)*

LNG Drivers in PSE Market Area

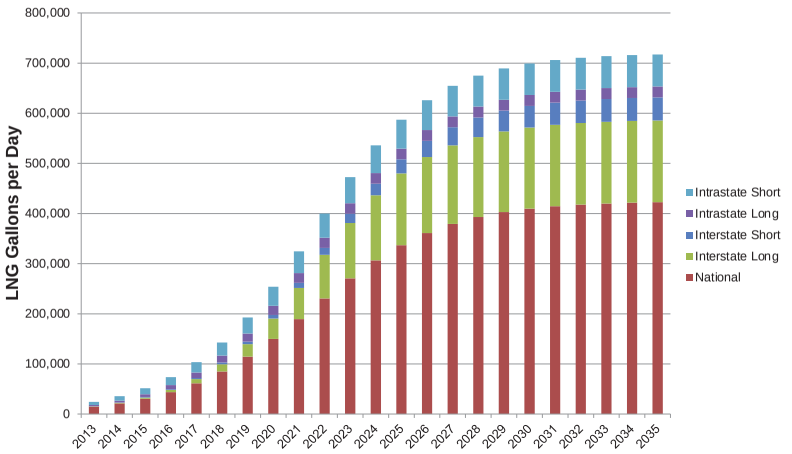
Marine Demand

Source: Concentric Energy Advisors 2012 study



Trucking Demand

Source: Concentric Energy Advisors 2012 study



Market drivers

- **Economic** – Sustainable price spread between natural gas and oil prices (approx. $15/Dth).
- **Regulatory** – New rules to reduce pollution and increase air quality: CARB Low Carbon Fuel Standards[1], IMO emission standards.[2]
- **Environmental** – No SOx particulates; carbon dioxide emissions greatly reduced compared to diesel or marine fuel oil.

[1] California Air Resource Board (CARB) Low Carbon Fuel Standards require fuel consumers to transition to lower carbon alternatives such as natural gas.
[2] International Maritime Organization (IMO) emission standards required that ships operating within 200 miles of the U.S.-Canadian coast reduce the sulfur content of their fuel to 1% in Aug. 2012 and must further reduce to 0.1% by 2015.

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Supply/Demand Dynamics Support Gas/Oil Spread

Wood Mackenzie forecasts Sumas to remain in the $4.00 - $5.25/Dth range.

- N. American gas supply of ~430 tcfe under current prices (enough supply for 15 years).
- Additional ~300 tcfe reserves with just a $1/Dth increase in price (enough supply for 24 years).

Refined products are expected to sustain a substantial premium to gas prices.

- Crude pricing is strengthened by increasing demand and higher breakeven economics for marginal projects.
- Bakken and other tight oil production skews refinery output towards the lighter end of the barrel, limiting potential supply of ULSD and IFO-380.

Wood Mackenzie identified potential risk factors to their forecast but expects the price spread to persist even in a "perfect storm" worst case scenario.

- Growth markets for natural gas demand are highly dependent on regulatory policy and are not expected to occur on a scale that would impact the price spread.
- Oil prices are supported due to a decreasing supply of heavier crude and higher production costs.
- Circumstances allowing for PSE's "price triggers" would be extreme market imbalances and would resolve as the market reacts in a span of months, not years.

Factors That May Impact the Spread

Natural Gas

Shale Gas Supply

- Significant downward pressure on gas prices with increased supply.

US Carbon Regulations

- Moderate upward pressure on gas prices with sizeable rise in power sector demand.

West Coast LNG Exports

- Slight upward pressure on gas prices with increased demand.

NG Vehicle Growth

- Little to no impact on gas prices as demand is insignificant relative to supply.

Petroleum Products

Lightening of Crude Supply

- Upward pressure on diesel and fuel oil prices as 'tight oil' from the Bakken skews the supply towards lighter refined products, reducing supply.

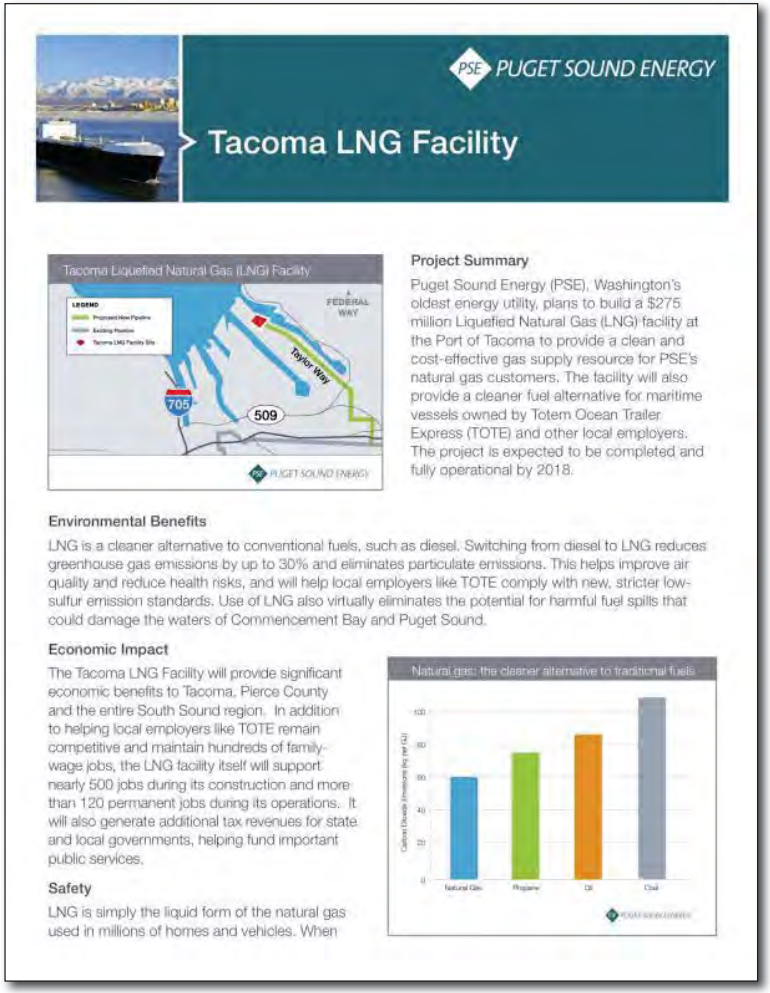
California Low Carbon Fuel

- Downward pressure on diesel prices due to extra PNW refinery output that cannot be consumed in California.

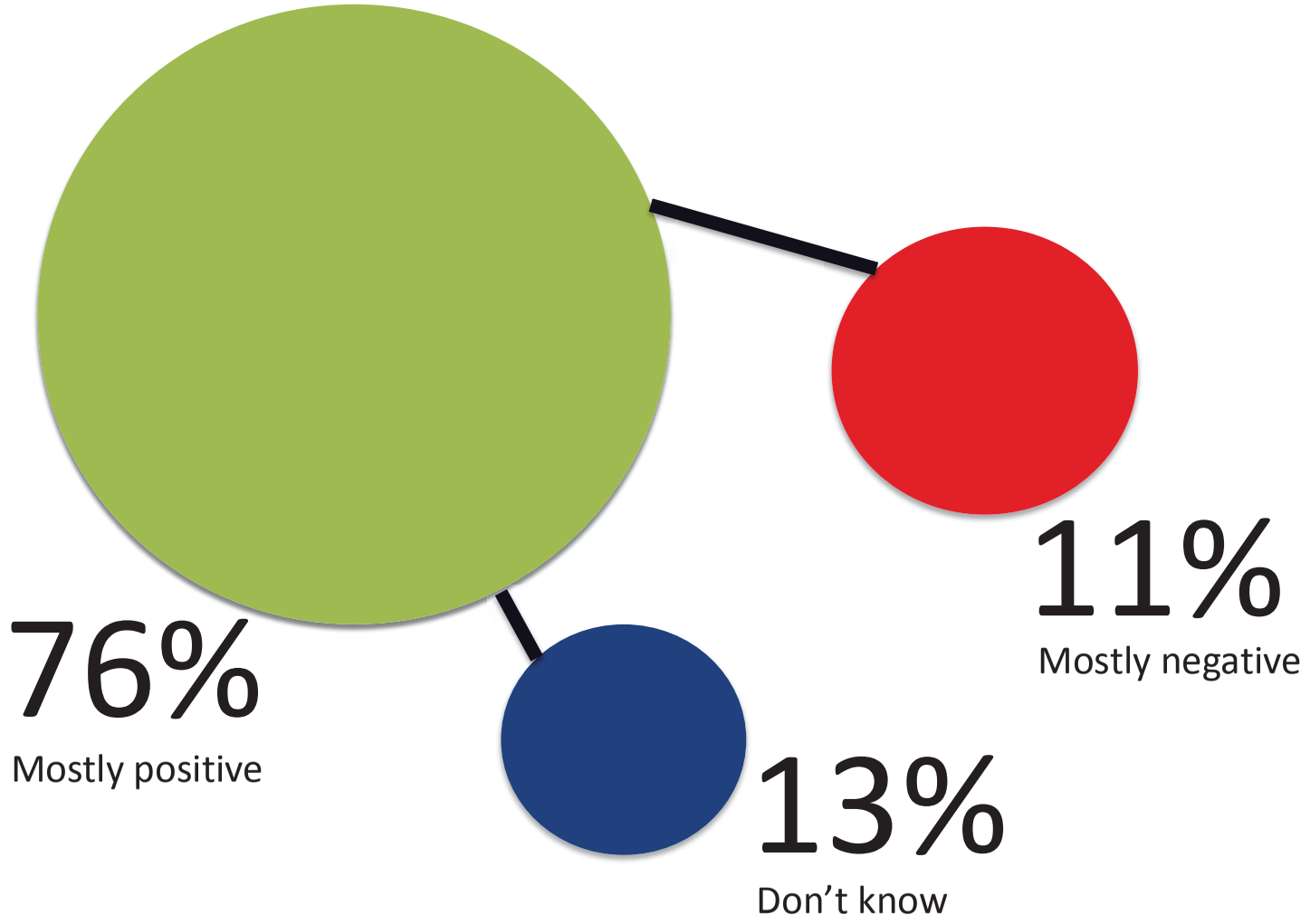
Transocean Shipping Regulations

- MARPOL regulations require shippers to switch to low sulfur diesel or LNG resulting in upward pressure on diesel.

Examples of Communications Materials



Reaction to LNG development



Key messages

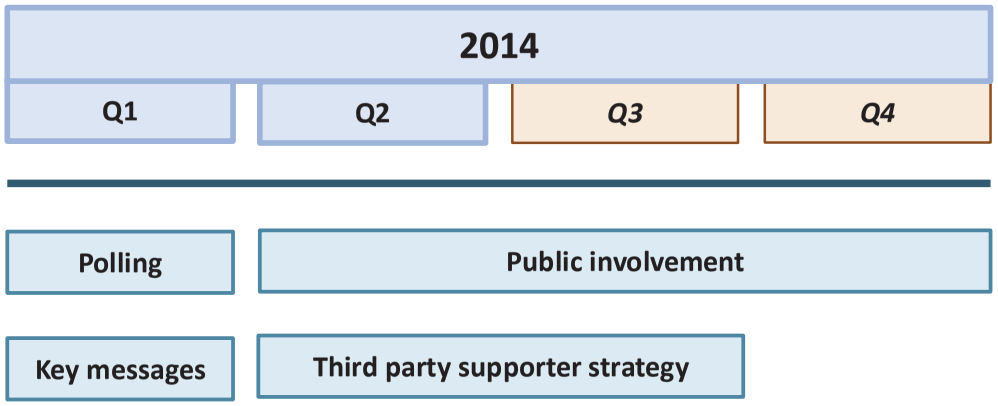
* Greater reliability for Tacoma/Pierce NG customers
* Local jobs and economic opportunity
* Environmental benefits (local air quality, marine and global)
* Safe, proven use of a domestically-sourced fuel

Key Risks

* Neighborhood group opposition (safety)
* Confusion with other Port NG projects (exports)
* Special interest group intervention (fracking)

Mitigation

* Process modeled after Thurston County effort
* Emphasis on local benefits (system reliability, economy, environment)
* Careful differentiation from other proposed facilities
* Communications focus on messaging, large audiences



Tacoma LNG Project Board

Board Decision

Roger Garratt
Clay Riding

July 30, 2014

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Safe. Dependable. Efficient.

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Requested Board Action

Based on the determination of need, the analysis of alternatives, and the benefits of the proposed transaction, PSE Management recommends that the Board of Directors approve the continued development of the Tacoma LNG Project. Specifically, approval will authorize PSE to:

- ***Enter into a long-term Fuel Supply Agreement*** to sell to Totem Ocean Trailers Express ("TOTE") LNG supplied from the Tacoma LNG Facility.
- ***Enter into a long-term lease with the Port of Tacoma*** for the land upon which the Facility will be sited.

Previous Board Interaction

The LNG initiative was discussed at the following board meetings:

Board Meeting Date	Description
May 9, 2012	Evaluated the LNG Strategy
January 23, 2013	Discussed the Tacoma LNG project development strategy
February 28, 2013	Reviewed the LNG development structure and regulatory strategy
May 8, 2013	Discussed the transportation initiative
November 8, 2013	Reviewed the project costs, structure and commercial plan
January 22, 2014	Board update on Tacoma LNG Project
July 2, 2014	Deep dive update on Tacoma LNG Project

Board Report Updates

The following updates have been made since the July 2 Board meeting:

- **Resolution (Exhibit A)**
  - Reflects liquidated damages in TOTE FSA
  - Removes interim supply agreement
- **Project Report**
  - Updated and clarified information related to potential Facility co-owner or long-term tolling customer
- **Summary of Commercial Terms (Exhibit E)**
  - Updated and clarified information related to potential Facility co-owner or long-term tolling customer
  - Added explanation of TOTE FSA Price Cap Mechanism and demonstrated cap function under different risk scenarios
- **Risk Analysis (Exhibit H)**
  - Updated risk analysis to show both pre- and post-mitigated risks, including heat mapping
- **Resource Need & Alternatives Analysis (Exhibit N)**
  - Included the joint ownership scenarios in the analysis, including the sensitivity analysis
- **Financial Pro Forma (Exhibit O)**
  - Updated to included additional joint ownership projections

Background – Project Description

PSE is developing an LNG facility to serve as a peaking resource for its core natural gas customers and to provide fuel to marine and on-road transportation markets.

Site: Port of Tacoma at corner of E. 11 St. and Alexander Ave. E.

Project In-service Date: January 1, 2019

LNG liquefaction capability: 250,000 gallons/day

On-site storage: 8 million gallons

Vaporized gas injection capability (into PSE's system)[1]: 66,000 Dth/day

Gas delivery to PSE's system: Northwest Pipeline

Electricity for facility: Procured at Mid-C market prices; wheeled via Tacoma Power's 115 kV system

Total Project Cost: $323 million

Tacoma LNG Facility in Tacoma, Washington

[1] *To meet peak-day demand of PSE retail gas customers*

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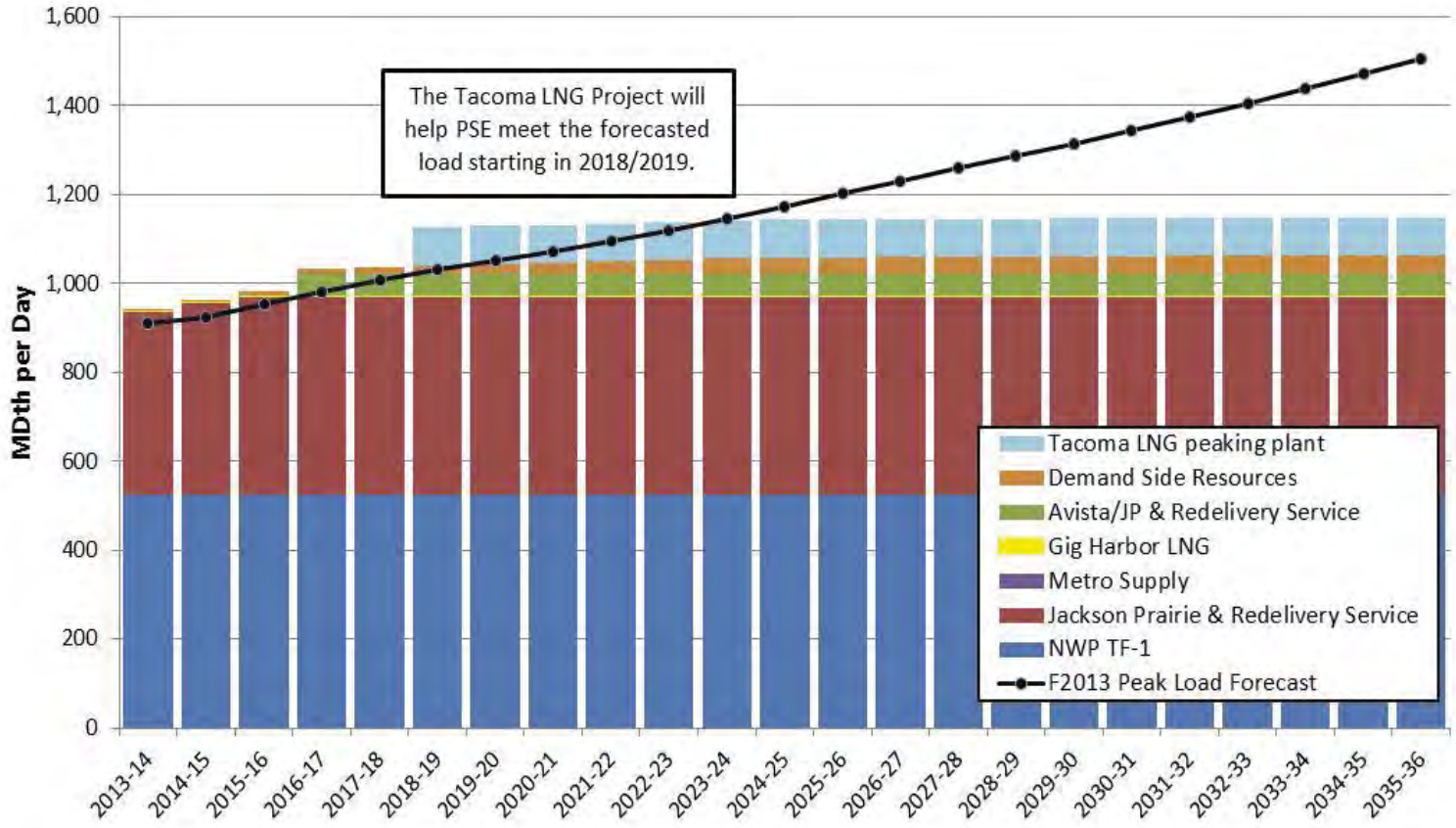
Background – Resource Need

PSE Natural Gas Resource Need



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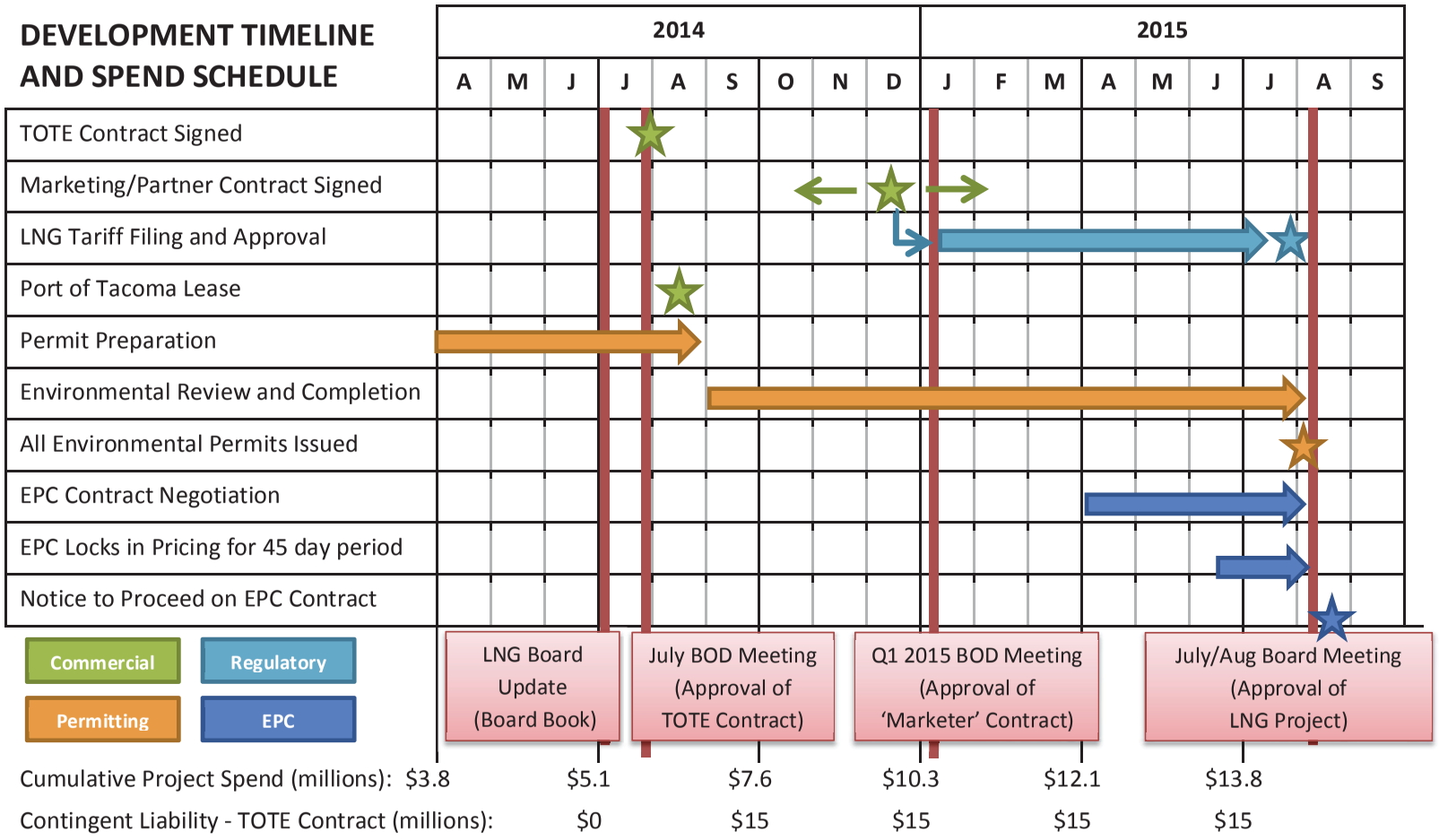
Background – Development Schedule



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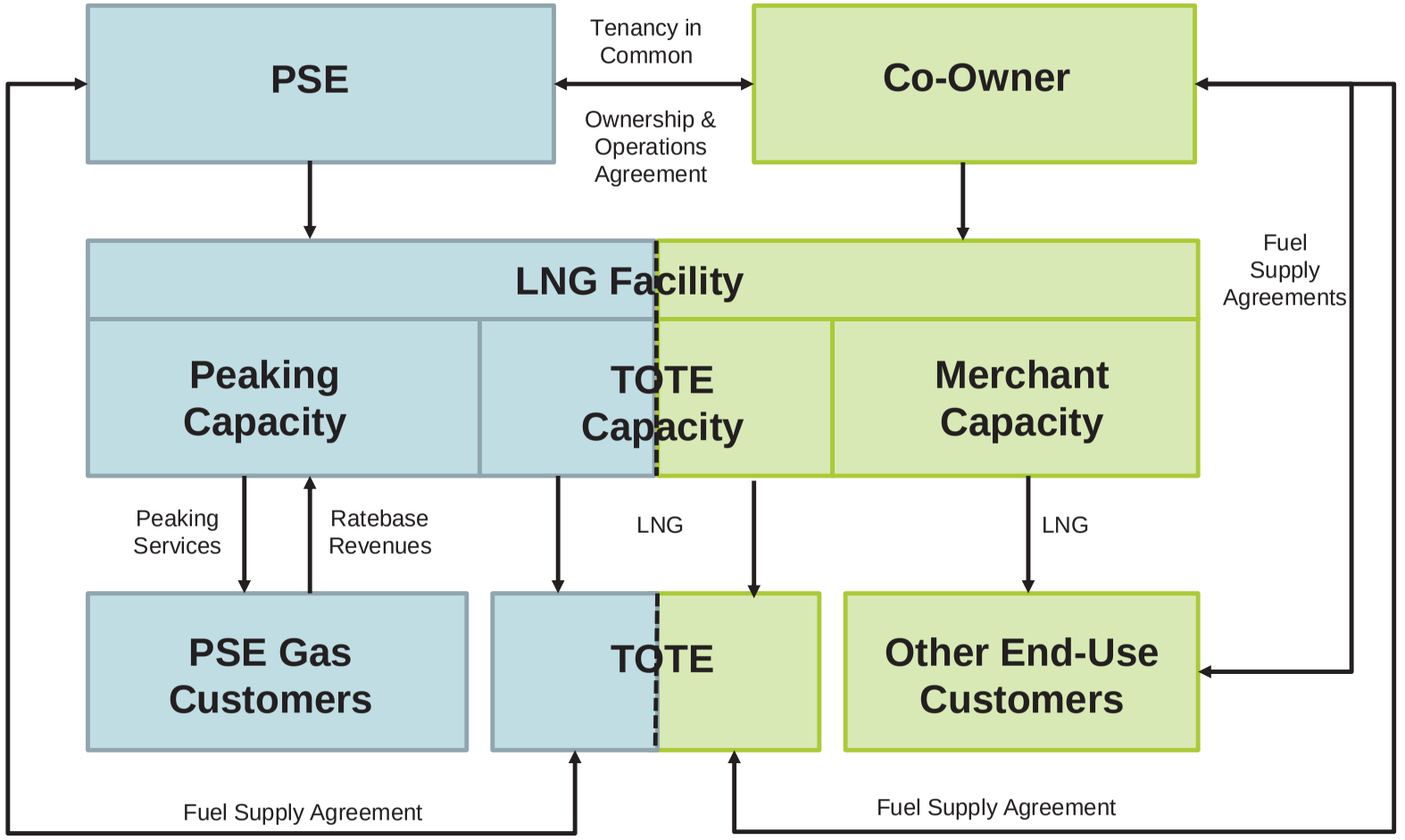
Project Structure – Joint Ownership



PSE-owned facilities, and WUTC-regulated facilities and services

Third-party owned facilities, and facilities and services not regulated by WUTC

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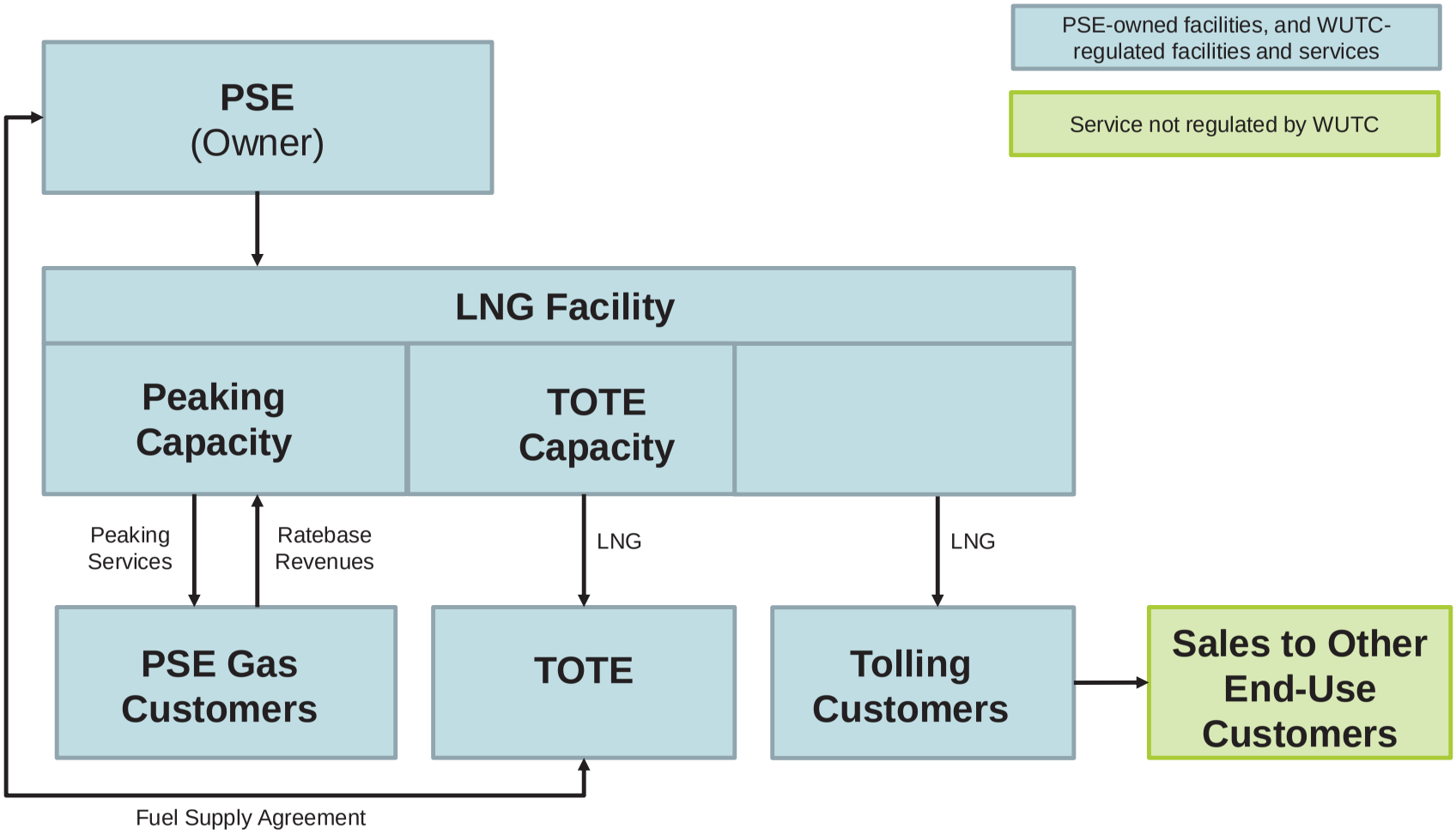
Project Structure – Tolling Customer



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Development Risk

DEVELOPMENT Risk	Cause	Inherent Probability	Inherent Magnitude	Mitigation	Mitigated Probability	Mitigated Magnitude
Merchant Risk [MR]	PSE unable to find co-owner or long-term tolling customer beyond TOTE and assumes merchant risk on un-contracted plant capacity.	Almost Certain	Critical	PSE intends to fully contract the Facility's capacity. However, to the extent that there is excess capacity, PSE will have to demonstrate that merchant risk is prudent.	Extremely Unlikely	Negligible
Project Costs [PC]	Final construction costs are significantly higher than the original FEED study and current estimates.	Possible	Major	PSE's budget includes contingency amounts commensurate with the current estimate stage. PSE's offtake contracts will allow for some pass through of cost escalations. PSE's prudency demonstrates that the Project can withstand a significant cost increase and still be the least cost peaking option for PSE's retail gas customers. (See ***Exhibit N*** for a discussion of PSE's resource alternatives analysis and results.)	Unlikely	Minor
Permits Delayed [PD]	Permitting delays may be caused by third-party interveners or delayed agency action. *See **Exhibit J** for a more detailed analysis of permitting delay risks.*	Possible	Major	To mitigate permitting delays PSE will do the following: • Initiate Project introduction meetings with all involved agencies to provide advance notice of the Project and schedule; • Initiate regular Project meetings with the agencies during permitting; • Engage an independent coordinator to help facilitate decision-making among agencies; • Reimburse key agencies for time dedicated to this Project.	Unlikely	Major
Permits Not Granted [PX]	Permitting agencies determine that project impacts cannot be mitigated. *See **Exhibit J** for a more detailed analysis of potential permitting delay risks.*	Possible	Critical	PSE has already begun to gain support for the Project from key community, business and government organizations to ensure its success. The Company will continue to educate others in federal, state and local government about the substantial public benefits of the Project.	Extremely Unlikely	Critical

Development Risk

DEVELOPMENT Risk	Cause	Inherent Probability	Inherent Magnitude	Mitigation	Mitigated Probability	Mitigated Magnitude
Regulatory (Tariff) [RT]	WUTC denies approval of LNG tariff and regulated treatment of the Facility.	Almost Certain	Critical	PSE has and will continue to work with WUTC commissioners and staff to promote the cost and reliability benefits of the Project to PSE's gas customers, and the economic and clean air benefits for the region. PSE has garnered support from state and local elected officials. Additionally, PSE continues to support legislation that promotes a regulatory environment that encourages the development of alternative fuels.	Unlikely	Critical
Environmental Contamination [EC]	Environmental contamination at the Port of Tacoma or along the gas distribution system upgrades route delays the Project and/or increases Project costs.	Likely	Major	PSE has, and will continue to perform environmental sampling at the site and along the pipeline route. If contamination is found at the plant site during the development phase, the Port will generally bear the financial responsibility of remediation. PSE will work to mitigate any schedule risk the remediation might pose.	Likely	Negligible
Community Concerns [CC]	The project encounters an organized effort to address community concerns regarding: • LNG safety; • Any project involving fossil fuels; • Opposition to using "fracked" gas.	Likely	Critical	PSE will work with communities to provide education about the benefits of LNG and the Project, and to address concerns. This will take the form of an outreach campaign, including community meetings and presentations, a web site and/or other forms of communication to help address any concerns the communities may have. (*See **Exhibit K** for details about PSE's plan to engage the community.)*	Unlikely	Negligible

Construction Risk

CONSTRUCTION Risk	Cause	Probability	Magnitude	Mitigation	Mitigated Probability	Mitigated Magnitude
Cost Risk [PC]	Changes to plant design after the EPC contract is executed, or significant, unforeseen environmental contamination drive increased cost.	Likely	Major	Facility construction will be executed via a lump-sum EPC contract. Remaining construction is accomplished by firm, fixed-price competitive bids. Scope control will be managed after contract execution. Environmental conditions will be evaluated and characterized prior to the start of construction.	Unlikely	Minor
Contractor Performance [CP]	The Facility fails to meet required specifications or work quality requirements.	Likely	Major	Contractors are pre-qualified and selected based upon best value and historical performance. PSE will use independent Quality Assurance inspection to validate contractor performance and require contract warranties to backstop risk.	Unlikely	Minor
Construction Delays [CP]	Supply chain disruptions, unforeseen site conditions, productivity issues, etc. delay project completion.	Likely	Major	The overall construction schedule includes float to accommodate uncertain duration of demolition and site work. The EPC contract will have liquidated damages for late completion.	Possible	Minor
Safety (Construction) [SC]	Unsafe work practices lead to onsite accidents or worker injuries.	Likely	Major	All contractors will be required to have rigid safety programs that meet or exceed PSE's standards.	Extremely Unlikely	Negligible
Distribution Upgrades Construction Risk [DU]	Distribution system costs increase or the schedule is delayed due to: • complexities associated with route (railroad crossings/contamination); • permitting; • environmental impacts/ restoration work; • regulatory approval for pressure increase.	Likely	Major	More detailed staff review/analysis, engineering work and testing will be performed as the Project progresses. PSE will consider construction methods, hours of work and restoration requirements as they relate to permitting. Special material handling and HAZWOP[1] training will be necessary. PSE intends to work with jurisdictions on cost impacts of unknown restoration requirements. (*See **Exhibit M** for more details about distribution system upgrade risks.*)	Possible	Minor

[1] *Hazardous Waste Operations ("HAZWOP")*

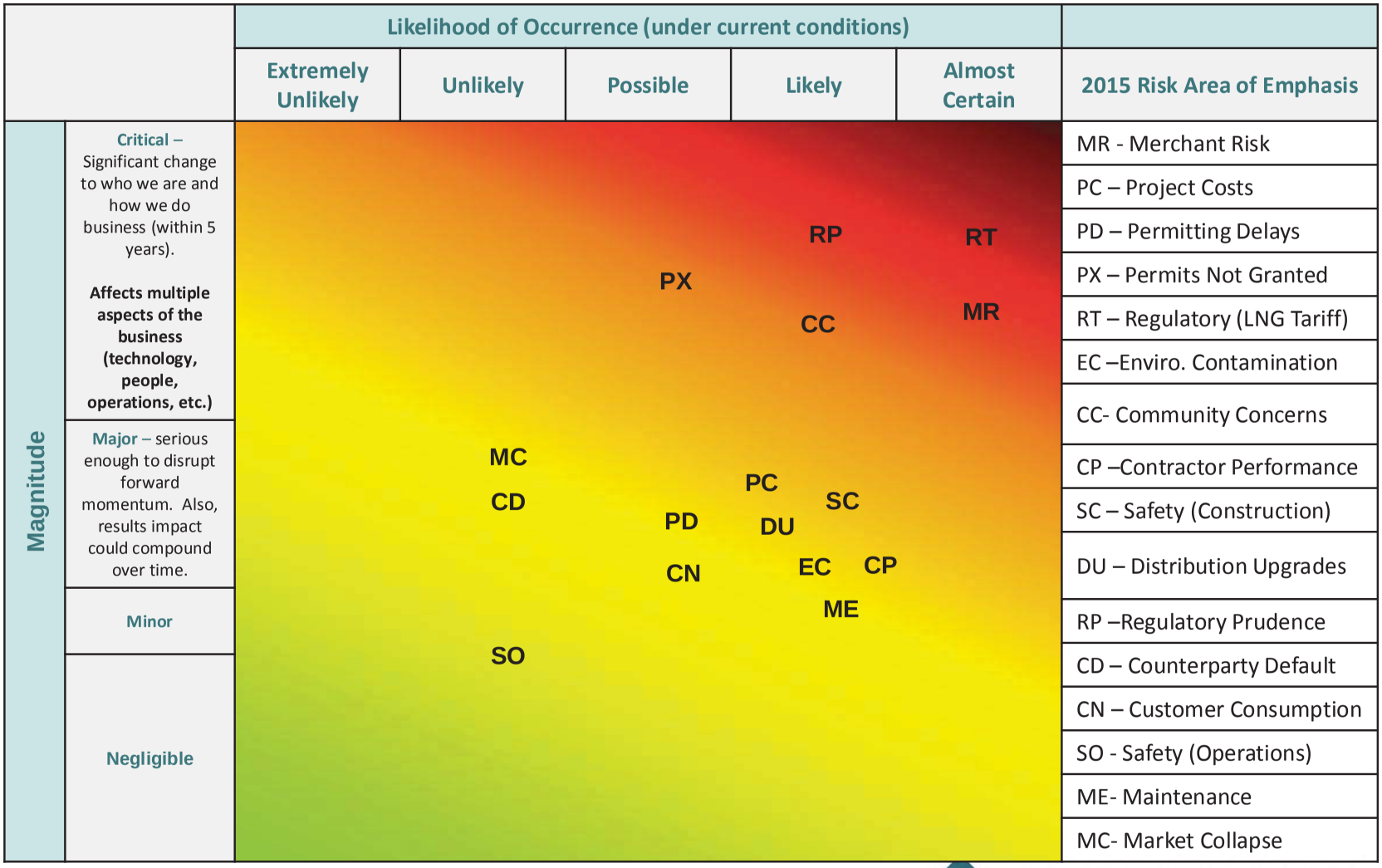
Operations Risk

OPERATIONS Risk	Cause	Probability	Magnitude	Mitigation	Mitigated Probability	Mitigated Magnitude
Regulatory Prudence [RP]	WUTC determines that PSE's investment in the LNG Facility is imprudent.	Likely	Critical	By virtue of the LNG tariff, PSE will have gauged the Commission's position on the project. The LNG Facility will have been evaluated in at least two IRPs prior to the WUTC's prudency determination. PSE has and will continue to work with WUTC commissioners and staff to promote the cost and reliability benefits of the Project to PSE's gas customers, and the economic and clean air benefits for the region. PSE has garnered support from state and local elected officials. Additionally, PSE continues to support legislation that promotes a regulatory environment that encourages the development of alternative fuels.	Unlikely	Minor
Customer Defaults or Breaks Contract [CD]	Long-term LNG customers don't fulfill their obligations under the contracts.	Unlikely	Major	LNG fuel supply agreements will have contractual provisions to mitigate counterparty credit risks (parental guarantees, etc.). Should a default occur, PSE would mitigate revenue impact by selling volumes associated with any breached contracts.		
Customer Consumption [CN]	Plant customers take significantly lower volumes than anticipated, resulting in sub-optimal plant operations.	Possible	Major	PSE will include contractual provisions such as deficiency payments or penalties to mitigate efficiency losses from running the Facility at a lower output. Alternatively, PSE could operate the Facility with longer or more frequent outages and use the LNG storage tank to mitigate operational inefficiency.	Unlikely	Minor

Operations Risk

OPERATIONS Risk	Cause	Probability	Magnitude	Mitigation	Mitigated Probability	Mitigated Magnitude
Market Collapse [MC]	The price spread between natural gas and diesel could collapse, eliminating the economic benefit associated with LNG	Unlikely	Major	PSE commissioned Wood Mackenzie to study the probabilistic spread between natural gas and diesel prices. The results of this study validated PSE's position regarding the sustainability of the spread. PSE will take on long-term contracts that will generate revenues sufficient to cover the costs of facilities during the contract term. TOTE has certain rights to exit its contract if a drastic collapse of the spread occurs; however, the exercise of such rights includes termination payments to PSE.	Unlikely	Minor
Liquefaction and Performance Efficiency [CP]	The Facility fails to meet design specifications and LNG quality requirements.	Likely	Major	The EPC contractor will guarantee production capability; the contract will include warranty provisions to meet specifications and/or liquidated damages.	Unlikely	Minor
Safety (Operations) [SO]	Equipment failure or operational error lead to onsite accidents and/or worker injuries.	Unlikely	Minor	The Facility will be designed, constructed, and inspected according to the latest safety standards. Extensive regulations govern required procedures and training for Facility personnel. The Facility will be operated consistent with PSE policies. In addition, the Facility will be insured under PSE's policy.	Extremely Unlikely	Minor
Maintenance of Plant Equipment [ME]	Major components prematurely fail due to improper maintenance.	Likely	Major	Major components will be inspected and tested at the factory prior to installation. Only qualified suppliers will be used. The Facility will have full operations and maintenance manuals, and will maintain onsite spares for component parts with higher failure rates. The Facility will be maintained in accordance with PSE's policies.	Unlikely	Minor

Inherent Risks



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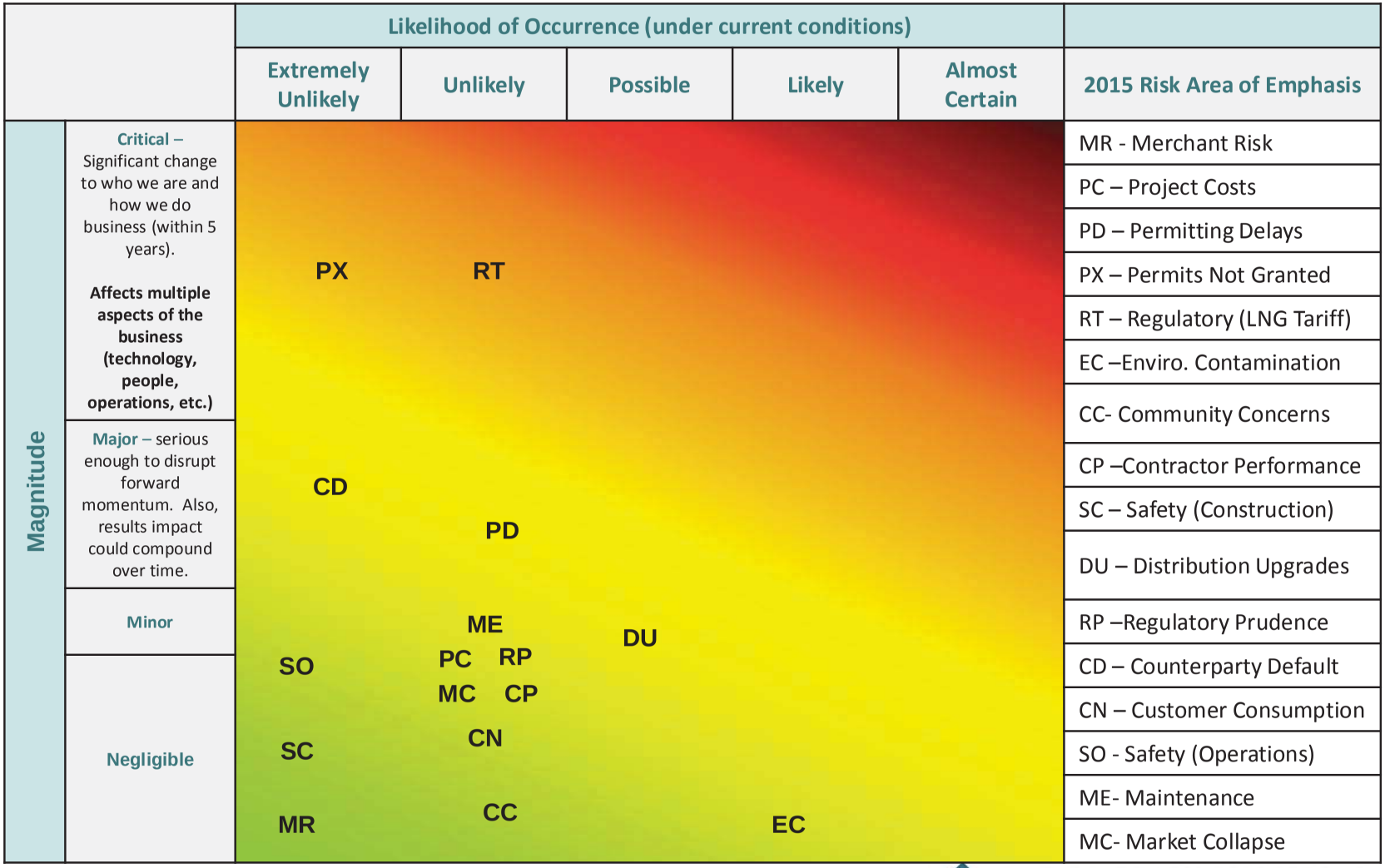
Mitigated Risks



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Financial Summary – Joint Ownership

Puget Sound Energy
2014 Financial Plan Update for 2015 Plan Preview
Liquefied Natural Gas Project (LNG) Base Case: Joint-Ownership Scenario (56% Owner)

- The LNG Initiative assumes the development, construction and ownership of a natural gas liquefaction and storage facility by PSE. The facility would: (1) serve as a natural gas peaking facility to be used by PSE's distribution system to meet peak demand and (2) provide LNG to customers to use as transportation fuel. The entire facility would be regulated as part of PSE's gas distribution system.
The capital forecast and Income Statement Impacts in this scenario of the 2015 Plan Preview are reduced from the 2014 Plan. The changes account for a third party ownership position in the facility equal to half of the capital needed to support the TOTE contract (13% of the capital requirement) and the remaining unsold portion of the facility (31% of capital requirement). The co-owner would also be responsible for operational expenses allocated to their share of the facility.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
$ in millions	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2013-2019**
Capital Expenditures	$1	$4	$17	$53	$97	$30	$0	$203
AFUDC	0	0	1	4	10	12	-	27
Total Capex (including AFUDC)	**$1**	**$4**	**$18**	**$57**	**$108**	**$41**	**$0**	**$230**
Income Statement Impacts								
Revenue	$0	$0	$0	$0	$0	$0	$55	$55
Operating Expenses	(0)	(1)	(0)	(0)	(0)	(1)	(27)	(29)
EBITDA	**($0)**	**($1)**	**($0)**	**($0)**	**($0)**	**($1)**	**$29**	**$26**
AFUDC	0	0	1	4	10	12	-	27
Interest Expense	(0)	(0)	(0)	(1)	(3)	(4)	(7)	(16)
Depreciation & Amortization	-	-	-	-	-	(1)	(9)	(10)
Taxes	0	0	0	1	1	(0)	(6)	(4)
Net Income	**($0)**	**($0)**	**$1**	**$3**	**$8**	**$5**	**$7**	**$23**

Financial Summary – 100% PSE Ownership

Puget Sound Energy
2014 Financial Plan Update for 2015 Plan Preview
Liquefied Natural Gas Project (LNG) Sensitivity Analysis: 100% PSE Ownership

The following summary shows the financial impact to the 5-year plan if PSE were to assume 100% ownership on the LNG facility. This scenario aligns with 2014 Plan, however the capital forecast in the 2015 Plan Preview is larger than the 2014 Plan due to changes in key cost drivers, including higher costs due to more challenging geotechnical conditions at the site than previously known and increased market demand for LNG equipment. The revenue forecast in this plan is delayed one year to 2019 to accommodate TOTE's request for service in Q1 2019.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
$ in millions	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2013-2019**
Capital Expenditures	$2	$6	$31	$90	$140	$53	$0	$322
AFUDC	0	1	2	7	16	21	-	47
Total Capex (including AFUDC)	**$2**	**$7**	**$33**	**$97**	**$157**	**$74**	**$0**	**$369**
Income Statement Impacts								
Revenue	$0	$0	$0	$0	$0	$0	$98	$98
Operating Expenses	(0)	(1)	(0)	(0)	(0)	(1)	(49)	(52)
EBITDA	**($0)**	**($1)**	**($0)**	**($0)**	**($0)**	**($1)**	**$49**	**$46**
AFUDC	0	1	2	7	16	21	-	47
Interest Expense	(0)	(0)	(0)	(1)	(3)	(4)	(11)	(20)
Depreciation & Amortization	-	-	-	-	-	(1)	(15)	(16)
Taxes	0	0	0	1	2	(1)	(9)	(7)
Net Income	**$0**	**$0**	**$2**	**$6**	**$15**	**$13**	**$13**	**$49**

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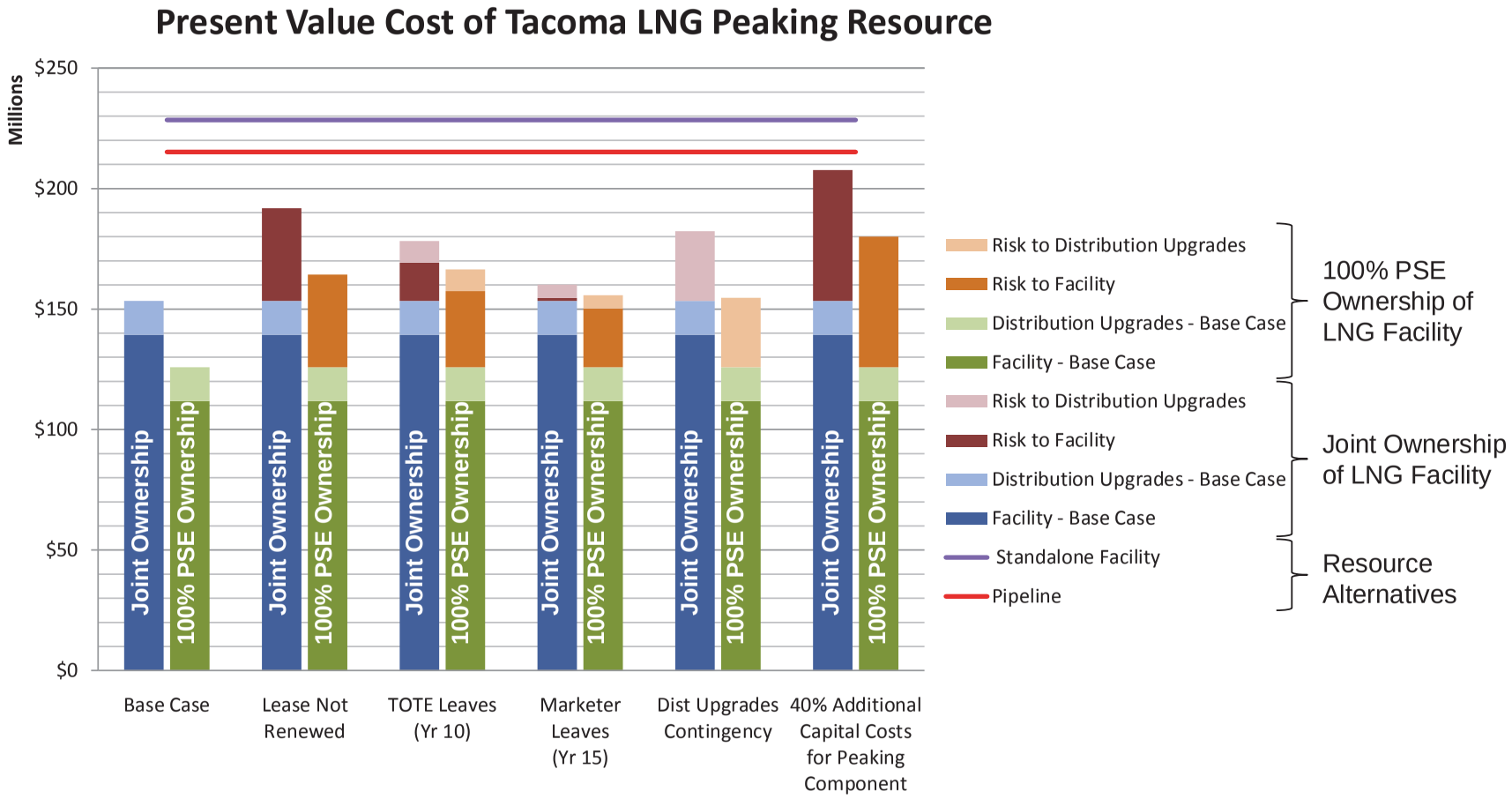
Comparison of Resource Alternatives



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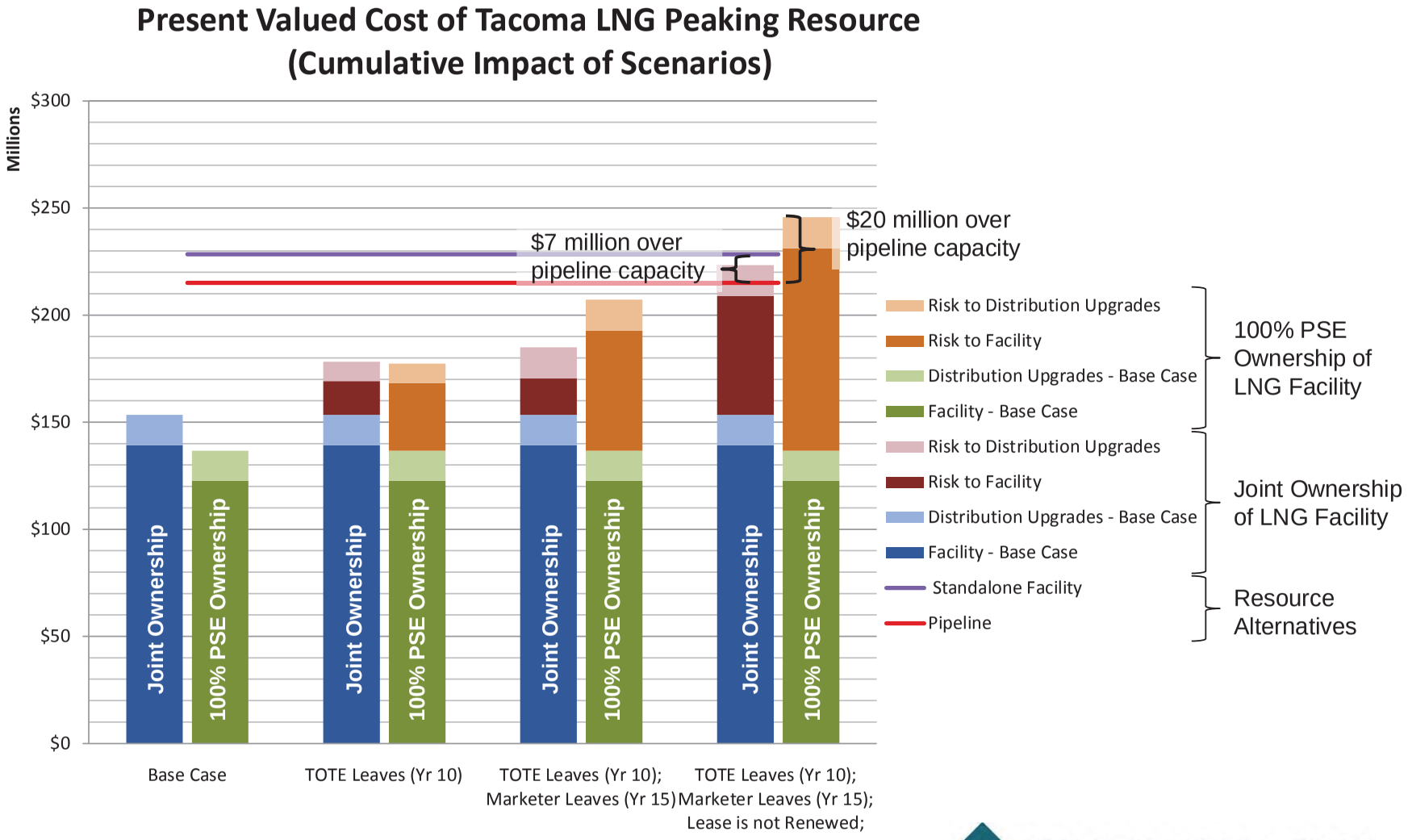
Impacts of LNG Market Not Materializing



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Strategy - Regulatory

Phase 1: Commences upon completion of marketing partner agreement

WUTC Approval of LNG Fuel Supply Service Tariff Schedule and Agreements.

PSE will demonstrate:

1. Rates recover all costs to provide LNG fuel supply service and contribute to other Facility fixed costs.
2. Need for and nature of the Facility.
3. Satisfactory commercial terms and conditions of LNG fuel supply service.
4. Agreements do not impose unreasonable preference for/rate discrimination to the counterparties.

Phase 2: General Rate Case in Q3/Q4 2018[1]

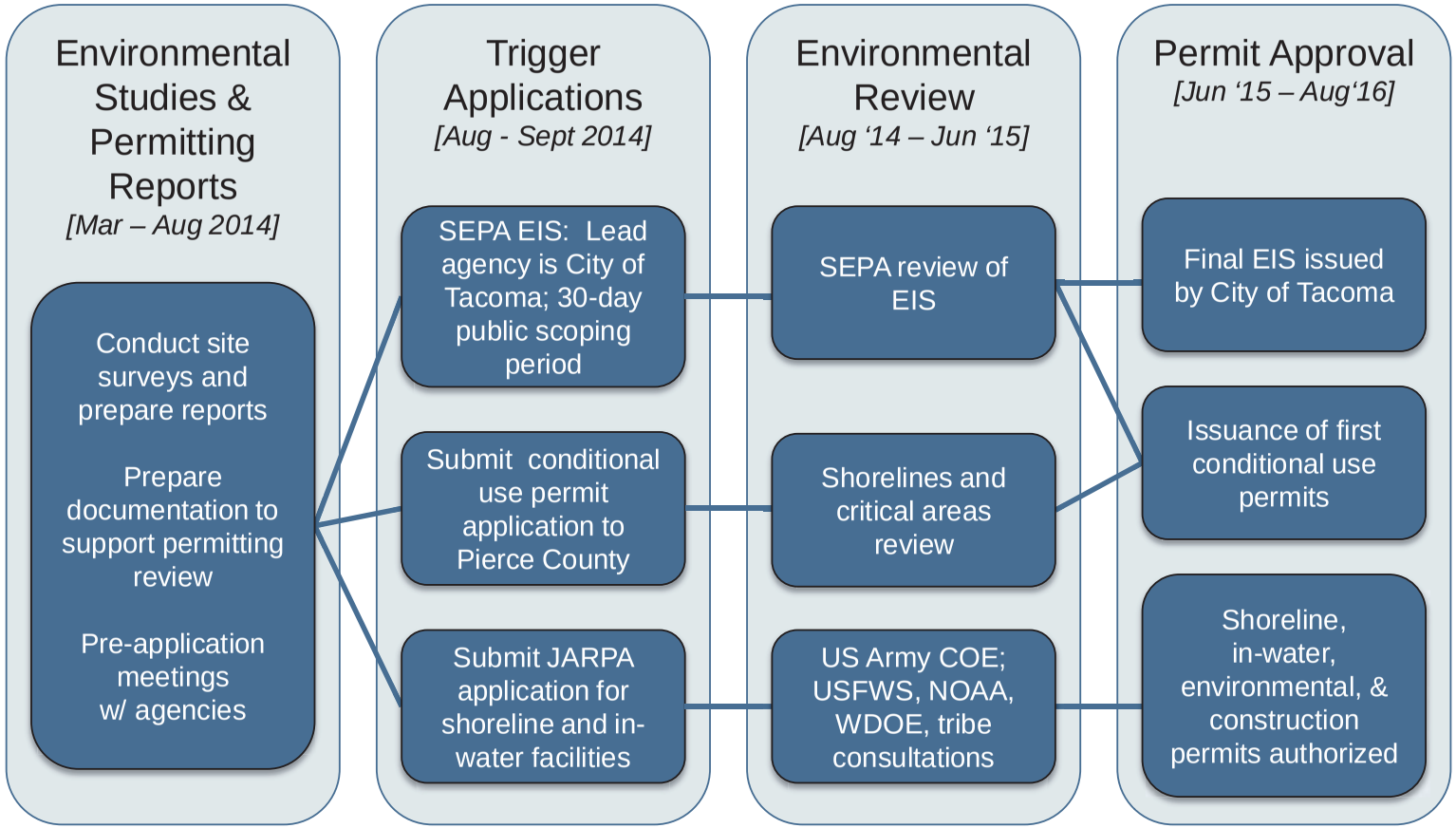
WUTC Prudence Determination and Rate Recovery of the Tacoma LNG Facility.

PSE will demonstrate:

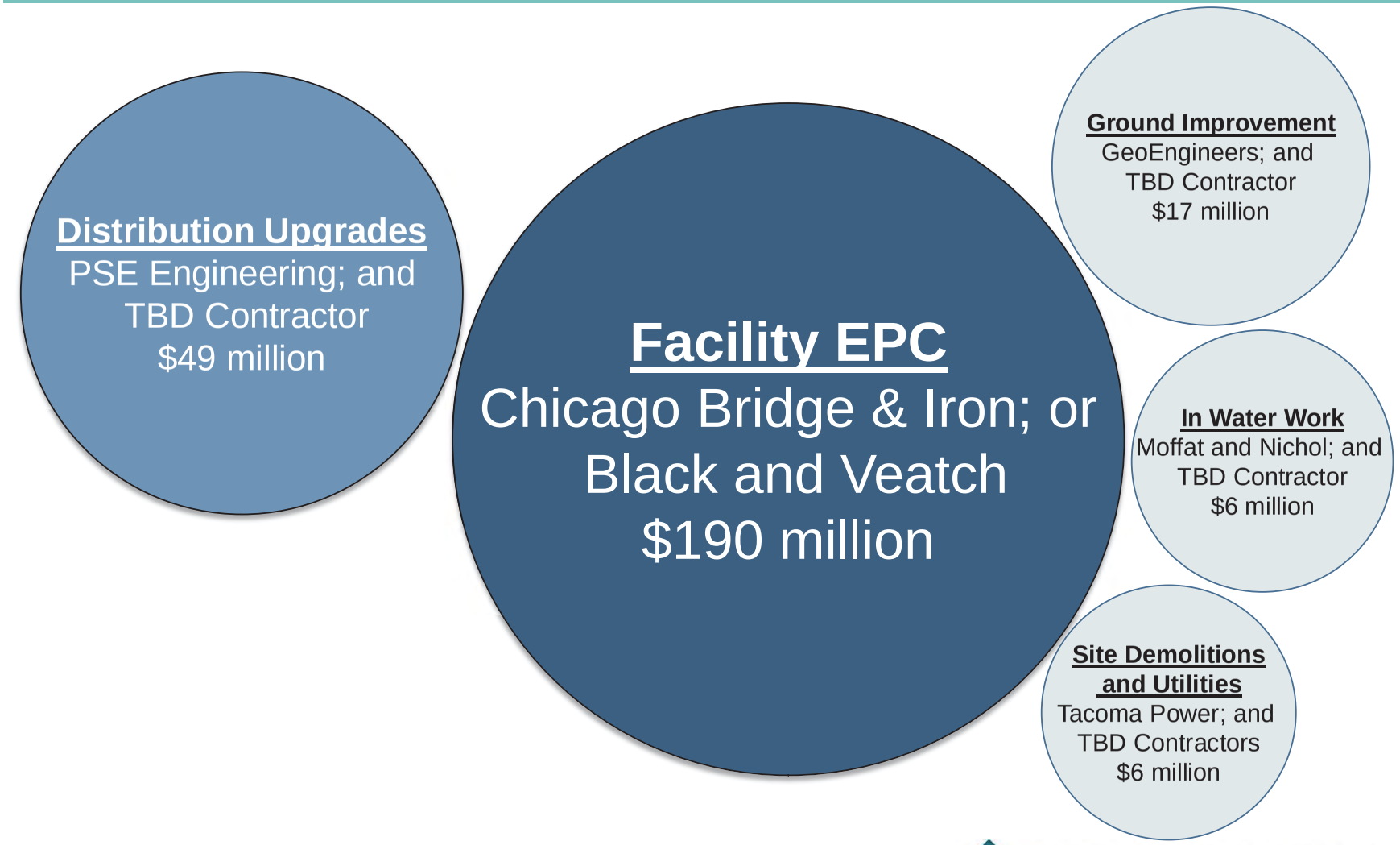
1. Need for the Facility.
2. Facility is cost-effective.
3. Alternatives considered and analysis conducted.
4. Contemporaneous information used by the Board to make acquisition decision.
5. Contemporaneous records kept by PSE.

[1]PSE may also file an accounting petition with the WUTC to request a cost deferral mechanism for fixed and variable costs of the Tacoma LNG Facility, if the Facility is placed in service in advance of the effective date for rates.

Strategy - Permitting



Engineering and Construction



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Tacoma LNG Project Benefits

A cost-effective way to meet the capacity needs of PSE's retail gas customers

- Least cost peak-day supply resource option to meet demonstrated capacity needs of PSE gas customers.
- Improves gas system reliability.
- Diversifies peak-day resources for PSE customers (on-system resource) and eliminates the need for long-haul interstate pipeline capacity.
- Supports WA's statutory goals to reduce carbon emissions from the state's transportation sector.
- Supports economic development at the Port of Tacoma.
- Supplies LNG fuel to region, which when compared to petroleum-based fuels:
  - Reduces harmful emissions that effect local air quality.
  - Emits less carbon dioxide.
  - Costs less, allowing operators to invest in conversion and new builds.
  - Complies with new maritime regulations.
  - Complies with California's Low Carbon Fuel Standard.

Next Steps

- **Commercial**: Ensure that the LNG facility is fully contracted by PSE customers, TOTE and a third-party marketer (i.e., BP, Shell, or others).
- **Permitting**: Submit permit applications and continue to educate and work with permitting agencies (City of Tacoma as lead agency).
- **Regulatory**: Demonstrate full prudency for LNG facility by validating resource need and regional resource benefits (e.g., economic, environmental).
- **Community Outreach**: Engage community and political leaders to garner support for the LNG project by emphasizing project benefits to customers and the region.
- **Engineering and Construction:** Black & Veatch FEED study and finalize site infrastructure designs.

Future Board Decisions

Decision	When
PSE Management will recommend approval of the TOTE Fuel Supply Agreement, Interim Supply Agreement and enter into a long-term lease with the Port of Tacoma.	July 30, 2014
Execution of Joint Ownership Agreement or Tolling Agreement with Marketing Partner	Upon completion of a marketing or co-ownership agreement with a third-party fuel marketer
Final project approval; execute all project construction agreements including requisite engineering, procurement and construction ("EPC") agreement with the lead contractor; and issue Notice to Proceed	Upon receipt of a final non-appealable EIS, Section 10/404 Permits, Shoreline and Pierce County CUP;[1] execution-ready construction contracts and all required real-estate rights.

Requested Board Action

Based on the determination of need, the analysis of alternatives, and the benefits of the proposed transaction, PSE Management recommends that the Board of Directors approve the continued development of the Tacoma LNG Project. Specifically, approval will authorize PSE to:

- ***Enter into a long-term Fuel Supply Agreement*** to sell to Totem Ocean Trailers Express ("TOTE") LNG supplied from the Tacoma LNG Facility.
- ***Enter into a long-term lease with the Port of Tacoma*** for the land upon which the Facility will be sited.

APPENDIX

- TOTE Fuel Supply Agreement
- TOTE Price Cap
- Facility Siting
- Port of Tacoma Lease
- Project Budget and Allocation
- Distribution Upgrades
- Communications Strategy and Materials

TOTE Fuel Supply Agreement

- **Guaranteed Completion** with penalties after January 1, 2019; plant must be in place by January 1, 2021.
- **Capped Maximum Price** on plant and fixed O&M charges.
- **First Option Right** with similar terms and pricing for TOTE and affiliates.
- **Deficiency Payments,** if TOTE fails to purchase at least 95% of contract volumes.
- **Conditions precedent:**
  - All permits and regulatory approvals received.
  - WUTC approval.
  - Board approval to execute the EPC contract.
  - Binding site lease with Port of Tacoma.
- **Interim supply agreement** will contain damages if the plant is late or PSE cancels the project (estimated ~ $15 million if PSE cancels the project).
- **Damages:**
  - No damages on failure to deliver due to Force Majeure.
  - Limited damages on non-Force Majeure event: TOTE is asking for up to $10 million in any contract year (low probability event).
  - No limit to damages on willful failure to deliver.
  - Damage to TOTE's property if PSE provides off-spec LNG - TOTE asking for up to $15 million in any contract year (low probability event; will be insurable).

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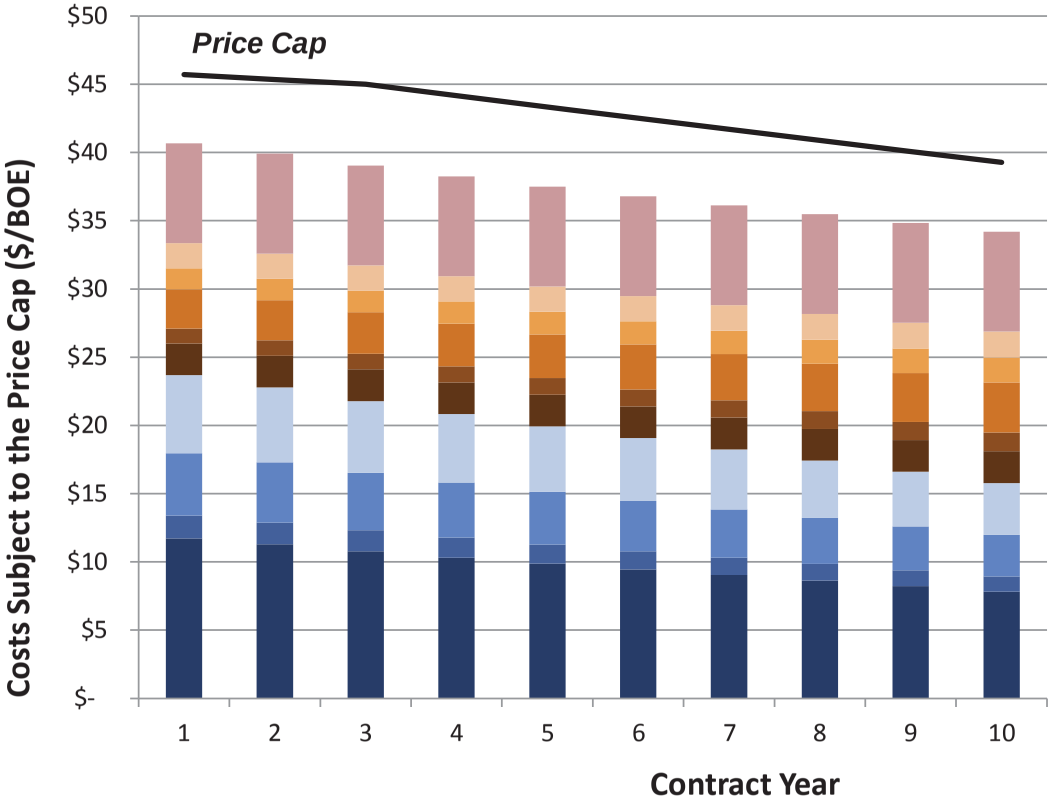
TOTE Price Cap



Fixed Plant Charges Subject to Cap*:

- Short Term Premium
- Allocated General Costs
- Fixed Electric Costs
- Labor and Lease
- Maintenance & Misc
- Property Tax
- Common
- Bunkering
- Storage
- Liquefaction

Additional Revenues

Fixed O&M Charge

Fixed Facility Charge

* **Capital and Fixed O&M** are subject to a price cap.
Costs related to gas commodity and transport, electric commodity, and port volumetric charges are NOT subject to a cap and are passed through at costs.

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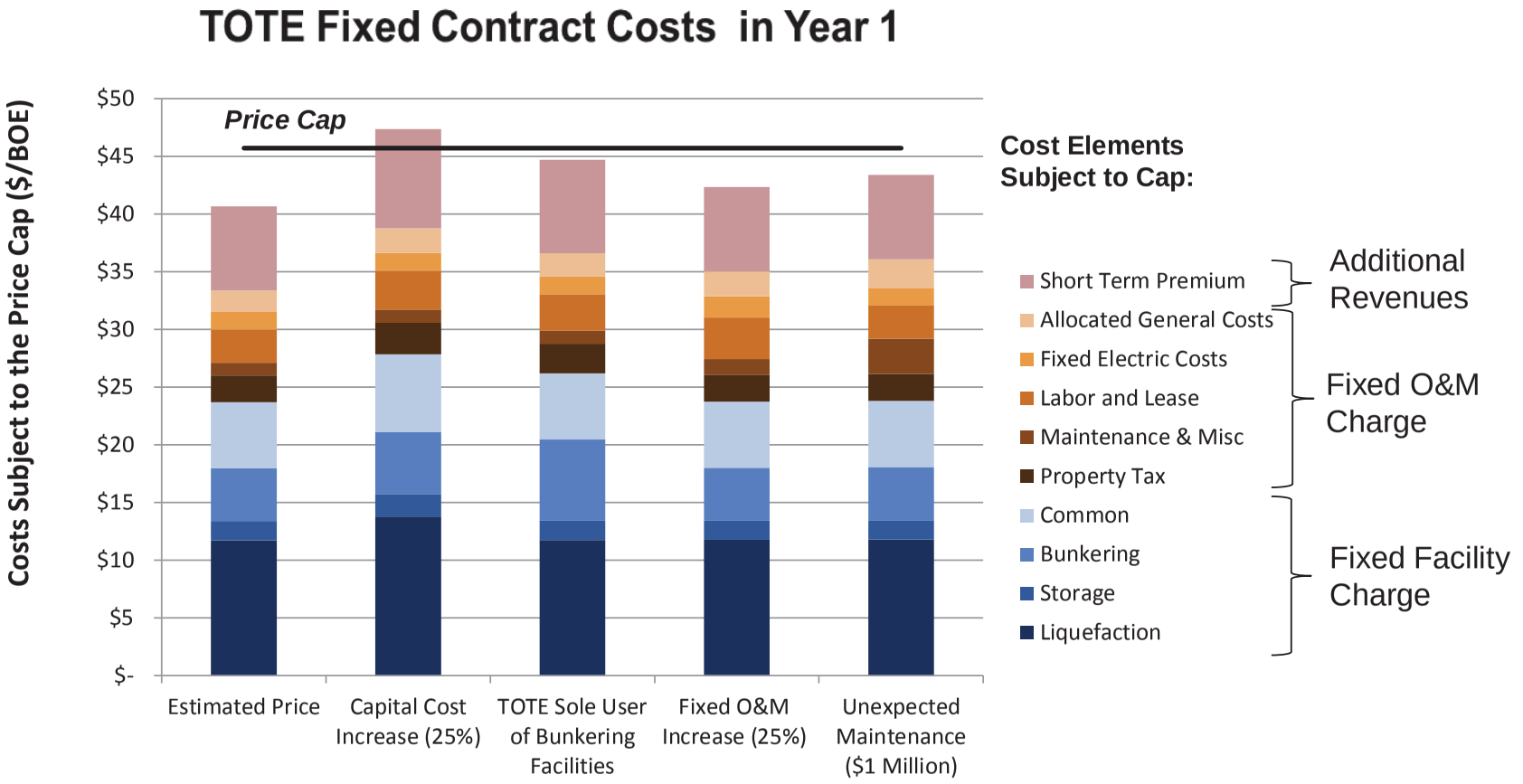
TOTE Price Cap Scenarios



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Facility Siting

Selected Site

- 33-acre site at the Port of Tacoma.
- Inside PSE's gas system.
- Situated on waterway.
- Located adjacent to TOTE.

Siting Requirements

- **PSE Resource Need:** Capable of supporting PSE peak-day needs.
- **Market Access**: Safe, efficient and dependable supply to LNG fuel customers.
- **Compliance:** Comply with setbacks and exclusion zones as defined in federal codes and national safety standards.

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Port of Tacoma Lease

Lease terms have been negotiated with the Port of Tacoma for a 33-acre site adjacent to TOTE's facility.

- **Term:** 25 years from date of first commercial operations.
  - 25-year renewal option, unilateral if 45% of capacity is used for marine purposes.
  - **Termination:** Anytime during the 2-year due diligence and permitting phase with notice and $50,000 termination fee; termination fee not applicable, if due to existing environmental contamination.
- **Pricing:** Varies by phase; requires security deposit of $2.9 million (one year's rent).
  - **Due diligence period:** $49,725 per month.[1]
  - **Construction period:** $146,000 per month.
  - **Operating period:** $212,445 per month.
  - **Volumetric charge:** $0.085/barrel for volumes sold; Port reserves right to establish LNG or other tariffs (but will collaborate with PSE and give 10-years' notice).
  - **Escalation:** Lease pricing components escalate annually at CPI.
- **Indemnification:** PSE must indemnify Port, if activities adversely inhibit normal Port operations.
- **Removal of Improvements:** Upon lease termination, Port reserves right to retain or have PSE remove leasehold improvements.

[1]*Increases $7,000 each month of extended due diligence (beyond initial 12 month period)*

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Project Budget

Development Budget		
PSE Labor and OH	$	2,193
Engineering and Analysis	$	4,474
Permitting & Legal Support	$	3,339
Communications/Outreach	$	391
Distribution Upgrades	$	1,126
Commercial and Regulatory[1]	$	1,100
Real Estate and Lease	$	766
Contingency	$	442
Project Development Sub-Total	**$**	**13,831**

[1]Commerical and Regulatory expenses are not capitalized

Budget assumes NO equity investment by marketing partner.

PROJECT BUDGET		
O&M Total	**$**	**1,700**
Development Budget (Capital)	$	11,605
PSE Labor and OH	$	5,800
Engineering & Legal	$	1,400
Real Estate and Lease	$	6,132
Geotechnical and Demolition	$	13,000
In Water Work	$	4,000
EPC Scope	$	181,792
Miscellaneous	$	6,900
Contingency	$	22,650
PSE Construction OH	$	7,830
Sales Tax	$	12,960
Tacoma LNG Facility Sub-Total	$	274,069
Gas Distribution Upgrades	$	49,041
Project Capital Total	**$**	**323,110**
AFUDC	$	46,841
GROSS PLANT	**$**	**369,951**

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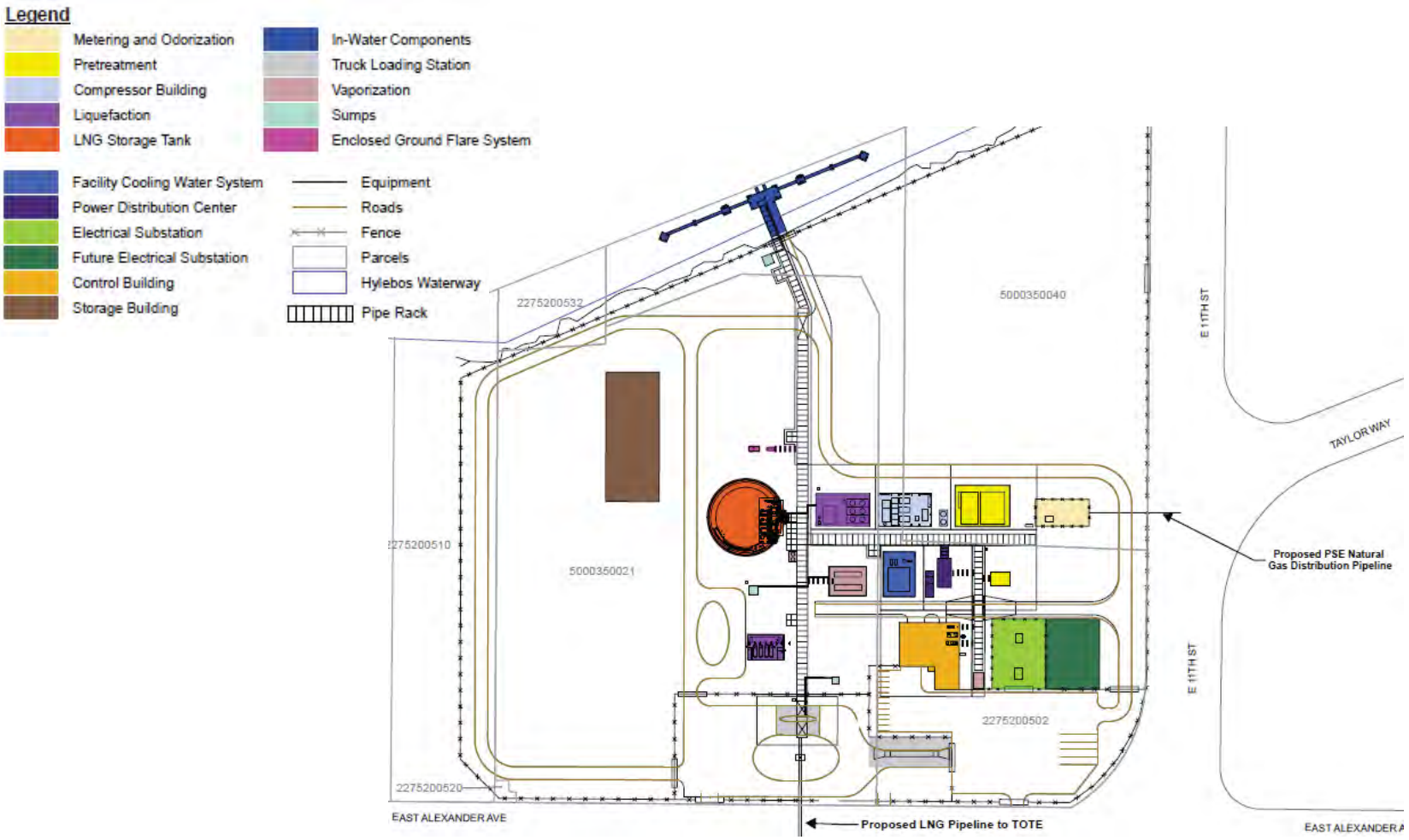
Allocation of LNG Plant

Facility Services	Capital Allocated to Each Service	Contributions from Customers Towards Services		
		PSE	TOTE	Marketer
Liquefaction	$81,591	10%	44%	46%
Storage	$82,378	79%	6%	15%
Bunkering	$21,165	0%	65%	35%
Truck Loading	$6,829	1%	0%	99%
Vaporization	$16,700	100%	0%	0%
Common Items	$65,406	45%	25%	30%
Gross Facility Contributions	$274,069	$118,610	$71,667	$83,792
Capital Allocation Ratio	100%	43%	26%	31%

CONFIDENTIAL per Protective Order in WUTC Docket No. UG-151663

Proposed Layout



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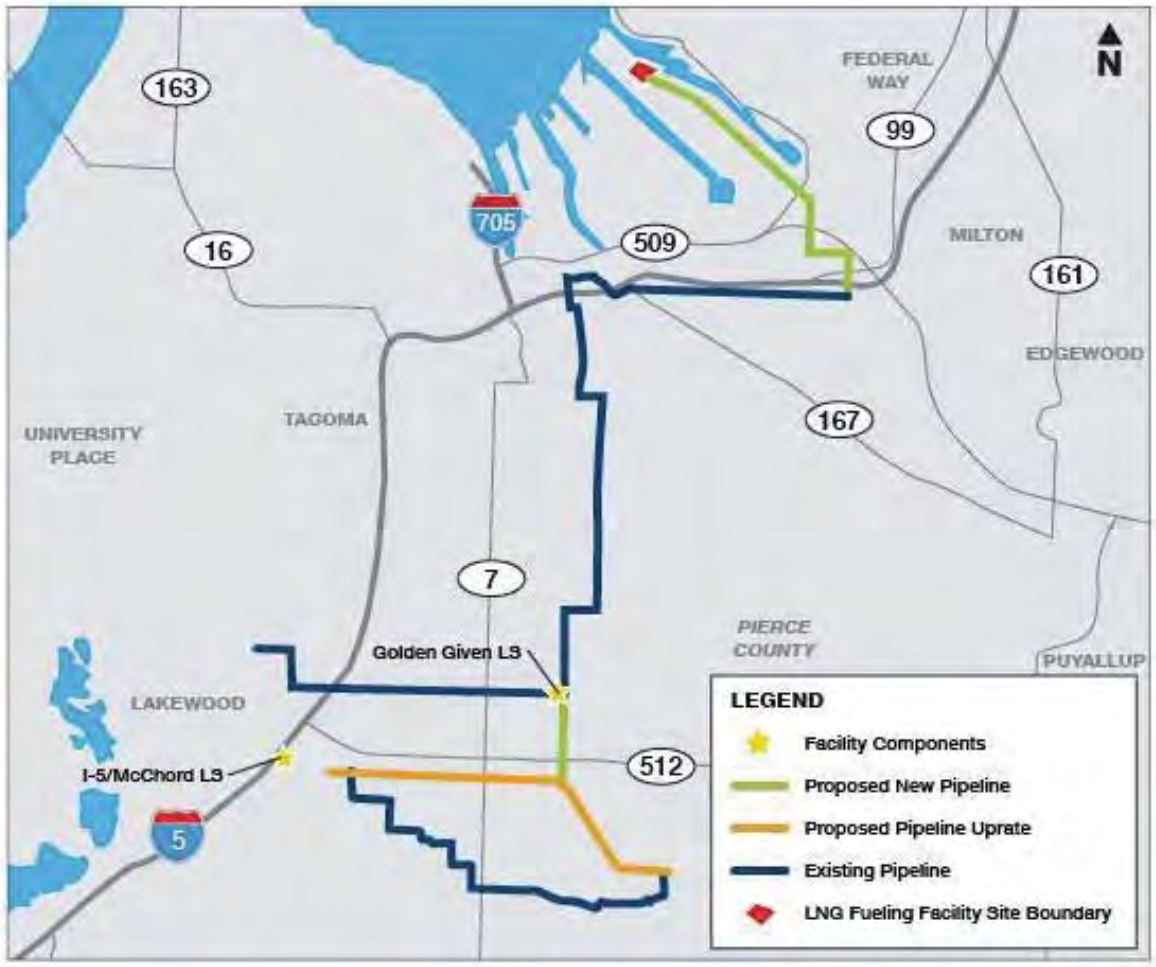
Gas Distribution System Upgrades



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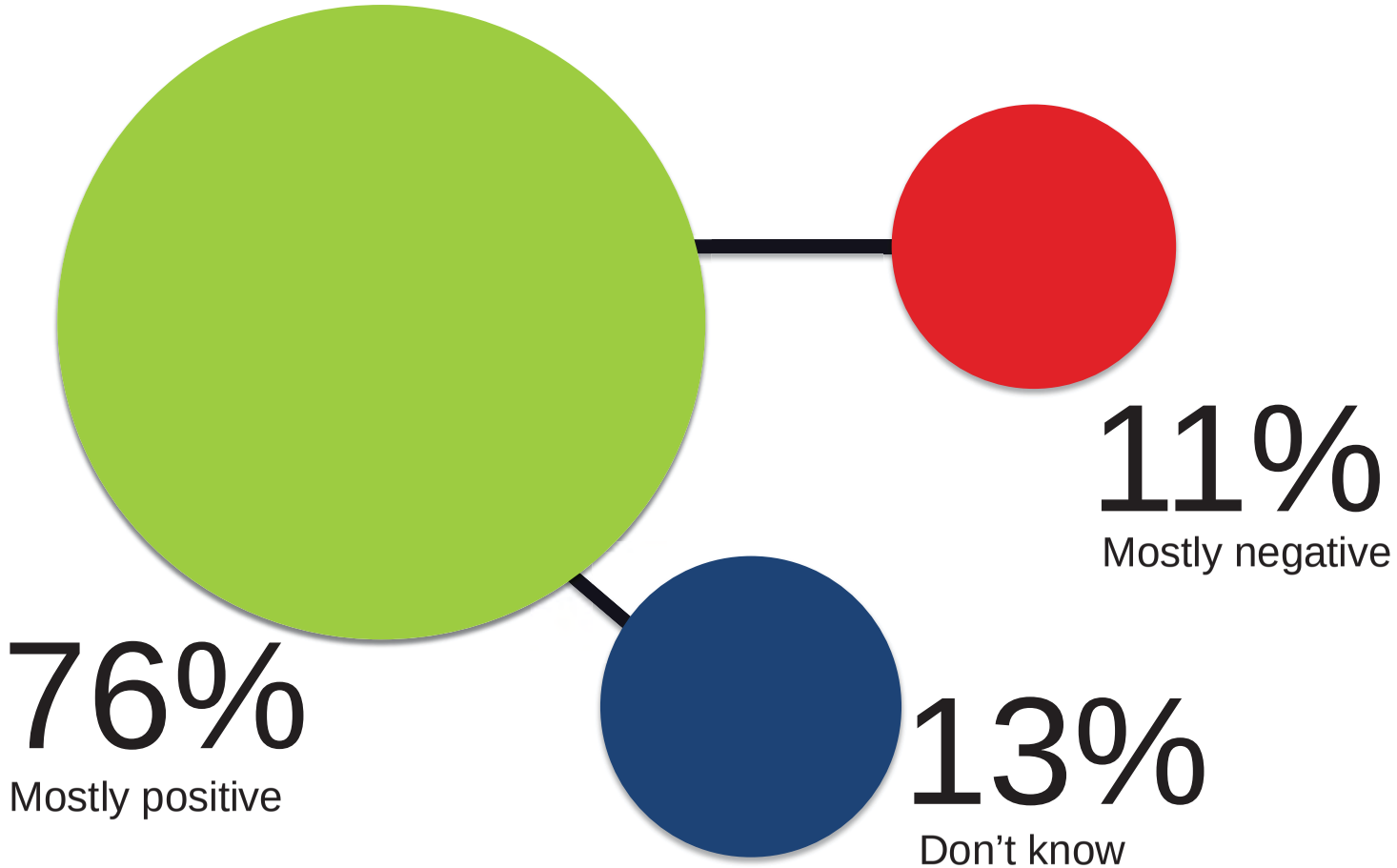
Reaction to LNG Development



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Communications Strategy

Key Messages

- Greater reliability for Tacoma/Pierce NG customers
- Local jobs and economic opportunity
- Environmental benefits (local air quality, marine and global)
- Safe, proven use of a domestically-sourced fuel

Key Risks

- Neighborhood group opposition (safety)
- Confusion with other Port NG projects (exports)
- Special interest group intervention (fracking)

Mitigation

- Process modeled after Thurston County effort
- Emphasis on local benefits (system reliability, economy, environment)
- Careful differentiation from other proposed facilities
- Communications focus on messaging, large audiences

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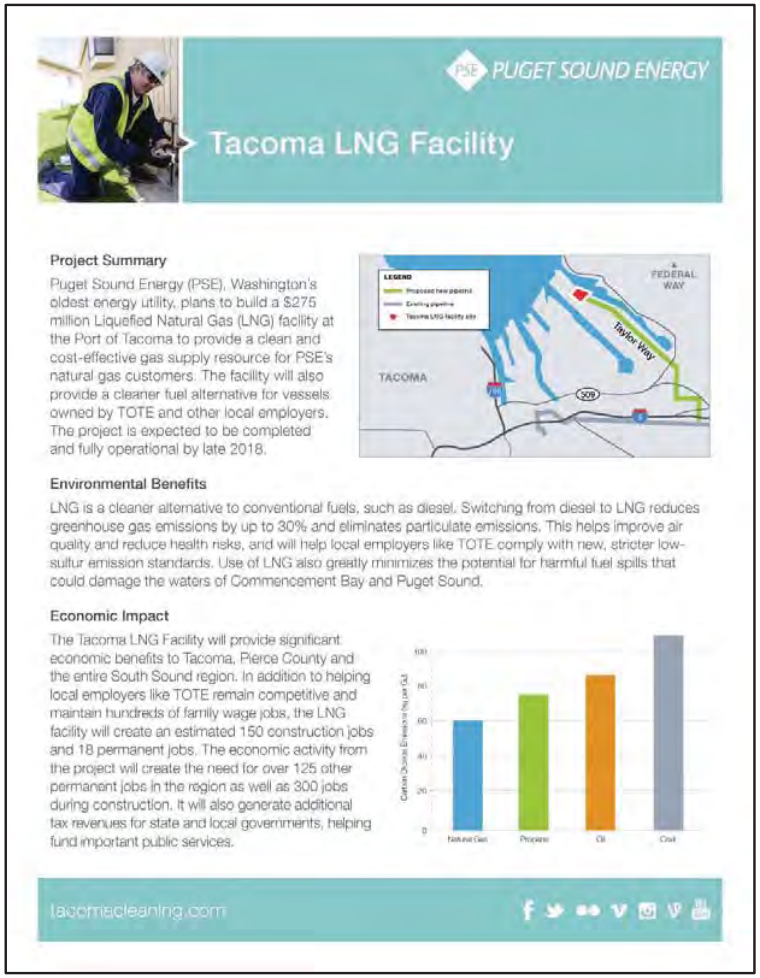
Communication Materials Examples



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Memorandum

July 23, 2014

To: PSE Board of Directors

cc:

From: Roger Garratt, Director Strategic Initiatives
Clay Riding, Director Natural Gas Resources

Subject: Updates to the July 2, 2014 Tacoma LNG Project Report to the Board of Directors

On July 2, 2014, PSE staff presented detailed information regarding the Tacoma LNG Project (the "Project") to the Board. The purpose of the meeting was to provide a review of the proposed Project prior to the Board decision meeting on July 30, 2014. The project team created an informational report to describe the development, construction and operations of the Tacoma LNG Facility (the "Facility") and associated upgrades to PSE's natural gas distribution system. Details included the commercial aspects of the Project, the development plan, anticipated financial performance, risks and mitigation plans, and an analysis of Project costs and benefits. The report concluded with a recommendation that at the July 30, 2014 meeting the Board authorize PSE to enter into a fuel supply agreement under which PSE would be obligated, subject to conditions precedent, to provide LNG to TOTE on a long-term basis.

Since the July 2 meeting, the project team has revised the report in response to questions and discussions raised by board members, and to incorporate project updates. The purpose of this memo is to summarize material updates, and provide copies of the revised report and affected exhibits.

Resolutions

Exhibit A (Resolutions) has been updated to reflect that under the FSA, PSE is exposed to liquidated damages of up to $7.5 million per year (as opposed to $10 million per year) in the event of a failure to deliver that is not caused by force majeure. Further, it recognizes that liquidated damages of up to $15 million for failure to complete the Facility by January 1, 2019, has been moved from the interim supply agreement to the FSA.

The resolution to authorize PSE to enter into an interim supply agreement with TOTE has been removed from the revised *Tacoma LNG Project Report*, *Exhibit A* and *Exhibit B (Presentation)*. The interim agreement has not progressed sufficiently to be executed. As currently envisioned, the interim supply agreement would not require specific Board approval, since it will be structured in a way that PSE has little or no contractual risk.

Project Structure and Marketing Partner

The *Tacoma LNG Project Report* and *Exhibit E* to the report *(Summary of Commercial Terms)* have been revised to include a more detailed discussion of the potential project structure with either a tolling customer or a co-owner, including WUTC regulatory oversight. Project structure drawings have been added to illustrate both potential scenarios. In addition, updates on discussions with potential marketing partners have been added. For increased clarity, we have strived to be more precise in our language associated with alternative options for the marketer role. The term "marketer" now refers generally to either a long-term tolling customer or a co-owner. Where the context requires it, we use the specific term: "long-term tolling customer" or "co-owner".

TOTE Pricing Mechanism for LNG Fuel

Exhibit E has been further revised to explain the TOTE FSA Price Cap Mechanism. Charts depicting various scenarios and risk sensitivities have been included.

Project Risks and Mitigations

Exhibit H (*Risk Analysis)* has been revised to summarize and describe both the inherent probability and magnitude, and the mitigated probability and magnitude of each listed risk. This is presented in both a matrix and a heat map. All risks identified as having a major or critical magnitude have an unlikely or extremely unlikely probability of occurrence post mitigation.

Risks with a possible or likely probability of occurrence have a minor or negligible magnitude post mitigation.

Resource Analysis

Exhibit N (Peak-Day Resource Analysis) has been revised to include the joint ownership scenario in the comparison of alternatives and sensitivities analysis. The analysis shows that under a joint-ownership structure, PSE customers will pay slightly more in the base case as compared to a structure where PSE owns 100% of the Facility, in exchange for reduced exposure to the risks outlined in the sensitivity analysis.

Financial Pro forma

Exhibit O (Financial Pro Forma) has been revised to account for a joint ownership structure where the Marketer's ownership interest includes the facilities needed to serve its capacity as well as half of the capacity under the TOTE contract. (The co-ownership scenario in the July 2, 2014 version did not consider the Marketer owning any facilities needed to serve TOTE.) This updated ownership structure has been added as a third set of financial statements in *The Projection* at the end of the exhibit.

Regulatory Matters

A new confidential attorney-client privileged memo from Steve Secrist to the Board of Directors has been prepared to discuss regulatory matters. The regulatory memo is dated July 23, 2014. It will be sent by separate cover and is not attached to this memo.

Sample Communication Tools

Exhibit K (Public Affairs and Communications) has been updated to include the latest sample communication tools for the Project. In addition to revising the Project fact sheet and website home screen capture, a new Frequently Asked Questions fact sheet is included at the end of the exhibit.

Presentation

The presentation has been revised where applicable to reflect the changes described throughout this memo. Additionally, new slides related to resource alternatives, risks, and engineering and construction matters have been added to clarify information.

Attachments

The following sections of the Tacoma LNG Project report have been revised since the Board of Directors' Meeting on July 2, 2014 and are attached for your review:

- July 30, 2014 Report to the Board of Directors: Tacoma LNG Project
- Exhibit A. Resolutions
- Exhibit B. Presentation
- Exhibit E. Summary of Commercial Terms
- Exhibit H. Risk Analysis
- Exhibit J. Permitting and Regulatory Matters
- Exhibit N. Peak-Day Resource Analysis
- Exhibit O. Financial Pro Forma

For a complete list of exhibits, refer to the exhibits list included in the attached *Report to the Board of Directors: Tacoma LNG Project* dated July 30, 2014.

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Report to the Board of Directors:

Tacoma LNG Facility

July 30, 2014 Update

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List of Exhibits

1. Executive Summary

The purpose of this Report to the Board of Directors ("Report") is to recommend approval to continue development of the Tacoma LNG Project (the "Project"), in accordance with the resolutions set forth in ***Exhibit A***. Specifically, approval will authorize PSE to enter into a long-term Fuel Supply Agreement ("FSA") to sell to Totem Ocean Trailers Express ("TOTE") liquefied natural gas ("LNG") supplied from the Tacoma LNG Facility (the "Facility"). Approval will also authorize PSE to enter into a long-term lease with the Port of Tacoma for the land upon which the Facility will be sited.

This Report, and this request for certain approvals, is anticipated to be the first of multiple decision-points for the Board. Due to the timing of the development process, management currently seeks approval of the contracts with TOTE and the Port of Tacoma. The Company will return to the Board later in 2014 and/or in 2015 to seek its approval of other aspects of the Project. Upon completion of a tolling or joint-ownership agreement with a third-party LNG fuel Marketer, management will bring such agreement to the Board for its consideration. Also, after issuance by the relevant agencies of environmental permits authorizing construction of the Facility, management will seek the Board's approval of the construction of the Facility and authority to execute the requisite engineering, procurement and construction ("EPC") agreement with the lead contractor. In the event that construction of the Facility does not proceed, for whatever reason, the contracts put forth for approval at this time are terminable by the Company, and in such event would leave the Company with relatively limited exposures, as detailed elsewhere in this Report.

This Report describes the Project, which includes development, construction and operations of the Facility and associated upgrades to PSE's natural gas distribution system (see ***Section 2*** for additional details). Details include the commercial aspects of the Project, the development plan, anticipated financial performance, risks and mitigation plans, and an analysis of Project costs and benefits as conducted by PSE's Natural Gas Resource, Strategic Initiatives and Project Management teams. The report concludes with a recommendation to authorize PSE to enter into fuel supply agreements under which PSE will be obligated, subject to conditions precedent, to provide LNG to TOTE on a long-term basis.

PSE anticipates that regulatory and permitting approvals will be received by Q3 2015 and the Project will be in-service in Q4 2018, assuming there are no appeals or other legal action during the permitting and development phase. The estimated cost of the development phase is $14 million and the total project capital cost is estimated to be $323 million.

2. Project Description

The Project will enable PSE to liquefy natural gas and to store and dispense LNG. The Project will be an integral part of the PSE gas business by providing additional peaking capability and be fully regulated by the WUTC. Additionally, PSE will secure long-term commercial contracts to sell LNG to customers who will use or market the LNG as a fuel. Project components include development, construction and operations of the LNG Facility, and associated upgrades to PSE's gas distribution system.

What is meant by Tacoma LNG Facility vs. Tacoma LNG Project?

Tacoma LNG Facility (the "Facility")

- Buildings, gas processing, storage and support equipment, and foundations located on PSE's leased site at the Port of Tacoma
- Underground LNG fuel line connecting the LNG tank to TOTE's berthing area, marine fueling system and in-water platform at TOTE's site
- LNG tanker truck loading racks
- Ground lease from the Port of Tacoma

Tacoma LNG Project (the "Project")

- Development, construction and operations of the Facility
- Improvements to PSE's gas distribution system needed to support the Facility
- Commercial contracts to sell LNG to customers
- Regulatory approvals to operate the Facility and sell LNG as part of a regulated service

The Facility

The Facility will be located at the Port of Tacoma, adjacent to the Hylebos waterway, on the corner of East 11th Street and Alexander Avenue East (see ***Figure 1*** on page 9). It will be capable of liquefying 250,000 gallons of LNG per day and storing approximately 8 million gallons of LNG on site. The Facility will be capable of injecting 66,000 Dth/day of vaporized gas and diverting 19,000 Dth/day of gas into PSE's distribution system to provide 85,000 Dth/day of peak-day supply. The Facility will also dispense LNG to other end-use customers via a tanker truck loading system and marine loading facilities located on the water.

Northwest Pipeline's ("NWP") interstate system will deliver natural gas to PSE's distribution system, which will in turn deliver the gas to the Facility. PSE's distribution system will require improvements to support the Facility, including a pressure increase on an existing section of pipe, constructing a new limit station, modifying an existing gate station and adding approximately five miles of new higher pressure pipe. The increase in operating pressure on the

existing pipeline (from 250 psig to 500 psig) is a planned system upgrade to be implemented in 2017. The upgrade process begins in 2014 with a Pressure Authorization Request to the WUTC. Electricity for the Facility will be procured at Mid-C based market prices and will be wheeled through Tacoma Power's 115 kV transmission system. The main energy consumer at the Facility will be the liquefaction compressor, which will draw approximately 14 MW of electricity.

See ***Exhibit C*** for a more detailed description of the Project.

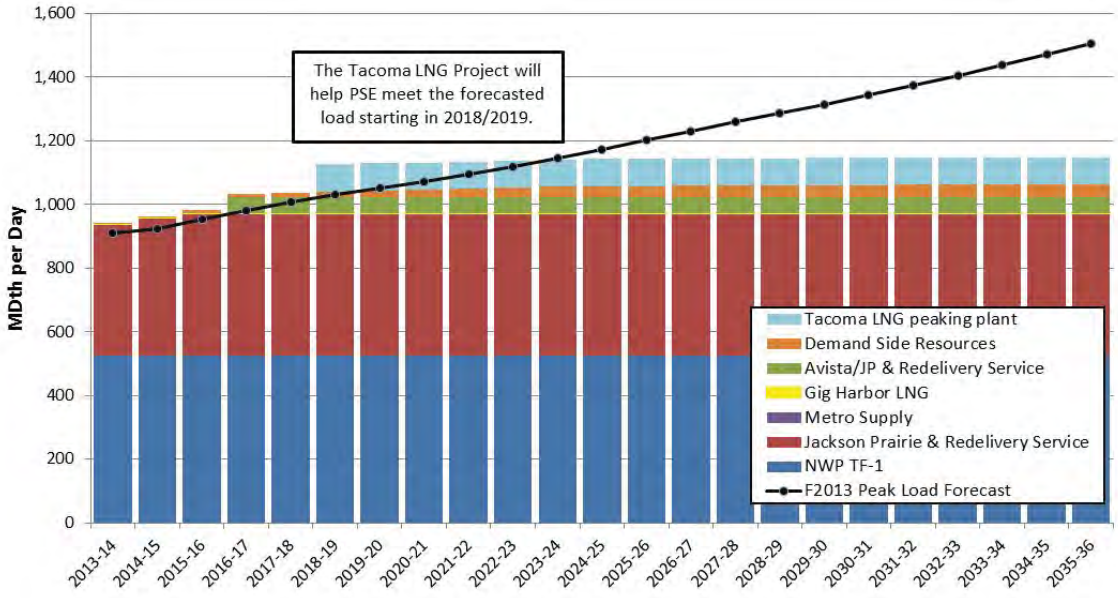
Figure 1. Tacoma LNG Facility Plot Plan

3. Determination of Need

PSE Resource Need

PSE's need for new peak-day resources to serve its retail natural gas customers is set forth in the 2013 Integrated Resource Plan (IRP). The IRP considered expected customer loads, including the effect of demand-side resource programs, based on expected regional economic growth. The 2013 IRP demonstrates a need for peaking resources beginning in 2017 that is expected to grow to a deficit of approximately 150,000 Dth per day by 2022, and 200,000 Dth per day by 2026. PSE will meet the resource needs with (i) additional Jackson Prairie storage (50,000 Dth/day) purchased from Avista Utilities and Williams-Northwest Pipeline redelivery transportation service; (ii) the Tacoma LNG Facility (85,000 Dth/day); and (iii) upgrading the SWARR propane-air facility (30,000 Dth/day; refurbishment is currently under evaluation). ***Figure 2*** shows the most recent load resource balance including the Tacoma LNG Project.

Figure 2. PSE's Peak Gas Resource Need (Tacoma LNG Project shown in light blue)



PSE evaluates various resource alternatives available to reliably meet customer demand and determines which resource, or set of resources, most cost effectively meets such customer demand. PSE evaluated the Tacoma LNG Project in comparison with long-haul interstate pipeline capacity as well as regional underground natural gas storage service and interstate pipeline storage redelivery service. Since interstate pipeline capacity in PSE's service territory is

generally fully subscribed, especially considering the level of PSE's resource needs, the resource alternatives analysis evaluated expansion of the regional pipeline grid. Due to the significant revenue contribution from marine and large scale truck fuel markets, the Tacoma LNG Facility is selected as a least-cost resource in PSE's analyses of resource alternatives.

A more detailed summary of the analysis of peak-day resource alternatives can be found in ***Exhibit N***.

Other LNG Customers

While the primary purpose of the Tacoma LNG Facility is to provide peak-day supply for PSE's retail natural gas customers, the Project's benefits are significantly enhanced by serving additional markets. LNG facilities are capital intensive and, therefore, costs for all customers are reduced when facilities are fully deployed. The peak-shaving component of the plant requires significant storage and relatively small liquefaction capacity, while the marine, heavy-duty trucking and other fuel markets require significant, steady liquefaction and minimal storage. By combining these complementary load profiles, PSE can optimize the Facility and minimize peaking-resource costs for PSE's retail natural gas customers. The Facility will be fully regulated by the WUTC and PSE's regulatory strategy is consistent with state policy support for LNG as a transportation fuel.[1]

Totem Ocean Trailers Express (TOTE)

A fuel supply agreement has been negotiated with TOTE and will be executed upon Board approval (see ***Exhibit E***). TOTE is a shipping company that transports approximately 30 percent of all consumer goods shipped to Alaska. It operates two Orca class ships between the Port of Tacoma and Anchorage on a regimented schedule of sailings departing from Tacoma every Wednesday and Friday evening. TOTE will consume more than 39 million gallons of LNG annually, which is approximately 44 percent of the LNG produced at the Tacoma LNG Facility. TOTE is fully owned by Saltchuk Resources Inc., a privately held investment group based in Seattle. TOTE's decision to use LNG (as opposed to a petroleum based fuel) has been driven by regulatory and economic factors. The following section, ***Market Drivers***, discusses these factors in further detail.

[1] If PSE jointly owns the Facility with a co-owner, only PSE's ownership interests and activities would be WUTC regulated, as further detailed in this report.

Marketer

In order to mitigate the merchant risk associated with the Facility, PSE intends to have a third party (or parties) under contract prior to seeking Board approval for the construction of the Facility, such that all or nearly all of PSE's portion of the Facility is contracted. Much of the demand for LNG fuel is likely to come from markets unaccustomed or unwilling to enter into long-term contracts for fuel. This creates an opportunity for an aggregator, or "Marketer", to take on a long-term contract with PSE or an ownership stake in Facility to market and distribute the LNG through shorter contracts with multiple buyers. PSE has had discussions with several parties who could fulfill this role and has targeted BP and Shell. These companies bring strong balance sheets, an existing marketing presence in transportation fuels, natural gas resources, and strategic value. Either company will likely want to invest equity in the Facility, which would dilute PSE's investment, but mitigate some of PSE's marketing and regulatory risks. Challenges with signing up BP may stem from a high hurdle rate for investment decisions and the need for a line of sight on Facility subscription. With Shell, an arrangement with PSE offers the opportunity to enter the Northwest market with a relatively modest investment compared to the larger facility they have been contemplating at an alternative site in the Port of Tacoma. Challenges with Shell may arise from their corporate culture, which may be averse to a minority ownership share. In getting to this point, PSE has considered other potential partners including: Blu, Clean Energy, Tenaska, Linde and LNG America.

Market adoption rates, or the perception thereof, and concerns regarding competition from Canadian LNG sources may impact PSE's ability to contract a Marketer. In addition, some potential marketers have expressed concern regarding gas transportation costs, since those costs include both interstate pipeline tariffs and PSE distribution charges. That said, PSE's Port of Tacoma location will provide the lowest cost LNG to marine customers in Tacoma and Seattle. The location allows for ready access to marine markets with efficient bunkering capability, avoiding the cost and logistical challenges of transporting bulk LNG to the water.

The Facility deal structure and the amount that PSE requests to be put into rates will depend on whether PSE's marketing partner ends up as a co-owner or a long-term tolling customer. As a result, PSE will wait to request WUTC approval of its LNG fuel supply service tariff until the structure and associated agreements have been finalized.

Figure 3 depicts the deal structure where PSE's marketing partner is a co-owner and further depicts the situation where PSE has partially assigned half of the TOTE FSA to this party. Under this arrangement, PSE and the co-owner would own the Facility as a tenancy-in-common. Based on current projections, PSE's ownership share would be approximately 56% and only PSE's services and sales would be regulated by the WUTC. As between PSE and the co-owner,

ownership and capacity rights and obligations related to liquefaction, storage, bunkering, truck loading, and vaporization would be specified in the ownership and operations agreement.

Figure 3. Project Structure – Joint Ownership

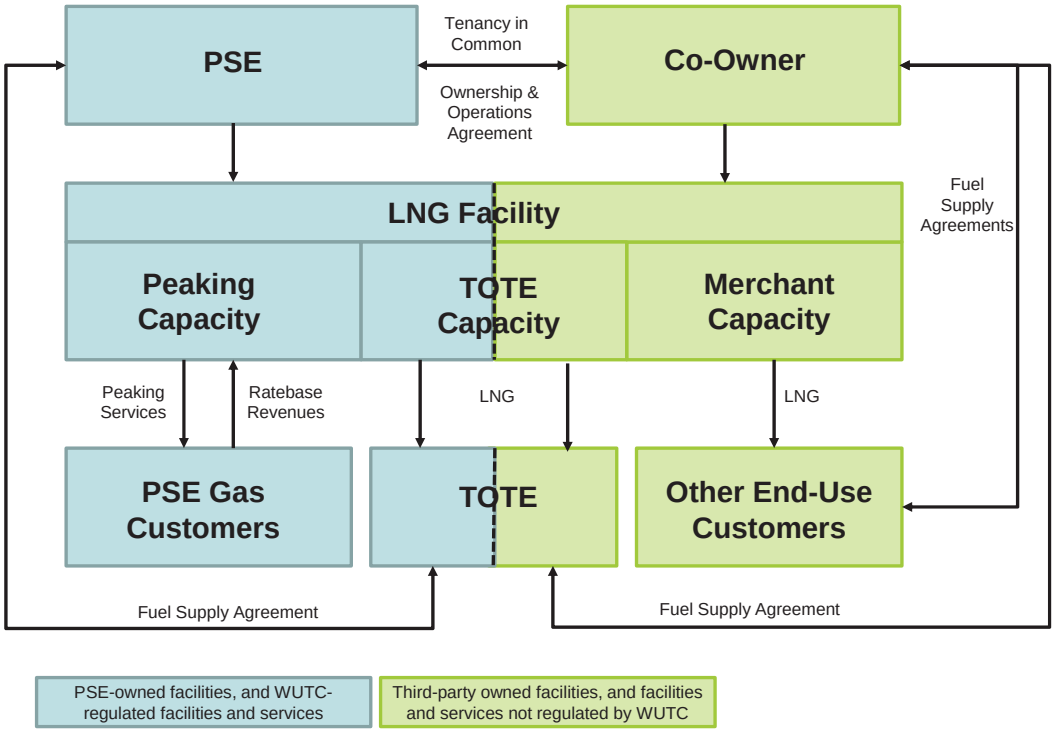
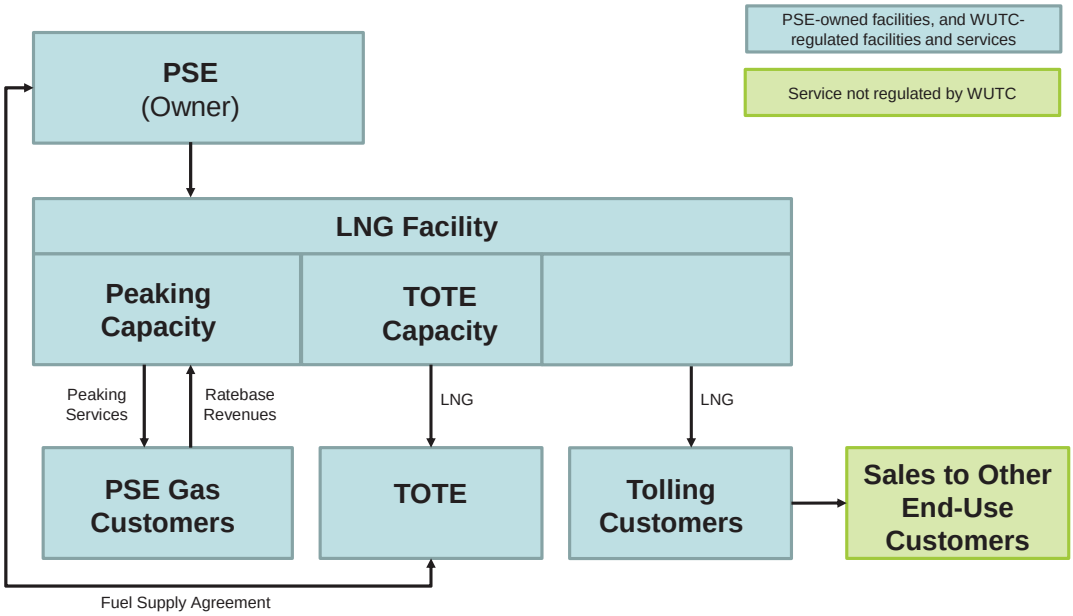


Figure 4 depicts the deal structure where PSE's marketing partner is a long-term tolling customer. Under this arrangement, PSE would own the entire Facility and the entire Facility would be regulated by the WUTC. Only the long-term tolling customer's sales to end-use customers would fall outside the scope of WUTC regulation. The long-term tolling customer would have specified capacity rights and obligations related to liquefaction, storage, bunkering, and truck loading and the agreement would employ cost-of-service pricing. The customer would deliver natural gas to PSE's interconnection point with the interstate pipeline system. The agreement would include a short-term premium for contract terms of less than 25 years. A term of at least 20 years would be targeted, but a 15-year term may be required in the current market. It is further possible that rather than a long-term tolling agreement, this party could enter into a long-term fuel supply agreement, similar in form to the TOTE contract, including a short-term premium for contracts less than 25 years. In this arrangement, PSE would be responsible for gas supply and transportation.

Figure 4. Project Structure – Tolling Customer



As a fallback to a marketing partner, either a co-owner or long-term tolling customer, PSE would seek to contract with one or more large end-use customers in order to subscribe the Facility. PSE has been in discussion with other entities interested in entering into long-term LNG supply contracts and able to serve as an additional anchor customer. These parties are either shipping or marine customers, or utilities that cannot be served by interstate pipelines. They include Horizon, Matson and Hawaiian gas and electric utilities. Contracts with end-use customers would be similar in form to the TOTE FSA and would fall under the WUTC-regulated tariff.

Market Drivers

The success of PSE's Marketer or other end-use contracts and the potential for plant expansion depends on the success of the LNG market as a whole. There are three factors driving the market for LNG as fuel:

- ***Economic.*** Recent development of unconventional gas resources has stabilized the cost of natural gas. At the same time, increasing global demand has increased the cost of diesel and other petroleum-based fuels. Wood Mackenzie (an energy sector consultant commissioned by PSE) studied these market factors and determined that the wide price spread between natural gas and oil (approximately $15/MMBtu) is sustainable. In fact, Wood Mackenzie

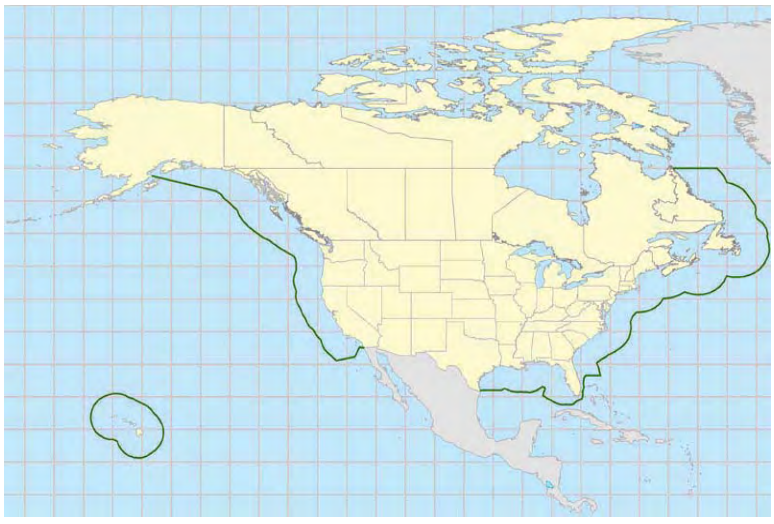
concluded that it would be difficult to imagine a scenario where a significant spread was ***not*** sustained on a long-term basis over the study period (see ***Exhibit S***).

- ***Regulatory.*** Regulators have increasingly looked to natural gas to replace petroleum-based fuels in order to reduce pollution and increase air quality. The California Air Resource Board (CARB) recently passed rules on Low Carbon Fuel Standards (LCFS) which require fuel consumers to transition to lower carbon fuel alternatives including natural gas.

  In 2010, the International Maritime Organization (IMO) approved the North American Emissions Control Area (ECA), establishing more stringent emissions standards within 200 miles of the US and Canadian coast (see ***Figure 3*** on page 14). The Environmental Protection Agency (EPA) is responsible for administering vessels operating in the ECA. Ships operating within the ECA were required to reduce the sulfur content of their fuel to one percent in August 2012 and must further reduce it to 0.1 percent by 2015. Vessel operators can meet the new standard by switching to lower sulfur diesel fuels, installing scrubbers or transitioning to a cleaner fuel, such as LNG. Many operators, including TOTE, are finding that LNG is the preferred alternative.

- ***Environmental.*** When compared to diesel or marine fuel oil, LNG has significant environmental benefits. Emissions from natural gas do not contain particulates or SO_x. LNG has been embraced by the American Lung Association as a "Clean Air Choice". Carbon dioxide emissions are also greatly reduced. Using LNG in long-haul trucking operations can result in a 25 percent reduction of CO_2 emissions.

Figure 3. North American Emissions Control Area

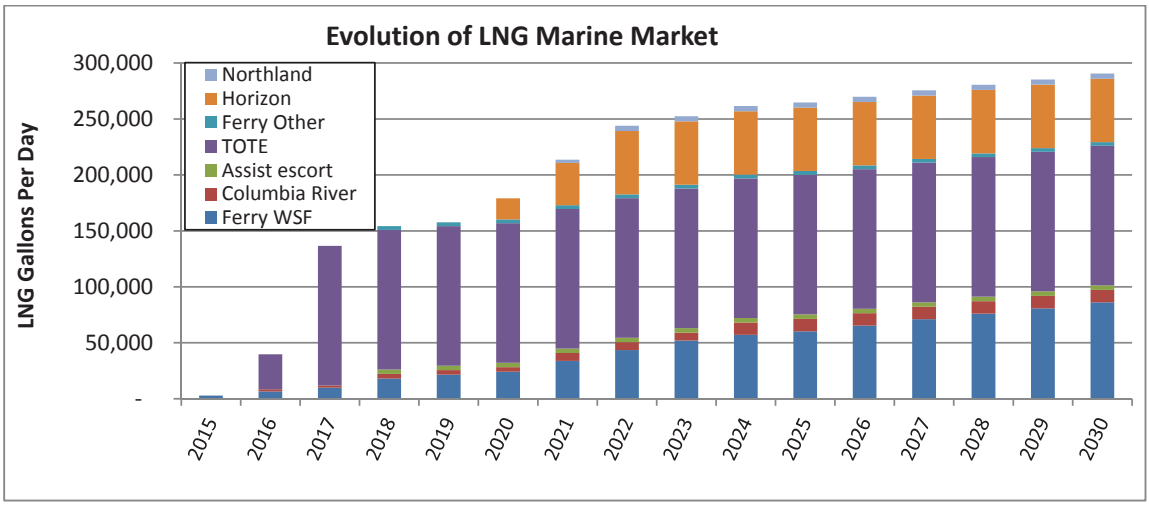


In order to fully understand this market, PSE retained Concentric Energy Advisors to assess the regional market potential for LNG in trucking, maritime and industrial applications. Concentric also provided a view of market drivers and insights into how the demand for LNG will develop over time. Concentric's full report can be found in ***Exhibit Q***.

Evolution of the Marine Market

Growth in the demand for LNG in the marine market will be driven by ECA and IMO requirements, which phase in over the next several years, resulting in higher fuel costs to the maritime industry. To assess growth in this market, Concentric looked at all potential candidates for conversion. Concentric's analysis in the marine market was relatively conservative, considering only vessels that burn a large amount of fuel and operate mostly or entirely within the North American ECA (200 miles from the coast of the US and Canada). The cruise industry could also represent substantial demand; however, at this time, the industry has not embraced LNG as an alternative. The results of Concentric's analysis of the maritime market are shown in ***Figure 5***.

Figure 4. Demand for LNG by the marine vehicles industry in PSE's market area[2]



It is important to note that the study specifically excluded shipping companies in the Hawaii trade, such as Matson and Horizon (the Horizon volumes above are for its Alaska trade), two entities that have subsequently announced they are purchasing LNG-ready ships or converting existing vessels. Both Matson's and Horizon's Hawaii trade consumption is similar to TOTE's volumes.

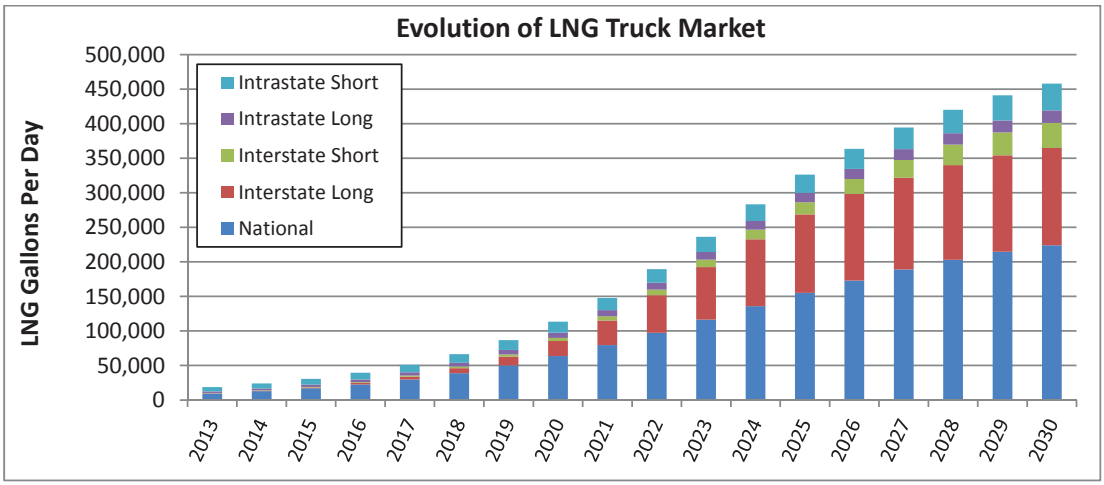
[2] Source: Concentric Energy Advisors

Evolution of the Heavy Duty Truck Market

The heavy-duty trucking demand for LNG will be driven by the price spread between low-sulfur diesel and natural gas. As market interest in LNG increases, engine and truck manufacturers will begin to roll out more LNG tractors and engines, which will help drive down costs. The first adopters of LNG trucks in the region are likely to be large interstate fleets (such as UPS) that can afford to convert their trucks and will realize savings due to high consumption. As this market develops, retailers like Clean Energy and Flying J, will begin to offer LNG at some key stations along interstate corridors. Blu LNG opened a station in Sumner, WA in Q4 2013. These stations will expand the market to smaller interstate and regional fleets that cannot afford the capital for a dedicated LNG station.

Concentric modeled fleet characteristics for all heavy duty combination trucking fleets that operate in Washington. By modeling fleet fuel consumption, diesel and LNG price forecasts, and conversion costs, Concentric projected when it would be economical for fleets to convert to LNG (assuming a 15 percent hurdle rate).

Figure 5. Demand for LNG by the trucking industry in PSE's market area[3]



[3] Source: Concentric Energy Advisors

4. Project Development

This section of the report summarizes PSE's past, current and future development work including siting, permitting, community outreach, plant engineering and financial modeling. To date, PSE has negotiated a ground lease for the Facility at the Port of Tacoma; completed a full front-end engineering and design ("FEED") study with Chicago Bridge and Iron ("CBI"), a leading firm in the design and construction of LNG facilities; and assembled an engineering team of consultants in the geotechnical, marine, and LNG sectors. (See ***Engineering and Construction*** on page 19 for more information.) PSE has also garnered support from local and state elected officials and has successfully supported legislation that achieved tax parity between natural gas and diesel as a transportation fuel. Permitting studies are being prepared by CH2MHill and permit applications will be submitted in Q3 2014. In addition to developing the Facility at the Port of Tacoma, the Project requires upgrades and improvements to PSE's gas distribution system.

Siting

PSE conducted an exhaustive site review of locations throughout Puget Sound. There were three primary siting criteria considered in the analysis:

1. Appropriate placement on PSE's gas distribution system to effectively provide peaking services;
2. A parcel large enough to support regulatory and other siting requirements;
3. Proximity to marine and other fuel markets.

Selected Site

After exploring multiple locations, the development team selected a 33-acre parcel at the Port of Tacoma as the most suitable site for the Facility. The site is located on the Hylebos waterway, on the corner of East 11th Street and East Alexander Avenue. The site will be connected to PSE's North Tacoma high pressure system with approximately four miles of new 16-inch pipe, allowing the plant to inject gas directly into PSE's distribution system.

The Pipeline and Hazardous Materials Safety Administration ("PHMSA") is a branch of the U.S. Department of Transportation that is responsible for regulating LNG facilities. PHMSA defines siting requirements based on two criteria. The first criterion is that in the event of a spill, all vapor must be contained on the property and cannot drift onto neighboring property. The

second criterion is that in the event of a fire, heat from the fire at the property line must be below a prescribed level. To satisfy these PHMSA requirements, the parcel must be appropriately sized. There are few parcels in areas zoned for industrial use that are both large enough to satisfy these regulations and capable of supporting PSE's resource needs.

The selected site at the Port of Tacoma is ideally situated for serving LNG fuel markets. Providing service to these LNG fuel customers optimizes use of the Facility and generates revenues that significantly lower the cost of the peaking resource for PSE's gas customers. The site is located across Alexander Avenue from the TOTE terminal. This location will allow PSE to meet TOTE's needs directly and at an inherent cost advantage over a network of LNG barges and bunker stations, which may be available in the future. The Facility will also be able to serve other marine customers from this location.

The Port of Tacoma is also centrally located to serve regional trucking demand concentrated in the Tacoma, Federal Way and Kent areas. The selected site has access to an existing rail spur that connects to Tacoma Public Rail's system. While LNG is not currently railed in the U.S., this may prove a viable option for transporting large volumes of LNG in the future.

The siting analysis and characteristics of the selected site are discussed in detail in ***Exhibit I***.

Port of Tacoma Lease

PSE will lease the 33-acre project site from the Port of Tacoma under a 25-year lease with extension rights for a second 25-year term, provided certain conditions are met. Details of the lease can be found in ***Exhibit I***.

Permitting

For a discussion of the permits and approvals required for the Tacoma LNG Project, refer to the confidential attorney-client privileged memo from Steve Secrist to the Board of Directors, dated July 2, 2014.

Community and Government Outreach

A coordinated communications and outreach strategy has been developed for local and state government, the Tacoma community, special interest groups, commercial partners, regulators and PSE customers. The plan, which includes a discussion of potential risks and mitigations, is designed to maintain and grow public support for the Project by educating stakeholders about the regional benefits of LNG and the Project. Plan details are summarized in ***Exhibit K***.

Engineering and Construction

The Facility will be engineered and constructed using a combination of two execution methodologies to obtain the best value for PSE. The Facility work (including pre-treatment, liquefaction, storage tank, truck rack, vaporization system, and balance of plant) will be performed in accordance with an engineering, procurement and construction ("EPC") contracting methodology. Site preparation (including demolition, ground improvement, and underground utilities) and marine facilities construction will be performed by PSE using a design-bid-build contracting methodology.

PSE considered several methodologies for engineering and constructing the Facility before selecting a strategy. Ultimately, PSE relied upon input from national engineering firm CH-IV and on market research in its determination of the preferred option.

Engineering, Procurement and Construction

An EPC contract is a firm, fixed price contract with performance guarantees and liquidated damages. In exchange for control of all elements of the project (engineering, procurement, and construction), the EPC contractor retains cost and schedule risks during project delivery. Because a single entity is responsible for both design and construction, a more active consideration of constructability and construction efficiency in the design of the Project is more likely than it would be with alternative contracting methodologies, such as design-bid-build, or even design-build.

PSE considered a pool of seven candidate firms and selected Chicago Bridge & Iron ("CBI") to perform an initial Front End Engineering Design ("FEED") study that developed the Facility to a conceptual level and provided budgetary pricing. CBI completed this work, which culminated in an open book price review and firm bid price in fall 2013. This design and pricing has been used to support commercial, permitting and regulatory efforts. In the coming months, remaining design uncertainties will be resolved and the design of the Facility will be frozen to allow CBI to re-bid all material and sub-contract elements, in order to present a final bid for open book review prior to signing an EPC contract.

CBI is an international leader in LNG plant and tank engineering and construction and has four decades of experience. CBI has designed and built peak-shaving LNG plants around the world. Projects have included complete peak shaving facilities—including pre-treatment, liquefaction, storage and send-out systems; stand-alone liquefaction systems; plant revamps; retrofits; and expansions. In addition, CBI has extensive experience with the key processes and equipment that are utilized in baseload natural gas liquefaction plants, including gas metering, CO_2

removal, dehydration, liquefaction, boil-off/flash gas recovery, gas vaporization, truck loading and unloading and fire protection. CBI is one of the leading contractors for LNG storage and loading systems. This experience includes the design and construction of approximately 220 LNG storage tanks, the majority were double-wall single containment storage tanks up to 200,000 cubic meters. In addition to the LNG sector, CBI provides engineering and construction solutions in the petrochemical, wastewater treatment, mining, nuclear power, and heavy infrastructure sectors with nearly 50,000 employees worldwide.

In order to ensure a competitive bid for the EPC contract, PSE is engaging Black & Veatch to perform a parallel FEED study. This FEED will be based upon the same design criteria used for the proposed CBI plant and will provide another price point for the Facility. Black & Veatch was a top contender for the original FEED contract and has experience designing and building LNG facilities globally. The value of having competitive options for the EPC contract is significant, particularly when compared with the relatively low cost of a second FEED study (approximately 0.5 percent of the plant cost).

CBI presented a proposed contract format as part of its FEED study deliverables in fall 2013. Black & Veatch will provide a competing contract proposal at the end of its FEED study. PSE will have an open book review of the EPC contractor's pricing package prior to contract signing. This gives PSE the ability to review all material and subcontractor bids, EPC contractor contingency (and methodology for determining it), and markup.

After selecting the winning EPC proposal, the EPC contract will be executed and Notice to Proceed will be issued once permitting is complete and the Board approves a subsequent request. This is expected to occur in Q3 2015. ***Exhibit L*** summarizes the contract features indicative of CBI's proposed contract form. These features may be amended during contract negotiations with either potential EPC contractor.

PSE will select an EPC contractor prior to final Board approval of the EPC contract. Details about the selection decision and negotiated contract terms will be included in a Board package at that time.

Work Performed by PSE

PSE will perform all design and construction work necessary to ready the site for the EPC contractor (site demolition, soil improvement, and underground utilities), as well as all marine work (TOTE loading platform). PSE is choosing to perform these project elements because they are outside the value-added capability of an EPC contractor and can be more cost effectively managed by PSE using local resources.

The list below summarizes the team PSE will use to complete its design and construction work, as well as each firm's scope of work. Many of the firms have experience with LNG facility development and several have experience working with the Port of Tacoma and/or other engineering and consulting firms retained by PSE for the Project. The qualifications and benefits of each firm are discussed in detail in ***Exhibit L.***

- ***GeoEngineers (Geotechnical Design).*** Develop ground improvement strategies to meet federal and local seismic design requirements, coordinate structural and foundation requirements with the EPC firm and provide contracting and quality assurance support for the execution of the ground improvement program.

- ***Moffatt & Nichol (Marine Design).*** Develop a demolition plan for the existing timber pier and design a new concrete pier on the Hylebos Waterway, design a new loading platform on the Blair Waterway, and marine construction oversight as necessary.

- ***Sanborn Head & Associates (Owner's Engineer).*** Review EPC design work product, perform a peer review of GeoEngineers work product, assist with EPC contract preparation, and provide support on permitting and community outreach efforts, as needed.

- ***Jim Lewis LNG Expertise, LLC (LNG Consultant).*** Work on select engineering tasks and regulatory discussions.

- ***Tacoma Power (Substation Design/Construction).*** Design and construct the utility substation located on the site. Tacoma Power has already completed an initial preliminary power supply study and will be further engaged as the Project moves forward.

- ***Proposed Firms – Site Civil Design.*** PSE has received proposals from four local civil engineering firms to work on the design of the site storm water management system, as well as modifications to the fire water and sanitary sewer systems. The contract will be awarded as the Project progresses.

Construction work performed by PSE has not yet been contracted. This includes site soil improvement work, which can only be performed by a limited number of specialized contractors, and site demolition and underground utility work, which can be performed by a number of general contractors in the Seattle-Tacoma area. See ***Exhibit L*** for additional details about the bid and selection process for the construction work.

Gas Distribution Upgrades

The PSE distribution system will require improvements to support the Tacoma LNG Facility, including approximately five miles of new pipeline in the cities of Fife/Tacoma and Pierce County, a new limit station and existing gate station modifications. A detailed discussion of the gas distribution upgrades can be found in ***Exhibit M***.

The design, engineering and execution of this work will be managed by PSE's Project Management and Gas Engineering organizations. The work is expected to be completed by the end of 2017 to support plant startup and commissioning in 2018. The cost of the upgrades, estimated to be $49 million, will be incorporated into PSE's gas ratebase and recovered through rates, including rates charged to LNG fuel customers for gas transportation service across the PSE distribution system. PSE included the cost of the distribution upgrades, which will be significantly offset by incremental revenue recovered from LNG fuel customers, as part of the analysis of the prudence of the Facility. The results of this analysis are discussed in detail in ***Exhibit N***.

Natural Gas Supply

PSE will provide natural gas supply for liquefaction services, unless a customer selects a tolling arrangement. The natural gas required for the initial design capacity of the plant is relatively modest—approximately 21,000 Dth per day[4], which is approximately two percent of PSE's current peak-day requirement and approximately five percent of PSE's annual daily average demand. Natural gas supply for turn-key customers will be provided under a market-sensitive pricing mechanism, tied to the monthly Sumas index (with "Sumas" being the interconnection point between Spectra Energy's BC pipeline system and the NWP interstate system, near Sumas, Washington). With this structure, PSE will carry no natural gas supply price risk.

Sufficient firm NWP interstate pipeline service will be procured to transport the natural gas to PSE's system. Customers will pay the transportation costs, except when PSE diverts the gas to serve retail customers during peak periods. The natural gas will generally be managed as a part of PSE's portfolio, but will not utilize PSE's underground storage resources because the Facility will have storage onsite.

[4] The Tacoma LNG Facility will require 21,000 Dth per day to meet the 250,000 LNG gal per day output. The capacity of the Facility to divert natural gas typically used during liquefaction is 19,000 Dth per day. This difference is attributed to the fact that PSE will not hold firm, year round, pipeline capacity for the gas needed for peak shaving (approximately 10 percent of the liquefaction capacity).

Budget and Schedule

The Project will be completed in two distinct phases: development and construction. The development phase is underway and will be considered complete upon issuance of environmental permits, execution of commercial contracts, approval of the LNG tariff and upon successful negotiation of all construction contracts, including the EPC contract. Barring any appeals or legal action during the permitting process, PSE anticipates completing this phase of the project in Q3 2015 at a cost of $14 million. Upon completion of the development phase, PSE will seek board approval to construct the Facility and gas distribution upgrades, and to execute an EPC contract with the lead contractor. The majority of the development phase costs are associated with preliminary engineering, permitting studies and permit application preparation.

The construction phase of the Project will begin with execution of the EPC contract and consist of detailed engineering, procurement, construction and commissioning of the Facility and the gas system upgrades. Capital construction costs for the Project are estimated to be $323 million ($274 million for the Facility and $49 million for the gas system upgrades). The majority of the Facility costs will be covered under a fixed price EPC contract. Other significant components include demolition and soil work. Furthermore, projected Project costs include a construction contingency which is determined by the level of engineering design and based off of industry standards. PSE anticipates construction will be complete in mid-2018, with plant commissioning to follow. The in-service date for the Project is expected to be January 1, 2019.

The figure on the following page shows a high level summary of the Tacoma LNG Project budget. The budget is shown under 2 scenarios:

1. PSE is the sole owner of the Facility and contracts with a tolling customer;
2. PSE enters into a joint ownership agreement with a co-owner and the co-owner provides equity for their share of the Facility costs (defined by their utilization of plant capacity).

A detailed Project budget by quarter and a Project schedule can be found in ***Exhibit F.*** Project costs are described in detail in ***Exhibit O***.

Figure 6: Tacoma LNG Project Budget (1,000s)

DEVELOPMENT BUDGET		Total Budget		PSE Cost Under Joint Ownership[2]
PSE Labor and OH	$	2,193	$	1,250
Engineering and Analysis	$	4,474	$	2,551
Permitting & Legal Support	$	3,339	$	1,904
Communications/Outreach	$	391	$	223
Distribution Upgrades	$	1,126	$	1,126
Commercial and Regulatory[1]	$	1,100	$	1,100
Real Estate and Lease	$	766	$	437
Contingency	$	442	$	252
Project Development Sub-Total	**$**	**13,831**	**$**	**8,843**
PROJECT BUDGET				
O&M Total	**$**	**1,700**	**$**	**1,700**
Development Budget (Capital)	$	11,605	$	6,617
PSE Labor and OH	$	5,800	$	3,307
Engineering & Legal	$	1,400	$	798
Real Estate and Lease	$	6,132	$	3,496
Geotechnical and Demolition	$	13,000	$	7,411
In Water Work	$	4,000	$	1,300
EPC Scope	$	181,792	$	105,803
Miscellaneous	$	6,900	$	3,331
Contingency	$	22,650	$	11,333
PSE Construction OH	$	7,830	$	4,486
Sales Tax	$	12,960	$	6,561
Tacoma LNG Facility Sub-Total	$	274,069	$	154,443
Gas Distribution Upgrades	$	49,041	$	49,041
Project Capital Total	**$**	**323,110**	**$**	**203,484**
AFUDC	$	46,841	$	27,344
GROSS PLANT	**$**	**369,951**	**$**	**230,828**

[1]Commerical and Regulatory expenses are not capitalized
[2]Assumes co-owner provides equity contribution for their full utilization of plant services (44% of Plant)

Pro Forma Financial Statements

The Project pro forma models the 25-year revenue requirement to recover all capital investment made during development and construction of the Tacoma LNG Project, and the subsequent 25 years of O&M expenses to operate the Facility and associated distribution upgrades. The pro forma considers revenue contributions from other Facility customers that purchase LNG as a fuel. These revenue contributions are calculated based on the percentage of plant facilities that will be charged to these customers. In addition to contributing revenue needed to pay for the incremental cost of the Facility, LNG fuel customers will also contribute revenues to cover PSE administrative and general costs, and pay a short-term contract premium if the initial contract term is less than 25 years. In June 2014, PSE engaged Deloitte & Touche to perform a comprehensive review of the financial model used to create the Project pro forma. Deloitte has confirmed verbally that the model is fit for purpose and appropriately calculates the revenue requirement and financial metrics of the Tacoma LNG Project. The final report from Deloitte will be delivered July 29th, 2014. The costs for Project construction and operation, as well as projected revenue contributions, are discussed in detail in ***Exhibit O***.

The pro forma for the Tacoma LNG Facility assumes that the entire plant has a depreciable life of 25 years. This assumption is based on the primary lease term that PSE will execute with the Port of Tacoma, which is expected to occur in July 2014.[5] PSE's unilateral right to extend the lease will be conditional as discussed in ***Exhibit I***. By assuming a 25-year life, the plant will fully depreciate by the time the lease expires. The engineering life of certain plant components (control systems, IT systems, etc.) may be less than 25 years; however, to simplify the analysis, the shorter life of these items is included in the pro forma as a more conservative O&M estimate, rather than a calculation of depreciation expenses on a more granular basis. The natural gas distribution system upgrades are depreciated over 50 years, which is typical for PSE distribution system facilities.

The pro forma assumes the gas distribution system upgrades go into service in January 2018 and the Facility goes into service in January 2019. The gas system upgrades must be in place to support plant startup and commissioning. The pro forma assumes perfect ratemaking. The LNG Facility and gas system distribution upgrades will be placed in ratebase at the conclusion of a general rate case timed to coincide with the in-service date of the LNG Facility. Revenues from LNG service customers will commence upon plant start-up for both LNG and distribution service.

[5] The 25-year depreciable life of the Tacoma LNG Facility will begin with the plant goes into operation (not in July 2014).

5. Regulatory Process

The regulatory process regarding the Tacoma LNG Facility will occur in two phases that will take place over several years. In the first phase, PSE will seek approval from the Washington Utilities and Transportation Commission ("WUTC") for the delivery of LNG to customers for use as fuel for marine vessels, motor vehicles, and industrial end-uses (the "LNG Fuel Supply Service"). In the second phase, PSE will seek a prudence determination and rate recovery of the Facility.

Phase 1: Approval of the LNG Fuel Supply Service Tariff Schedule and Agreements

The first phase of the regulatory process will commence after PSE has signed up a Marketer with the filing of an LNG Tariff Schedule pursuant to which PSE will provide a service consisting of the delivery of LNG to any customer for use as fuel for marine vessels, motor vehicles, and industrial end uses (the "LNG Fuel Supply Service"). The draft rate schedule will provide the details for the LNG Fuel Supply Service and outline the minimum terms for LNG Services Agreements pursuant to which customers will take such service. Concurrent with the filing of the draft rate schedule, PSE will file LNG Services Agreements that will provide the specific terms, conditions, and rates associated with the LNG Fuel Supply Service that PSE will provide to these customers.

During the LNG Fuel Supply Service and LNG Services Agreements approval process, PSE will need to demonstrate:

1. The rates charged under the LNG Services Agreements recover all costs resulting from providing the LNG Fuel Supply Service and contribute to PSE's other fixed costs associated with the Tacoma LNG Facility;

2. The need for and nature of the Tacoma LNG Facility, including, but not limited to, a discussion of the economies of scale provided by the provision of the LNG Fuel Supply Service and the resulting benefits to the peak day gas supply service;

3. Satisfactory commercial terms and conditions of the LNG Fuel Supply Service, including but not limited to an explanation of the basis and derivation of the proposed rates charged for such service; and

4. The LNG Services Agreements do not provide an unreasonable preference for, or rate discrimination with respect to, the counterparties.

Phase 1 will not be the process by which PSE will seek a prudence determination of or rate recovery for the Tacoma LNG Facility. Those issues will be addressed in Phase 2.

Phase 2: Prudence Determination and Rate Recovery of the Tacoma LNG Facility

PSE will seek a prudence determination and rate recovery for the Tacoma LNG Facility in a General Rate Case ("GRC") filed with the WUTC in the second or third quarter of 2018. Construction is estimated to be completed in January 2019. The filings may occur before all construction costs are known with certainty. If necessary, cost estimates may be updated during the filing. The figure below lists the major milestones associated with the second phase.

Figure 7. Projected Rate Recovery Milestone Dates Based on Current Permitting and Construction Timelines

Projected Date	Milestone
Q2/Q3 2018	PSE files GRC with rate recovery for Tacoma LNG Facility
Q2/Q3 2019	WUTC order with new rates

The GRC would seek a prudence determination for the Tacoma LNG Facility (as well as other potential resource acquisitions or contract restructurings for unrelated resources). In order to demonstrate the prudence of the Tacoma LNG Facility, PSE will need to address:

1. The necessity of the Tacoma LNG Facility;
2. The cost-effectiveness of the Tacoma LNG Facility;
3. The resource alternatives considered by PSE to meet its need, including consideration of factors such as capital costs, impact on the utility's credit quality, dispatchability, transportation costs, and other need-specific analysis at the time of the acquisition decision;
4. The contemporaneous information provided to and used by the Board of Directors in making the acquisition decision and its costs; and
5. The contemporaneous records of PSE to allow the WUTC to evaluate PSE's actions with respect to the decision process.

Concurrent with the rate filing, PSE may also file an accounting petition with the WUTC to request a cost deferral mechanism. Cost deferral may be necessary if the Tacoma LNG Facility is placed in service in advance of the effective date for rates. Under this option, PSE would request deferral of fixed and variable costs associated with the Tacoma LNG Facility.

6. Project Execution

PSE will execute this project as part of its regulated operations, in a similar manner to other large infrastructure projects recently undertaken. PSE will finance the project on balance sheet and will recover the investment as it would any other ratebased asset. Project execution will largely be completed by outside contractors with PSE's oversight. Ultimately, PSE anticipates operating the project as part of the Energy Operations organization. In accordance with PSE's corporate policies, PSE has conducted a risk analysis and believes that risks for the project can be appropriately mitigated. Having considered risks, mitigations and project benefits, Management recommends approval of the resolution in ***Exhibit A.***

Financing

The Project will be financed consistent with past utility financing practices, employing a combination of funds from operations, short-term debt drawn from the Company's capital expenditure facility, long-term debt and, as needed to balance debt, equity provided from PSE's parent company Puget Energy.

Development and Construction Execution

PSE's Strategic Initiatives team will lead the development of the project with support from other internal departments including Natural Gas Resources, Project Management, Rates, Regulatory, and Accounting. PSE will also rely on legal and engineering expertise from outside firms (discussed further in the exhibits) to work through the development phase of the Project including permitting, negotiating long-term fuel supply agreements and filing an LNG tariff with the WUTC. The Company will update the Board of Directors continuously and will return to recommend the execution of an EPC contract after PSE has received environmental permits and regulatory approvals[6]. PSE anticipates seeking approval of the EPC contract and any other contracts needed to execute the project in Q3 2015, but acknowledges that permitting delays due to appeal or other legal actions could delay this schedule.

PSE will oversee the execution and construction of the Project. All Project elements will be managed by PSE's Project Management organization, which includes project managers and support staff, a project controls organization (cost and schedule tracking), and a ready network of supporting engineering, construction management, and quality assurance resources. The gas

[6] Building permits and WUTC approval to construct the Facility, which are administrative in nature, will come after executing the EPC contract (upon completion of detailed engineering).

distribution upgrades will be executed in a similar manner to other projects regularly performed by PSE in its role as a natural gas utility. PSE's strategy for construction of the Facility includes a combination of an EPC contract for plant construction and commissioning, and direct contracting for ancillary features (site preparation and marine work).

Management and Operations of the Project

The Tacoma LNG Facility will be managed and operated by PSE's Energy Operations group, under the direction of Natural Gas Resources, which also manages the Jackson Prairie underground storage facility. The Facility will operate and be staffed 24 hours per day, 365 days per year. Onsite management and operations staff will include: plant manager, plant engineer, operations and maintenance supervisor, maintenance planner, controls technician, office administrator and 10 represented gas operators.

Staff will be located onsite, housed in an existing onsite building that will be retrofitted for use by the Tacoma LNG Facility. Most work will be conducted within the boundaries of the leased property; however, PSE staff will also be responsible for operating and maintaining the direct pipeline and fuel loading equipment that will be located on TOTE's property. Maintenance and operating protocols will be developed taking into account regulations, PSE policies and practices, and best industry practices.

In addition to the staff detailed above, PSE will contract for security service as required to meet regulatory requirements, and stevedoring services to bunker TOTE's ships and load other marine vessels.

Estimates of future Tacoma LNG Facility expenses are reflected in the pro forma financial statements included as ***Exhibit O***, and an operations organization chart can be found in ***Exhibit P***.

Insurance

PSE will procure builder's risk insurance for the plant while under construction. PSE typically procures this insurance on large capital projects because PSE can obtain it at a lower cost than the contractor performing the work. Builder's risk insurance covers material on site and any work in progress from typical risks such as fire, wind, theft, vandalism, etc.

At the end of the construction period, the plant will be covered by PSE's insurance program. PSE's insurer, FM Global, has reviewed preliminary designs of the plant and may be involved

with further design and construction to provide additional guidance on risk mitigation strategies.

Risk Analysis

Consistent with past resource acquisition and development activity, PSE staff has identified incremental risks associated with the development and execution of the Project.

There are known areas of contamination on and adjacent to the Facility site and in the area that may be used for the new high pressure pipeline that extends to the Facility. Cooperation and consensus will be required among the cleanup agencies to ensure that construction and operation of the Tacoma LNG Facility will not impede cleanup efforts nor affect compliance with established cleanup agreements. PSE has been working closely with cleanup staff from EPA, WDOE and the Port to ensure that our construction is not impacted or delayed by these issues, and that the Project's construction and operations will not impede future cleanup.

In the development of this Project, the development team has referenced internal audit findings related to the Snoqualmie Falls Redevelopment Project. These findings describe concerns associated with a "lack of enterprise-wide policies and procedures" related to consolidated business case development, risk management, schedule management, estimating issues, and project delivery system selection. Although PSE is developing new policies and procedures in parallel with the Tacoma LNG Project development, the development team is placing specific emphasis on using the lessons learned from the Snoqualmie Falls audit report.

PSE has prepared a detailed description of the principle risks for each phase of the Project and has identified mitigation plans to address these risks. Risks associated with specific project components (such as permitting, commercial and others) are discussed in more detail in the exhibits attached to this report. Management believes that the proposed mitigation plans adequately address the risks identified. ***Exhibit H*** provides a summary of these risks and mitigation plans.

Project Benefits

PSE's development and construction of the Tacoma LNG Project benefits PSE customers, the Pacific Northwest and the natural environment. The principle benefits of this new resource include:

1. The Tacoma LNG Project will help ensure continued dependable service and additional benefits to PSE natural gas customers.

- The Tacoma LNG Facility will be an integral part of PSE's strategy for serving its gas customers on the coldest days of the year
- Serving new commercial markets –like transportation—helps lower costs for existing and future natural gas customers
- The Tacoma LNG Facility provides critical infrastructure more cost-effectively for PSE customers
- Construction of the Tacoma LNG Project will bring upgrades to local natural gas lines ahead of schedule, improving reliability to Tacoma customers

2. The Tacoma LNG Project will provide important environmental benefits.
   - Switching from diesel to LNG reduces carbon dioxide emissions by up to 30 percent
   - Clean-burning LNG eliminates harmful particulate emissions
   - Converting to LNG will help companies like TOTE comply with new, stricter federal low-sulfur emission standards
   - The Project reduces the potential for harmful fuels spills that could damage Puget Sound
   - Driving innovative uses for natural gas demonstrates PSE's leadership in delivering cleaner energy options to customers
3. The Tacoma LNG Project will generate important economic benefits for all South Sound residents
   - Switching to clean, abundant natural gas will help local employers remain competitive and protect local jobs
   - The Tacoma LNG Project helps the Port diversify its customer base, support new industries, and enhance its position as a driver of job creation and economic activity
   - Construction and operation of the Tacoma LNG Facility will create many direct and indirect jobs in the area
4. Utilizing LNG reduces reliance on foreign fuels, using North America's natural resources here at home to benefit human health, the environment and the economy.

Recommendation

Based on the determination of need, the identification and analysis of alternatives and the established benefits of the Project, management recommends that the Board of Directors adopt the Resolutions stated in ***Exhibit A***, approving the continued development of the Tacoma LNG Facility, which includes entering into a long-term fuel supply agreement and a long-term lease with the Port of Tacoma.

PUGET SOUND ENERGY

Exhibit A.

Resolutions

Approval of Liquefied Natural Gas Fuel Supply and Related Agreements

At the July 30, 2014 meeting of the Board of Directors, Ms. Harris is expected to call on Mr. Riding and Mr. Garratt to present to the Board for decision a fuel supply agreement for the sale of liquefied natural gas ("LNG") to TOTE, Inc., and related agreements (referred to herein as the "LNG Project"). Mr. Riding and Mr. Garratt will review with the Board a presentation entitled, "Report to the Board of Directors: Tacoma LNG Facility." Materials regarding the LNG Project are being provided to the Board in advance of this meeting, and a copy is filed with the records of this meeting. As more fully described in such materials, the LNG Project relates to the sale to TOTE, Inc., a marine shipper, of LNG to be manufactured at a natural gas liquefaction facility to be constructed by the Company in Tacoma, Washington (the "LNG Facility"). The sale of LNG is to be pursuant to an LNG Fuel Supply Agreement between the Company and TOTE (the "FSA"). The LNG Facility is to be built on real property which the Company has leased from the Port of Tacoma (the "Port") pursuant to a ground lease (the "Lease").

The Board and the Company's senior officers held a lengthy discussion about the LNG Project, including: the Company's need for cost-effective peaking resources for its natural gas retail customers and the analysis supporting the LNG Facility's ability to meet that need; the construction schedule of the LNG Facility; risks to that schedule and the consequences of any delays; the payment schedule for the LNG Facility's various components and the impact of such spending on the Company's capital budgets; strategies for recovery of its costs through the regulatory process; the credit-worthiness of the various counterparties; indemnity obligations, limitations of liability and other exposures to the Company under the FSA; and other matters. Upon conclusion of this discussion, and upon a motion duly made and seconded, the Board approved the resolutions set forth below:

> WHEREAS, this Board of Directors of Puget Sound Energy, Inc. (the "Company") has determined that it is in the best interests of the Company, in its capacity as a regulated utility, to develop an LNG facility to meet peak resource need and, in order to minimize the cost of such a peaking resource, to enter into the business of selling liquefied natural gas ("LNG") to customers on a cost-of-service basis pursuant to a tariff to be submitted to the Washington Utilities and Transportation Commission ("WUTC") for consideration;
>
> WHEREAS, TOTE, Inc., owner of Totem Ocean Express, Inc., which operates two diesel-fueled ships that provide cargo service on a nearly continuous basis between the ports of Tacoma, Washington and Anchorage, Alaska, conducted a request for proposals for a long-term supply of LNG following its decision to convert its ships to operate on LNG;

WHEREAS, the Company has taken steps to develop, with the goal of constructing and operating, a natural gas liquefaction facility for the production of LNG, located at the Port of Tacoma (the "LNG Facility") to provide peak-day natural gas supply to its retail sales customers and LNG as a fuel for maritime vessels and large trucks;

WHEREAS, the Company concurrently has determined that the LNG Facility would provide a cost-effective peaking resource to its natural gas customers in comparison with alternative peaking resources;

WHEREAS, the Company's proposal to supply LNG to TOTE on a long-term basis was selected by TOTE as the winner of its RFP for LNG supply;

WHEREAS, the Company's management has negotiated with TOTE the terms and conditions of a contract for the long-term supply of LNG from the LNG Facility, and has negotiated and executed with the Port of Tacoma (the "Port") the terms and conditions of a ground lease for real property upon which the LNG Facility will be located, all pursuant to the definitive transaction documents (the "Principal Transaction Documents") described in part below:

1. PSE will sell LNG to TOTE for a minimum term of ten years starting January 1, 2019 and extendable for up to a total of 15 additional years, pursuant to a Fuel Supply Agreement (the "FSA"). PSE's obligations to deliver LNG under the FSA will be conditioned upon, among other things, receipt by PSE of all requisite permits and approvals necessary to construct the LNG Facility, as well as the approval of the WUTC. The FSA specifies minimum annual delivery obligations as to quantity and quality of LNG, and delineates the method for determining the contract price of LNG sold, which includes both fixed and index-tied variable components. The FSA does not impose any damages on PSE in the event an act of force majeure impedes the delivery of LNG, but does expose the Company to up to $7.5 million in any year in the event of a failure to deliver not caused by force majeure or up to $7.65 million per year for up to two years in the event PSE fails to complete the LNG Facility by January 1, 2019. Also, TOTE may terminate the FSA under certain scenarios involving the price of fuel oil or of ultra-low sulfur diesel by paying the termination fees detailed in the FSA. A guaranty of the obligations of TOTE under the FSA will be provided by its ultimate parent, Saltchuck Resources.

2. PSE and the Port intend to enter into a ground lease for 33 acres at the Port of Tacoma (the "Lease"), which includes a two-year due diligence period (during which time PSE may terminate with 30 days' notice), followed by a three-year construction period, followed by a 25-year term commencing upon commercial operation of the LNG Facility. The term may be extended for an additional 25 years. Rent, lower

during the diligence period, will step up to $146,000 per month for the construction period, and then to $212,000 per month subsequent to operation, escalating annually at CPI.

3. The provisions of each of the Principal Transaction Agreements are more fully described in the Summary of Commercial Terms, attached as Exhibit E of the LNG Project Proposal.

WHEREAS, the Principal Transaction Documents, the current development status and development plan of the LNG Facility and the LNG Project, its anticipated budget, and the primary risks relevant to its development, construction and operation are described more fully in a report provided to the Board of Directors in advance of this meeting and filed with the minutes (the "LNG Project Proposal"); and

WHEREAS, the officers now seek Board approval of and authority to enter into the Principal Transaction Documents set forth above and such other contracts or actions described in the LNG Project Proposal and relating to the sale of LNG as set forth therein;

IT IS, THEREFORE

RESOLVED, that the Board, after full consideration and due deliberation, deems it advisable and in the best interests of the Company to approve the sale of LNG to TOTE pursuant to the Principal Transaction Documents, and to approve or ratify any related agreements and the other transactions described in the LNG Project Proposal and in accordance with the budget and other materials set forth therein; and

RESOLVED, that the Board hereby authorizes the Company's Chief Executive Officer and its Chief Financial Officer (the "Authorized Officers") to execute the Principal Transaction Documents, which may include such further additions, amendments or changes to the terms thereof as are deemed necessary and appropriate by the Authorized Officers, and further authorizes any such other officer the Chief Executive Officer deems appropriate to execute any agreements or contracts described in the LNG Project Proposal other than the Principal Transaction Documents; and

RESOLVED, that the Authorized Officers are further authorized to waive any conditions precedent to the closing of any of the Principal Transaction Documents in order to facilitate the closing of such agreement, provided that each of the Authorized Officers agree to such waiver and deem it to be in the best interest of the Company.

GENERAL AUTHORITY

RESOLVED, FURTHER, that any and all actions taken by the officers of the Company, or any of them, as deemed by such officers to be necessary or advisable to effectuate the

transactions contemplated by the foregoing resolutions, including the filing of appropriate documentation with the Washington Utilities and Transportation Commission, whether prior to or subsequent to this action by this Board of Directors, are hereby authorized, approved and ratified, and the taking of any and all such actions and the performance of any and all such things in connection with the foregoing shall conclusively establish such officers' authority therefore from the Company and the approval and ratification thereof by this Board of Directors.

PUGET SOUND ENERGY

Exhibit B.

Presentation to the Board of Directors

July 30, 2014

Tacoma LNG Project Board

Board Decision

Roger Garratt
Clay Riding

July 30, 2014

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Requested Board Action

Based on the determination of need, the analysis of alternatives, and the benefits of the proposed transaction, PSE Management recommends that the Board of Directors approve the continued development of the Tacoma LNG Project. Specifically, approval will authorize PSE to:

- ***Enter into a long-term Fuel Supply Agreement*** to sell to Totem Ocean Trailers Express ("TOTE") LNG supplied from the Tacoma LNG Facility.
- ***Enter into a long-term lease with the Port of Tacoma*** for the land upon which the Facility will be sited.

Previous Board Interaction

The LNG initiative was discussed at the following board meetings:

Board Meeting Date	Description
May 9, 2012	Evaluated the LNG Strategy
January 23, 2013	Discussed the Tacoma LNG project development strategy
February 28, 2013	Reviewed the LNG development structure and regulatory strategy
May 8, 2013	Discussed the transportation initiative
November 8, 2013	Reviewed the project costs, structure and commercial plan
January 22, 2014	Board update on Tacoma LNG Project
July 2, 2014	Deep dive update on Tacoma LNG Project

Board Report Updates

The following updates have been made since the July 2 Board meeting:

- **Resolution (Exhibit A)**
  - Reflects liquidated damages in TOTE FSA
  - Removes interim supply agreement
- **Project Report**
  - Updated and clarified information related to potential Facility co-owner or long-term tolling customer
- **Summary of Commercial Terms (Exhibit E)**
  - Updated and clarified information related to potential Facility co-owner or long-term tolling customer
  - Added explanation of TOTE FSA Price Cap Mechanism and demonstrated cap function under different risk scenarios
- **Risk Analysis (Exhibit H)**
  - Updated risk analysis to show both pre- and post-mitigated risks, including heat mapping
- **Resource Need & Alternatives Analysis (Exhibit N)**
  - Included the joint ownership scenarios in the analysis, including the sensitivity analysis
- **Financial Pro Forma (Exhibit O)**
  - Updated to included additional joint ownership projections

Background – Project Description

PSE is developing an LNG facility to serve as a peaking resource for its core natural gas customers and to provide fuel to marine and on-road transportation markets.

Site: Port of Tacoma at corner of E. 11 St. and Alexander Ave. E.

Project In-service Date: January 1, 2019

LNG liquefaction capability: 250,000 gallons/day

On-site storage: 8 million gallons

Vaporized gas injection capability (into PSE's system)[1]: 66,000 Dth/day

Gas delivery to PSE's system: Northwest Pipeline

Electricity for facility: Procured at Mid-C market prices; wheeled via Tacoma Power's 115 kV system

Total Project Cost: $323 million

Tacoma LNG Facility in Tacoma, Washington

[1] *To meet peak-day demand of PSE retail gas customers*

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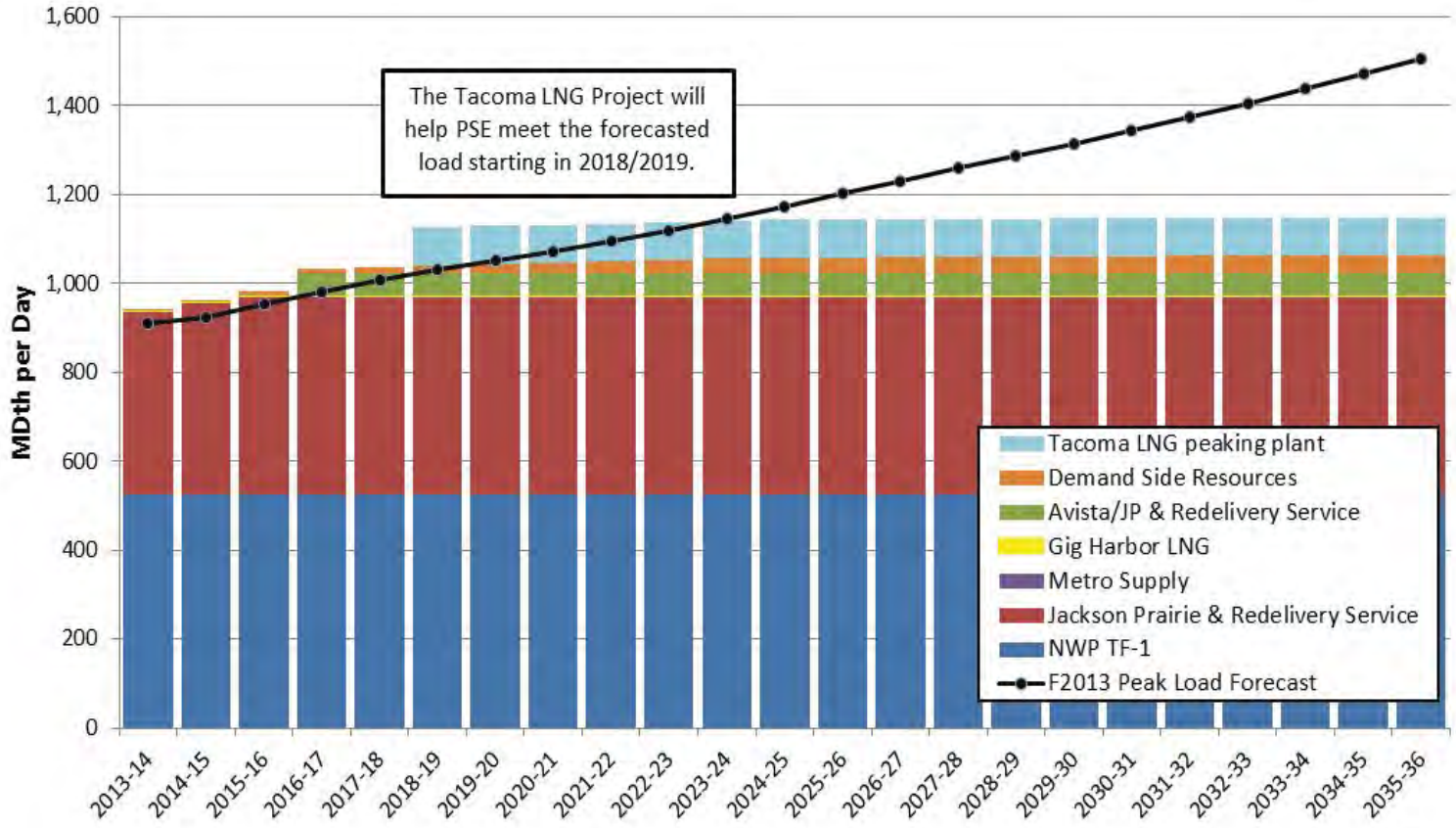
Background – Resource Need

PSE Natural Gas Resource Need



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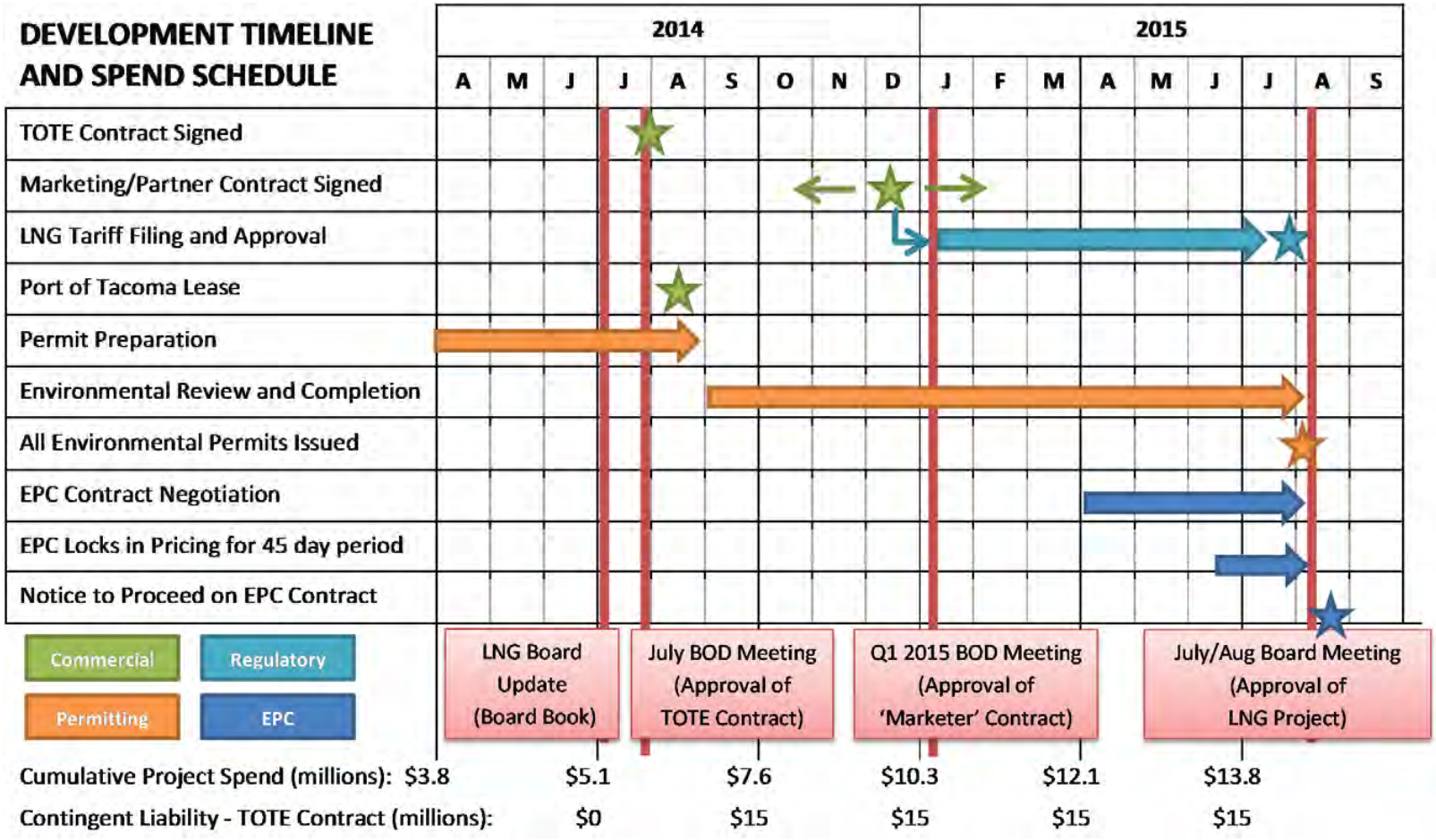
Background – Development Schedule



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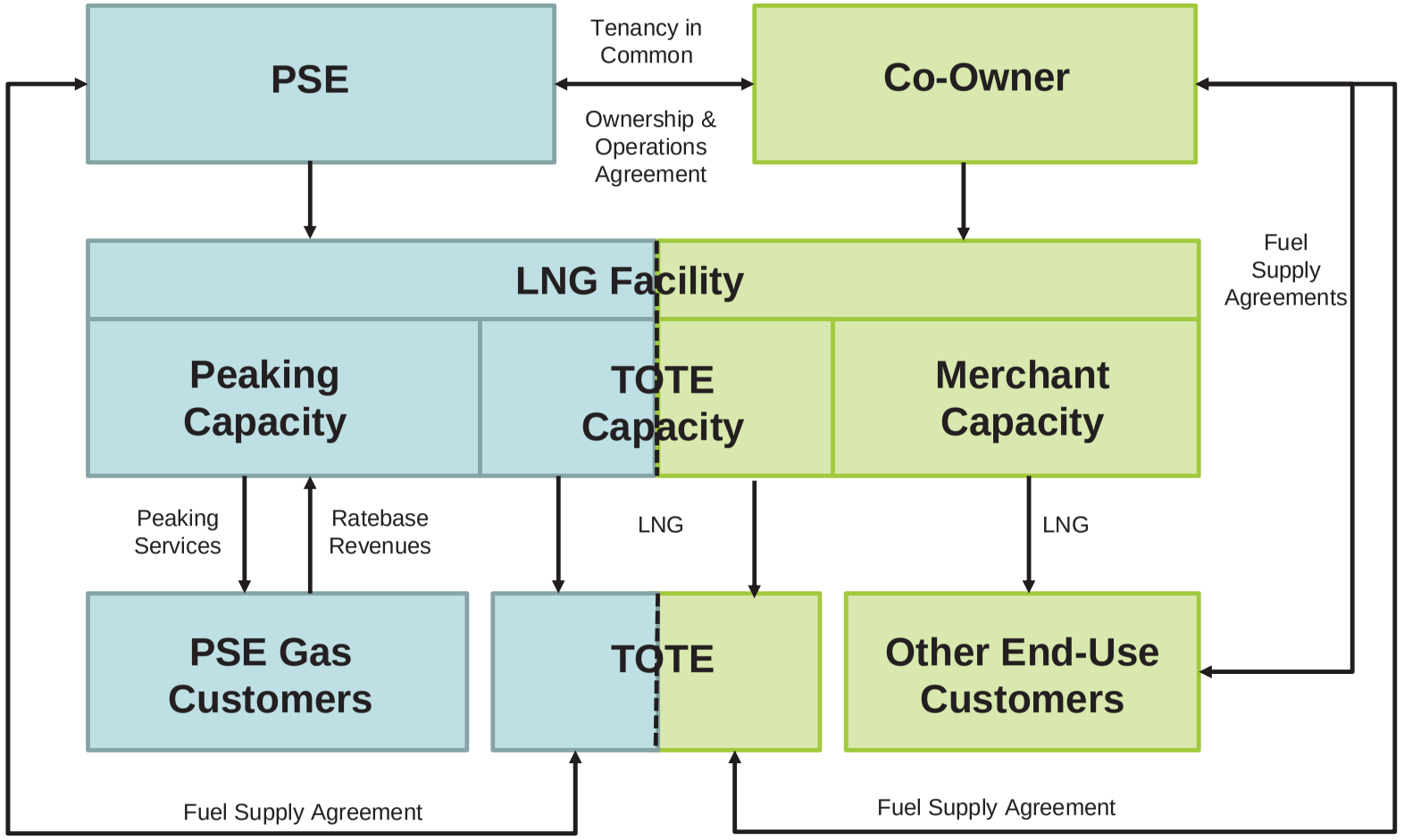
Project Structure – Joint Ownership



PSE-owned facilities, and WUTC-regulated facilities and services

Third-party owned facilities, and facilities and services not regulated by WUTC

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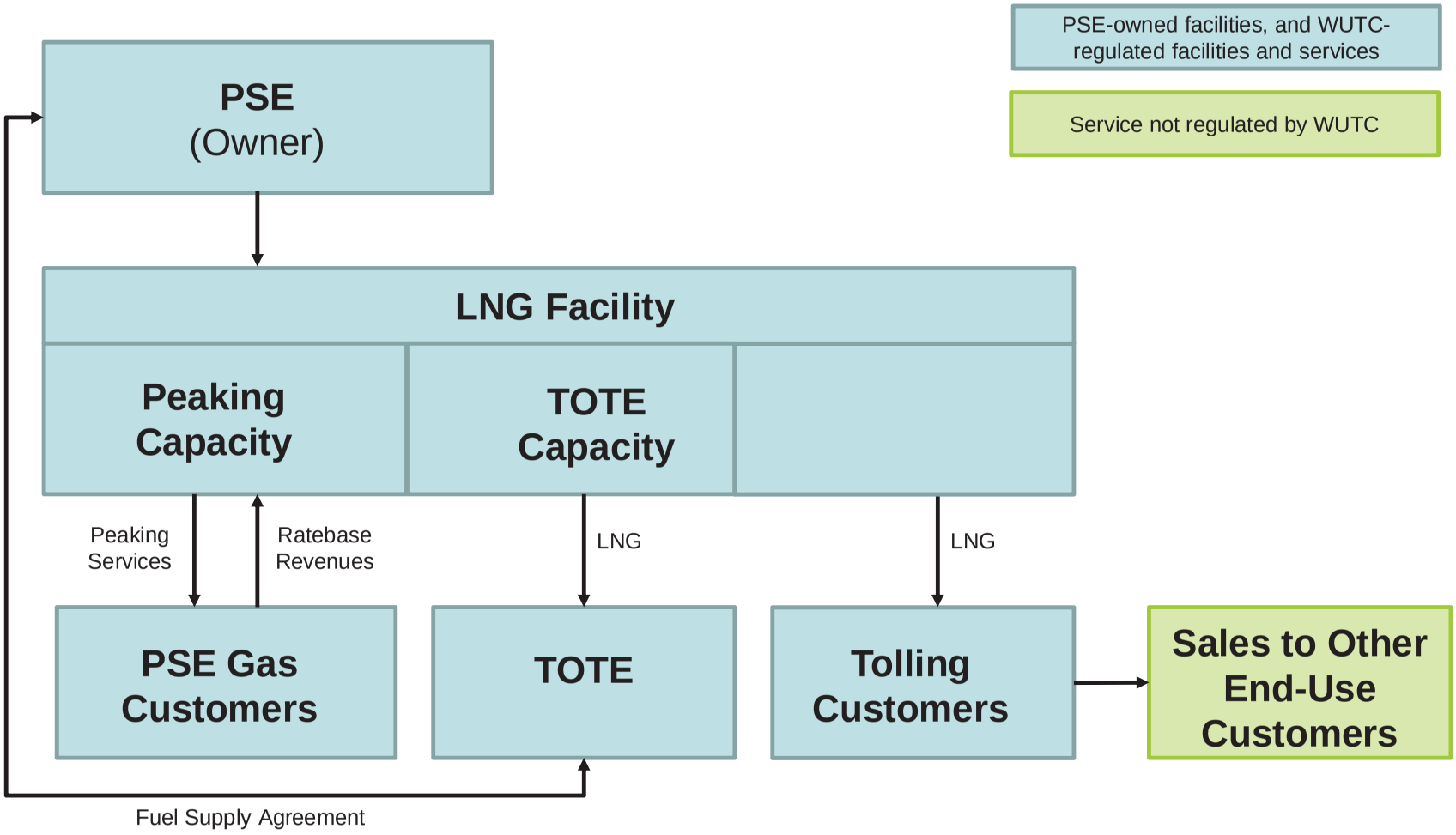
Project Structure – Tolling Customer



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Development Risk

DEVELOPMENT Risk	Cause	Inherent Probability	Inherent Magnitude	Mitigation	Mitigated Probability	Mitigated Magnitude
Merchant Risk [MR]	PSE unable to find co-owner or long-term tolling customer beyond TOTE and assumes merchant risk on un-contracted plant capacity.	Almost Certain	Critical	PSE intends to fully contract the Facility's capacity. However, to the extent that there is excess capacity, PSE will have to demonstrate that merchant risk is prudent.	Extremely Unlikely	Negligible
Project Costs [PC]	Final construction costs are significantly higher than the original FEED study and current estimates.	Possible	Major	PSE's budget includes contingency amounts commensurate with the current estimate stage. PSE's offtake contracts will allow for some pass through of cost escalations. PSE's prudency demonstrates that the Project can withstand a significant cost increase and still be the least cost peaking option for PSE's retail gas customers. (See ***Exhibit N*** for a discussion of PSE's resource alternatives analysis and results.)	Unlikely	Minor
Permits Delayed [PD]	Permitting delays may be caused by third-party interveners or delayed agency action. *See **Exhibit J** for a more detailed analysis of permitting delay risks.*	Possible	Major	To mitigate permitting delays PSE will do the following: • Initiate Project introduction meetings with all involved agencies to provide advance notice of the Project and schedule; • Initiate regular Project meetings with the agencies during permitting; • Engage an independent coordinator to help facilitate decision-making among agencies; • Reimburse key agencies for time dedicated to this Project.	Unlikely	Major
Permits Not Granted [PX]	Permitting agencies determine that project impacts cannot be mitigated. *See **Exhibit J** for a more detailed analysis of potential permitting delay risks.*	Possible	Critical	PSE has already begun to gain support for the Project from key community, business and government organizations to ensure its success. The Company will continue to educate others in federal, state and local government about the substantial public benefits of the Project.	Extremely Unlikely	Critical

Development Risk

DEVELOPMENT Risk	Cause	Inherent Probability	Inherent Magnitude	Mitigation	Mitigated Probability	Mitigated Magnitude
Regulatory (Tariff) [RT]	WUTC denies approval of LNG tariff and regulated treatment of the Facility.	Almost Certain	Critical	PSE has and will continue to work with WUTC commissioners and staff to promote the cost and reliability benefits of the Project to PSE's gas customers, and the economic and clean air benefits for the region. PSE has garnered support from state and local elected officials. Additionally, PSE continues to support legislation that promotes a regulatory environment that encourages the development of alternative fuels.	Unlikely	Critical
Environmental Contamination [EC]	Environmental contamination at the Port of Tacoma or along the gas distribution system upgrades route delays the Project and/or increases Project costs.	Likely	Major	PSE has, and will continue to perform environmental sampling at the site and along the pipeline route. If contamination is found at the plant site during the development phase, the Port will generally bear the financial responsibility of remediation. PSE will work to mitigate any schedule risk the remediation might pose.	Likely	Negligible
Community Concerns [CC]	The project encounters an organized effort to address community concerns regarding: • LNG safety; • Any project involving fossil fuels; • Opposition to using "fracked" gas.	Likely	Critical	PSE will work with communities to provide education about the benefits of LNG and the Project, and to address concerns. This will take the form of an outreach campaign, including community meetings and presentations, a web site and/or other forms of communication to help address any concerns the communities may have. (*See **Exhibit K** for details about PSE's plan to engage the community.*)	Unlikely	Negligible

Construction Risk

CONSTRUCTION Risk	Cause	Probability	Magnitude	Mitigation	Mitigated Probability	Mitigated Magnitude
Cost Risk [PC]	Changes to plant design after the EPC contract is executed, or significant, unforeseen environmental contamination drive increased cost.	Likely	Major	Facility construction will be executed via a lump-sum EPC contract. Remaining construction is accomplished by firm, fixed-price competitive bids. Scope control will be managed after contract execution. Environmental conditions will be evaluated and characterized prior to the start of construction.	Unlikely	Minor
Contractor Performance [CP]	The Facility fails to meet required specifications or work quality requirements.	Likely	Major	Contractors are pre-qualified and selected based upon best value and historical performance. PSE will use independent Quality Assurance inspection to validate contractor performance and require contract warranties to backstop risk.	Unlikely	Minor
Construction Delays [CP]	Supply chain disruptions, unforeseen site conditions, productivity issues, etc. delay project completion.	Likely	Major	The overall construction schedule includes float to accommodate uncertain duration of demolition and site work. The EPC contract will have liquidated damages for late completion.	Possible	Minor
Safety (Construction) [SC]	Unsafe work practices lead to onsite accidents or worker injuries.	Likely	Major	All contractors will be required to have rigid safety programs that meet or exceed PSE's standards.	Extremely Unlikely	Negligible
Distribution Upgrades Construction Risk [DU]	Distribution system costs increase or the schedule is delayed due to: • complexities associated with route (railroad crossings/contamination); • permitting; • environmental impacts/ restoration work; • regulatory approval for pressure increase.	Likely	Major	More detailed staff review/analysis, engineering work and testing will be performed as the Project progresses. PSE will consider construction methods, hours of work and restoration requirements as they relate to permitting. Special material handling and HAZWOP[1] training will be necessary. PSE intends to work with jurisdictions on cost impacts of unknown restoration requirements. (*See **Exhibit M** for more details about distribution system upgrade risks.*)	Possible	Minor

[1] *Hazardous Waste Operations ("HAZWOP")*

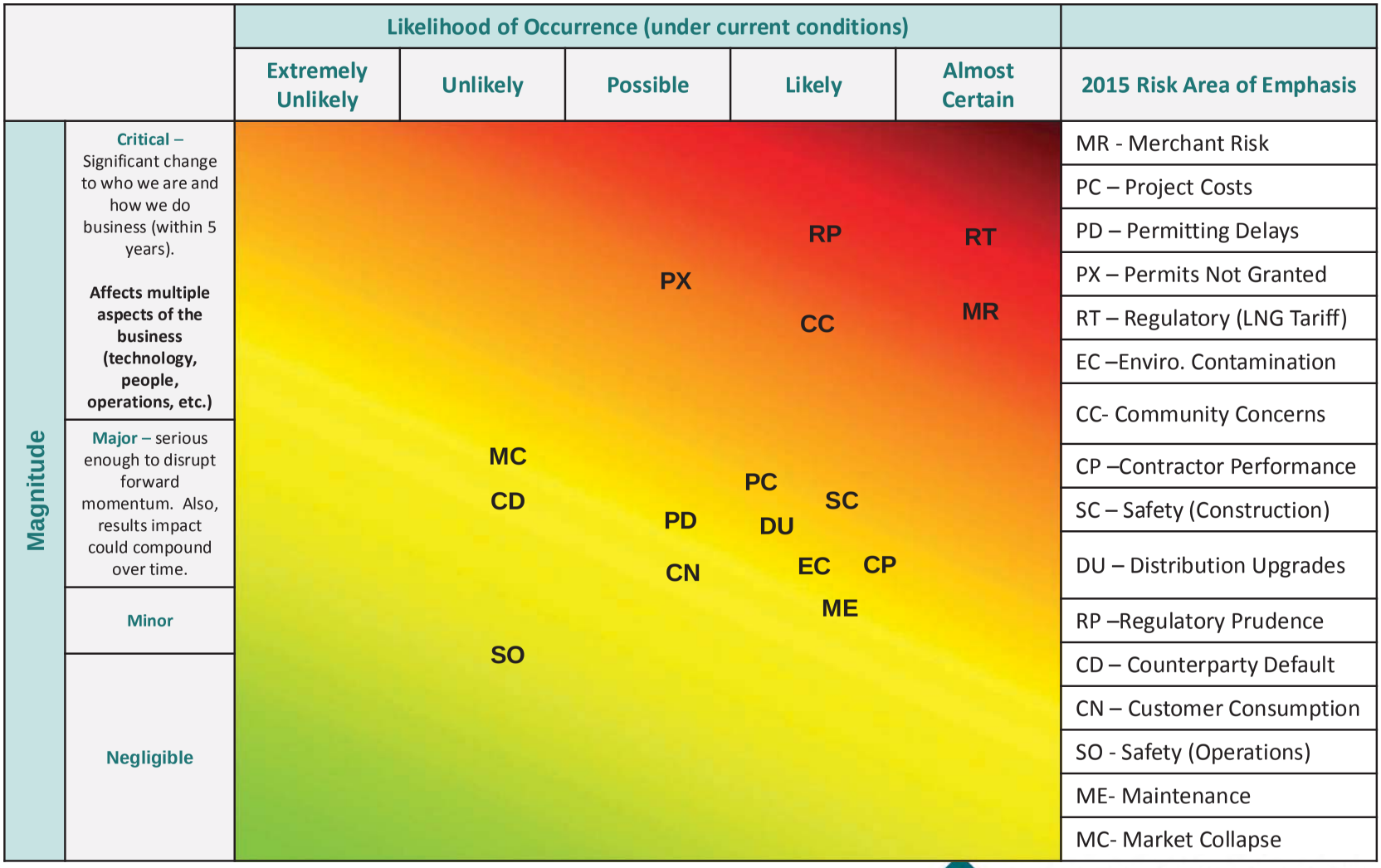
Operations Risk

OPERATIONS Risk	Cause	Probability	Magnitude	Mitigation	Mitigated Probability	Mitigated Magnitude
Regulatory Prudence [RP]	WUTC determines that PSE's investment in the LNG Facility is imprudent.	Likely	Critical	By virtue of the LNG tariff, PSE will have gauged the Commission's position on the project. The LNG Facility will have been evaluated in at least two IRPs prior to the WUTC's prudency determination. PSE has and will continue to work with WUTC commissioners and staff to promote the cost and reliability benefits of the Project to PSE's gas customers, and the economic and clean air benefits for the region. PSE has garnered support from state and local elected officials. Additionally, PSE continues to support legislation that promotes a regulatory environment that encourages the development of alternative fuels.	Unlikely	Minor
Customer Defaults or Breaks Contract [CD]	Long-term LNG customers don't fulfill their obligations under the contracts.	Unlikely	Major	LNG fuel supply agreements will have contractual provisions to mitigate counterparty credit risks (parental guarantees, etc.). Should a default occur, PSE would mitigate revenue impact by selling volumes associated with any breached contracts.		
Customer Consumption [CN]	Plant customers take significantly lower volumes than anticipated, resulting in sub-optimal plant operations.	Possible	Major	PSE will include contractual provisions such as deficiency payments or penalties to mitigate efficiency losses from running the Facility at a lower output. Alternatively, PSE could operate the Facility with longer or more frequent outages and use the LNG storage tank to mitigate operational inefficiency.	Unlikely	Minor

Operations Risk

OPERATIONS Risk	Cause	Probability	Magnitude	Mitigation	Mitigated Probability	Mitigated Magnitude
Market Collapse [MC]	The price spread between natural gas and diesel could collapse, eliminating the economic benefit associated with LNG	Unlikely	Major	PSE commissioned Wood Mackenzie to study the probabilistic spread between natural gas and diesel prices. The results of this study validated PSE's position regarding the sustainability of the spread. PSE will take on long-term contracts that will generate revenues sufficient to cover the costs of facilities during the contract term. TOTE has certain rights to exit its contract if a drastic collapse of the spread occurs; however, the exercise of such rights includes termination payments to PSE.	Unlikely	Minor
Liquefaction and Performance Efficiency [CP]	The Facility fails to meet design specifications and LNG quality requirements.	Likely	Major	The EPC contractor will guarantee production capability; the contract will include warranty provisions to meet specifications and/or liquidated damages.	Unlikely	Minor
Safety (Operations) [SO]	Equipment failure or operational error lead to onsite accidents and/or worker injuries.	Unlikely	Minor	The Facility will be designed, constructed, and inspected according to the latest safety standards. Extensive regulations govern required procedures and training for Facility personnel. The Facility will be operated consistent with PSE policies. In addition, the Facility will be insured under PSE's policy.	Extremely Unlikely	Minor
Maintenance of Plant Equipment [ME]	Major components prematurely fail due to improper maintenance.	Likely	Major	Major components will be inspected and tested at the factory prior to installation. Only qualified suppliers will be used. The Facility will have full operations and maintenance manuals, and will maintain onsite spares for component parts with higher failure rates. The Facility will be maintained in accordance with PSE's policies.	Unlikely	Minor

Inherent Risks



Mitigated Risks

		Likelihood of Occurrence (under current conditions)					
		Extremely Unlikely	Unlikely	Possible	Likely	Almost Certain	2015 Risk Area of Emphasis
Magnitude	**Critical** – Significant change to who we are and how we do business (within 5 years). **Affects multiple aspects of the business (technology, people, operations, etc.)**						MR - Merchant Risk
							PC – Project Costs
							PD – Permitting Delays
		PX	RT				PX – Permits Not Granted
							RT – Regulatory (LNG Tariff)
							EC –Enviro. Contamination
							CC- Community Concerns
	Major – serious enough to disrupt forward momentum. Also, results impact could compound over time.						CP –Contractor Performance
		CD					SC – Safety (Construction)
			PD				DU – Distribution Upgrades
	Minor		ME		DU		RP –Regulatory Prudence
		SO	PC RP				CD – Counterparty Default
			MC CP				CN – Customer Consumption
	Negligible	SC	CN				SO - Safety (Operations)
							ME- Maintenance
		MR	CC			EC	MC- Market Collapse

Financial Summary – Joint Ownership

Puget Sound Energy
2014 Financial Plan Update for 2015 Plan Preview
Liquefied Natural Gas Project (LNG) Base Case: Joint-Ownership Scenario (56% Owner)

- The LNG Initiative assumes the development, construction and ownership of a natural gas liquefaction and storage facility by PSE. The facility would: (1) serve as a natural gas peaking facility to be used by PSE's distribution system to meet peak demand and (2) provide LNG to customers to use as transportation fuel. The entire facility would be regulated as part of PSE's gas distribution system.
The capital forecast and Income Statement Impacts in this scenario of the 2015 Plan Preview are reduced from the 2014 Plan. The changes account for a third party ownership position in the facility equal to half of the capital needed to support the TOTE contract (13% of the capital requirement) and the remaining unsold portion of the facility (31% of capital requirement). The co-owner would also be responsible for operational expenses allocated to their share of the facility.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
$ in millions	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2013-2019**
Capital Expenditures	$1	$4	$17	$53	$97	$30	$0	$203
AFUDC	0	0	1	4	10	12	-	27
Total Capex (including AFUDC)	**$1**	**$4**	**$18**	**$57**	**$108**	**$41**	**$0**	**$230**
Income Statement Impacts								
Revenue	$0	$0	$0	$0	$0	$0	$55	$55
Operating Expenses	(0)	(1)	(0)	(0)	(0)	(1)	(27)	(29)
EBITDA	**($0)**	**($1)**	**($0)**	**($0)**	**($0)**	**($1)**	**$29**	**$26**
AFUDC	0	0	1	4	10	12	-	27
Interest Expense	(0)	(0)	(0)	(1)	(3)	(4)	(7)	(16)
Depreciation & Amortization	-	-	-	-	-	(1)	(9)	(10)
Taxes	0	0	0	1	1	(0)	(6)	(4)
Net Income	**($0)**	**($0)**	**$1**	**$3**	**$8**	**$5**	**$7**	**$23**

Financial Summary – 100% PSE Ownership

Puget Sound Energy
2014 Financial Plan Update for 2015 Plan Preview
Liquefied Natural Gas Project (LNG) Sensitivity Analysis: 100% PSE Ownership

The following summary shows the financial impact to the 5-year plan if PSE were to assume 100% ownership on the LNG facility. This scenario aligns with 2014 Plan, however the capital forecast in the 2015 Plan Preview is larger than the 2014 Plan due to changes in key cost drivers, including higher costs due to more challenging geotechnical conditions at the site than previously known and increased market demand for LNG equipment. The revenue forecast in this plan is delayed one year to 2019 to accommodate TOTE's request for service in Q1 2019.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
$ in millions	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2013-2019**
Capital Expenditures	$2	$6	$31	$90	$140	$53	$0	$322
AFUDC	0	1	2	7	16	21	-	47
Total Capex (including AFUDC)	**$2**	**$7**	**$33**	**$97**	**$157**	**$74**	**$0**	**$369**
Income Statement Impacts								
Revenue	$0	$0	$0	$0	$0	$0	$98	$98
Operating Expenses	(0)	(1)	(0)	(0)	(0)	(1)	(49)	(52)
EBITDA	**($0)**	**($1)**	**($0)**	**($0)**	**($0)**	**($1)**	**$49**	**$46**
AFUDC	0	1	2	7	16	21	-	47
Interest Expense	(0)	(0)	(0)	(1)	(3)	(4)	(11)	(20)
Depreciation & Amortization	-	-	-	-	-	(1)	(15)	(16)
Taxes	0	0	0	1	2	(1)	(9)	(7)
Net Income	**$0**	**$0**	**$2**	**$6**	**$15**	**$13**	**$13**	**$49**

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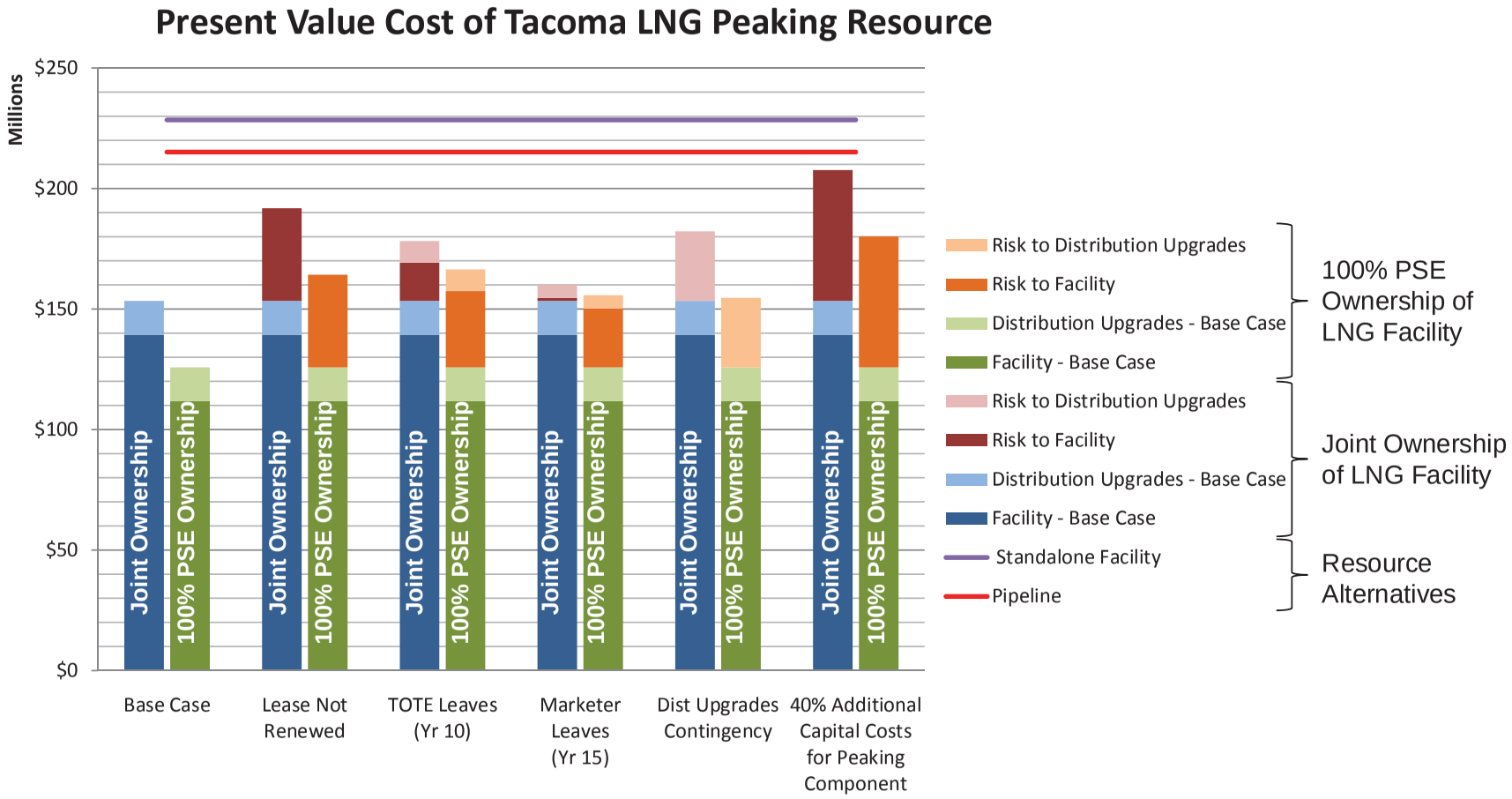
Comparison of Resource Alternatives



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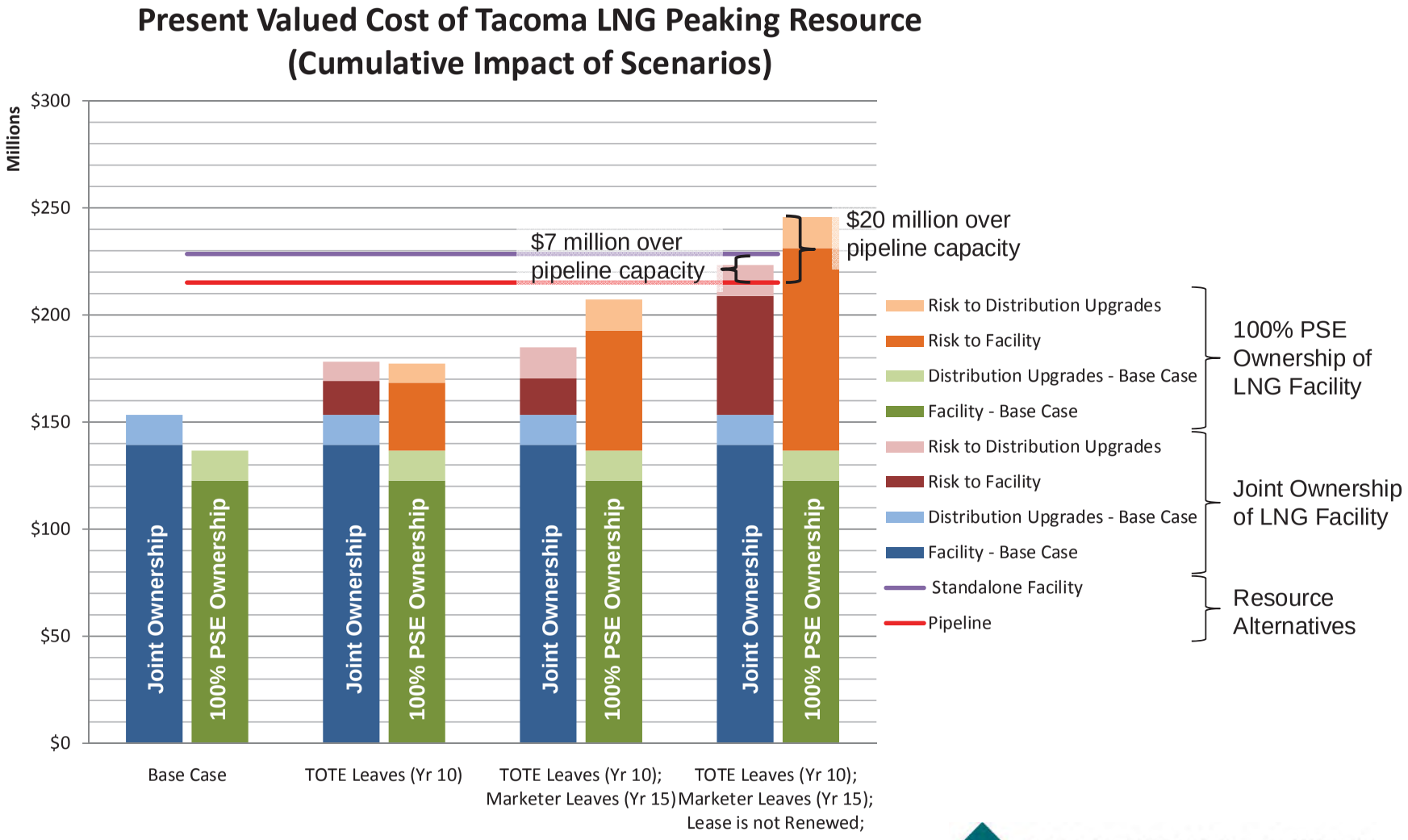
Impacts of LNG Market Not Materializing



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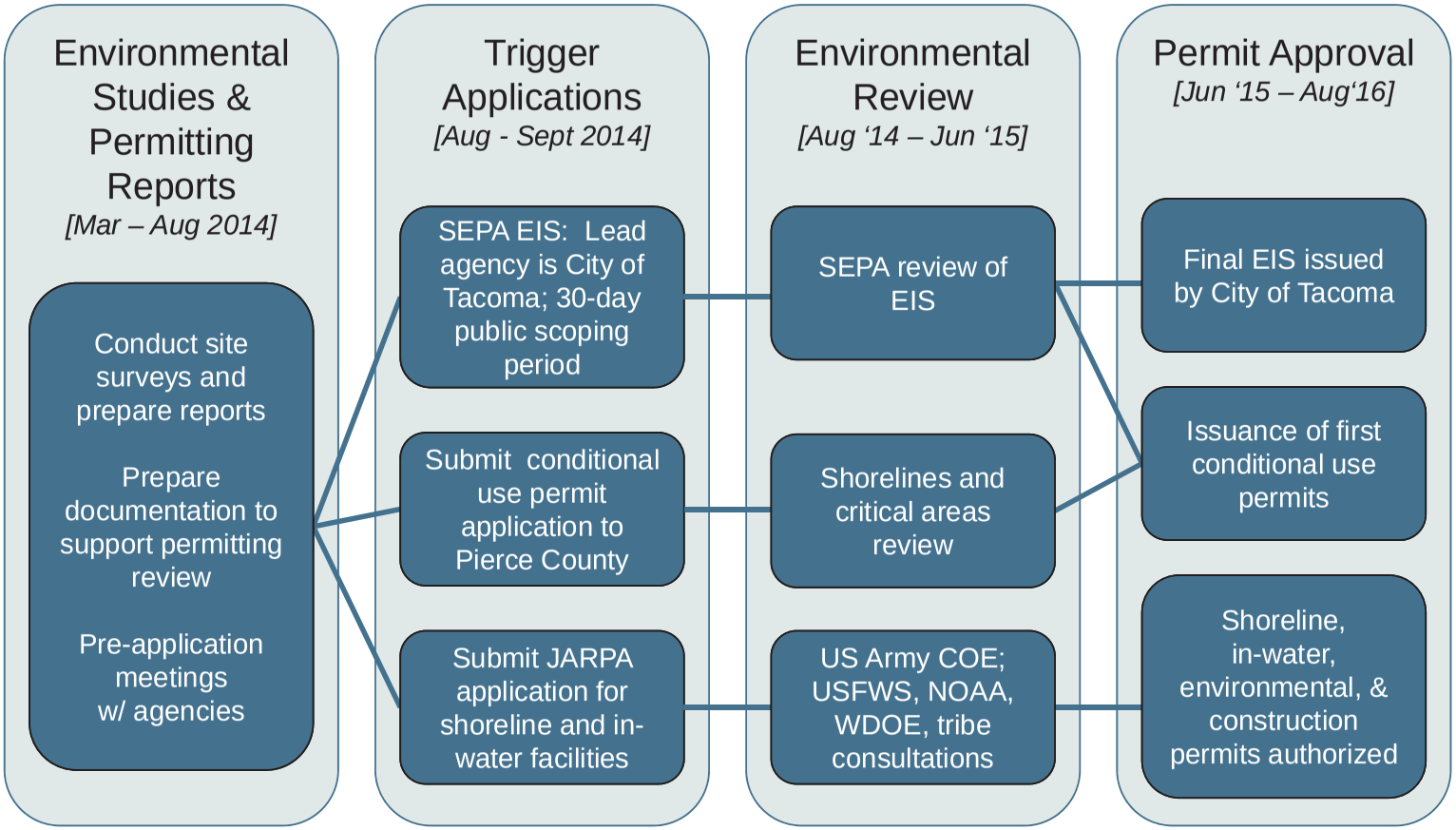
Strategy - Regulatory

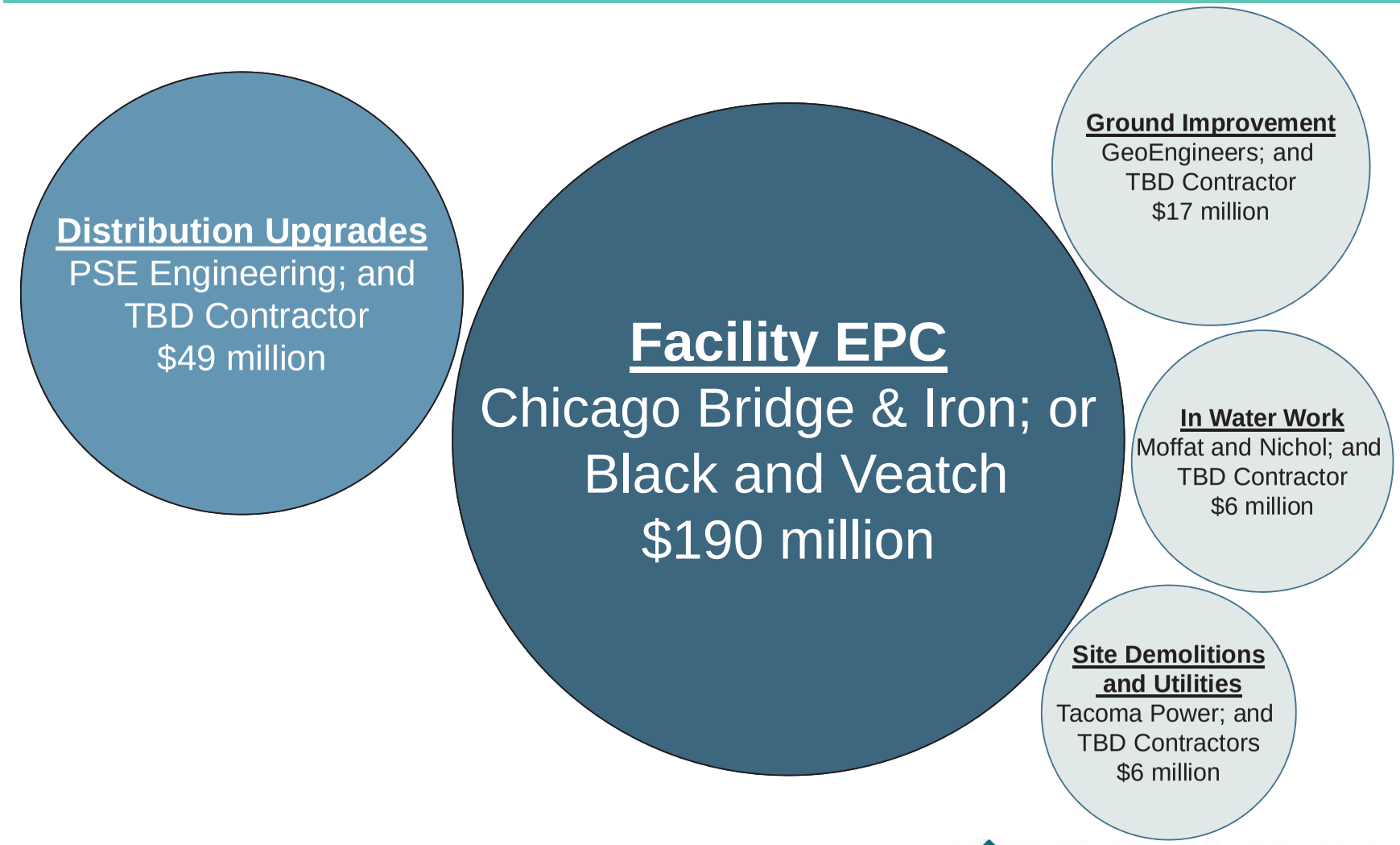
Phase 1: Commences upon completion of marketing partner agreement	Phase 2: General Rate Case in Q3/Q4 2018[1]
WUTC Approval of LNG Fuel Supply Service Tariff Schedule and Agreements.	**WUTC Prudence Determination and Rate Recovery of the Tacoma LNG Facility.**
PSE will demonstrate: 1. Rates recover all costs to provide LNG fuel supply service and contribute to other Facility fixed costs. 2. Need for and nature of the Facility. 3. Satisfactory commercial terms and conditions of LNG fuel supply service. 4. Agreements do not impose unreasonable preference for/rate discrimination to the counterparties.	PSE will demonstrate: 1. Need for the Facility. 2. Facility is cost-effective. 3. Alternatives considered and analysis conducted. 4. Contemporaneous information used by the Board to make acquisition decision. 5. Contemporaneous records kept by PSE.

[1]PSE may also file an accounting petition with the WUTC to request a cost deferral mechanism for fixed and variable costs of the Tacoma LNG Facility, if the Facility is placed in service in advance of the effective date for rates.

Strategy - Permitting



Engineering and Construction



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Tacoma LNG Project Benefits

A cost-effective way to meet the capacity needs of PSE's retail gas customers

- Least cost peak-day supply resource option to meet demonstrated capacity needs of PSE gas customers.
- Improves gas system reliability.
- Diversifies peak-day resources for PSE customers (on-system resource) and eliminates the need for long-haul interstate pipeline capacity.
- Supports WA's statutory goals to reduce carbon emissions from the state's transportation sector.
- Supports economic development at the Port of Tacoma.
- Supplies LNG fuel to region, which when compared to petroleum-based fuels:
  - Reduces harmful emissions that effect local air quality.
  - Emits less carbon dioxide.
  - Costs less, allowing operators to invest in conversion and new builds.
  - Complies with new maritime regulations.
  - Complies with California's Low Carbon Fuel Standard.

Next Steps

- **Commercial**: Ensure that the LNG facility is fully contracted by PSE customers, TOTE and a third-party marketer (i.e., BP, Shell, or others).
- **Permitting**: Submit permit applications and continue to educate and work with permitting agencies (City of Tacoma as lead agency).
- **Regulatory**: Demonstrate full prudency for LNG facility by validating resource need and regional resource benefits (e.g., economic, environmental).
- **Community Outreach**: Engage community and political leaders to garner support for the LNG project by emphasizing project benefits to customers and the region.
- **Engineering and Construction:** Black & Veatch FEED study and finalize site infrastructure designs.

Future Board Decisions

Decision	When
PSE Management will recommend approval of the TOTE Fuel Supply Agreement, Interim Supply Agreement and enter into a long-term lease with the Port of Tacoma.	July 30, 2014
Execution of Joint Ownership Agreement or Tolling Agreement with Marketing Partner	Upon completion of a marketing or co-ownership agreement with a third-party fuel marketer
Final project approval; execute all project construction agreements including requisite engineering, procurement and construction ("EPC") agreement with the lead contractor; and issue Notice to Proceed	Upon receipt of a final non-appealable EIS, Section 10/404 Permits, Shoreline and Pierce County CUP;[1] execution-ready construction contracts and all required real-estate rights.

Requested Board Action

Based on the determination of need, the analysis of alternatives, and the benefits of the proposed transaction, PSE Management recommends that the Board of Directors approve the continued development of the Tacoma LNG Project. Specifically, approval will authorize PSE to:

- ***Enter into a long-term Fuel Supply Agreement*** to sell to Totem Ocean Trailers Express ("TOTE") LNG supplied from the Tacoma LNG Facility.
- ***Enter into a long-term lease with the Port of Tacoma*** for the land upon which the Facility will be sited.

APPENDIX

- TOTE Fuel Supply Agreement
- TOTE Price Cap
- Facility Siting
- Port of Tacoma Lease
- Project Budget and Allocation
- Distribution Upgrades
- Communications Strategy and Materials

TOTE Fuel Supply Agreement

- **Guaranteed Completion** with penalties after January 1, 2019; plant must be in place by January 1, 2021.
- **Capped Maximum Price** on plant and fixed O&M charges.
- **First Option Right** with similar terms and pricing for TOTE and affiliates.
- **Deficiency Payments,** if TOTE fails to purchase at least 95% of contract volumes.
- **Conditions precedent:**
  - All permits and regulatory approvals received.
  - WUTC approval.
  - Board approval to execute the EPC contract.
  - Binding site lease with Port of Tacoma.
- **Interim supply agreement** will contain damages if the plant is late or PSE cancels the project (estimated ~ $15 million if PSE cancels the project).
- **Damages:**
  - No damages on failure to deliver due to Force Majeure.
  - Limited damages on non-Force Majeure event: TOTE is asking for up to $10 million in any contract year (low probability event).
  - No limit to damages on willful failure to deliver.
  - Damage to TOTE's property if PSE provides off-spec LNG - TOTE asking for up to $15 million in any contract year (low probability event; will be insurable).

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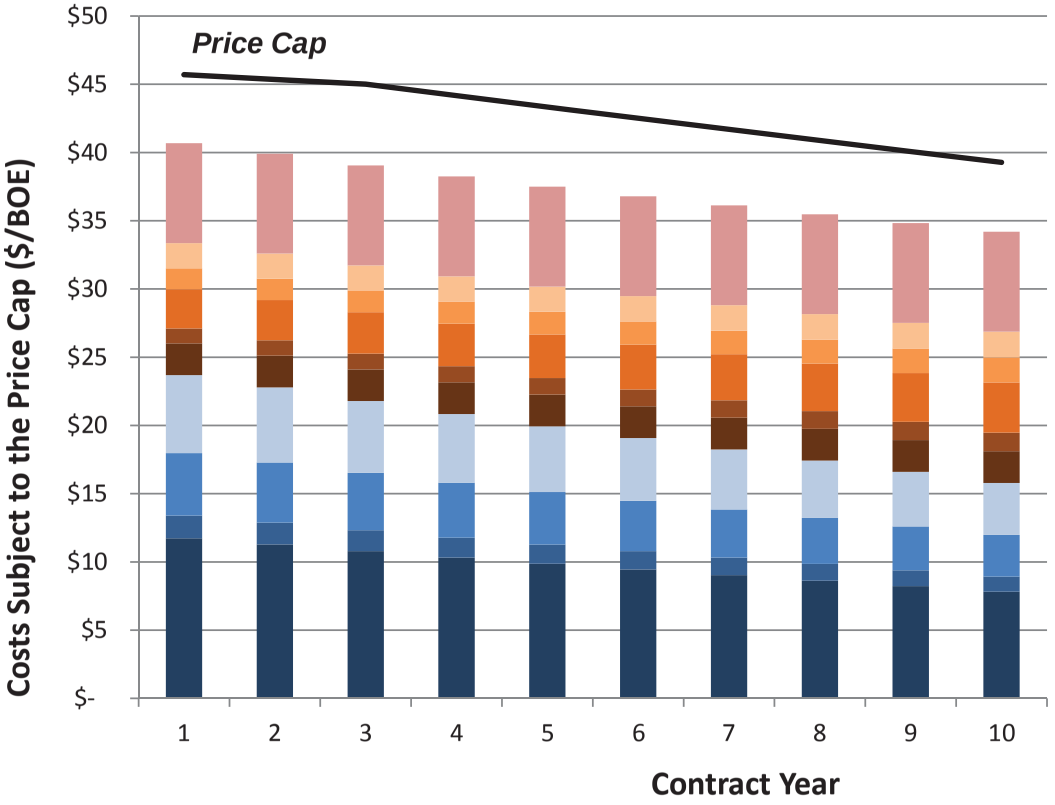
TOTE Price Cap



Fixed Plant Charges Subject to Cap*:

- Short Term Premium
- Allocated General Costs
- Fixed Electric Costs
- Labor and Lease
- Maintenance & Misc
- Property Tax
- Common
- Bunkering
- Storage
- Liquefaction

Additional Revenues

Fixed O&M Charge

Fixed Facility Charge

* **Capital and Fixed O&M** are subject to a price cap.
Costs related to gas commodity and transport, electric commodity, and port volumetric charges are NOT subject to a cap and are passed through at costs.

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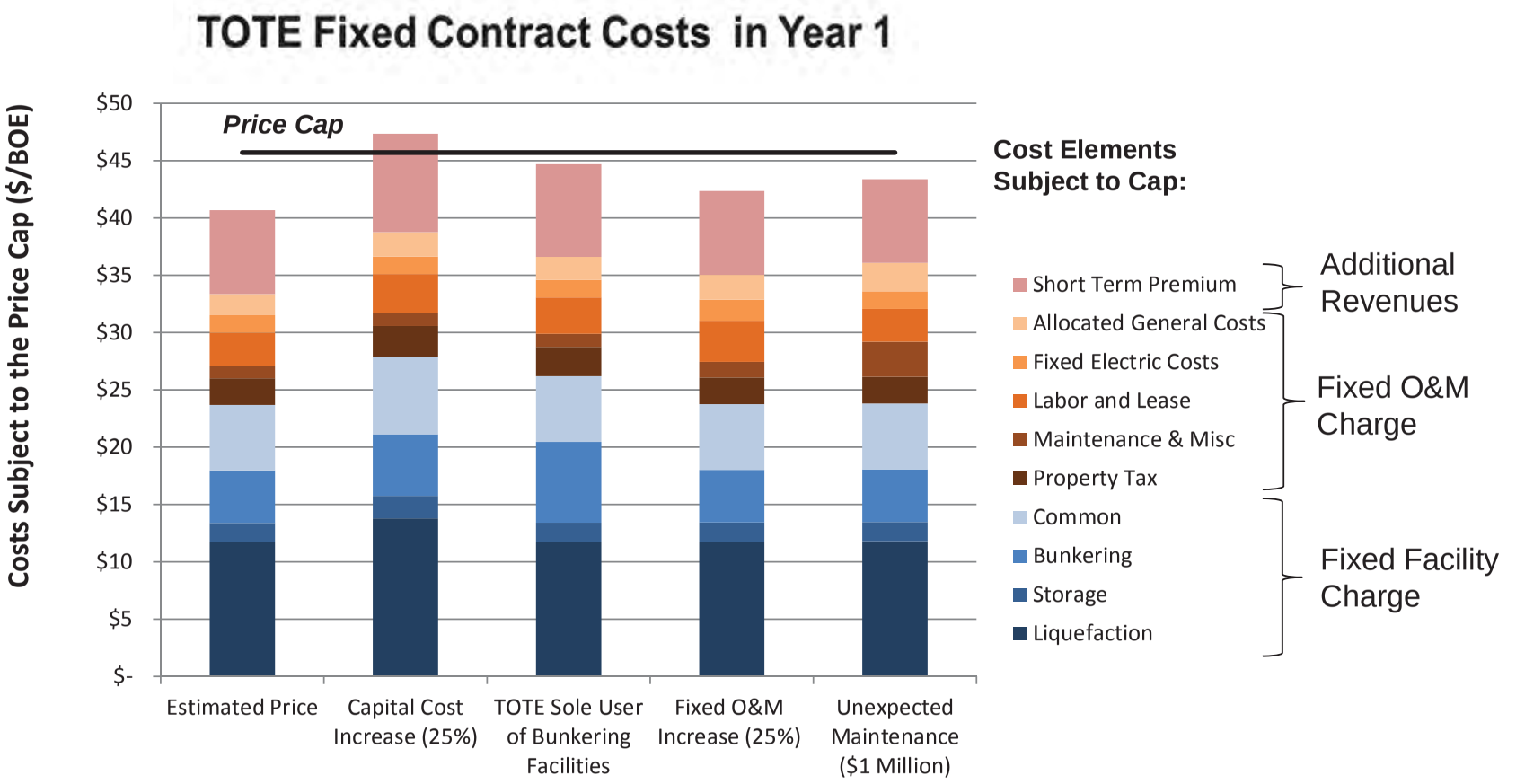
TOTE Price Cap Scenarios



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Facility Siting

Selected Site

- 33-acre site at the Port of Tacoma.
- Inside PSE's gas system.
- Situated on waterway.
- Located adjacent to TOTE.

Siting Requirements

- **PSE Resource Need:** Capable of supporting PSE peak-day needs.
- **Market Access**: Safe, efficient and dependable supply to LNG fuel customers.
- **Compliance:** Comply with setbacks and exclusion zones as defined in federal codes and national safety standards.

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Port of Tacoma Lease

Lease terms have been negotiated with the Port of Tacoma for a 33-acre site adjacent to TOTE's facility.

- **Term:** 25 years from date of first commercial operations.
  - 25-year renewal option, unilateral if 45% of capacity is used for marine purposes.
  - **Termination:** Anytime during the 2-year due diligence and permitting phase with notice and $50,000 termination fee; termination fee not applicable, if due to existing environmental contamination.
- **Pricing:** Varies by phase; requires security deposit of $2.9 million (one year's rent).
  - **Due diligence period:** $49,725 per month.[1]
  - **Construction period:** $146,000 per month.
  - **Operating period:** $212,445 per month.
  - **Volumetric charge:** $0.085/barrel for volumes sold; Port reserves right to establish LNG or other tariffs (but will collaborate with PSE and give 10-years' notice).
  - **Escalation:** Lease pricing components escalate annually at CPI.
- **Indemnification:** PSE must indemnify Port, if activities adversely inhibit normal Port operations.
- **Removal of Improvements:** Upon lease termination, Port reserves right to retain or have PSE remove leasehold improvements.

[1]*Increases $7,000 each month of extended due diligence (beyond initial 12 month period)*

Project Budget

Development Budget		
PSE Labor and OH	$	2,193
Engineering and Analysis	$	4,474
Permitting & Legal Support	$	3,339
Communications/Outreach	$	391
Distribution Upgrades	$	1,126
Commercial and Regulatory[1]	$	1,100
Real Estate and Lease	$	766
Contingency	$	442
Project Development Sub-Total	**$**	**13,831**

[1]Commerical and Regulatory expenses are not capitalized

Budget assumes NO equity investment by marketing partner.

PROJECT BUDGET		
O&M Total	**$**	**1,700**
Development Budget (Capital)	$	11,605
PSE Labor and OH	$	5,800
Engineering & Legal	$	1,400
Real Estate and Lease	$	6,132
Geotechnical and Demolition	$	13,000
In Water Work	$	4,000
EPC Scope	$	181,792
Miscellaneous	$	6,900
Contingency	$	22,650
PSE Construction OH	$	7,830
Sales Tax	$	12,960
Tacoma LNG Facility Sub-Total	$	274,069
Gas Distribution Upgrades	$	49,041
Project Capital Total	**$**	**323,110**
AFUDC	$	46,841
GROSS PLANT	**$**	**369,951**

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Allocation of LNG Plant

Facility Services	Capital Allocated to Each Service	Contributions from Customers Towards Services		
		PSE	TOTE	Marketer
Liquefaction	$81,591	10%	44%	46%
Storage	$82,378	79%	6%	15%
Bunkering	$21,165	0%	65%	35%
Truck Loading	$6,829	1%	0%	99%
Vaporization	$16,700	100%	0%	0%
Common Items	$65,406	45%	25%	30%
Gross Facility Contributions	$274,069	$118,610	$71,667	$83,792
Capital Allocation Ratio	100%	43%	26%	31%

CONFIDENTIAL per Protective Order in WUTC Docket No. UG-151663

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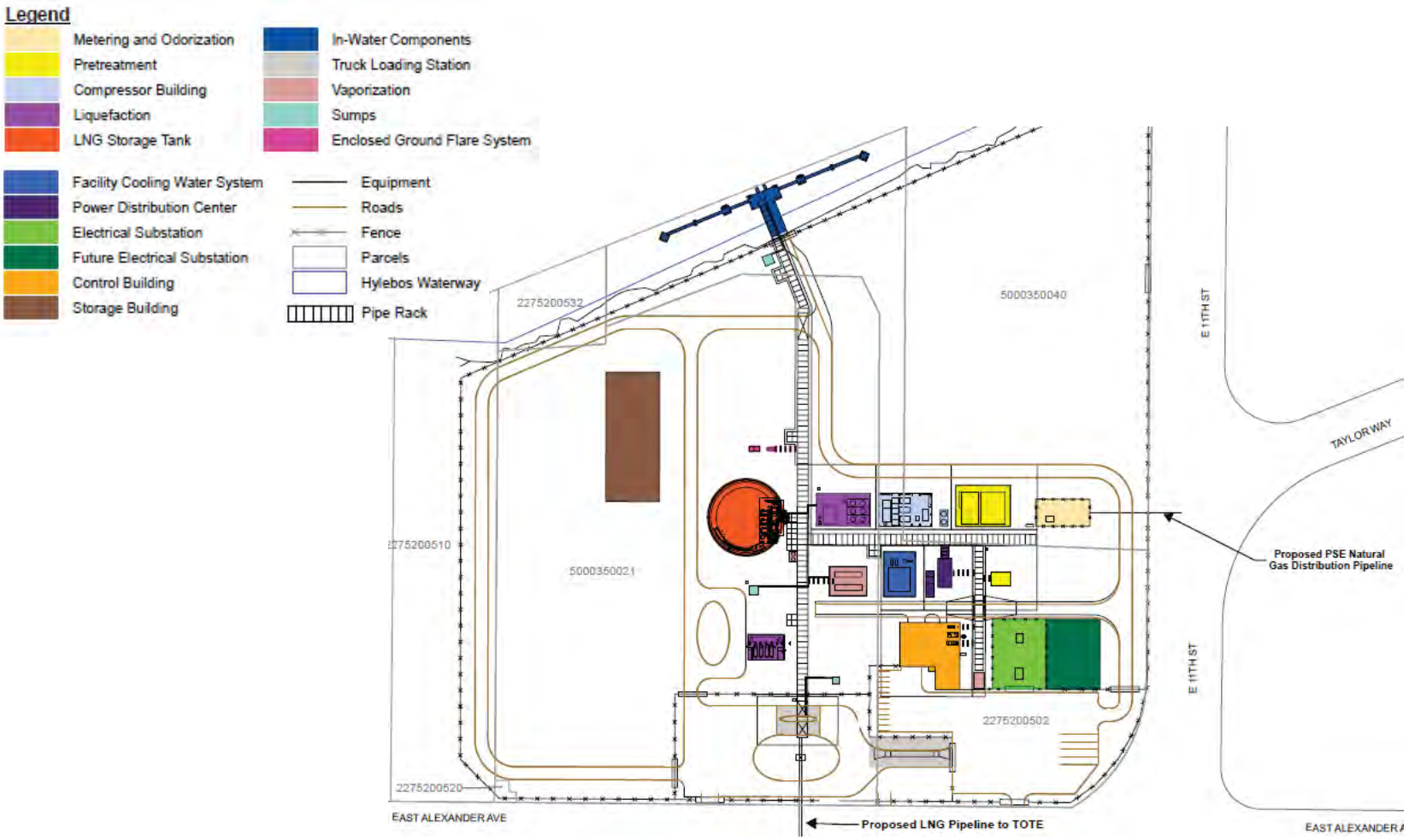
Proposed Layout



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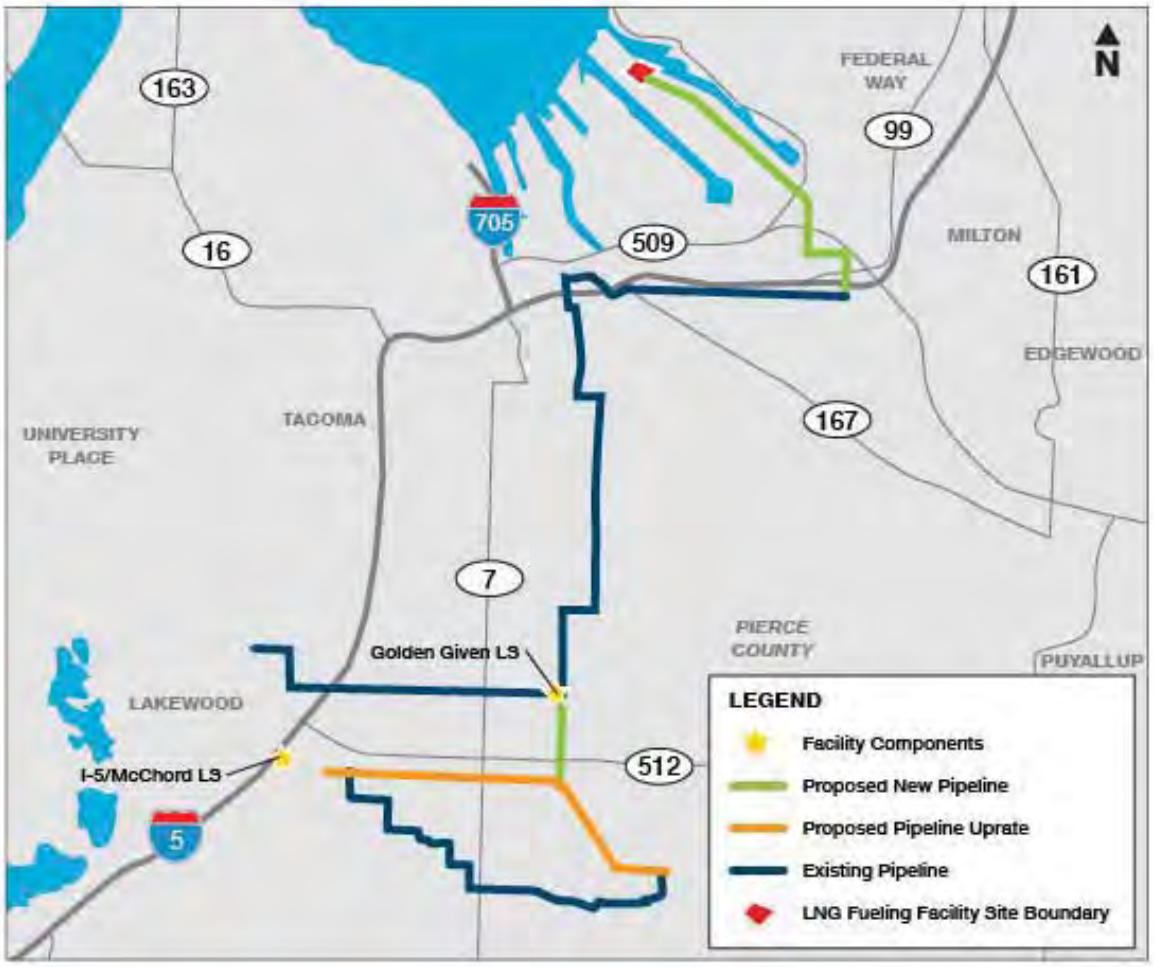
Gas Distribution System Upgrades



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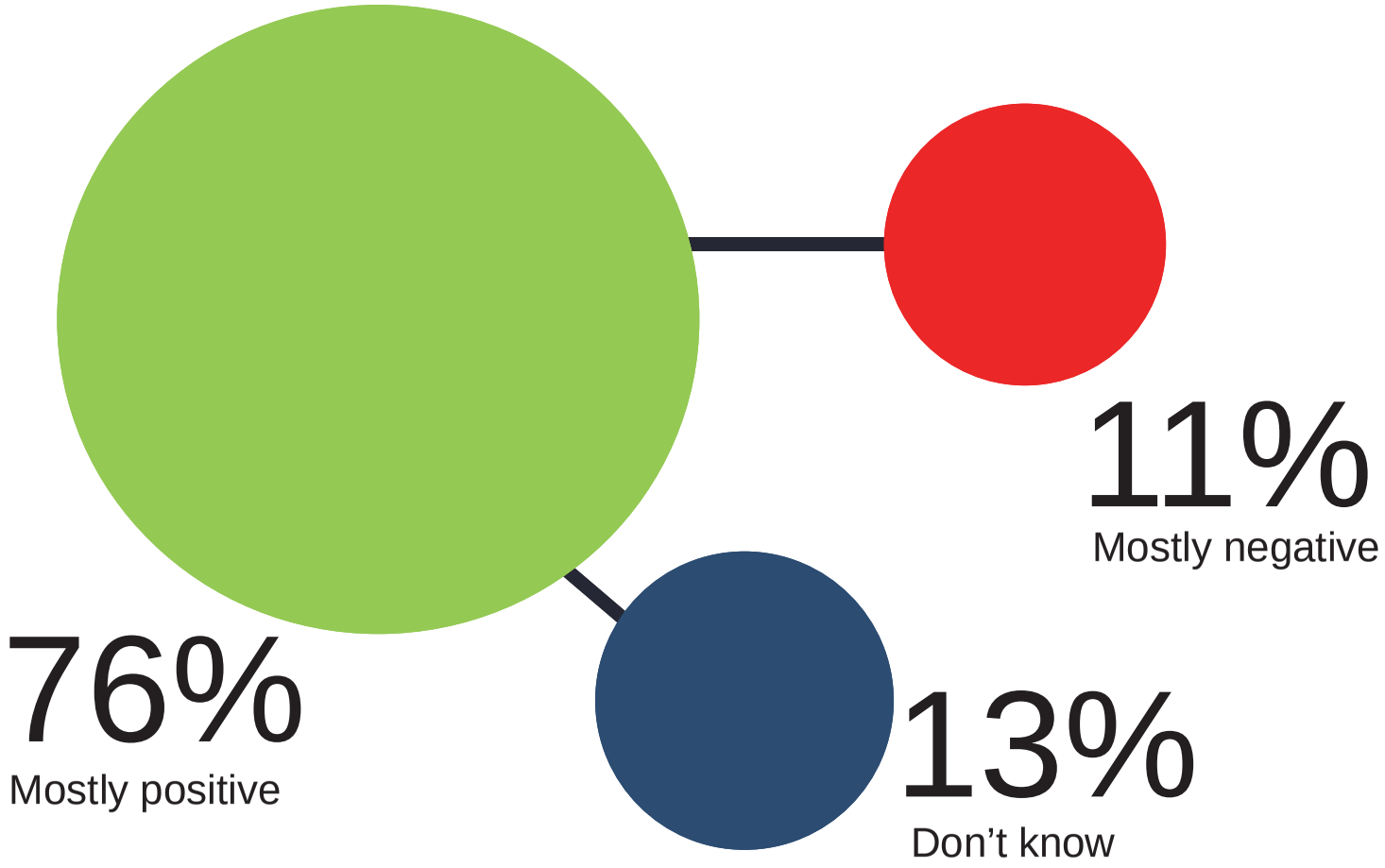
Reaction to LNG Development



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Communications Strategy

Key Messages

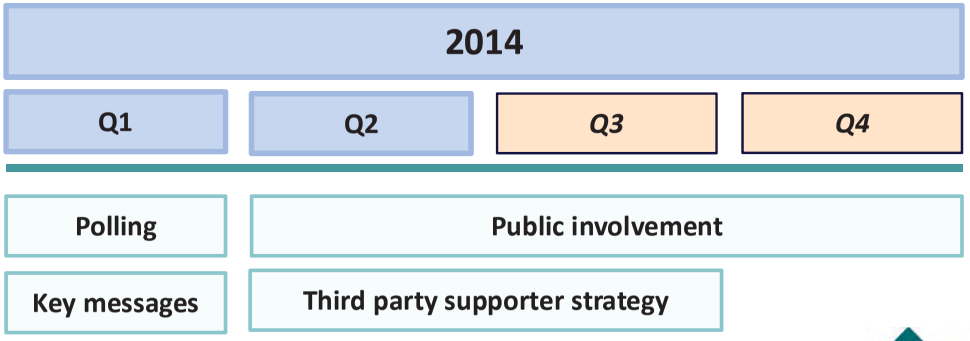
- Greater reliability for Tacoma/Pierce NG customers
- Local jobs and economic opportunity
- Environmental benefits (local air quality, marine and global)
- Safe, proven use of a domestically-sourced fuel

Key Risks

- Neighborhood group opposition (safety)
- Confusion with other Port NG projects (exports)
- Special interest group intervention (fracking)

Mitigation

- Process modeled after Thurston County effort
- Emphasis on local benefits (system reliability, economy, environment)
- Careful differentiation from other proposed facilities
- Communications focus on messaging, large audiences



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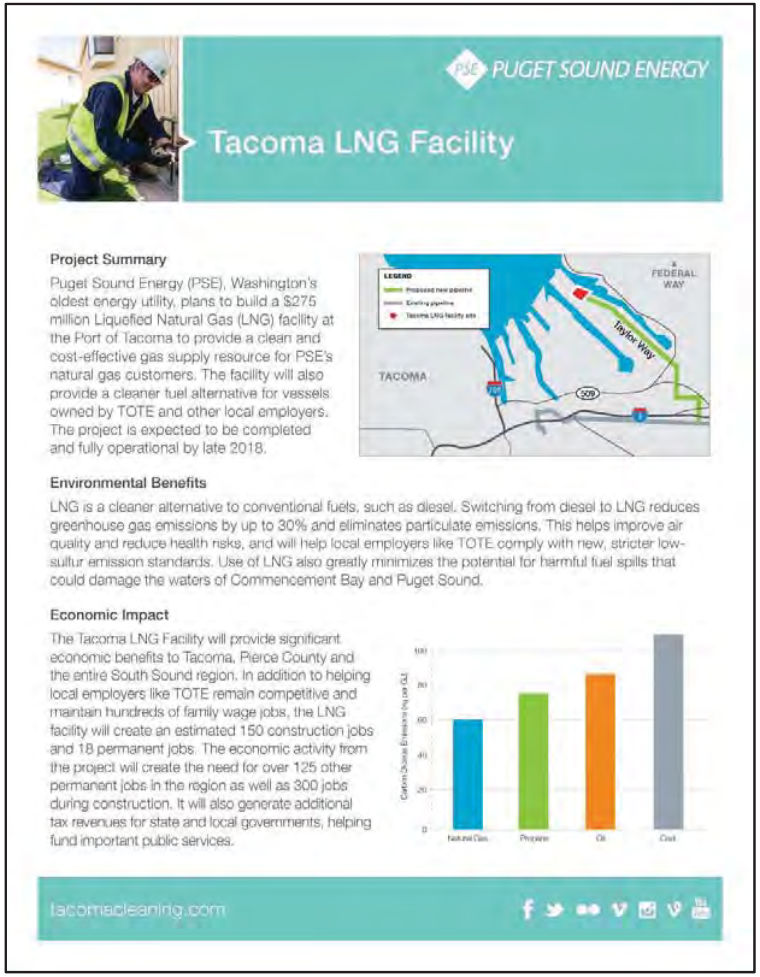
Communication Materials Examples



PUGET SOUND ENERGY
The Energy To Do Great Things

PUGET SOUND ENERGY

Exhibit E.

Summary of Commercial Terms

Contents

Summary of Commercial Terms

To achieve the economies of scale that will provide PSE's gas customers with a least cost resource, PSE will provide service to LNG fuel customers, who will receive LNG from the Tacoma LNG Facility for use in marine, heavy-duty trucking or industrial applications. Commercial arrangements will fall into two categories: end-use customers and fuel marketers.

The Facility's primary LNG end-use fuel customer is Totem Ocean Trailer Express (TOTE). Based in Tacoma, TOTE operates two roll-on/roll-off container ships,[1] carrying consumer goods to and from Alaska. TOTE's ships follow a regimented schedule, refueling in Tacoma every Wednesday and Friday. TOTE typically has 100 to 102 bunkering events every year, and will consume 510,000 barrels of oil equivalent (BOE) per year (approximately 39.6 million gallons of LNG).

TOTE Fuel Supply Agreement

PSE will provide a turn-key LNG service to TOTE under a WUTC-regulated tariff. PSE and TOTE will enter into an LNG fuel supply agreement (FSA) consistent with the tariff.[2] The FSA will contain the following key provisions:

- ***Term:*** The initial term of the FSA will be 10 years, beginning on January 1, 2019 and terminating on December 31, 2028.
    - TOTE has the unilateral right to extend the agreement in five-year increments with 18 months' notice. Extension term pricing contains favorable terms for three successive extension periods, recognizing that TOTE will have paid a short-term contract premium during the initial 10-year term.
- ***Pricing:*** Pricing will be provided under a cost-of-service model, with demand and variable components, and includes overhead allocations. Typical cost-of-service rate-making applies, with the following exceptions:

[1] The term "roll-on/roll-off" in this context denotes a cargo operation in which cargo trailers are driven onto a ship pulled by tractors, rather than an operation in which containers are lifted on to the ship by cranes.

[2] WUTC approval of the LNG tariff will occur later in the development phase of the Project after the agreement with the marketing partner has been finalized. The tariff will incorporate the TOTE FSA.

- TOTE will be charged a short-term contract premium designed to recover associated capital charges over the primary term of the agreement.
- Pricing will be subject to a maximum fixed-price component, recovering capital and fixed O&M. Further explanation of this price cap mechanism follows later in this exhibit.
- Provided TOTE gives proper notice to extend, extension pricing will include capital recovery at reduced rates, recognizing that TOTE will have paid a short-term contract premium during the initial term.
- Natural gas and electricity costs will be passed through to TOTE at market rates. Natural gas will be tied to the Sumas index and electricity will be tied to the Mid-C index. PSE will purchase and deliver the natural gas to the Tacoma LNG Facility.

- ***Conditions Precedent:*** The FSA contains the following conditions precedent through the development phase. Such conditions must be met by January 1, 2017.
  - All permits and regulatory approvals received
  - WUTC approval of LNG tariff received
  - Board approval to execute the EPC contract received – negotiations continue
  - Binding site lease with the Port of Tacoma executed

  As of the date this report is posted, TOTE has not yet agreed on the Board condition listed above. TOTE is concerned about what they may perceive as an unfettered Board out, and is requesting something more definitive and measureable. An example that might be acceptable is "Negotiation of an acceptable EPC contract with costs that are within 10% of the original FEED estimate." PSE will work on resolving this issue prior to the July 30 Board meeting.

- ***Delay Liquidated Damages:*** PSE will be subject to payments for damages to TOTE if PSE cancels the Project for any reason or does not commence service at the Facility by January 1, 2019. In such instance, PSE will pay monthly damages, for a period of up to two years (through 2020), in the amount of $15/BOE, based on an annual consumption of 510,000 BOE per year (maximum of $7.65 million per year).

- ***Direct Service Pipeline***: Bunkering is to be provided via an LNG pipeline from the Tacoma LNG Facility to TOTE's berthing location.

- ***Annual Contract Quantities:*** Estimated contract quantities are 510,000 BOE annually. TOTE has the right to modify the annual contract quantity by 7.5%, up or down, after

the first year of operation to reflect actual consumption. After the first year, TOTE anticipates an annual variance of +/- 5%.

- Deficiency payments – If TOTE fails to take 95% of the annual contract quantity, deficiency payments apply to allow PSE to recover charges not collected through demand charge components.
- Excess LNG charges – If TOTE takes more than 105% of the annual contract quantity, additional demand charges apply. If TOTE exceeds 105% of the annual contract quantity in two consecutive years, PSE has the right to increase the annual contract quantity to reflect the increased consumption.

- ***Failure to Deliver/Receive:***
  - *Force Majeure –*
    - TOTE continues to pay demand charges during the 15 days of a PSE Force Majeure event, after which demand charges are suspended, but the contract is extended for a period equal to the duration of the Force Majeure event, with demand charges applying during the extended period. No damages apply.
    - TOTE continues to pay demand charges during the duration of a TOTE Force Majeure event, but the contract is extended for a period equal to the duration of the Force Majeure event, with no demand charges applying during the extended period. No damages apply.
  - *Non-Force Majeure (excluding Willful Failure to Deliver) –*
    - PSE pays for the incremental cost of replacement fuel subject to certain limits (price capped at double the contract LNG price and annual damages are capped at $7.5 million).
    - TOTE continues to pay demand charges and deficiency payments apply.
  - *Willful Failure to Deliver (e.g., PSE elects to use TOTE's gas to serve natural gas customers) –*
    - PSE pays the full incremental cost of replacement fuel.

- ***Delivery of Off-Spec LNG:*** PSE will be liable for damages to TOTE's engine/ship if it delivers off-spec LNG that is found to cause such damage. Damages are limited to $15 million per contract year. Damages would be covered by PSE's general liability insurance (however, such an event is highly unlikely).

- ***Oil Price Triggers:*** TOTE has the right to terminate the agreement if the price spread between fuel oil and natural gas narrows to within a defined band. TOTE's termination fee compensates PSE at an amount relative to the undepreciated investment (based on the 10-year contract investment recovery) for the first five years of the contract and 50% of the undepreciated investment during the last five years of the initial term.

TOTE Price Cap Mechanism

Since LNG fuel pricing to TOTE is provided under a cost-of-service model, TOTE's pricing will increase as the actual cost of the Facility increases up to a point. Fixed costs elements in TOTE's pricing will be subject to a cap. These costs elements include the return on and of the capital used to construct the Facility (shown in blue in the charts below), the fixed O&M (shown in orange) and the short-term contract premium. The price cap decreases over the contract term as does the expected pricing, which is based on the portion of the Facility ratebase allocated to TOTE and which is also declining over time. ***Figure 1*** shows the price cap and expected pricing over the contract term. Note that the short-term premium is the amount PSE is collecting over the traditional cost-of-service rate, due to the shorter initial term of the TOTE contract (i.e., 10 years) as compared to the Facility's depreciable life (i.e., 25 years). The short-term premium accrues to the benefit of PSE's core natural gas customers.

Figure 1. TOTE price cap and estimated pricing of fixed contract components.

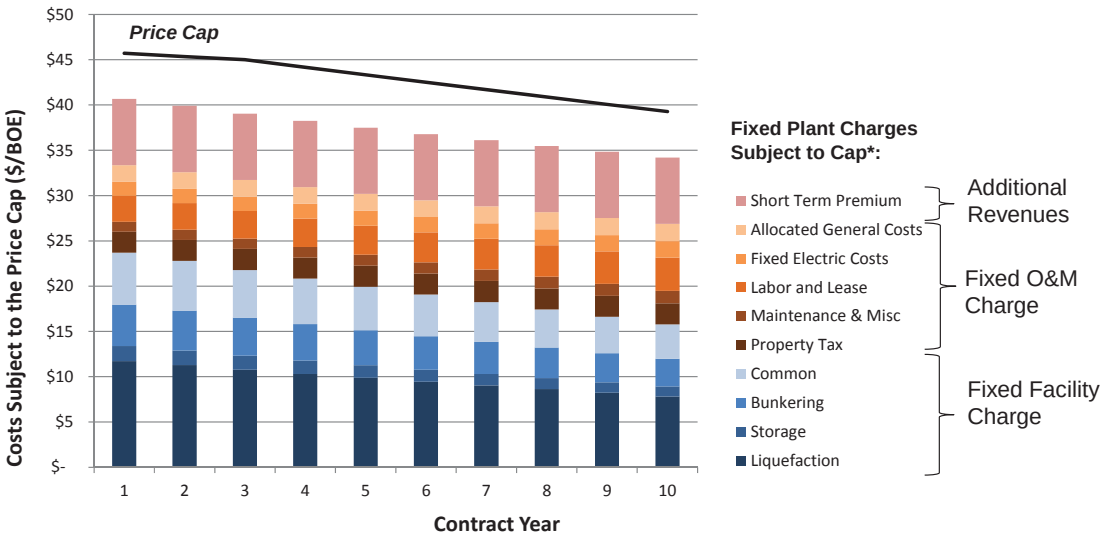
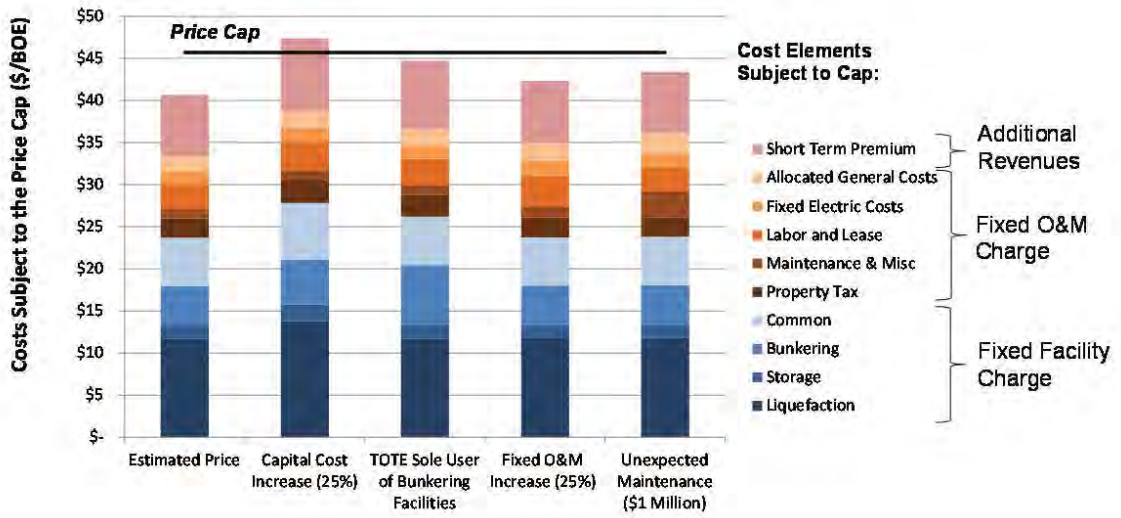


Figure 2 shows a sensitivity analysis of how the TOTE contract pricing mitigates risk even with the price cap mechanism. Different unfavorable scenarios have been modeled. Figure 2 uses the first contract year to illustrate the results. This sensitivity analysis demonstrates that the price cap has enough room to absorb most reasonable project risks including large maintenance expenses which would be unlikely to occur on an ongoing basis. The capped price components are more sensitive to impacts to the capital costs and allocations. As can be seen, in all but one of the unfavorable scenarios modeled, the TOTE contract pricing absorbs the cost increase. In the one case, at a 25% capital increase (above the contingency levels in the Facility budget), TOTE's price would exceed the contractual cap. However, TOTE's revenues would still be sufficient to cover depreciation, financing and all operating costs. PSE would collect a smaller short-term premium but there would still be a yearly benefit to PSE core gas customers.

Figure 2. TOTE fixed costs components in year 1 under different scenarios.



Interim Supply Agreement

In addition to the FSA, PSE will provide LNG to TOTE under an interim supply agreement. PSE will help to facilitate the interim supply but will not take on any contract risk related to the delivery of the supply. The interim supply agreement will be developed with counterparties that can supply LNG and handle delivery logistics. The interim supply agreement has been frustrated and delayed by the exit of the selected shipping/bunkering company.

The interim supply agreement is expected to contain the following provisions:

- ***Supply:*** Liquefaction service will be purchased from FortisBC at its Tilbury LNG facility near Vancouver, BC.
- ***LNG Logistics:*** WesPac Energy Group, owned by Highstar Capital and Primoris Services, will provide ISO containers and arrange for container handling and bulk loading to move the LNG from FortisBC onto the LNG ship or barge.
- ***Shipping/Bunkering:*** A shipping/bunkering company will provide the bunkering ship or barge and LNG system necessary to ship the LNG from Vancouver, BC to the Port of Tacoma and bulk load the LNG onto TOTE's ships. The selected shipping/bunkering company has elected not to pursue the LNG bunkering business, so WesPac, TOTE and PSE are evaluating alternative solutions.
- ***Natural Gas:*** PSE will supply natural gas to FortisBC to produce the LNG.
- ***Pricing:*** TOTE will bear the full cost of the interim supply agreement for a three-year term. The FortisBC, WesPac and shipping/bunkering charges will largely be demand-charge-based. Natural gas charges will be based on the monthly Sumas index.
- ***Contracting:*** PSE will contract with Fortis for liquefaction services and WesPac for the logistics and shipping/bunkering services. PSE will contract with TOTE for interim supply and will pass through the costs and risks to TOTE. WesPac will contract with shipping/bunkering company for shipping/bunkering services (unless PSE elects to contract with the shipping/bunkering company for credit reasons).

Other Commercial Agreements

In order to mitigate the merchant risk associated with the Facility, PSE intends to find a co-owner or long-term tolling customer to subscribe the remaining capacity of the Facility. PSE has had discussions with several potential parties, and has targeted BP and Shell.

The Facility deal structure and the amount that PSE requests to be put into rates will depend on whether PSE's marketing partner ends up as a co-owner or a long-term tolling customer. As a result, PSE will wait to request WUTC approval of its LNG fuel supply service tariff until the structure and associated agreements have been finalized.

Figure 3 depicts the deal structure where PSE's marketing partner is a co-owner and further depicts the situation where PSE has partially assigned half of the TOTE FSA to this party. Under this arrangement, PSE and the co-owner would own the Facility as a tenancy-in-common. Based on current projections, PSE's ownership share would be approximately 56% and only PSE's services and sales would be regulated by the WUTC. As between PSE and the co-owner, ownership and capacity rights and obligations related to liquefaction, storage, bunkering, truck loading, and vaporization would be specified in the ownership and operations agreement.

Figure 3. Project Structure – Joint Ownership

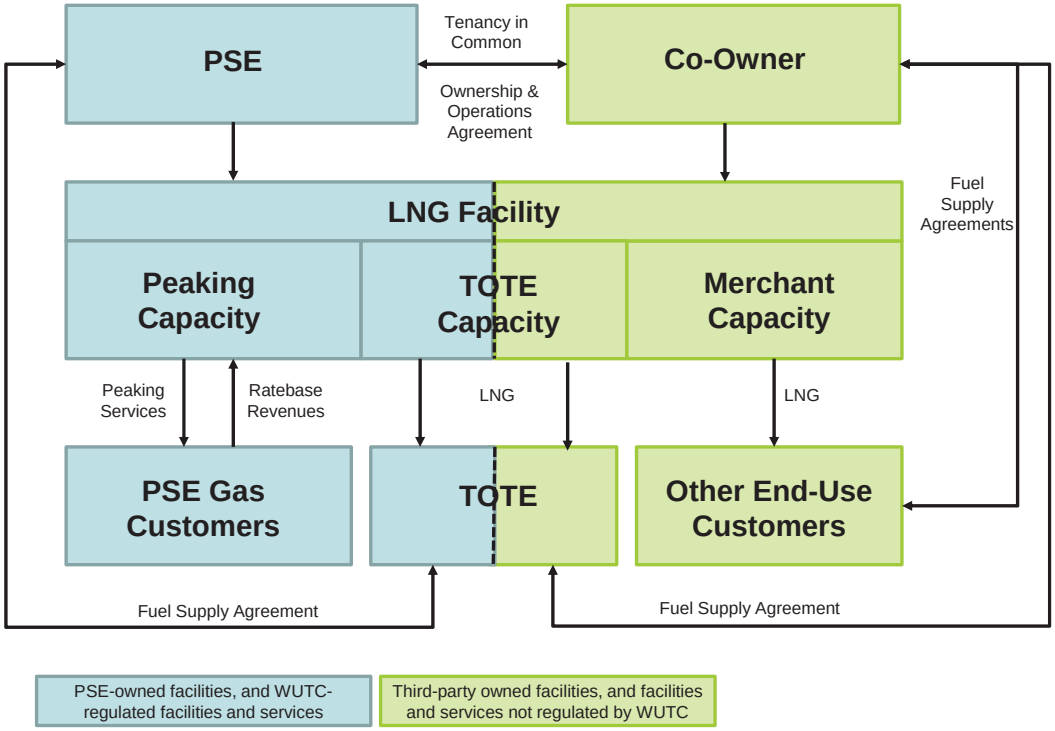
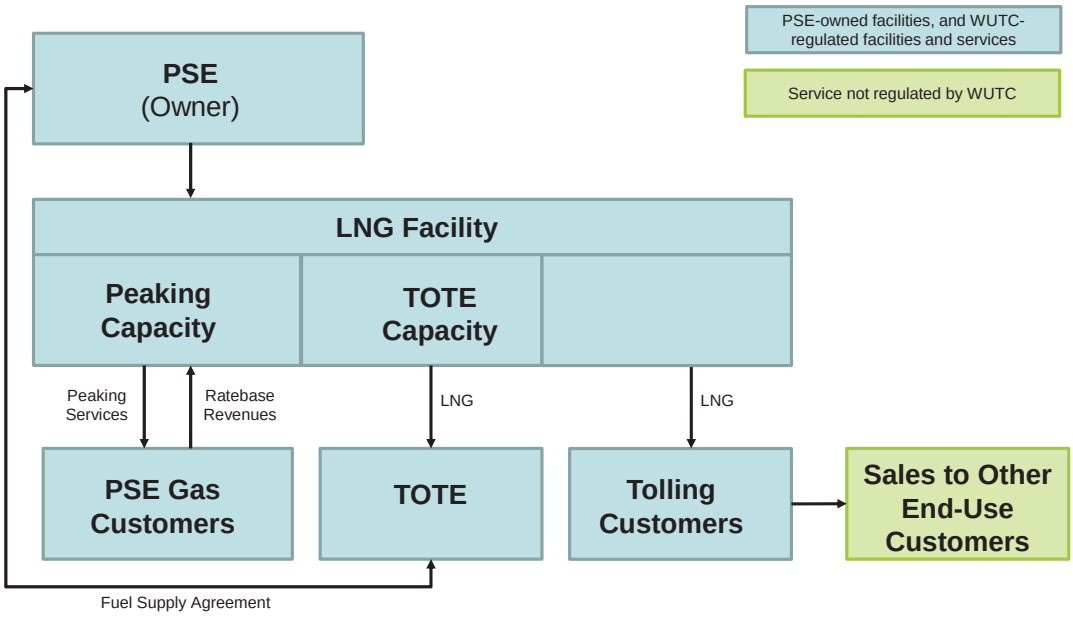


Figure 4 depicts the deal structure where PSE's marketing partner is a long-term tolling customer. Under this arrangement, PSE would own the entire Facility and the entire Facility would be regulated by the WUTC. Only the long-term tolling customer's sales to end-use customers would fall outside the scope of WUTC regulation. The long-term tolling customer would have specified capacity rights and obligations related to liquefaction, storage, bunkering, and truck loading and the agreement would employ cost-of-service pricing. The customer would deliver natural gas to PSE's interconnection point with the interstate pipeline system.

The agreement would include a short-term premium for contract terms of less than 25 years. A term of at least 20 years would be targeted, but a 15-year term may be required in the current market. It is further possible that rather than a long-term tolling agreement, this party could enter into a long-term fuel supply agreement, similar in form to the TOTE contract, including a short-term premium for contracts less than 25 years. In this arrangement, PSE would be responsible for gas supply and transportation.

Figure 4. Project Structure – Tolling Customer



As a fallback to a marketing partner, either a co-owner or long-term tolling customer, PSE would seek to contract with one or more large end-use customers in order to subscribe the Facility. PSE has been in discussion with other entities interested in entering into long-term LNG supply contracts and able to serve as an additional anchor customer. These parties are either shipping or marine customers, or utilities that cannot be served by interstate pipelines. They include Horizon, Matson and Hawaiian gas and electric utilities. Contracts with end-use customers would be similar in form to the TOTE FSA and would fall under the WUTC-regulated tariff.

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Exhibit H.

Risk Analysis

Contents

Risk Analysis

This exhibit summarizes the risks associated with the Tacoma LNG Project (the "Project") and describes the management actions PSE has developed to address them. There are three principle Project phases, each with a different risk profile:

- Development Phase
- Construction Phase
- Operations Phase

PSE has identified risks associated with each Project phase and developed plans to eliminate or mitigate them to the extent that it is reasonable and practicable.

Many of the risks associated with specific project elements are discussed in detail in other exhibits:

- Commercial risks related to the TOTE contract are discussed in ***Exhibit E***
- Permitting risks are discussed in detail in ***Exhibit J***
- Community relations risks are discussed in detail in ***Exhibit K***

Development Risks

Development risks include risks assumed prior to entering the construction phase of the Project. (The construction phase commences when PSE enters into an engineering, procurement and construction (EPC) contract and other Project construction agreements.) To date, PSE has completed a significant amount of work required to demonstrate that the Project is feasible (as summarized in this report). However, there are risks associated with obtaining permits, regulatory approvals and community support that must be mitigated and controlled.

In addition to a summary of risks and mitigations, this exhibit includes a development timeline with associated dollars spent to reach key milestones.

During the development phase, the worst-case would occur as the consequence of an event which caused development to fail, thus forcing PSE to abandon its efforts, and further assuming the event occurred after the execution of the TOTE fuel supply agreement and near the end of

the planned development phase. In such a circumstance, PSE might need to pay TOTE as much as $15.3 million in liquidated damages under the fuel supply agreement and write off as much as $14 million in capitalized development costs. Examples of such risk events would be permits not granted or WUTC denial of PSE's requested regulatory treatment. These events would also result in significant reputational risk, which has not been quantified. These risks and other development phase risks are detailed in the tables that follow.

Construction Risks

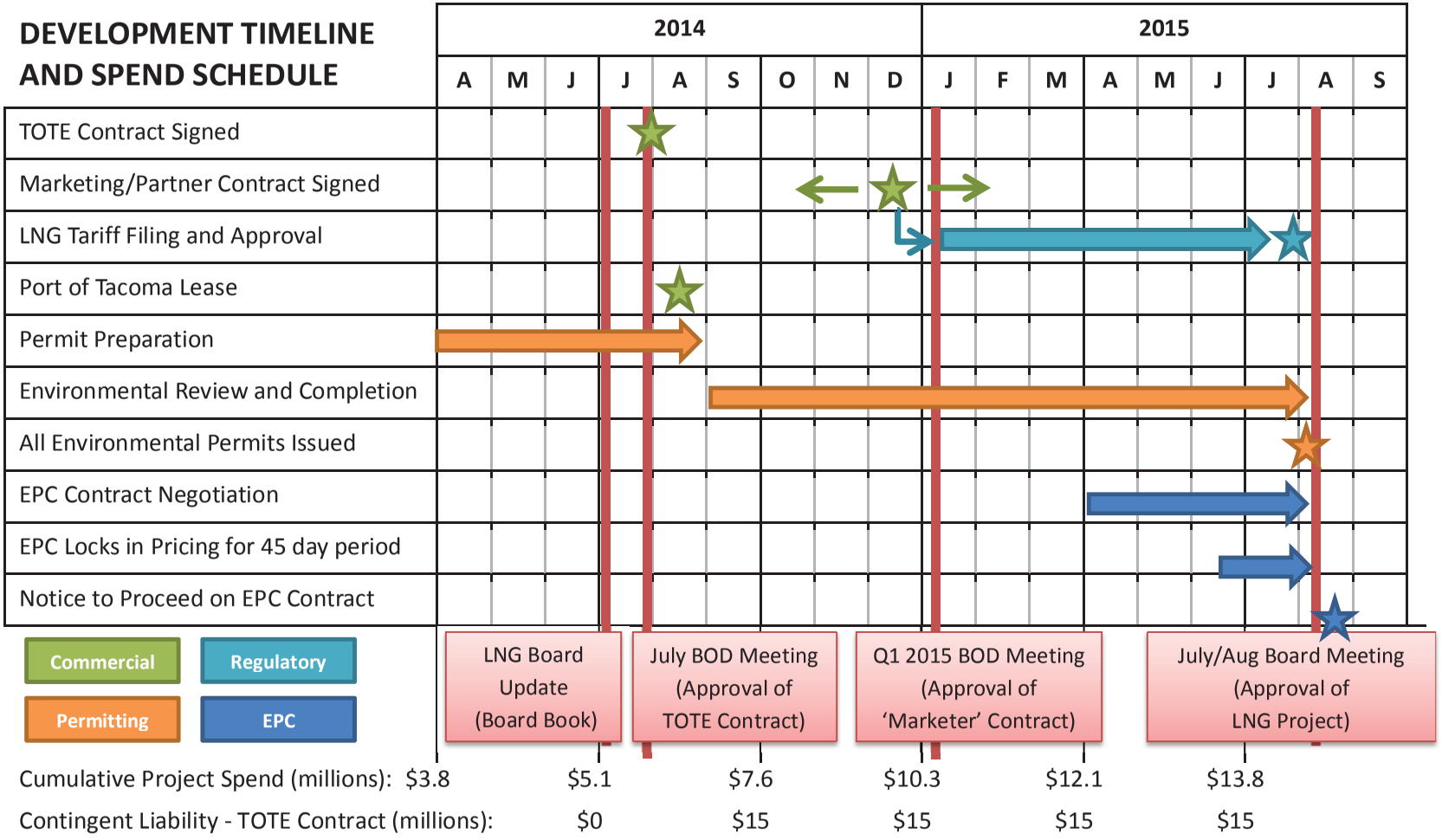
Prior to requesting board approval to execute the EPC contract, PSE will obtain all environmental permits necessary to construct and operate the Facility. Building permits and WUTC approvals, which are administrative in nature, will come after executing the EPC contract (upon completion of detailed engineering).Construction risks can usually be categorized as cost, schedule or performance risks. Most of the Plant costs and schedule are driven by the EPC scope of work, which is performed under a fixed-price contract with liquidated damages for late completion. The PSE-performed work will be completed under fixed-priced contracts (most likely design-bid-build, or design-build), which will minimize the cost risks to PSE. Since PSE intends that the LNG Facility will be fully regulated, cost increases can generally be recovered in rates or through specific LNG tariffs, unless such overruns ultimately result in a regulatory disallowance. Site preparation and in-water work performed by PSE carries greater schedule risks, specifically due to uncertainties related to the ground improvement program. Schedule float has been included to allow sufficient lead-time to address these uncertainties. Schedule risk, which cannot be absorbed by float, may result in liquidated damage payments due to TOTE under the fuel supply agreement. Performance risk will be managed by detailed specifications and definitions associated with the scope of work backed by contract warranties.

Operations Risks

The worst-case risk during the operations phase would occur in the event that PSE ended up with a regulatory disallowance as a result of the general rate case order in which the WUTC determined prudence. This risk is briefly summarized in the tables that follow. PSE's regulatory strategy is detailed elsewhere in this document.

Other than regulatory risk, operations risk may result from market, performance, warranty or safety events. To mitigate performance, warranty and safety risks, PSE is considering Chicago Bridge & Iron or Black and Veatch for its EPC contractor. Both firms are established world leaders in LNG plant design and construction. The selected firm's experience, along with the expected contract performance guarantees and liquidated damages, will limit PSE's exposure to

Facility performance risks. PSE will staff and operate the Facility according to established safety standards and the designer's operational procedures; staff training, maintenance and operating protocols will be developed taking into account regulations, PSE policies and practices, and best industry practices.



DEVELOPMENT Risk	Cause	Inherent Probability	Inherent Magnitude	Mitigation	Mitigated Probability	Mitigated Magnitude
Merchant Risk [MR]	PSE unable to find co-owner or long-term tolling customer beyond TOTE and assumes merchant risk on un-contracted plant capacity.	Almost Certain	Critical	PSE intends to fully contract the Facility's capacity. However, to the extent that there is excess capacity, PSE will have to demonstrate that merchant risk is prudent.	Extremely Unlikely	Negligible
Project Costs [PC]	Final construction costs are significantly higher than the original FEED study and current estimates.	Possible	Major	PSE's budget includes contingency amounts commensurate with the current estimate stage. PSE's offtake contracts will allow for some pass through of cost escalations. PSE's prudency demonstrates that the Project can withstand a significant cost increase and still be the least cost peaking option for PSE's retail gas customers. (See ***Exhibit N*** for a discussion of PSE's resource alternatives analysis and results.)	Unlikely	Minor

DEVELOPMENT Risk	Cause	Inherent Probability	Inherent Magnitude	Mitigation	Mitigated Probability	Mitigated Magnitude
Permits Delayed [PD]	Permitting delays may be caused by third-party interveners or delayed agency action. *See **Exhibit J** for a more detailed analysis of permitting delay risks.*	Possible	Major	To mitigate permitting delays PSE will do the following: • Initiate Project introduction meetings with all involved agencies to provide advance notice of the Project and schedule; • Initiate regular Project meetings with the agencies during permitting; • Engage an independent coordinator to help facilitate decision-making among agencies; • Reimburse key agencies for time dedicated to this Project.	Unlikely	Major
Permits Not Granted [PX]	Permitting agencies determine that project impacts cannot be mitigated. *See **Exhibit J** for a more detailed analysis of potential permitting delay risks.*	Possible	Critical	PSE has already begun to gain support for the Project from key community, business and government organizations to ensure its success. The Company will continue to educate others in federal, state and local government about the substantial public benefits of the Project.	Extremely Unlikely	Critical

DEVELOPMENT Risk	Cause	Inherent Probability	Inherent Magnitude	Mitigation	Mitigated Probability	Mitigated Magnitude
Regulatory (Tariff) [RT]	WUTC denies approval of LNG tariff and regulated treatment of the Facility.	Almost Certain	Critical	PSE has and will continue to work with WUTC commissioners and staff to promote the cost and reliability benefits of the Project to PSE's gas customers, and the economic and clean air benefits for the region. PSE has garnered support from state and local elected officials. Additionally, PSE continues to support legislation that promotes a regulatory environment that encourages the development of alternative fuels.	Unlikely	Critical
Environmental Contamination [EC]	Environmental contamination at the Port of Tacoma or along the gas distribution system upgrades route delays the Project and/or increases Project costs.	Likely	Major	PSE has, and will continue to perform environmental sampling at the site and along the pipeline route. If contamination is found at the plant site during the development phase, the Port will generally bear the financial responsibility of remediation. PSE will work to mitigate any schedule risk the remediation might pose.	Likely	Negligible

DEVELOPMENT Risk	Cause	Inherent Probability	Inherent Magnitude	Mitigation	Mitigated Probability	Mitigated Magnitude
Community Concerns [CC]	The project encounters an organized effort to address community concerns regarding: • LNG safety; • Any project involving fossil fuels; • Opposition to using "fracked" gas.	Likely	Critical	PSE will work with communities to provide education about the benefits of LNG and the Project, and to address concerns. This will take the form of an outreach campaign, including community meetings and presentations, a web site and/or other forms of communication to help address any concerns the communities may have. (*See **Exhibit K** for details about PSE's plan to engage the community.)*	Unlikely	Negligible

CONSTRUCTION Risk	Cause	Probability	Magnitude	Mitigation	Mitigated Probability	Mitigated Magnitude
Cost Risk [PC]	Changes to plant design after the EPC contract is executed, or significant, unforeseen environmental contamination drive increased cost.	Likely	Major	Facility construction will be executed via a lump-sum EPC contract. Remaining construction is accomplished by firm, fixed-price competitive bids. Scope control will be managed after contract execution. Environmental conditions will be evaluated and characterized prior to the start of construction.	Unlikely	Minor

CONSTRUCTION Risk	Cause	Probability	Magnitude	Mitigation	Mitigated Probability	Mitigated Magnitude
Contractor Performance [CP]	The Facility fails to meet required specifications or work quality requirements.	Likely	Major	Contractors are pre-qualified and selected based upon best value and historical performance. PSE will use independent Quality Assurance inspection to validate contractor performance and require contract warranties to backstop risk.	Unlikely	Minor
Construction Delays [CP]	Supply chain disruptions, unforeseen site conditions, productivity issues, etc. delay project completion.	Likely	Major	The overall construction schedule includes float to accommodate uncertain duration of demolition and site work. The EPC contract will have liquidated damages for late completion.	Possible	Minor
Safety (Construction) [SC]	Unsafe work practices lead to onsite accidents or worker injuries.	Likely	Major	All contractors will be required to have rigid safety programs that meet or exceed PSE's standards.	Extremely Unlikely	Negligible

CONSTRUCTION Risk	Cause	Probability	Magnitude	Mitigation	Mitigated Probability	Mitigated Magnitude
Distribution Upgrades Construction Risk [DU]	Distribution system costs increase or the schedule is delayed due to: • complexities associated with route (railroad crossings/contamination); • permitting; • environmental impacts/ restoration work; • regulatory approval for pressure increase.	Likely	Major	More detailed staff review/analysis, engineering work and testing will be performed as the Project progresses. PSE will consider construction methods, hours of work and restoration requirements as they relate to permitting. Special material handling and HAZWOP[1] training will be necessary. PSE intends to work with jurisdictions on cost impacts of unknown restoration requirements. (*See **Exhibit M** for more details about distribution system upgrade risks.*)	Possible	Minor

[1] Hazardous Waste Operations ("HAZWOP")

OPERATIONS Risk	Cause	Probability	Magnitude	Mitigation	Mitigated Probability	Mitigated Magnitude
Regulatory Prudence [RP]	WUTC determines that PSE's investment in the LNG Facility is imprudent.	Likely	Critical	By virtue of the LNG tariff, PSE will have gauged the Commission's position on the project. The LNG Facility will have been evaluated in at least two IRPs prior to the WUTC's prudency determination. PSE has and will continue to work with WUTC commissioners and staff to promote the cost and reliability benefits of the Project to PSE's gas customers, and the economic and clean air benefits for the region. PSE has garnered support from state and local elected officials. Additionally, PSE continues to support legislation that promotes a regulatory environment that encourages the development of alternative fuels.	Unlikely	Minor
Customer Defaults or Breaks Contract [CD]	Long-term LNG customers don't fulfill their obligations under the contracts.	Unlikely	Major	LNG fuel supply agreements will have contractual provisions to mitigate counterparty credit risks (parental guarantees, etc.). Should a default occur, PSE would mitigate revenue impact by selling volumes associated with any breached contracts.		

OPERATIONS Risk	Cause	Probability	Magnitude	Mitigation	Mitigated Probability	Mitigated Magnitude
Customer Consumption [CN]	Plant customers take significantly lower volumes than anticipated, resulting in sub-optimal plant operations.	Possible	Major	PSE will include contractual provisions such as deficiency payments or penalties to mitigate efficiency losses from running the Facility at a lower output. Alternatively, PSE could operate the Facility with longer or more frequent outages and use the LNG storage tank to mitigate operational inefficiency.	Unlikely	Minor

OPERATIONS Risk	Cause	Probability	Magnitude	Mitigation	Mitigated Probability	Mitigated Magnitude
Market Collapse [MC]	The price spread between natural gas and diesel could collapse, eliminating the economic benefit associated with LNG	Unlikely	Major	PSE commissioned Wood Mackenzie to study the probabilistic spread between natural gas and diesel prices. The results of this study validated PSE's position regarding the sustainability of the spread. PSE will take on long-term contracts that will generate revenues sufficient to cover the costs of facilities during the contract term. TOTE has certain rights to exit its contract if a drastic collapse of the spread occurs; however, the exercise of such rights includes termination payments to PSE.	Unlikely	Minor
Liquefaction and Performance Efficiency [CP]	The Facility fails to meet design specifications and LNG quality requirements.	Likely	Major	The EPC contractor will guarantee production capability; the contract will include warranty provisions to meet specifications and/or liquidated damages.	Unlikely	Minor

OPERATIONS Risk	Cause	Probability	Magnitude	Mitigation	Mitigated Probability	Mitigated Magnitude
Safety (Operations) [SO]	Equipment failure or operational error leads to onsite accidents and/or worker injuries.	Unlikely	Minor	The Facility will be designed, constructed, and inspected according to the latest safety standards. Extensive regulations govern required procedures and training for Facility personnel. The Facility will be operated consistent with PSE policies. In addition, the Facility will be insured under PSE's policy.	Extremely Unlikely	Minor
Maintenance of Plant Equipment [ME]	Major components prematurely fail due to improper maintenance.	Likely	Major	Major components will be inspected and tested at the factory prior to installation. Only qualified suppliers will be used. The Facility will have full operations and maintenance manuals, and will maintain onsite spares for component parts with higher failure rates. The Facility will be maintained in accordance with PSE's policies.	Unlikely	Minor

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Exhibit J.

Permitting and Regulatory Matters

Permitting and Regulatory Matters

For a discussion of permitting and regulatory matters related to the Tacoma LNG Project, please refer to the confidential attorney-client privileged memos from Steve Secrist to the Board of Directors, dated respectively July 2, 2014 and July 23, 2014.

PUGET SOUND ENERGY

Exhibit K.

Public Affairs and Communications

Contents

Public Affairs and Communications

Joint Strategy and Messaging

This Public Affairs plan intends to grow and maintain support for the project, with a specific focus on permitting and siting the Facility. Central to the plan is a coordinated communications and outreach strategy for local and state government, the Tacoma/Pierce County community and special interest groups, including environmental, commercial partners, regulators and PSE customers.

The strategy for the Project's communications and outreach program was built in part using:

- Public opinion research to test existing perceptions of LNG and potential focus areas for the key message platform, including:
    - Two focus groups (King County and Tacoma)
    - A telephone poll with 1,000 respondents in Pierce County and King County
- Stakeholder interviews with subject matter experts, commercial partners, local decision makers and project team.
- Study of best practices and lessons learned from other LNG and natural gas projects, including their key messaging and outreach strategy.

<u>The key messages include:</u>

1. **The Tacoma LNG Project will provide important environmental benefits for the people of Tacoma and for the State of Washington.**
    a. Talking points focus on how the LNG provided by this Facility will help address the community's air quality issues as well as Washington State's ability to meet its carbon emission goals. Other environmental benefits include eliminating the threat of marine spills and PSE's leadership as an early adopter of environmentally progressive alternative fuel options for our customers.

2. **The Tacoma LNG Project will help ensure continued dependable service and additional benefits to PSE natural gas customers.**

    a. Talking points include the substantial peak shaving benefit for PSE natural gas customers and the cost advantage of LNG compared to alternative resources such as long-haul interstate pipeline capacity for peak days.

3. **The Tacoma LNG Project will generate important economic benefits for all South Sound residents.**

    a. Talking points include new job growth and existing job security due to the economic advantages of natural gas and the overall economic benefit for the Port of Tacoma, City of Tacoma and State.

4. **Natural gas is a proven, safe source of energy that reduces reliance on foreign fuels.**

    a. Talking points include the safe history of LNG use world-wide, PSE's experience with LNG and natural gas and the benefits of relying on an abundant, North American fuel source.

<u>The Project communications tools, consistent with our messaging, include:</u>

- Project webpage (see below for screenshot)
- Project fact sheets and FAQs
- Graphics, including:
    - Visual simulations of the Facility
    - Maps of the Port and pipeline
    - Graphs illustrating the environmental benefit
- A briefing packet for PSE messengers to use in their outreach activities

<u>The coordinated outreach strategy includes but is not limited to:</u>

- Targeted stakeholder briefings, with:

  - Puget Sound Pilots
  - Port of Tacoma Customers
  - Labor
  - Northeast Tacoma community leadership
  - Customers affected by new pipeline construction
- Grassroots outreach to:
  - Local Government officials
  - State Government officials
  - Potential Project supporters

State Government

The Tacoma LNG Facility received strong proactive support from State legislators and the Governor. These elected officials view the Project as a multifaceted win. The Mayor and Governor are especially attracted to the Project because it promotes State and local economic development and positions both governments as regional and national leaders in the low carbon transportation fuels arena. The Project also creates jobs, improves the environment through the reduction of greenhouse gas emissions and particulate matter, and provides infrastructure support for PSE's natural gas customers in the form of peaking resources and pipeline development. The primary area of concern has been related to Project operational safety, which is addressed through education around the Facility and its operation and separating PSE from other Tacoma area natural gas projects.

Local Government

The goal of the Local Government Affairs strategy is to maintain support from elected officials and key community leaders in order to provide a platform for regulatory tax reforms, approval of the lease from the Port of Tacoma, timely permitting and successful construction of the LNG Facility.

Initial briefings have been conducted with over 30 elected officials and key leaders and City permitting officials and the reception has generally been very favorable. Leaders view this Project as positive for the Port of Tacoma, for the environment and air, and as a driver of a new industry and fuel source.

Media Relations

There has been some early news coverage of the Tacoma LNG Facility in local media and trade journals. The Public Affairs plan includes news releases and interviews with local publications, including the Tacoma News Tribune, at certain project milestones. We anticipate generally favorable reaction in the media, based on early coverage and positive Project messages regarding economy, clean air and local customer peak shaving benefit.

PSE will respond to all requests for interviews and information with our consistent Project messaging strategy.

Speaking Engagements

Puget Sound Energy representatives testified at several state committee hearings in 2014 to support tax legislation needed to level the playing field regarding taxation for PSE to develop the Project. Additionally PSE staff continues to meet individually with elected officials to provide update information in support of permitting and development of the Tacoma LNG Facility.

Agency and Local Jurisdiction Outreach

PSE will be working closely with state agencies to educate staff on the Tacoma LNG Project to ensure favorable outcomes in the permitting and regulatory arenas. Outreach to Energy Facility State of Washington, the Department of Ecology, and other agencies will smooth concerns and provide positive outcomes for Project development.

Community Involvement

The community outreach plan includes strategies for engaging with local community leaders, special interest groups and members of the public. The primarily grassroots approach includes tactics like:

- Attending public meetings (such as Home Owners Associations and local Chambers of Commerce) to educate groups about LNG and the Project
- Seeking public support from groups like the American Lung Association
- Natural gas safety and education tables at local events

Potential Risks to Public Acceptance

Risk 1: Public confusion of the LNG Facility and larger nearby proposed projects, including:

- A proposed methanol plant at the Port of Tacoma
- A feasibility study being conducted by a global energy company looking to build an LNG plant close to but not on Port property

Mitigation: Messaging will focus on the characteristics that differentiate the facilities, highlighting the local partners and local benefit of the Tacoma LNG Project.

Risk 2: Delayed permits and regulatory decisions due to:

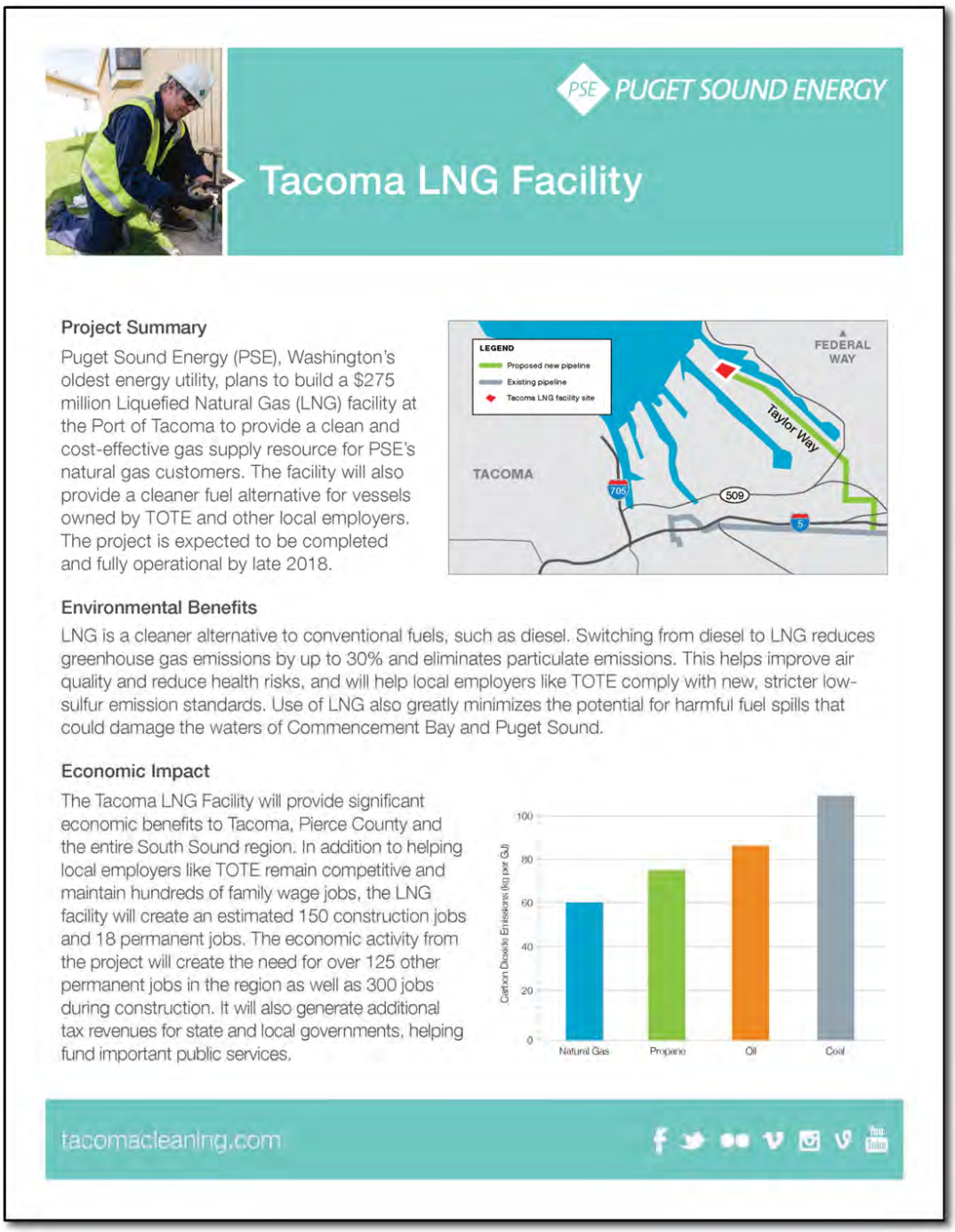
- Agencies simultaneously permitting both the LNG and methanol plant and wanting to address the "combined impacts"
- Federal, state and local governments' ability to stay on timelines

Risk 3: Opposition groups (e.g., groups opposed to natural gas fracking or the use of fossil fuels) will attempt to disrupt the Project's success through activism or other methods.

Mitigation: Contingency plans for potential activism or protests will be in place prior to public rollout. Project messaging and strategy addresses some potential concerns proactively.

Sample Communication Tools

Project Fact Sheet (Page 1)



PUGET SOUND ENERGY

Tacoma LNG Facility

Project Summary

Puget Sound Energy (PSE), Washington's oldest energy utility, plans to build a $275 million Liquefied Natural Gas (LNG) facility at the Port of Tacoma to provide a clean and cost-effective gas supply resource for PSE's natural gas customers. The facility will also provide a cleaner fuel alternative for vessels owned by TOTE and other local employers. The project is expected to be completed and fully operational by late 2018.

Environmental Benefits

LNG is a cleaner alternative to conventional fuels, such as diesel. Switching from diesel to LNG reduces greenhouse gas emissions by up to 30% and eliminates particulate emissions. This helps improve air quality and reduce health risks, and will help local employers like TOTE comply with new, stricter low-sulfur emission standards. Use of LNG also greatly minimizes the potential for harmful fuel spills that could damage the waters of Commencement Bay and Puget Sound.

Economic Impact

The Tacoma LNG Facility will provide significant economic benefits to Tacoma, Pierce County and the entire South Sound region. In addition to helping local employers like TOTE remain competitive and maintain hundreds of family wage jobs, the LNG facility will create an estimated 150 construction jobs and 18 permanent jobs. The economic activity from the project will create the need for over 125 other permanent jobs in the region as well as 300 jobs during construction. It will also generate additional tax revenues for state and local governments, helping fund important public services.

tacomacleanlng.com

Project Fact Sheet (Page 2)

Safety

LNG is simply the liquid form of the natural gas used in millions of homes and vehicles. When cooled, natural gas is reduced to a liquid that is one six-hundredth the volume, making it easier to store and transport. It is not explosive or flammable in its liquid state. When warmed, it returns to its gaseous state, and the same safe handling procedures are used as with natural gas. More than 100 LNG production, storage and fueling facilities currently operate in the US – including one that PSE has owned and operated in Gig Harbor for more than a decade.

When natural gas is liquified, it shrinks by more than 600 times.

The difference in size is similar to a **beach ball** compared to a **ping pong ball**.

Review and Approval Process

The Tacoma LNG Facility will go through an extensive review and approval process with federal, state and local government agencies. The project will undergo an environmental review under the State Environmental Policy Act and require multiple permits, which will provide numerous opportunities for the public to comment.

PSE's Tacoma LNG Facility, to be completed by 2018

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Frequently Asked Questions (Page 1)

PSE PUGET SOUND ENERGY

Tacoma LNG Facility

Answers to Frequently Asked Questions

Q: What type of facility is Puget Sound Energy (PSE) proposing?

A: PSE plans to build a Liquefied Natural Gas (LNG) facility to provide PSE customers with natural gas reserves to maintain dependable service on the coldest days of the year. It will also provide commercial customers with a cleaner fuel alternative.

Q: Where will the facility be located?

A: It will be located at the Port of Tacoma on Taylor Way (see map).

Q: When will the facility be completed and operational?

A: A facility like this goes through an extensive review and approval process prior to construction. A thorough permitting process, with many opportunities for the public to comment, will be followed by site preparation work and construction. We expect the facility to be completed and operational in late 2018.

Q: What exactly is LNG?

A: LNG is simply another form of natural gas currently used in millions of homes and vehicles. When cooled, natural gas becomes a liquid that is one six hundredth the volume, making it easier to store and transport.

When natural gas is liquified, it shrinks by more than 600 times.

The difference in size is similar to a **beach ball** compared to a **ping pong ball.**

Q: Is LNG safe?

A: Yes. LNG is neither explosive nor flammable in its liquid state. When it returns to its gaseous state, it behaves as any natural gas and must be handled accordingly. LNG carrier vessels have completed over 135,000 voyages with no significant safety incidents.

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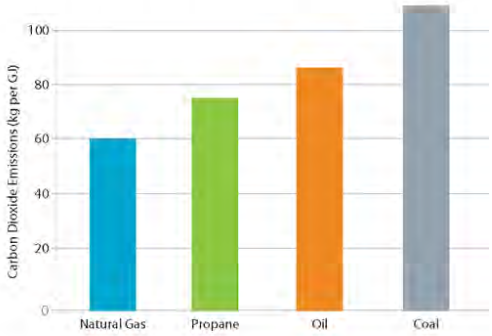
Frequently Asked Questions (Page 2)

Q: What are the environmental benefits from using LNG?

A: LNG offers many environmental benefits over conventional fuels, like diesel. Switching from diesel to LNG reduces greenhouse gas emissions by up to 30% and eliminates particulate emissions. This helps improve air quality and reduce health risks. Use of LNG also virtually eliminates the potential for harmful fuel spills that could damage the waters of Commencement Bay and Puget Sound.

Q: What customers will the LNG facility serve?

A: The facility will serve PSE's existing customers by providing a dependable natural gas source during times of peak demand. The LNG produced at the facility will also provide a cleaner fuel alternative for regional businesses, including TOTE, a local shipping company operating cargo ships between Tacoma and Alaska. This innovative step will help them comply with new, stricter federal low-sulfur emission requirements.



Q: Will LNG be exported from this facility to customers in other countries?

A: No. We do not plan to export any fuels from this facility and it will not be large enough to serve the export market. We will only be serving domestic customers from the facility.

Q: Are there any benefits for PSE natural gas customers beyond those being directly served by the facility?

A: Yes. The Tacoma LNG facility will benefit all PSE natural gas customers ensuring continued dependable natural gas service on the coldest days of the year. Having a reserve of available natural gas stored as a liquid will also allow PSE to reduce its gas purchases at times of peak demand, reducing costs that would otherwise be passed on to customers. Also, healthy growth of PSE's commercial customer base helps spread PSE's overhead costs, lowering costs for existing natural gas customers.

Q: How much will the facility cost to build?

A: We expect PSE's total investment in the project to be $275 million.

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Frequently Asked Questions (Page 3)

Q: How many jobs will be created at the facility?

A: Hundreds of family-wage jobs will be created, both directly and indirectly, by the construction and operation of the facility. An independent analysis of the project estimated that construction would create 150 union jobs on site, and that the associated economic activity would generate more than 300 indirect jobs in the area. Once the facility is up and running, its operation will generate enough economic activity to support 125 jobs throughout the area as well as 18 jobs at the facility itself. These figures do not include the hundreds of local family-wage jobs that can be protected by helping TOTE and other local employers stay competitive.

Q: What role does the Port of Tacoma play in approving the facility or overseeing its operations?

A: PSE will be leasing land for the facility from the Port of Tacoma and the Port Commission will review the project proposal before signing the lease. Its ongoing role will be to ensure that PSE complies with the terms of that agreement.

Q: How much experience does PSE have with LNG?

A: In addition to providing natural gas service to some 800,000 customers throughout Western Washington, PSE has owned and operated an LNG storage facility in Gig Harbor for more than a decade. PSE also uses LNG reserves to meet increased gas demand on cold days.

Q: Does PSE need to make any upgrades to its gas system in the surrounding area to support this facility?

A: Yes. Approximately 5 miles of new natural gas pipeline and related infrastructure will be built to support this project, mostly at the Port of Tacoma. PSE maintains a regular schedule of upgrades to the natural gas lines throughout its service territory.

Q: Do other facilities like this exist elsewhere?

A: There are more than 100 LNG production, storage and fueling facilities currently operating across the United States.

Q: Where does PSE get the natural gas for this facility?

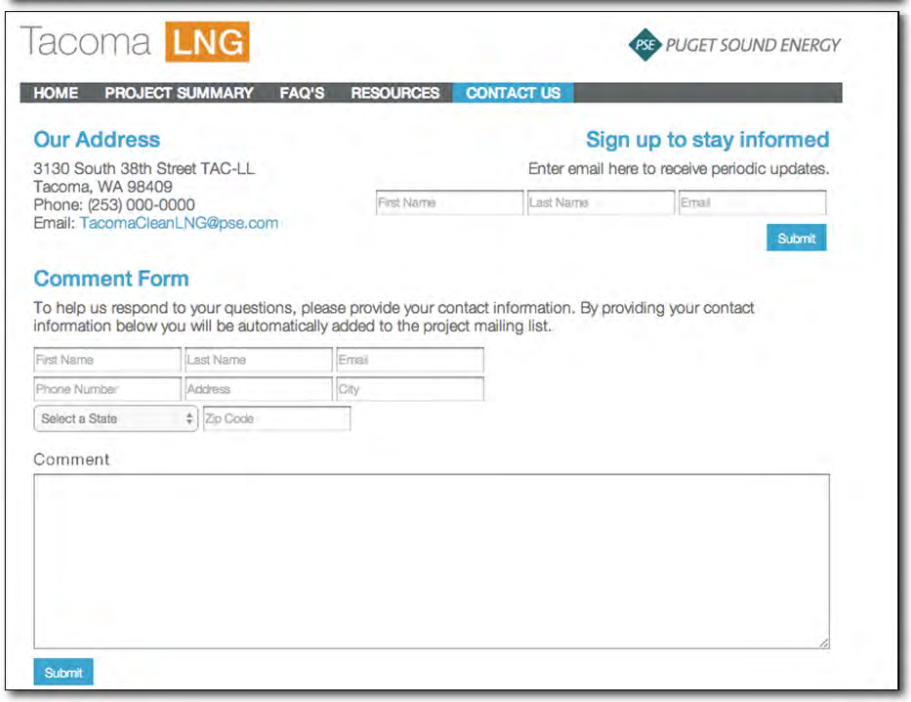
A: The natural gas for the Tacoma LNG facility will come from the same North American market which PSE buys the rest of its natural gas supplies. PSE does not own or operate any natural gas fields and mostly buys its gas from bulk distributors.

Q: Is PSE's Tacoma LNG facility similar to the methanol facility that has been proposed for the Tacoma area?

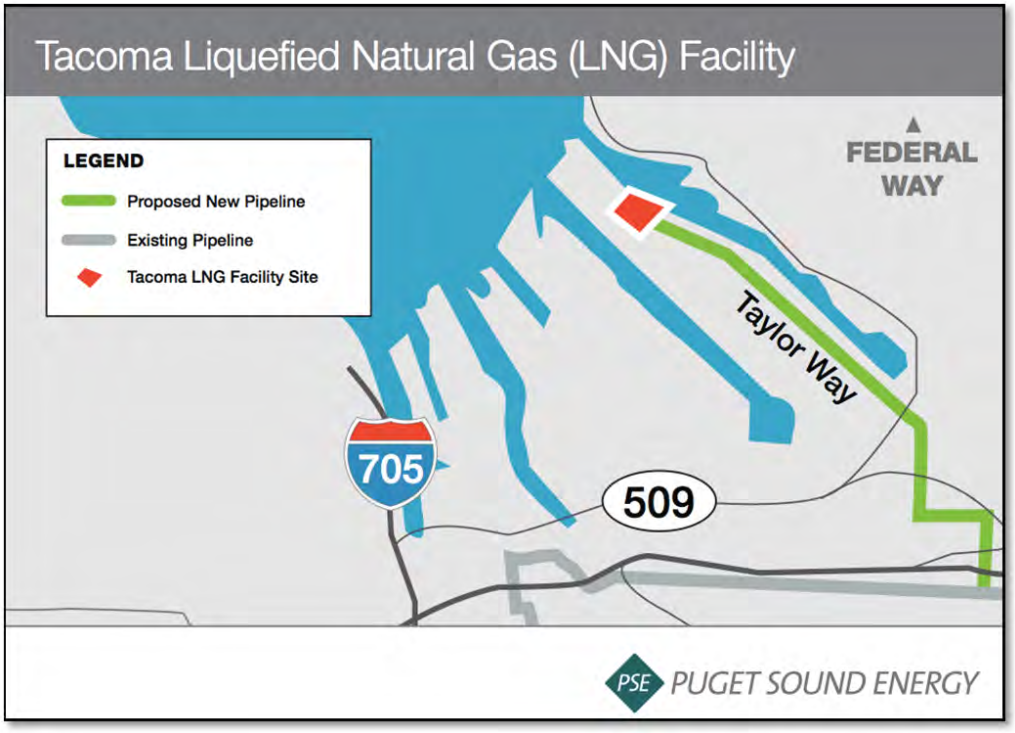
A: No. The plants are very different in size, product and target customers. PSE's Tacoma LNG Facility will be smaller than the proposed methanol plant and will focus on serving local customers.

tacomacleaning.com

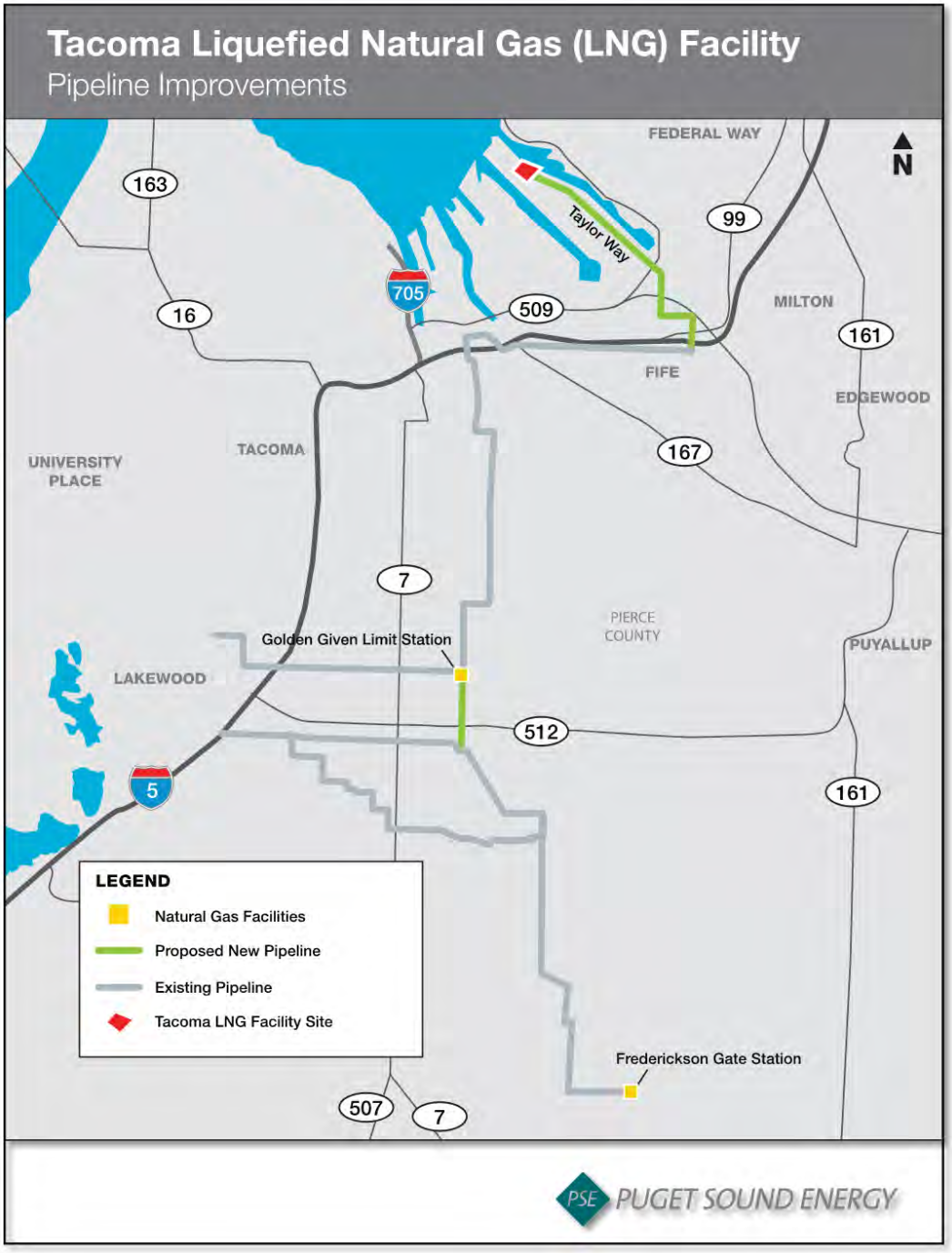
Website (www.TacomaCleanLNG.com)



Project Maps



Project Maps (continued)



PUGET SOUND ENERGY

Exhibit N.

Gas Peak Day Resource Need and Alternatives Analysis

Contents

Gas Peak Day Resource Need and Alternatives Analysis

This exhibit considers PSE's gas peak-day resource needs and the options available to meet such needs. PSE's resource requirements are determined in the Integrated Resource Plan ("IRP").

PSE conducted two separate analyses to compare the cost of resource alternatives. One analysis uses the Resource Planning department's planning software to simulate total portfolio costs by optimally selecting resources to serve demand. The second analysis uses discounted cash flows ("DCF") to evaluate the present value of the costs and revenues associated with owning and operating the Tacoma LNG Project. The DCF analysis also evaluates the cost of serving growing demand with a smaller peak shaving facility and long-haul interstate pipeline capacity.

A summary of the analyses and their results are discussed in detail below.

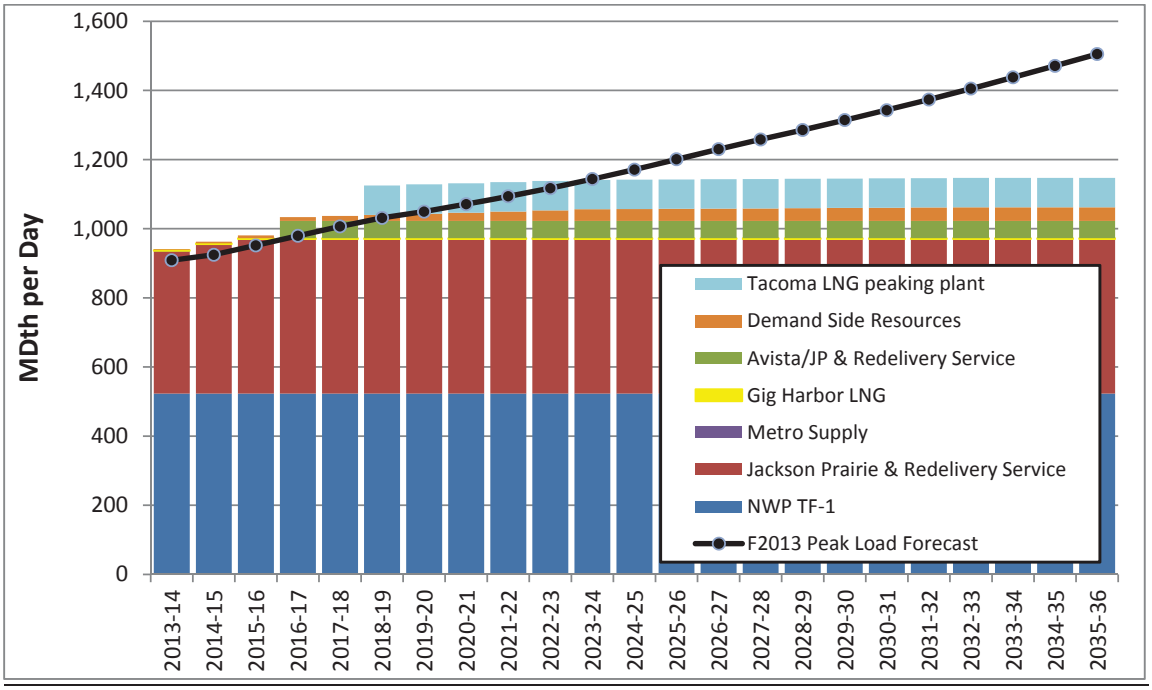
Resource Need

PSE's resource need is defined as the design peak demand of its retail sales customers less the existing portfolio resources available to meet such demand. Each IRP includes an updated long-term forecast of customer demand, based on existing customer count, use per customer trends, temperature response and economic conditions in the service area. Resource need is determined by comparing this forecast to existing resources, including firm pipeline capacity contracts, gas storage and other peaking resources that PSE controls and expects to maintain. Potential new resources, both demand- and supply-side, are then compared to determine the least-cost (adjusted for risk) resources to serve the future needs of the customers. New supply-side resources may be hypothetical or conceptual, and lack specific site-driven or detailed cost estimates, but inclusion of such resources is intended to guide the company toward further evaluation of promising alternatives.

Further analysis of specific resources with known contractual terms or more detailed cost estimates are performed to confirm the cost-effectiveness of the resource prior to an acquisition decision.

Below is the most recent load/resource balance (including the Tacoma LNG Project) presented graphically; the difference between the total projected customer demand and the resources is the resource need.

Figure 1. PSE's load/resource balance



Gas Sales Portfolio Load/Resource Balance

The firm peak-day supply resources and forecasted peak-day loads for the winter peak periods 2013 to 2014 through 2035 to 2036 are shown in Figure 2 below. The F2013 peak-load forecast, net of Demand Side Resources (DSR), is compared with the available supply resources. During the 2013 to 2014 winter period, PSE had 938 MDth/day of supply resources compared to a forecasted peak-load, net of DSR, of 907 MDth/day, resulting in a load/resources surplus of 32 MDth/day. As shown, with the existing and planned resources and F2013 load forecast, the gas sales portfolio has sufficient resources to supply loads until the winter of 2019 to 2020. Even a minor change in projected peak-day load or achieved DSR could result in a shortfall in the gas sales portfolio in winter 2018 to 2019.

Figure 2. Gas sales portfolio peak load/resource balance without Swarr (MDth/day) - 03/31/2014

				On-System					
Winter Period	NWP TF-1	Jackson Prairie & Redelivery Service	Avista/JP & Redelivery Service	Swarr	Metro Supply	Gig Harbor LNG	Total Supply Side Resources	F2013 Load Forecast net of DSR	Load Resource Balance net of DSR
2013-14	523.1	412.1		0	0.5	2.5	938	907	32
2014-15	523.1	432.1		0	0	2.5	958	920	38
2015-16	523.1	447.1		0	0	2.5	973	944	29
2016-17	523.1	447.1	50.0	0	0	2.5	1,023	968	54
2017-18	523.1	447.1	50.0	0	0	2.5	1,023	992	30
2018-19	523.1	447.1	50.0	0	0	2.5	1,023	1,014	9
2019-20	523.1	447.1	50.0	0	0	2.5	1,023	1,029	-6
2020-21	523.1	447.1	50.0	0	0	2.5	1,023	1,047	-25
2021-22	523.1	447.1	50.0	0	0	2.5	1,023	1,067	-44
2022-23	523.1	447.1	50.0	0	0	2.5	1,023	1,087	-64
2023-24	523.1	447.1	50.0	0	0	2.5	1,023	1,110	-88
2024-25	523.1	447.1	50.0	0	0	2.5	1,023	1,137	-114
2025-26	523.1	447.1	50.0	0	0	2.5	1,023	1,166	-143
2026-27	523.1	447.1	50.0	0	0	2.5	1,023	1,195	-172
2027-28	523.1	447.1	50.0	0	0	2.5	1,023	1,222	-199
2028-29	523.1	447.1	50.0	0	0	2.5	1,023	1,249	-226
2029-30	523.1	447.1	50.0	0	0	2.5	1,023	1,277	-255
2030-31	523.1	447.1	50.0	0	0	2.5	1,023	1,305	-282
2031-32	523.1	447.1	50.0	0	0	2.5	1,023	1,335	-312
2032-33	523.1	447.1	50.0	0	0	2.5	1,023	1,366	-343
2033-34	523.1	447.1	50.0	0	0	2.5	1,023	1,398	-376
2034-35	523.1	447.1	50.0	0	0	2.5	1,023	1,432	-409
2035-36	523.1	447.1	50.0	0	0	2.5	1,023	1,466	-443

Notes:
1. Annual peak loads are assumed to be in December of each year

The largest supply resource is firm pipeline capacity on Williams-Northwest Pipeline ("NWP") with a total of 523 MDth/day of capacity to PSE's service territory. This consists of capacity from British Columbia originating at Sumas (261.5 MDth/day) and a similar amount of capacity from Alberta and the Rockies (261.6 MDth/day).

PSE also owns and contracts for Jackson Prairie natural gas storage service, which is delivered to PSE's service territory via firm NWP redelivery pipeline capacity; Jackson Prairie provides peak-supply resources of 447 MDth/day. As reflected in the table, some of the Jackson Prairie capacity has been reserved for PSE's power portfolio through the 2014 to 2015 winter periods. The full capacity will be returned to the natural gas retail sales portfolio in 2015 to 2016.

PSE controls two small, on-system supply resources: an LNG satellite peaking facility located near Gig Harbor with vaporization capacity of 2.5 MDth/day that serves peak-loads in the Gig

Harbor area; and biogas (approximately 0.5 MDth/day) purchased from King County's waste water treatment plant in Renton. The biogas agreement is expected to be terminated prior to the winter of 2014 to 2015.

PSE has entered into an agreement with Avista Utilities for a long-term lease of 50 MDth/day of withdrawal capacity and associated storage capacity from Avista's portion of Jackson Prairie. This agreement will begin in April 2016 and extends through March 31, 2046. This new Jackson Prairie storage supply will be delivered to PSE's service territory with NWP storage redelivery pipeline capacity.

Description of Resource Alternatives Considered

Past IRPs have found that a generic, regional LNG peaking resource may be a cost-effective addition to the company's portfolio. Because there were other lesser-cost resources available at the time of those prior studies, the regional LNG peaking plant was not selected as the least-cost solution. However, the most recent IRP evaluated the Tacoma LNG Project and selected it as a preferred resource in essentially all cases.

As part of the ongoing analysis of the prudency of the Tacoma LNG Project, PSE is considering the following resource options:

Swarr Propane-Air Facility Upgrade. The Swarr propane-air facility has been temporarily removed from service while it awaits upgrades that would improve environmental safety and operational reliability and efficiency. When upgraded, Swarr's capacity will be 30 MDth/day. Before the Swarr upgrade begins, PSE will evaluate the overall risk associated with operating Swarr. While cost estimates are not yet fully developed, project costs are not expected to exceed $10 million; the upgraded facilities could be available as early as 2016.

Tacoma LNG Project. The peaking portion of the proposed Tacoma LNG Project is designed to provide 85 MDth/day of firm delivered gas supply and assumed to be available for the 2018 to 2019 heating season.

Mist Storage and NWP Interstate Pipeline Capacity. PSE has been exploring the possibility of participating in NW Natural Gas Company's proposed expansion of the Mist storage project in northwest Oregon. Recent discussions considered a project that was proposed to be completed and in-service as early as 2017. PSE contemplated service with withdrawal capacity of 50 MDth/day to serve PSE's retail natural gas customers, with firm delivery into NWP via the Kelso-Beaver Pipeline. After analysis of both internal estimates and external consulting studies, NW

Natural provided a detailed cost-estimate of the proposed storage project, including 20-year annualized costs.

In order for the Mist storage service to be considered a firm resource, PSE would also need to acquire additional firm Northwest Pipeline capacity from the Kelso-Beaver Pipeline interconnect with NWP to PSE's distribution system (south to north). Incremental, discounted storage redelivery service is not currently available, so PSE is assuming that NWP capacity would have to be acquired through an NWP expansion project, and carry cost equal to or greater than existing rates.

NWP and Westcoast Energy Pipeline Capacity and Gas Supply. Another resource alternative is PSE acquiring 85 MDth/day of firm NWP pipeline capacity from the Sumas, Washington interconnect with Westcoast Energy's pipeline. Since NWP is generally fully-contracted on a long-term basis, PSE is assuming that such service will require an NWP expansion of its interstate system. PSE has received order-of-magnitude estimates from NWP and has seen the results of recent expansion open seasons, which indicate that expansion pipeline capacity will cost more than existing pipeline capacity. Consistent with PSE's existing supply diversity strategy, PSE would also acquire 43 MDth/day (or 50%) of firm capacity on the Westcoast Energy T-South system. Of course, pipeline capacity does not include a supply resource, so PSE would likely have to purchase a call option or similar product to ensure gas supply is available during peak demand. For purposes of this evaluation, PSE is simply assuming that gas supply will be available at Sumas at a daily index price, and does not include the cost of a peak-day gas supply resource.

SENDOUT® Model Portfolio Analysis of Resource Alternatives

PSE's Resource Planning department evaluated the alternatives described above with the SENDOUT® model using the existing gas sales portfolio database from the 2013 IRP.

The SENDOUT® model considered four alternatives using the following input data:

1) the Tacoma LNG Project cost and performance inputs;

2) the cost and performance inputs for the proposed Mist storage expansion which were updated based on revised data (as of Oct. 1, 2013);

3) the load forecast was updated to the F2013 forecast net of DSR; and

4) the gas price forecast was updated using the forward price marks as of 2/28/2014 (for years 2015 to 2018) and the Wood Mackenzie Fall 2013 Long Term View (2019 to 2035). The time horizon of the SENDOUT analysis was extended from the 20 years (2014 to 2033) used in the IRP to 2043 to include the full 25 years of depreciable life of the Tacoma LNG Facility.

The SENDOUT Software Model

PSE uses the SENDOUT® software model from Ventyx for long-term gas supply portfolio planning. SENDOUT® is a widely used model that helps identify the long-term least-cost combination of resources to meet stated loads. The SENDOUT® model is used by other regional utilities including Avista, Cascade Natural Gas, and Fortis B.C. The current version of SENDOUT® used by PSE (version 12.5.5) incorporates Monte Carlo capabilities, allowing consideration of uncertainties about future prices and weather-driven loads.

SENDOUT® is an integrated tool set for gas resource analysis that models the gas supply network and the portfolio of supply, storage, transportation, and demand-side resources (DSR) to meet demand requirements. The Monte Carlo capabilities allow simulation of uncertainties regarding weather and commodity prices. The SENDOUT® portfolio is run over many draws (each with different underlining weather and commodity price assumptions) to provide a probabilistic view of the optimal portfolio.

SENDOUT® can operate in two different modes: It can be used to determine the optimal set of resources (energy efficiency, supply, storage and transport) to minimize costs over a defined planning period; or, specific portfolios can be defined, and the model will determine the least-cost dispatch to meet demand requirements for each portfolio. SENDOUT® solves both problems using a linear program (LP). It determines how a portfolio of resources (energy efficiency, supply, storage, and transport), including associated costs and contractual or physical constraints, should be added and dispatched to meet demand at the lowest cost. By using an LP, SENDOUT® considers thousands of variables and evaluates tens of thousands of possible solutions in order to generate the least-cost solution. A standard dispatch considers the capacity level of all resources as given, and therefore performs a variable-cost dispatch. A resource-mix dispatch can look at a range of potential capacity and size resources, including their fixed and variable costs.

Summary Results

The deterministic runs use the input load forecast and market gas prices to develop a single set of resources which supply the loads at the least-cost. The stochastic (Monte Carlo) analyses include monthly variations or "draws" of input data. Two stochastic runs were made for each case; one run with variations in loads only and the other case with variations in both loads and gas prices. Each stochastic run produces 100 sets of resources that are the least-cost in a particular draw. The numbers included in the table below are the average of 100 draws.

In general, the results for the updated analyses are similar to those from PSE's 2013 IRP. The Tacoma LNG Facility is selected in essentially all cases. The Swarr upgrade project and expansion of NWP between Sumas and PSE's service territory are selected in the years beyond 2021. The Mist storage expansion is only selected in a small number of the stochastic draws. Based on this analysis, PSE concludes that the Tacoma LNG Facility is a least-cost resource option.

Summary of SENDOUT Results

Figure 3. Peak capacity resources added by winter 2021 to 2022 – MDth/day (numbers represent average times a resource is selected out of 100 draws)

	Deterministic	Load Only Stochastic Inputs	Load and Price Stochastic Inputs
Swarr	0	1	3
Tacoma LNG Facility	85	85	78
Mist Expansion	0	0	0
NWP + Westcoast	0	3	3
Total	85	89	84

Peak-Day Resource Financial Analysis

This Section considers the costs of the Tacoma LNG Project to PSE gas customers by examining the revenue requirement of the Facility and the supporting gas distribution upgrades along with the revenue contribution from TOTE and another long-term plant customer or co-owner. For the purpose of this analysis, the other long-term customer or co-owner is simply referred to as 'Marketer'. PSE has targeted BP or Shell for this role. Ultimately this capacity could be contracted for under co-ownership agreement or a long-term tolling arrangement.

Gas Peak-Day Resource Capacity

The total peak-day capacity of the Tacoma LNG Facility is 85 MDth/day. This includes 66 MDth/day of gas injection from the Facility and 19 MDth/day of diverted gas that can be delivered to any PSE gate station along NWP.

Plant Injection Capacity. The Tacoma LNG Facility will be equipped with vaporizers capable of gasifying and injecting natural gas into PSE's distribution system at a rate 66 MDth/day. Natural gas will be injected directly into PSE's high pressure gas system at the Facility. To supply the vaporized gas, PSE will reserve approximately 4.9 million gallons (or 416 MDth) of the onsite storage tank capacity. This storage will allow the facility to supply 66 MDth/day for more than six days.

Diverted Gas. PSE will procure 19 MDth/day of year-round pipeline capacity for the plant's LNG fuel customers (or in the case of tolling customer or co-owner, the customer/owner will be required to provide firm natural gas supply to PSE's distribution system). Since the LNG Facility will not liquefy natural gas at the same time it is vaporizing for injection back into the system, PSE will utilize this pipeline capacity and natural gas supply as an additional peaking resource. In order to continue to serve the other LNG customers, PSE will hold 1.4 million gallons (or 122 MDth) of additional tank capacity and serve the customers from this capacity during a vaporization event. This allows PSE to divert the 19 MDth/day allocated to retail customers to peak system use. Note that the LNG customers will be paying for the natural gas and related transportation capacity and will be receiving uninterrupted LNG service. ***Figure 4*** summarizes the peak day resource capacity of the Tacoma LNG Facility.

Figure 4. Peaking resource plant capacity

		MDth	LNG Gallons
	Injection Capacity		
[1]	Daily Plant Injection Capacity	66	772,807
[2]	Tank Capacity for Plant Injection (6+ Day Period)	416	4,876,126
	Diverted Gas Capacity		
[3]	Retail LNG Customers Dailey Liquefaction	19	225,667
[4]	Tank Capacity for Diverted Gas (6+ Day Period)	122	1,423,874
[5]	**Other**		
[6]	Additional Liquefaction for Gig Harbor	23	270,000
[7]	**Total Peak Day Capacity ([1]+[3])**	85	998,473
[8]	**Total LNG Tank Storage Capacity ([2]+[4])**	561	6,300,000
[9]	**Dailey Liquefaction Capacity ([2]+[4]+[6])/ [270 Days]**	2	24,333

Optimizing Peak Resource Capacity. The tank will be filled over a 270-day period using PSE's reserved liquefaction capacity. During the winter months, PSE can sell its liquefaction capacity on a short-term basis for the benefit of PSE gas customers.

In years when the peaking resource is not fully called upon over the course of a given winter season, PSE can sell unutilized liquefaction capacity over the non-winter period (up to 270 days). This would likely add an additional economic benefit for PSE's core gas customers. The value associated with selling such underutilized LNG capacity is not considered in this analysis.

Revenue Requirement for Tacoma LNG Facility

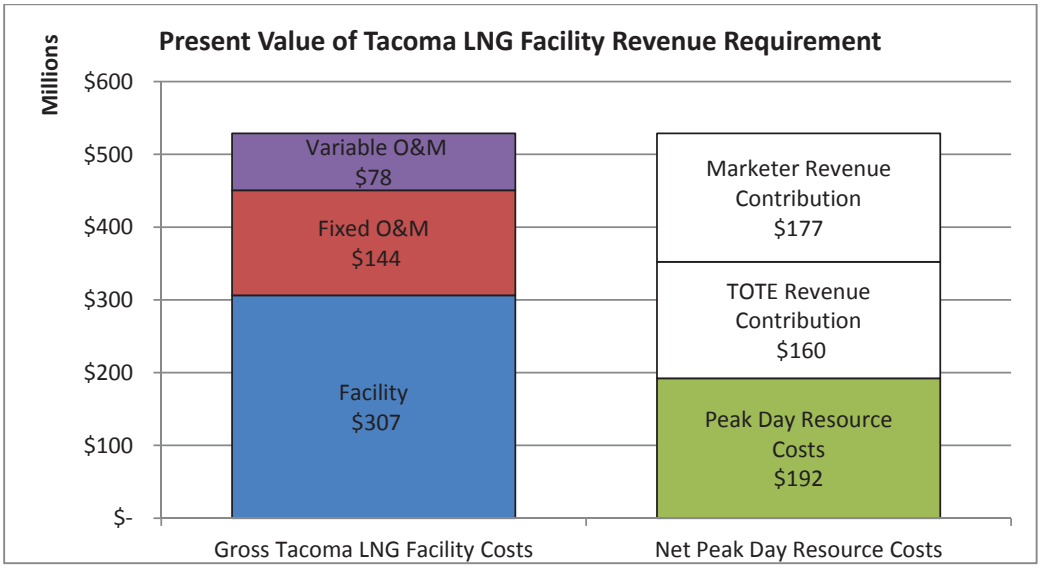
The revenue requirement for the Tacoma LNG Project consists of Facility costs (return on and of the asset), fixed O&M costs and variable O&M costs related to the Tacoma LNG Facility as well as the cost of the distribution system upgrades. The specific costs in these categories and the assumptions that support them are described in detail in ***Exhibit O***. The cost of the peaking resource to PSE gas customers will be offset by revenue contributions from TOTE and Marketer.

This analysis summarizes the costs and revenues over the 25-year (2019 through 2044) depreciable life of the Project by taking the present value of these costs/revenues. The annual costs for each year are discounted using PSE's after-tax cost of capital of 6.69 percent and summed to reflect 2014 present value. Since revenue taxes will be applied to all revenues generated from PSE gas customers at the same rate, taxes are not considered in this analysis. In considering all scenarios, revenue streams have not been grossed up for state utility tax.

Tacoma LNG Facility Revenue Requirement. The present value of the 25-year revenue requirement of the Tacoma LNG Facility is shown in ***Figure 5***. The first column considers all incremental revenues needed to operate the Tacoma LNG Facility. The entire cost for the facility over the 25-year depreciable life is approximately $529 million.

The second column considers the revenue contributions from TOTE and Marketer. The revenue contributions considered in ***Figure 5*** include only the revenues from TOTE and Marketer that are needed to cover the incremental cost of owning and operating the Facility based on the 25-year depreciable life. They do not include additional revenues collected from TOTE and the Marketer related to allocated administrative and general costs or premiums for a contract of less than 25 years (referred to below as the "shorter-term contract premium"). These revenues are considered in ***Figure 6*** as they are additional to incremental revenues needed to own and operate the Facility. After the revenue contributions, the cost for the Facility to provide 85 MDth/day of supply is estimated to be $192 million; shown as the peak-day resource costs in ***Figure 5***.

Figure 5. Present value of Tacoma LNG revenue requirement

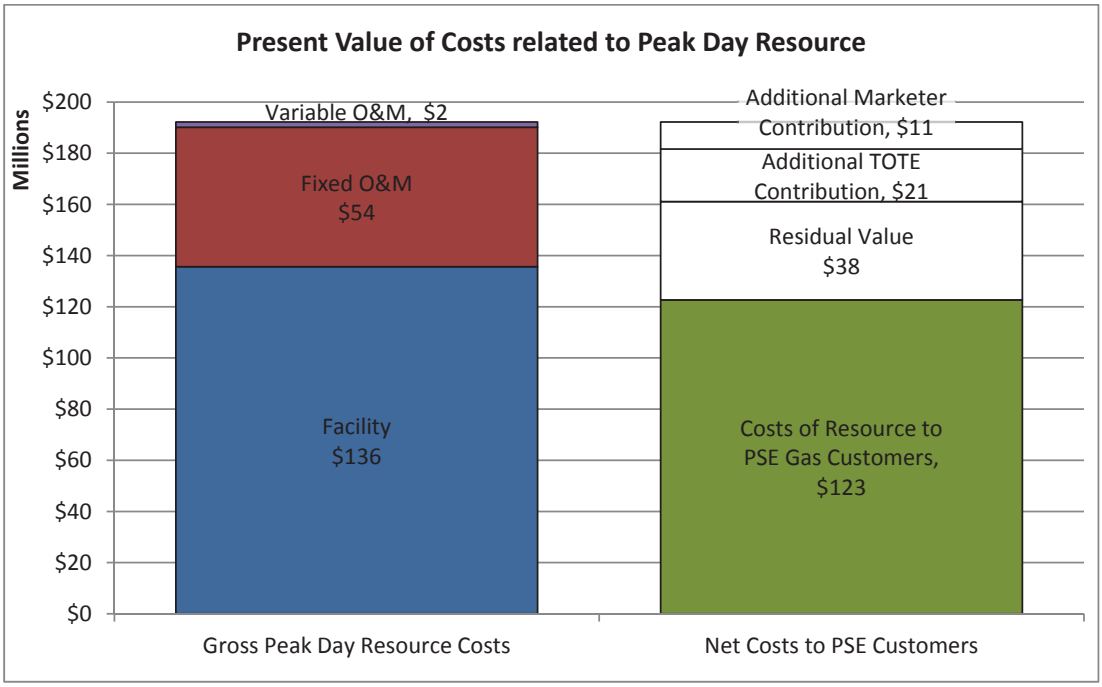


Facility Costs Borne by PSE Gas Customers. The present value of the revenue requirement to PSE gas customers is shown in ***Figure 6***. The first column shows the break out of the estimated $192 million peak-day resource costs by cost components. The second column considers the present value of the additional revenues from TOTE and the Marketer beyond the incremental revenues needed to own and operate the plant as well as the residual value of the plant. The additional revenue contributions include a contribution to PSE's administrative and general costs (A&G costs) as well as a premium for entering into a contract that is less than the depreciable life of the Facility. These components are discussed in more detail in ***Exhibit O***. The costs of the peaking resource are netted against the additional revenue contributions and residual value resulting in a $123 million present value cost to PSE gas customers.

The analysis in this exhibit assumes that Marketer takes on a long-term tolling agreement of 25 years. PSE would not collect a short-term premium for the 25 year contract so the only additional revenue contribution is the result of A&G costs. If the Marketer takes an ownership position in the Project, PSE would still collect a small A&G costs from the Marketer (likely equal to 10% of O&M costs attributed to the Marketer). PSE estimates that ownership participation from the Marketer would reduce the additional revenue contribution by $7.6 million on a present value basis (from $10.5 million to $2.9 million), resulting in a 6% increase in the costs of

the resource to PSE gas customers[1] (the green block in ***Figure 6*** below). This small increase does not affect the outcome of the analysis as the Tacoma LNG Project is still the least cost resource in all scenarios (see the following section, ***Comparison to Alterative Resources***).

Figure 6. Present value of Facility costs to PSE gas customers



The components of the calculation shown in ***Figure 6*** are described below:

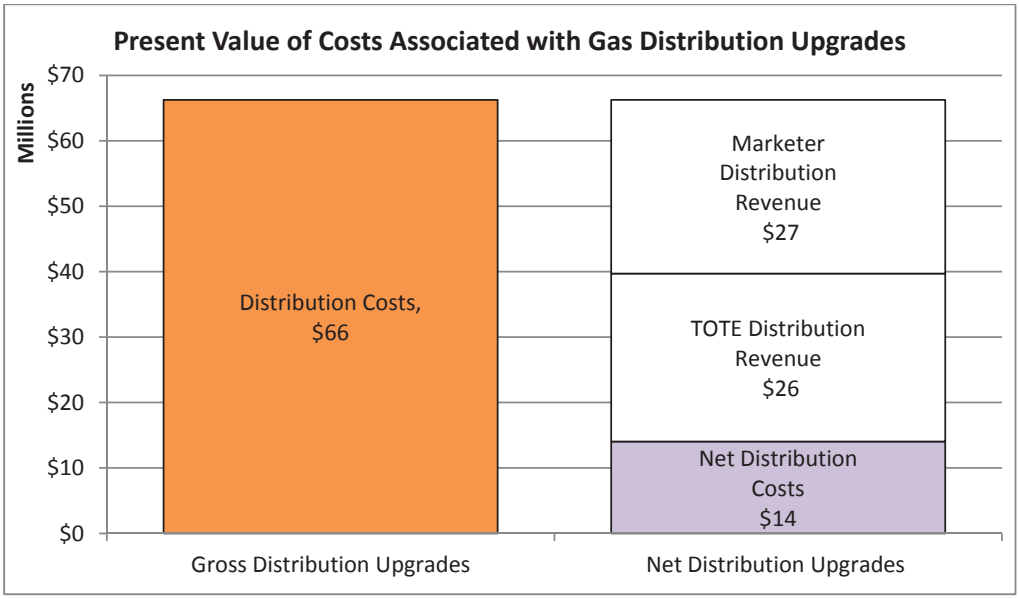
Gross Peak-Day Resource Costs	The total incremental revenues needed to own and operate the Tacoma LNG Facility less the incremental revenue contribution for TOTE and Marketer as shown in ***Figure 5***. This is equivalent to the incremental revenues needed to own and operate the Tacoma LNG facility over the 25-year depreciable life.

[1] While the cost of the resource would increase slightly under a joint ownership structure, the risk to PSE gas customers would be reduced. As an owner, the Marketer would share in costs risk associated with construction and operations of the Facility and may potentially share in TOTE commercial risk as discussed in the following section of this exhibit.

Net Costs to PSE Customers	The net costs are equal to the gross peak-day resource costs less the additional revenue contributions for TOTE and Marketer and the residual value of the peak-day resource at the end of 25 years. This reflects the actual costs of the Facility to PSE's gas customers.
Additional Marketer and TOTE Contributions	***Figure 5*** considers the revenue contribution from TOTE and Marketer needed for the incremental costs to own and operate the Tacoma LNG Facility. However, TOTE and Marketer will contribute additional revenues beyond the incremental cost-of-service revenue requirement based on a 25-year depreciable life. These additional revenues are the shown in ***Figure 6***.
Residual Value	The residual value considers the present value of the peaking resource assuming the plant continues to operate from years 26 through 50. The Facility will be fully depreciated at the end of year 25. Therefore, PSE core gas customers will only pay for the operating costs and any sustaining capital in years 26 to 50. The residual value is calculated by considering the cost differential between operating the facility in years 26 to 50 and pipeline capacity in that same time period, less a $25 million (in 2014 $'s) capital infusion in year 26 to sustain continued operations. The operating life of the Facility is expected to be 50 years (the depreciable life is limited by the primary term of the Port of Tacoma lease). Furthermore, LNG plants have a long history of reliable operations and many have remained in service for up to 50 years with the major components of original equipment intact. Therefore, $25 million of sustaining capital is considered to be a conservative estimate.
Cost of Resource to PSE Gas Customers	This is the net cost of the Tacoma LNG Facility that will be borne by PSE gas customers.

Distribution System Upgrades. The final cost component of the Project is the distribution system upgrades necessary to support the Facility. These upgrades, and their costs, are discussed in detail in ***Exhibit M***. This analysis considers the incremental costs to the gas system and the incremental revenues from TOTE and Marketer for transportation across the distribution system. The gross revenue costs and the incremental revenues are shown in ***Figure 7***.

Figure 7. Present value of costs associated with the gas distribution system upgrades



The first column of ***Figure 7*** shows the present value of the incremental costs associated with the gas distribution system upgrades. The second column shows the effect of the incremental gas distribution system revenues from TOTE and Marketer.

The total present value PSE natural gas retail customer cost for the Project ($137 million) is equal to the sum of the present value of the net Facility costs and the net distribution upgrade costs ($123 million and $14 million, respectively).

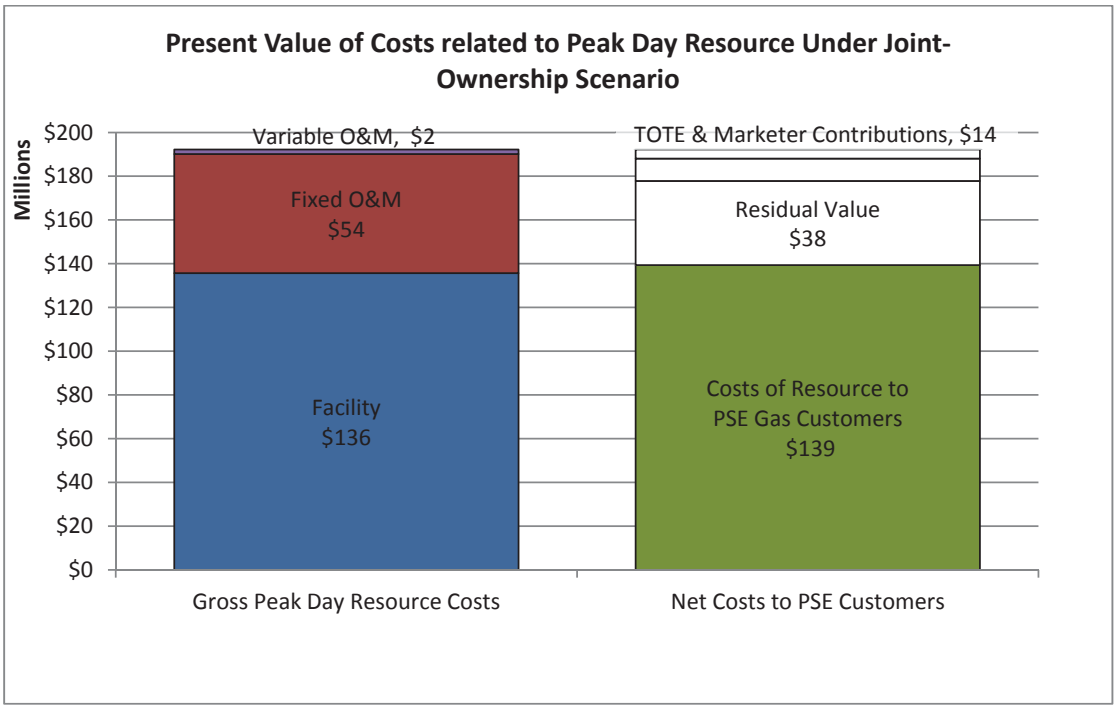
Joint Ownership

PSE is considering one commercial structure where the Marketer would become a co-owner in the Facility. Under the scenario discussed in this section, the Marketer would own a specific and undivided share of the facility services needed to meet its capacity as well as half of the capacity needed to meet the obligations of the TOTE contract. This structure is discussed in more detail in Exhibit E.

Under the joint-ownership structure, the present value of the incremental revenues needed to operate the peak-day resource component of the plant is still $192 million as shown in ***Figure 5***. However, the benefits (as well as the risks) of the TOTE and Marketer contracts are reduced resulting in smaller additional revenue contribution. ***Figure 8***, shown below, reflects this lower contribution, resulting in present value peak-day resource costs of $139 million in the joint-

ownership structure (an increase of $16 million over the 100% PSE ownership case). The cost of the distribution upgrades (shown in ***Figure 8***) to gas customers remains unchanged.

Figure 8. Present value Facility costs to PSE gas customers under joint-ownership.



Comparison to Alternative Resources

Incremental Pipeline Capacity

PSE currently meets approximately half its peak-day gas need through long-haul pipeline capacity and most of the other half through storage redelivery pipeline capacity from the Jackson Prairie underground storage facility. Long-haul pipeline capacity is paid for year-round, but as a peaking resource would be utilized only a few days of the year. Furthermore, pipeline capacity, by itself, does not come with natural gas supply, so additional peak-day natural gas supply arrangements must be made. Nevertheless, due to limited alternatives, it is one of the options that must be considered. Storage redelivery pipeline capacity has historically been significantly cheaper than long-haul pipeline capacity and, therefore, has made acquisition of regional underground storage attractive. However, there is no discounted redelivery service available, so regional underground storage acquisitions would have to be supported by an interstate pipeline expansion, which is assumed to be equal to long-haul pipeline costs.

Pipeline Assumptions. The assumptions used to create the 25-year revenue requirement for additional pipeline capacity are shown in ***Figure 9***.

Figure 9. Pipeline Assumptions

Northwest Pipeline Cost ($/Dth/day)	$ 0.50
Westcoast Pipeline ($/Dth/day)	$ 0.40
Westcoast Capacity %	50%
Pipeline escalator (annual)	1.25%
Summer/Winter Gas Differential ($/Dth)	$ 0.50

The assumptions are described in more detail below:

NWP Costs	Northwest Pipeline (NWP) year round firm shipping costs. The cost is assumed to be 2014 costs and escalated annually, and assumes the pipeline has to be expanded for the volumes under consideration (recent expansion quotes from NWP have been as high as $0.60, so the $0.50 is considered conservative).
Westcoast Pipeline	Spectra's Westcoast pipeline costs. This pipeline delivers gas from producing fields and processing plants in northern B.C. and delivers it to NWP near Sumas, WA. The cost is a year 2014 estimate and escalates annually.
Westcoast Capacity %	PSE's pipeline acquisition strategy includes purchasing at least 50 percent of its NWP receipt point capacity at Sumas upstream on Westcoast. For example, if PSE were to procure 100 MDth/Day of NWP capacity with a receipt of Sumas, it would also procure 50 MDth/day of Westcoast capacity.
Pipeline Escalator	The annual increase in pipeline tariff rates (commensurate with PSE's IRP analysis).
Summer/Winter Gas Differential	The price differential between summer and winter gas purchases. The supply that is stored at the Tacoma LNG Project will be purchased over the non-winter months and the analysis reflects that benefit for the LNG project. Conversely, the pipeline alternative does not enjoy that benefit and reflects winter gas costs.

Timing of Supply. The Tacoma LNG Facility is expected to be operational in winter 2018 to 2019. PSE typically buys pipeline capacity in large blocks, however this analysis conservatively

assumes that capacity is purchased in two smaller blocks: 69 MDth/day in 2020 and the remaining 16 MDth/day capacity in 2023, such that the total capacity modeled is equal to the capacity of the Project.

Revenue Requirement Results. The revenue requirement for pipeline capacity was calculated over the life of the Project using the inputs above. The values were discounted at PSE's after tax cost of capital so that the 2014 present value can be compared with the present value costs of the Tacoma LNG Project.

The results of the analysis are shown in ***Figure 10.*** The cost of additional pipeline capacity, in present value terms, is $78 million greater than the Tacoma LNG Project.

Figure 10. Results of Pipeline Capacity Alternative ($ millions)

Pipeline Capacity Alternative	
PV of Northwest Pipeline Costs	$153
PV of Westcoast Pipeline Costs	$61
PV of Additional Gas Costs[1]	$0.5
TOTAL	$215
Present Value of Tacoma LNG Project	$137
Cost Saving to PSE Customers	$78

[1] Pipeline costs do not include the cost of procuring a peak-day supply of gas (call option or similar product), as SENDOUT simply assumes the gas is available at some daily price.

Standalone LNG Facility

The costs of the Tacoma LNG Project were also compared to those of a small standalone LNG peak shaving facility. This standalone facility has a liquefaction, storage and vaporization capacity equal to that of the peak-day resource component of the Tacoma LNG Project (as described in ***Figure 11***). However, the standalone peaking resource does not serve LNG fuel customers and, therefore, does not benefit from the economies of scale of the Tacoma LNG Project.

Key Assumptions. There were two key cost savings associated with this smaller facility. The standalone facility was assumed to be sited in the Sumner area with a land purchase cost of $6.5 million (approximately the same cost of three years of the Port of Tacoma lease), and the required gas system upgrades were estimated to be approximately $4 million, which is an order of magnitude less than the Project's distribution system upgrades.

The capital costs of the standalone facility were estimated by Chicago Bridge & Iron at $120 million. With the addition of development costs (similar to the Tacoma Project), land costs, contingency and sales tax, the all-in cost of the standalone facility is estimated to be $174 million.

Results. The results of the analysis (shown in ***Figure 11***) clearly demonstrate the value of developing the Tacoma LNG Project with the economies of scale that are achievable through serving LNG fuel customers:

Figure 11. Standalone LNG Facility and Tacoma LNG Project present value cost comparison

Project Costs	Standalone LNG Facility	Tacoma LNG Cost to Gas Customers	Tacoma LNG Project Total	TOTE Contribution	Marketer Contribution
Fixed Facility Costs	$183	$136	$306	($79)	($92)
Fixed Operational Costs	$67	$54	$144	($42)	($48)
Variable Operational Costs	$5	$2	$78	($39)	($37)
Net Distribution Costs	$6	$14	$66	($26)	($27)
Total Project Costs	$262	$206	$595		
Project Value					
Residual Value	($33)	($38)			
Addition Contributions[2]		($31)			
TOTAL Cost to PSE Customers	**$228**	**$137**			

Due to the much greater liquefaction capacity and higher lease costs, Tacoma LNG Project has a much higher level of full-cycle costs than the standalone LNG facility ($595 million as compared to $262 million). However, the revenue contributions from TOTE and Marketer dramatically reduce the cost of the Tacoma LNG Project to PSE natural gas retail customers. Note that each row in the second column of ***Figure 11*** is equal to the sum of columns three through five. This represents the net revenue requirement attributable to PSE's natural gas retail customers to support the Project.

Even before considering the short-term contract premium and allocated A&G paid by LNG customers, the Tacoma LNG Project is substantially cheaper than the standalone facility. After

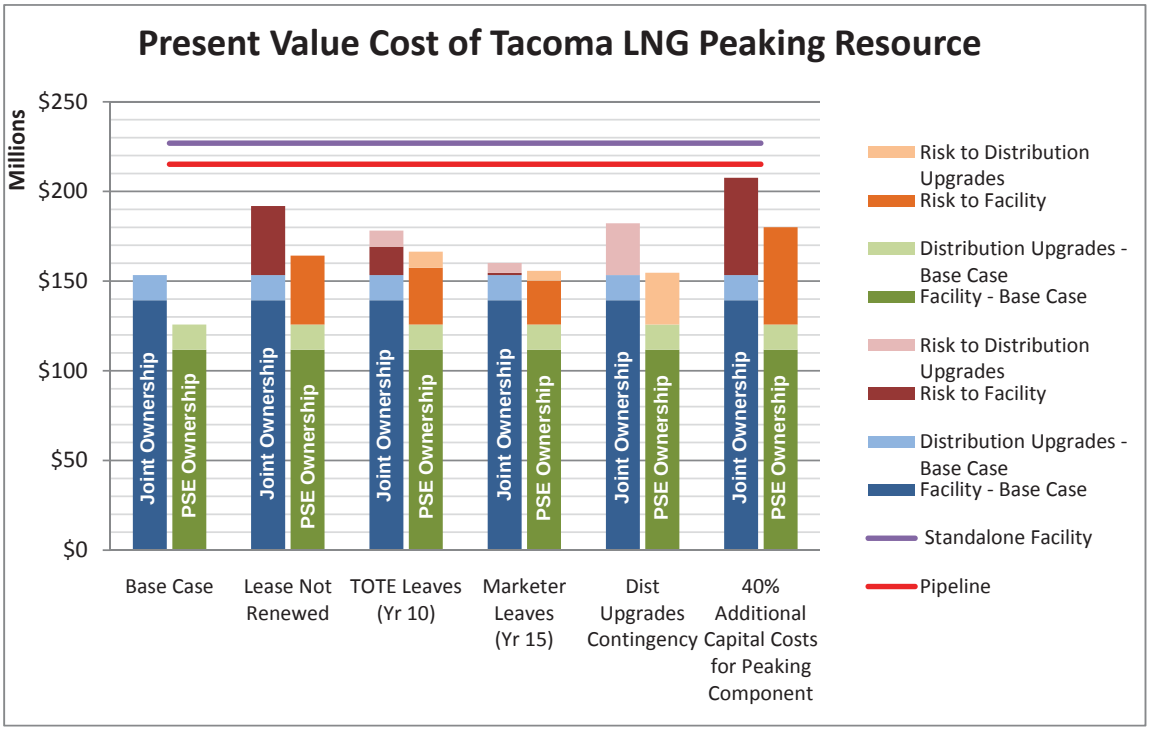
[2] Additional contributions include the present value of the revenues that TOTE and the Marketer will pay that effectively ease rate pressure on PSE gas customers and includes revenues towards administrative and general costs as well as the short-term contract premium. The values shown in the table consider the full PSE ownership and 25 year toll to the Marketer. Under the joint-ownership structure considered in ***Figure 8***, this contribution would decrease by $16 million.

considering those benefits, the total present value revenue requirement attributable to PSE customers is $228 million for the standalone LNG facility and $137 million for the Tacoma LNG Project.

Results and Sensitivities

The present value costs of the Tacoma LNG Project (discussed in the Revenue Requirement section above) are compared to the costs of additional pipeline capacity and the costs of a standalone LNG facility in ***Figure 12***. This analysis considered both the joint-ownership (in blue and red) and full PSE ownership (in green and orange) structures. Each red and orange bar represents a different risk scenario that could raise the costs of the Facility or the distribution upgrades to PSE customers. Clearly, the Tacoma LNG Project remains least-cost to PSE customers under any one of the scenarios outlined below.

Figure 12. Comparison of alternatives with sensitivities



The numeric values from ***Figure 12*** are shown in the table below. Base case costs are higher for joint-ownership; however, commercial risks are reduced. Base case costs are higher because PSE customers will not gain the full benefit from TOTE and the Marketer, since half of the TOTE benefits and the Marketer benefits flow to the Marketer. However, PSE's exposure to TOTE and particularly the Marketer are greatly reduced as shown in the 'TOTE Leaves' and 'Marketer Leaves' columns. If the Marketer was a co-owner, it would be contractually committed to supporting its share of operational costs. Risk to the distribution system are included in this scenario, however, the joint-ownership agreement would establish a commitment for those payments as well.

Figure 13. Numeric values of the sensitivities shown in Figure 14.

	Base Case	Lease Not Renewed	TOTE Leaves (Year 10)	Marketer Leaves (Year 15)	Distribution Upgrades Contingency	40% Additional Capital Costs to Peaking Component
Facility (Joint-Ownership)	$ 139	$ 38	$ 16	**NA**	$ -	$ 54
Distribution Upgrades (Joint-Ownership)	$ 14	$ -	$ 9	$ 6	$ 29	$ -
Facility (PSE Ownership)	$ 112	$ 38	$ 32	$ 24	$ -	$ 54
Distribution Upgrades (PSE Ownership)	$ 14	$ -	$ 9	$ 6	$ 29	$ -

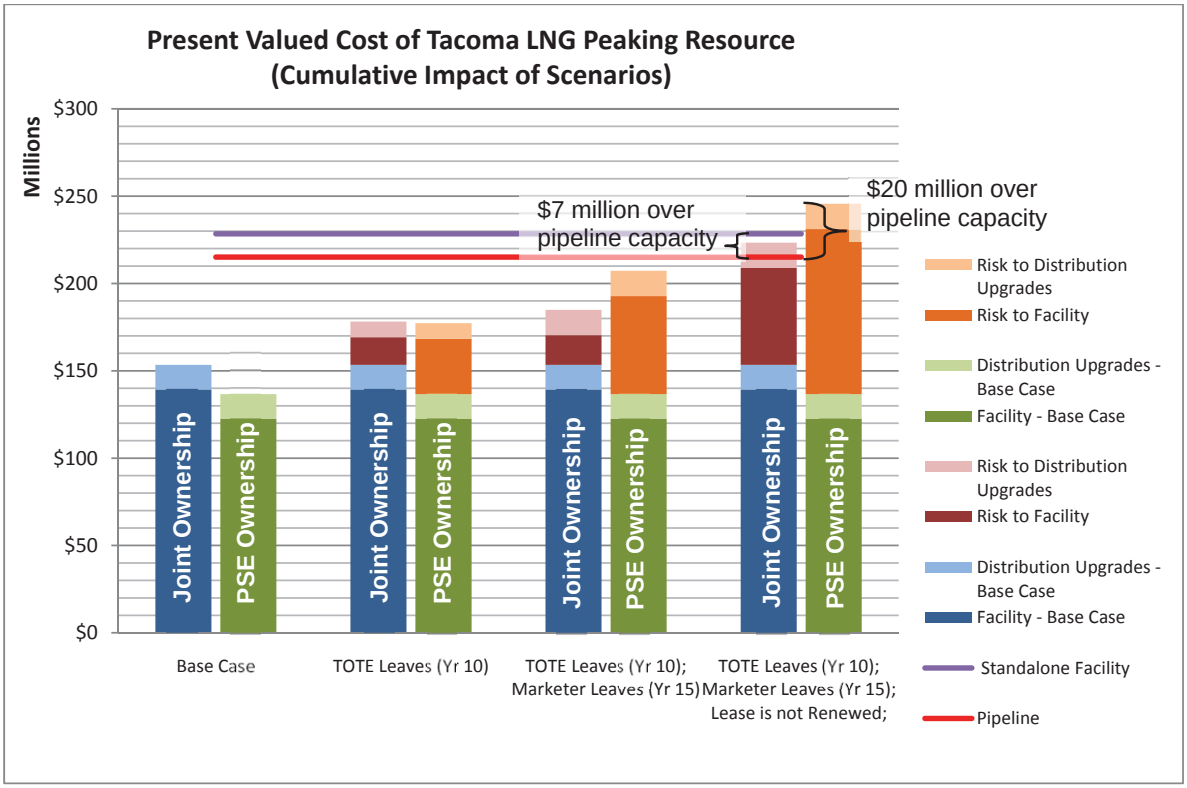
The scenarios in ***Figure 12*** and ***Figure 13*** are:

Base Case	The base case represents the cost to PSE gas customers discussed in the ***Peak Day Resource Financial Analysis*** section of this exhibit. The exception is that the Marketer's tolling term in the PSE ownership case has been reduced to 15 years to conservatively estimate the commercial risk in the event the Marketer does not renew its contract.
Lease Not Renewed	If the lease cannot be renewed at the Port of Tacoma, then the residual value of the Tacoma LNG project in year 26 becomes zero. The loss of that value is shown in this scenario. PSE anticipates that the probability of this happening is very small, since PSE will have the right to extend if a majority of product leaving the facility is serving the marine market. However, even if this requirement is not met, the Port of Tacoma will face significant pressure to renew the lease if the Facility continues to serve PSE gas customers, and PSE agrees to pay then-current market value to the Port for the lease.

TOTE Leaves (Year 10)	This scenario considers TOTE leaving in year 10 (the end of its contract term) and PSE not being able to resell any of TOTE's volumes. In this scenario there is no additional revenue contribution after year 10. The probability of this scenario is low as TOTE will have operated on LNG for 10 years, and it is unlikely that a competitor could beat PSE's pricing by year 11 given TOTE's renewal pricing. Even if TOTE were to leave, it is likely that the market will have fully developed by 2030, and PSE would be able to generate additional revenues through sales to another customer.
Marketer Leaves (Year 15)	This scenario considers the Marketer having a 15-year tolling term and leaving at the end of the term with PSE being unable to resell the capacity. In the joint-ownership case, this risk is set to $0 for the Facility. This analysis conservatively leaves in a risk to the distribution upgrades in the joint-ownership case even though the Marketer will likely be obligated to demand charges regardless of its utilization.
Distribution Upgrades Contingency	This scenario assumes that the costs of the gas system upgrades come in at 10 % greater than the contingency case.
40% Additional Capital Costs for Peaking Component	This scenario assumes that the Facility costs shown in ***Figure 6*** increase by 40%. It is highly unlikely that costs for construction come in at 40% above expected costs considering a conservative level of contingency. However, if costs come in significantly higher than current estimates, PSE will not be able to sufficiently raise pricing for TOTE under the FSA and the excess beyond that would be absorbed by core gas customers. A joint-ownership structure would reduce this risk; however this analysis conservatively shows a full 40% increase in either arrangement.

Cumulative Impacts of LNG Market Not Materializing. If the LNG fuel market does not materialize, then it is unlikely that TOTE or the Marketer (if a tolling customer) would renew their contracts and PSE would not be able to resell the capacity. In addition, the lease from the Port of Tacoma could also expire since PSE would fail to adequately serve the marine market. ***Figure 14*** shows the cumulative impact of these three risk scenarios happening under both ownership structures.

Figure 14. Comparison of alternatives with cumulative probabilistic impacts of sensitivities.



The cumulative costs of the scenarios shown in ***Figure 14*** are $222 million and $235 million for the joint-ownership and PSE ownership structures respectively. The analysis clearly shows how the joint-ownership structure, while more expensive in the base case, reduces the commercial risk. Both ownership structures cost slightly more than pipeline capacity in this scenario (2% and 9% for joint ownership and PSE ownership, respectively). While the consequences of this risk occurring are significant, the probability is low (see the Wood Mackenzie study in ***Exhibit S***). Furthermore, the benefit of the Project is considerable as the base case shows that the joint ownership and PSE ownership are 30% and 40% less expensive than pipeline capacity, and on an expected value basis, the benefits for core gas customers outweigh the risks.

PUGET SOUND ENERGY

Exhibit O.

Pro Forma Financial Statements

Pro Forma Financial Statements

Project Description

The Tacoma LNG Project ("Project") consists of the permits, land lease, other real estate rights, commercial contracts, upgrades to PSE's gas distribution system and other necessary rights, agreements, equipment and work to develop, construct, own and operate an LNG facility ("Facility") at the Port of Tacoma in Pierce County, Washington. The cost to develop and construct the Facility is approximately $274 million and the supporting upgrades to PSE's distribution system are estimated at around $49 million, before AFUDC.

A. Ownership of the Tacoma LNG Facility

As discussed in **Section 3** of the *Report to the Board of Directors*, PSE may enter into a Joint Ownership Agreement with a marketing entity ("Marketer"). Under such an arrangement, PSE and the Marketer would own an undivided but specific percentage of the Facility, based on the facility services (as defined in the next section of this exhibit). During construction, the Marketer would supply capital sufficient to pay for its share of the Facility. PSE will retain full ownership for equipment related to the peaking service and maintain majority ownership of the Facility.

B. Description of the Project

Siting	The Facility will be located at the Port of Tacoma, on the Hylebos waterway, on the corner of East 11th Street and Alexander Avenue East. The 33-acre site is currently a mix of warehouses, vacant offices and support buildings.
Owner	Puget Sound Energy will either fully own the Facility or enter into a Joint Ownership Agreement with a Marketer (likely BP or Shell). PSE will retain fully ownership of the distribution upgrades regardless of the ownership structure of the Facility.
Timing of Project Development	PSE anticipates having all commercial contracts negotiated, a ruling on an LNG tariff and a ground lease by Q1 of 2015. Permit applications will be filed by Q3 2014. Permits are expected in Q3 2015 and a notice to proceed with the EPC contract can be issued at that time following Board approval.

Timing of Project Construction	PSE plans to start demolition once environmental permits are received and final Board approval is obtained; anticipated in Q3 2015. The Facility will be constructed and commissioned over a three-year period with commercial operation expected in late 2018. The financial statements in this exhibit assume the Facility goes into service December 31, 2018.
Full Notice to Proceed	Q3 2015 (estimated)
COD	Late 2018 (estimated). For the purposes of this pro forma COD is assumed to be December 12, 2017 for the distribution upgrades and December 31, 2018 for the Facility. The distribution upgrades need to be in service to support Facility commissioning and startup.
Liquefaction Capacity	250,000 LNG gallons/day (21 MDth/day)
Storage Capacity	8 million LNG gallons (680 MDth)
Peaking Capacity	66 MDth/day (The total peaking resource will be 85 MDth/day, with 66 MDth/day of LNG vaporized and injected into the gas distribution system at the Tacoma LNG Facility and 19 MDth/day of gas intended for liquefaction diverted to other customers on PSE's distribution system).
Real Estate	PSE will lease the 33-acre parcel from the Port of Tacoma. PSE will also acquire easements and property to support the gas distribution system upgrades and for the direct LNG pipeline to TOTE.

Estimated Project Budget and Allocations

The following section outlines the estimated Project budget and LNG Facility customer (and joint owner under a joint ownership scenario) contributions to the revenue requirement of the Facility and gas distribution upgrades.

A. Estimated Project Budget

The breakdown of the total Project budget is shown on the following page. A calendar view of the Project budget as well as a month by month view of the development budget is included in ***Exhibit F***. The budget considers the costs to PSE under two ownership scenarios. In the first scenario, PSE is the sole owner and is responsible for 100% of the capital cost. In the second scenario, PSE retains ownership of approximately 56% of the Facility while the Marketer would own the remainder. The allocation of the Facility is described in detail in the following section and the percentages are shown in ***Table 2*** on page O-9.

Table 1. Estimated Project Budget ($1,000s)

Development Budget	Total Budget	PSE share under Joint Ownership[2]
PSE Labor and OH	$ 2,193	$ 1,250
Engineering and Analysis	$ 4,474	$ 2,551
Permitting & Legal Support	$ 3,339	$ 1,904
Communications/Outreach	$ 391	$ 223
Distribution Upgrades	$ 1,126	$ 1,126
Commercial and Regulatory[1]	$ 1,100	$ 1,100
Real Estate and Lease	$ 766	$ 437
Contingency	$ 442	$ 252
Project Development Sub-Total	**$ 13,831**	**$ 8,843**
Capital Facility Budget		
Development Budget (Capital)[3]	$ 11,605	$ 6,617
PSE Labor and OH	$ 5,800	$ 3,307
Engineering & Legal	$ 1,400	$ 798
Real Estate and Lease	$ 6,132	$ 3,496
Geotechnical and Demolition	$ 13,000	$ 7,411
In Water Work	$ 4,000	$ 1,300
EPC Contractor Scope		
Site, Civil and Foundations	$ 19,855	$ 10,964
Liquefaction Equipment	$ 45,813	$ 14,634
Storage Tank	$ 57,269	$ 46,889
Vaporization Equipment	$ 7,411	$ 7,411
Truck Loading Equipment	$ 3,592	$ 36
Bunkering Line to TOTE Vessels	$ 8,000	$ 2,600
Balance of Facility	$ 33,810	$ 19,865
Commissioning	$ 6,042	$ 3,404
EPC Contractor Sub-Total	$ 181,792	$ 105,803
Miscellaneous	$ 6,900	$ 3,331
Contingency	$ 22,650	$ 11,333
PSE Construction OH	$ 7,830	$ 4,486
Sales Tax	$ 12,960	$ 6,561
Facility Sub-Total	**$ 274,069**	**$ 154,443**
AFUDC on Development and Plant Construction	*$ 44,279*	*$ 24,782*
Gas System Upgrades Construction Budget		
Gas System Upgrades Development	$ 1,126	$ 1,126
Improvements at the Port of Tacoma	$ 32,647	$ 32,647
Improvements in South Tacoma	$ 15,268	$ 15,268
Gas System Upgrades Sub-Total	**$ 49,041**	**$ 49,041**
AFUDC on Gas System Upgrades Construction	*$ 2,562*	*$ 2,562*
PROJECT O&M COSTS	$ 1,700	$ 1,700
PROJECT CAPITAL COSTS	$ 323,110	$ 203,484
AFUDC	$ 46,841	$ 27,344
GROSS PLANT	**$ 369,951**	**$ 230,828**

[1]Commerical and Regulatory expenses are not capitalized
[2]Assumes Marketer provides equity contribution for their utilization of plant services including half of the TOTE Contract (~44% of Plant)
[3]Capital development budget for the Facility excludes the work on the gas distribution upgrades and O&M work.

The budget items are defined as follows:

Development Budget	The development budget shown in ***Table 1*** represents the costs to complete the development phase of the Project. This phase includes all work necessary up to the notice to proceed to begin construction.
PSE Labor and Overhead	PSE labor for this Project includes the PSE project team, other supporting PSE employees as well as their expenses and overheads. All charges from outside firms receive a PSE 3% construction overhead charge. Charges associated with PSE internal costs receive a 17% overhead charge.
Engineering and Analysis	This estimate includes all engineering and analysis work during the development phase, as well as preliminary analyses by engineering and economic firms. It includes work done on a time and materials basis by PSE contractors Chicago Bridge and Iron ("CBI"), Moffat and Nichol, Sanborn Head, Jim Lewis and Geo Engineers.
Permitting and Legal Support	Permitting support is provided primarily by CH2MHill who is responsible for preparing the first draft of the EIS for the City of Tacoma and its consultants. Berger ABAM is also supporting permitting and Stoel Rives has been engaged as environmental and land-use attorneys.
Communications and Outreach	PSE has and will continue to engage outside firms to provide strategy and support with outreach to the local community and other key stakeholders at the Port of Tacoma and in local and state government.
Commercial and Regulatory	PSE has engaged Perkins Coie to assist in regulatory matters related to LNG such as drafting the LNG tariff. Baker Botts have been engaged to assist with the TOTE contract and will likely assist with other commercial arrangements, including the EPC contract. Development dollars spent on legal fees associated with negotiating and executing commercial contracts and regulatory filings cannot be capitalized.
Real Estate and Lease	The ground lease with the Port of Tacoma includes up to 24 months for permitting and due diligence. During this time, the lease payments will be at a reduced rate. The lease payments will increase to 75% of the full lease payment when construction activities begin; the lease provides for a three-year construction period. Lease payments prior to commercial operations will be capitalized.
Development Contingency	There is a 5% contingency on all development estimates other than the Port of Tacoma lease.

Capital Facility Budget	The construction budget includes all capital costs associated with constructing and commissioning the Facility.
PSE Labor and Overhead	PSE labor for construction includes PSE project managers, continued permitting and commercial support and other supporting PSE employees as well as their expenses and overheads.
Engineering and Legal	Non-construction items include engineering analysis, legal review, and communications and outreach after the Project enters the construction phase.
Lease Payments	Lease payments at the Port of Tacoma will increase to $146,000 per month when demolition and site improvements begin. Lease payments during construction will be capitalized.
Geotechnical and Demolition	Significant geotechnical work will need to be done onsite to stabilize the soils. LNG Facilities must meet strict earthquake guidelines and the poor soil conditions at the Port of Tacoma require improvements in order to meet the guidelines.
In-Water Work at TOTE Dock	PSE will be responsible for engineering and constructing marine structures at TOTE's facility to support bunkering operations.
EPC Contractor Scope	The EPC contractor scope includes all facilities used to receive, treat, liquefy, store and deliver the LNG as well as supporting facilities such as the control room and electrical systems. CBI completed a front end engineering design study in late 2013.
Miscellaneous	Miscellaneous items include a substation, capital spares and construction insurance. Tacoma Public Utilities will construct a substation onsite to serve the Facility load which is estimated to be 14.8 MW at peak demand. The Facility will require spares of some critical components.
Contingency	The assumed contingency for the EPC contractor scope is 5% of the FEED estimate provided by CBI. The contingency for other Facility items that are yet to go through detailed engineering design is determined by industry standards. Specifically, there is a 50% contingency on geotechnical work, 20% contingency on the substation, 60% on the direct line to TOTE and 50% on the in-water work.
Construction Overhead	Construction overhead for the Project is assumed to be 3% for non-PSE expenditures.

Sales Tax	PSE has received a manufacturing exemption from sales tax for machinery and equipment used in producing LNG for expenditures made after July 2015. PSE will pay regular sales tax on the machinery and equipment as expenditures are made and receive refunds beginning in 2017.
AFUDC	Allowance for funds used during development and construction for the LNG Facility will be applied at PSE's weighted average cost of capital of 7.8%.
Gas System Upgrades	In order to supply gas to the Facility for liquefaction and receive vaporized gas from the Facility, PSE will upgrade the existing gas distribution system. These upgrades include installing new pipe at the Port of Tacoma, installing pipe and increase operating pressure in the South Tacoma distribution system, upgrading the Frederickson gate station and installing a new limit station. Upgrades in the South Tacoma system are either planned or will be required in the near future to support system growth regardless of the added load of the Facility.
Improvements at the Port of Tacoma	PSE will construct approximately four miles of 16-inch pipeline at the Port of Tacoma. This line will connect the Tacoma LNG Facility to PSE's high pressure gas system.
Improvements in South Tacoma	In order to support the additional load at the Port, PSE will improve the distribution system near the Clover Creek limit station. This work includes increasing the operating pressure in an existing segment of pipe up to 500 psi, adding two limit stations and adding a mile of pipe to connect the north and south Tacoma systems. In addition, PSE will rebuild parts of the Frederickson gate station. The pressure increase and addition of one limit station will be undertaken independent of the Tacoma LNG Project to support customer growth in the area; but the improvements are mentioned here because the Tacoma LNG Project requires the pressure increase to be in place before service can commence.
AFUDC	Allowance for funds used during development and construction of the gas system upgrades will be applied at PSE's weighted average cost of capital of 7.8%.

B. Allocation of Facility Capital and Customer Contributions

The capital used to develop and construct the Facility will be allocated amongst services the Facility provides. The two main services at the Facility are liquefaction and storage. The other services are related to dispensing LNG from the Facility, including vaporization, truck loading and marine vessel bunkering. Facility customers will contribute revenues based on their utilization of these services. ***Table 2*** shows the capital allocated to each service and the contribution from each of the customers for each service. For example, TOTE's volumes will equal 44% of the Facility's liquefaction capacity. Therefore, TOTE's cost-of-service pricing will contribute revenues to cover 44% of the cost allocated to the liquefaction service.

Table 2. Allocation of Facility Capital excluding AFUDC ($1,000)

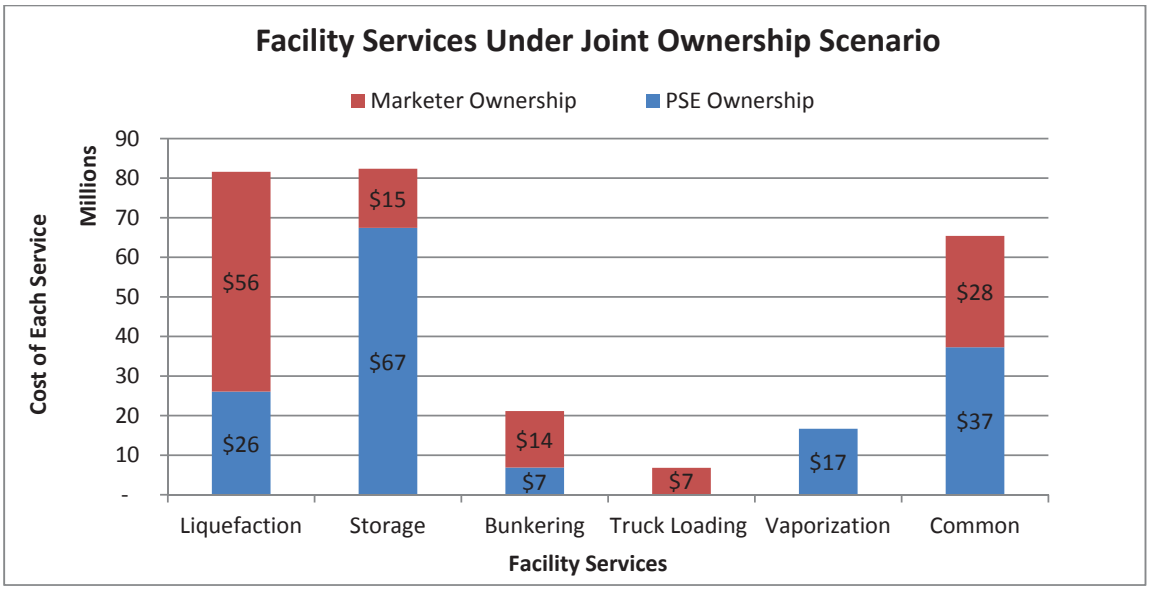
Facility Services	Capital Allocated to Each Service	Contributions from Customers Towards Services		
		PSE	TOTE	Merchant
Liquefaction	$ 81,591	10%	44%	46%
Storage	$ 82,378	79%	6%	15%
Bunkering	$ 21,165	0%	65%	35%
Truck Loading	$ 6,829	1%	0%	99%
Vaporization	$ 16,700	100%	0%	0%
Common Items	$ 65,406	45%	25%	30%
Gross Facility Contributions	$274,069	$118,610	$71,667	$83,792
Capital Allocation Ratio	100%	43%	26%	31%

The total cost of each service (column 2 of the above table) is calculated by assigning each line item of the capital budget to each service. The full capital budget, along with the percent assignment of each line item, can be found in ***Attachment 1*** of this exhibit.

Under a joint ownership structure, the Marketer would invest equity in part or all of the Facility reserved for the merchant capacity. The Marketer may also invest up to 50% of the Facility reserved for TOTE's capacity[1]. For the purposes of this exhibit, a joint-ownership scenario assumes that the Marketer invests wholly in the merchant capacity and half of the TOTE capacity, as outlined in the table above. The total investment from the Marketer in this scenario is $119.6 million ($83.8 million for the Marketers share of the Facility and $35.8 for half of the facilities needed to serve TOTE). The Marketer would own 68% of the liquefaction, 18% of the storage, etc., resulting in the Marketer supplying 44% of the Facility capital. ***Figure 1*** shows the cost of each facility service and the ownership of that service between PSE and the Marketer.

[1] The scenario where the Marketer owns 31% of the Facility (equal only to the full merchant capacity) is also included in the financial statements found at the end of this exhibit.

Figure 1. Cost of Facility services and breakdown of ownership assuming Marketer fully owns the share of the services needed for its capacity allocation.



The allocation of the Facility amongst the services and the Facility services are defined as follows:

Allocation of Facility Capital:	Capital is allocated to Facility services based upon the costs of those services. Customers will contribute revenues to support services based on their utilization of those services.
Facility Services	Facility services are the functions that the Tacoma LNG Facility provides PSE and its customers. The services are specifically: liquefaction, storage, bunkering, truck loading and vaporization.
Liquefaction	Costs that are allocated to liquefaction include the costs of facilities used to receive natural gas, treat the gas, cool the gas below its boiling point and deliver the gas to onsite storage.
Storage	A large portion of Facility costs are attributable to the site-erected full containment cryogenic storage tank. Costs that are allocated to storage include tank costs as well as foundations and other supporting facilities.

Bunkering	Costs allocated to bunkering include facilities used to move the LNG from the onsite storage tank to the marine loading facility, which will be located at TOTE's berthing location. PSE is working with regulators to determine if other vessels can be filled at TOTE's berth when TOTE vessels are not in port.
Truck Loading	Truck loading involves moving LNG from the onsite storage tank to tanker trucks or ISO containers.
Vaporization	Vaporization costs include facilities used to vaporize the gas and inject it into PSE's distribution system. This service and the facilities devoted to it are only utilized by PSE gas customers, so other LNG customers do not pay for vaporization.
Common Items	Approximately 20% of the Facility costs will be common items, which cannot be allocated to any individual service (e.g., Facility development, civil and site work, site utilities, etc.). For pricing or ownership purposes, revenue contributions or ownership of common items are based on the user's weighted average utilization of liquefaction and storage services.
Gross Facility Contributions:	Gross Facility contributions represent the amount of capital investment used to develop customer pricing or ownership percentage and the resultant cost-of-service revenue contribution from each customer or owner.
Capital Ratios	The capital ratio (expressed as a percentage) is the ratio of the capital attributable to each customer's services over the total capital cost of the Tacoma LNG Facility.

C. Estimated Operating Budget

Operating expenses include all of the fixed and variables costs of operating the Tacoma LNG Facility. Fixed expenses are modeled using estimates based on 2013 costs. ***Table 3*** shows a summary of the fixed O&M expenses for the Facility and the allocation of these expenses across the customers (or owners). Under a fuel supply or tolling arrangement PSE will pass through O&M costs to the customers. In a joint ownership arrangement the Marketer would pay for O&M costs associated with their ownership stake in the plant.

Table 3. Estimated Operating Budget and Allocation ($1,000s)

Fixed Expenses	Total Fixed Expense (2013 $'s)	Contribution of Customers to Cover Operating Costs			Escalation Factor
		PSE	TOTE	Merchant	
Plant Consumables	246	10%	44%	46%	2.5%
Maintenance	632	27%	35%	38%	2.5%
Staff	2,542	43%	26%	31%	3%
Incremental Insurance	579	43%	26%	31%	2.5%
Allocated General Costs*	1,989	N/A Based on Rate Dept. Calculation			1.1%
Lease	2,549	43%	26%	31%	2.5%
Fixed Electric Costs	1,186	10%	44%	46%	2.5%
Variable Expenses					
Port Volume Charge	163,508	10%	44%	46%	2.5%
Variable Electric Costs*	6,381	10%	44%	46%	2.9%

**The escalation of Allocated General Costs is formulaic. The factor shown is a cumulative average over the 25-year period. The escalation of variable electric costs is based on the IRP. The factor shown is a cumulative average over the 25-year period.*

Revenue Contributions for Operating Expenses	Charges will be divided amongst Facility customers/owners based on three separate methodologies. Fixed expenses related to liquefaction (mainly fixed electric utilities) will be based on the liquefaction ratio, maintenance expenses will be allocated based on customer utilization of the services requiring maintenance and all other fixed O&M charges will be based on the capital ratio. All variable charges will be based on the liquefaction ratio.
Liquefaction Ratio	The liquefaction ratio is expressed as a percentage and represents each customer's share of liquefaction service as compared to total liquefaction service (as show in ***Table 2***).

Capital Ratio	The capital ratio is expressed as a percentage of the total Facility capital attributable to each customer (as show in ***Table 2***).
Escalation of operational costs	For the purposes of the financial pro forma and cost estimates, all expenses are escalated annually at 2.5% with the exception of labor costs, which are escalated at 3% annually.
Fixed Operating Expenses	Fixed operating expense will be passed through to Facility customers at cost.
Plant Consumables	Consumables include the nitrogen and other compounds used to treat and cool the natural gas. Consumable costs will be charged to customers each month based on their actual liquefaction volumes for that month.
Maintenance	This category encompasses all maintenance cost other than consumables and labor. These costs include replacement parts and paying for outside service providers to perform maintenance on Facility components or Facility grounds. Maintenance that is attributable to equipment that is specifically used for a particular Facility service will be covered in revenues from customers based on their use of that service. Any other maintenance will be allocated to customers using the capital ratio.
Facility Staff	This category includes the salaries and overhead for Facility staff, which are expected to be fulltime PSE employees; PSE has included 16 employees in the financial pro forma. This includes 10 gas operators, and a control technician, which will be union positions. It is possible that the USCG and Dept. of Homeland Security will require manned security at the Facility at all times. PSE will contract with a service provider for security services.
Incremental Insurance	Incremental insurance premiums will be passed on to Facility customers based on the capital ratio.

Allocated General Costs	All PSE facilities and operations are allocated, on a formulaic basis determined by WUTC mandated ratemaking rules, a certain amount of overhead to recover corporate administrative and general expenses. The administrative fee will largely be charged to Facility customers based on their share of the Facility's total O&M expenses for the previous contract year, but a portion will be charged to Facility customers based on gross plant balances at the beginning of the contract year. The administrative fee will be set at the start of each contract year.
Lease	The Tacoma LNG Facility will be located on land that is under a long-term lease with the Port of Tacoma. All Facility customers will pay their allocable share of the lease payments, which are subject to an annual increase equal to the previous year's average CPI-U. For the purposes of the financial pro forma, CPI-U is assumed to be 2.5% annually.
Fixed Electric Costs	Fixed electric charges will be comprised mainly of fixed payments to Tacoma Power for providing transmission wheeling service to the Facility. For the purposes of this pro forma, PSE has conservatively assumed that the fixed electric costs will be at Tacoma's tariffed industrial rates. However, PSE and Tacoma Power have agreed that the preferable model is for PSE to buy power on the wholesale market and wheel through Tacoma's system at their OATT transmission rates, resulting in lower costs for customers.
Variable Expenses	Variable operating costs will be passed through to Facility customers without markup.
Port of Tacoma Volume Charge	The Port of Tacoma charges a fee for any commodity that is sold in the Port. This fee will be assessed at $0.085/volumetric barrel (approximately $0.1573/BOE). This rate is subject to an annual increase by CPI-U. The Port of Tacoma is reserving the right to develop a Port Tariff for LNG that may be substituted in lieu of this charge. This cost will be passed directly to customers based on their actual deliveries.
Variable Electric Costs	Electricity is the largest Facility operating cost. Electricity will be provided at wholesale market prices and wheeled by Tacoma Power. For the purposes of the pro forma, the Mid-C price forecast from PSE's 2013 IRP has been used for estimating wholesale power prices.

D. Fuel Charge

PSE will be offering a bundled service to TOTE, and other potential customers may also subscribe to a bundled service. Bundled service includes the gas commodity and transportation to the Tacoma LNG Facility.

Fuel Charge	The fuel charge includes the cost of natural gas delivered to the Tacoma LNG Facility.
Commodity Charge	The commodity charge is variable and billed each month based on the previous month's usage. The commodity charge will equal the total amount of natural gas used by Facility customers (as measured in MMBtu) including plant fuel multiplied by the Sumas index price plus 3 cents ($0.03) per MMBtu for the month in which the gas was liquefied.
Northwest Pipeline Charges	Northwest Pipeline LLC ("NWP") delivers gas from British Columbia to PSE's city gate via an interstate pipeline system. NWP Charges will be passed through at cost. Current Pricing includes: *Pipeline transportation charges – Pursuant to NWP's then effective FERC Gas Tariff –* • Rate Schedule TF-1 Reservation (Large Customer) System-Wide rate, currently $.41/MMBtu/day; • Rate Schedule TF-1 Volumetric (Large Customer) System-Wide rate, currently $.0318/MMBtu/day; • Rate Schedule TF-1 fuel use reimbursement charge (fuel reimbursed in-kind), currently 1.6%. The reservation and volumetric rates detailed above are expected to be in place until 2017; NWP's rates typically change every 3 to 5 years, oftentimes through settlements negotiated with its customers. The fuel reimbursement factor changes every six months (usually effective October 1 and April 1 each year), and are adjusted to reflect actual activity.
PSE Distribution Charge	PSE distribution charges reflect the cost of moving gas on PSE's distribution system from the interstate pipeline to the Tacoma LNG Facility. These costs will be charged pursuant to PSE's LNG tariff and/or a negotiated special contract. The charges will include a fixed monthly payment and a variable component that will be assessed on a $/MMBtu basis.

The Projection

The following write-up and associated pro forma financials (the "Projection") describes the incremental financial impact the Project will have over the approximately 5-year development and construction timeline and the first 10 years of operations.

In June 2014, PSE engaged Deloitte & Touche to perform a comprehensive review of the financial model used for the Projection. Deloitte has confirmed verbally that the model is fit for purpose and appropriately calculates the revenue requirement and financial metrics of the Tacoma LNG Project. The final report from Deloitte will be delivered July 29th, 2014.

This section includes a projection for three items: project revenues, income statement and balance sheet. The first summary table in each section assumes that PSE retains full ownership of the Facility. The second summary table assumes that the Marketer owns the portion of the Facility reserved for merchant capacity (31% of the total Facility at an investment of $83.8 million). Finally, the third summary table assumes the Marketer owns the portion of the Facility reserved for merchant capacity and half of the services under the TOTE contract (44% of the total Facility at an investment of $119.6 million).

A. Summary of Project Revenues

Project Revenues:	Facility revenues will come from increased customer revenues driven by growth in gas system ratebase and long-term LNG supply contracts. As a regulated asset, the Facility's entire costs will be covered through the revenues generated from customers. LNG customers will subscribe to service through long-term contracts that cover their share of the Facilities costs, distribution costs as described above and an allocable share of A&G expenses.
LNG Facility Revenues	Total revenues collected from LNG customers (TOTE and Marketer) include all revenues needed for Facility operations including return on and of allocated capital and any applicable taxes. In addition to revenues for Facility operations, LNG customers will have revenues associated with allocated A&G and may have a short term contract premium. LNG Facility revenues exclude revenues associated with upgrades to PSE's distribution system.

Short-Term Contract Premium	PSE will collect additional revenues from LNG customers with contracts shorter than 25 years to compensate for potential revenue deficit exposure on the back end of the contract. PSE retail gas customers will accrue the benefit of these revenues.
Allocated A&G	LNG customers will also be charged a portion of administrative and general costs, as discussed above.
LNG Facility Operating Revenues	Operating revenues for the Facility include all revenues needed to support the LNG Facility. Operating revenues do not include short-term contract premiums or allocated A&G as these revenues are passed on to retail gas customers.
Distribution Revenues	LNG customers will pay fees associated with moving natural gas through PSE's distribution system. These fees are expected to be part of the LNG tariff and special contract but will be based on the PSE's transport tariff (Schedule 87).
Contributions to Retail Gas Customers	Contributions to retail gas customers include revenues above and beyond the cost of service associated with the LNG Facility and include the short-term contract premium and allocated A&G.
Distribution Revenues from Retail Gas Customers	Incremental revenues from retail gas customers to support the upgrades to PSE's gas distribution system.

REVENUE SUMMARY (100% PSE OWNERSHIP; 0% MARKETER OWNERSHIP)

	Operating Year:	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
	Revenues From TOTE										
[1]	LNG Facility Revenues	47,122	47,975	48,676	48,675	49,573	49,604	50,451	51,209	51,506	52,235
[2]	Short Term Contract Premium	(3,815)	(3,815)	(3,815)	(3,815)	(3,815)	(3,815)	(3,815)	(3,815)	(3,815)	(3,815)
[3]	Allocated A&G Revenues	(965)	(962)	(961)	(962)	(964)	(967)	(971)	(976)	(981)	(987)
[4]	LNG Plant Operations Revenues	42,342	43,198	43,900	43,898	44,794	44,822	45,664	46,418	46,710	47,433
[5]	Distribution Transport Revenues	1,914	1,956	1,999	2,043	2,088	2,134	2,181	2,229	2,278	2,328
[6]	TOTE Contribution to Core Gas	(4,673)	(4,671)	(4,670)	(4,670)	(4,672)	(4,676)	(4,680)	(4,684)	(4,689)	(4,695)
	Revenues From Marketer										
[7]	LNG Plant Revenues	22,890	22,455	22,125	21,665	21,343	20,997	20,709	20,468	20,182	19,912
[8]	Short Term Contract Premium	-	-	-	-	-	-	-	-	-	-
[9]	Allocated A&G Revenues	(1,100)	(1,097)	(1,095)	(1,095)	(1,097)	(1,100)	(1,104)	(1,109)	(1,114)	(1,120)
[10]	LNG Plant Operations Revenues	21,789	21,358	21,030	20,570	20,246	19,897	19,605	19,360	19,068	18,792
[11]	Distribution Transport Revenues	1,981	2,024	2,069	2,114	2,161	2,208	2,257	2,307	2,357	2,409
[12]	Marketer Contribution to Core Gas	(1,095)	(1,091)	(1,090)	(1,090)	(1,091)	(1,094)	(1,099)	(1,103)	(1,109)	(1,115)
	Plant Revenue Summary										
[13]	TOTE	47,122	47,975	48,676	48,675	49,573	49,604	50,451	51,209	51,506	52,235
[14]	Marketer	22,890	22,455	22,125	21,665	21,343	20,997	20,709	20,468	20,182	19,912
[15]	Core Gas Customer (LNG Plant)	30,504	30,376	29,797	29,117	28,657	28,059	27,648	27,230	26,722	26,301
[16]	Total Revenues Collected	100,516	100,806	100,598	99,457	99,573	98,660	98,808	98,908	98,410	98,449
[17]	TOTE Contribution to Core Gas	(4,673)	(4,671)	(4,670)	(4,670)	(4,672)	(4,676)	(4,680)	(4,684)	(4,689)	(4,695)
[18]	Marketer Contribution to Core Gas	(1,095)	(1,091)	(1,090)	(1,090)	(1,091)	(1,094)	(1,099)	(1,103)	(1,109)	(1,115)
[19]	Revenues from Plant Operations	94,748	95,044	94,838	93,697	93,809	92,890	93,030	93,120	92,612	92,639
[20]	Distribution Transport Revenues	3,895	3,980	4,068	4,157	4,249	4,342	4,438	4,535	4,635	4,737
[21]	Distribution Revenues from Core Gas	3,536	3,244	2,959	3,673	4,083	3,765	3,455	3,150	2,845	2,540
[22]	Incremental Revenues from Distribution	7,430	7,224	7,027	7,830	8,332	8,107	7,893	7,685	7,480	7,277
[23]	**TOTAL Revenues**	**102,179**	**102,267**	**101,865**	**101,527**	**102,141**	**100,998**	**100,923**	**100,806**	**100,092**	**99,916**

REVENUE SUMMARY (69% PSE OWNERSHIP; 31% MARKETER OWNERSHIP)

	Operating Year:	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
	Revenues From TOTE										
[1]	LNG Facility Revenues	47,122	47,975	48,676	48,675	49,573	49,604	50,451	51,209	51,506	52,235
[2]	Short Term Contract Premium	(3,815)	(3,815)	(3,815)	(3,815)	(3,815)	(3,815)	(3,815)	(3,815)	(3,815)	(3,815)
[3]	Allocated A&G Revenues	(965)	(962)	(961)	(962)	(964)	(967)	(971)	(976)	(981)	(987)
[4]	LNG Plant Operations Revenues	42,342	43,198	43,900	43,898	44,794	44,822	45,664	46,418	46,710	47,433
[5]	Distribution Transport Revenues	1,914	1,956	1,999	2,043	2,088	2,134	2,181	2,229	2,278	2,328
[6]	TOTE Contribution to Core Gas	(4,673)	(4,671)	(4,670)	(4,670)	(4,672)	(4,676)	(4,680)	(4,684)	(4,689)	(4,695)
	Revenues From Marketer										
[7]	LNG Plant Revenues	242	249	255	262	269	277	284	292	300	308
[8]	Short Term Contract Premium	-	-	-	-	-	-	-	-	-	-
[9]	Allocated A&G Revenues	(242)	(249)	(255)	(262)	(269)	(277)	(284)	(292)	(300)	(308)
[10]	LNG Plant Operations Revenues	-	-	-	-	-	-	-	-	-	-
[11]	Distribution Transport Revenues	1,981	2,024	2,069	2,114	2,161	2,208	2,257	2,307	2,357	2,409
[12]	Marketer Contribution to Core Gas	(241)	(248)	(254)	(261)	(268)	(275)	(283)	(290)	(298)	(306)
	Plant Revenue Summary										
[13]	TOTE	47,122	47,975	48,676	48,675	49,573	49,604	50,451	51,209	51,506	52,235
[14]	Marketer	242	249	255	262	269	277	284	292	300	308
[15]	Core Gas Customer (LNG Plant)	30,504	30,376	29,797	29,117	28,657	28,059	27,648	27,230	26,722	26,301
[16]	Total Revenues Collected	77,869	78,600	78,728	78,054	78,500	77,940	78,383	78,732	78,528	78,844
[17]	TOTE Contribution to Core Gas	(4,673)	(4,671)	(4,670)	(4,670)	(4,672)	(4,676)	(4,680)	(4,684)	(4,689)	(4,695)
[18]	Marketer Contribution to Core Gas	(241)	(248)	(254)	(261)	(268)	(275)	(283)	(290)	(298)	(306)
[19]	Revenues from Plant Operations	72,955	73,681	73,804	73,123	73,560	72,989	73,421	73,757	73,540	73,843
[20]	Distribution Transport Revenues	3,895	3,980	4,068	4,157	4,249	4,342	4,438	4,535	4,635	4,737
[21]	Distribution Revenues from Core Gas	3,536	3,244	2,959	3,673	4,083	3,765	3,455	3,150	2,845	2,540
[22]	Incremental Revenues from Distribution	7,430	7,224	7,027	7,830	8,332	8,107	7,893	7,685	7,480	7,277
[23]	**TOTAL Revenues**	**80,385**	**80,905**	**80,831**	**80,953**	**81,891**	**81,096**	**81,314**	**81,442**	**81,020**	**81,120**

REVENUE SUMMARY (56% PSE OWNERSHIP; 44% MARKETER OWNERSHIP)

	Operating Year:	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
	Revenues From TOTE										
[1]	LNG Facility Revenues	23,561	23,988	24,338	24,337	24,787	24,802	25,225	25,605	25,753	26,117
[2]	Short Term Contract Premium	(1,908)	(1,908)	(1,908)	(1,908)	(1,908)	(1,908)	(1,908)	(1,908)	(1,908)	(1,908)
[3]	Allocated A&G Revenues	(482)	(481)	(481)	(481)	(482)	(484)	(486)	(488)	(491)	(494)
[4]	LNG Plant Operations Revenues	21,171	21,599	21,950	21,949	22,397	22,411	22,832	23,209	23,355	23,716
[5]	Distribution Transport Revenues	1,914	1,956	1,999	2,043	2,088	2,134	2,181	2,229	2,278	2,328
[6]	TOTE Contribution to Core Gas	(2,337)	(2,335)	(2,335)	(2,335)	(2,336)	(2,338)	(2,340)	(2,342)	(2,345)	(2,348)
	Revenues From Marketer										
[7]	LNG Plant Revenues	348	358	367	377	387	398	408	419	431	442
[8]	Short Term Contract Premium	-	-	-	-	-	-	-	-	-	-
[9]	Allocated A&G Revenues	(348)	(358)	(367)	(377)	(387)	(398)	(408)	(419)	(431)	(442)
[10]	LNG Plant Operations Revenues	-	-	-	-	-	-	-	-	-	-
[11]	Distribution Transport Revenues	1,981	2,024	2,069	2,114	2,161	2,208	2,257	2,307	2,357	2,409
[12]	Marketer Contribution to Core Gas	(346)	(356)	(365)	(375)	(385)	(396)	(406)	(417)	(429)	(440)
	Plant Revenue Summary										
[13]	TOTE	23,561	23,988	24,338	24,337	24,787	24,802	25,225	25,605	25,753	26,117
[14]	Marketer	348	358	367	377	387	398	408	419	431	442
[15]	Core Gas Customer (LNG Plant)	30,504	30,376	29,797	29,117	28,657	28,059	27,648	27,230	26,722	26,301
[16]	Total Revenues Collected	54,414	54,721	54,502	53,831	53,831	53,259	53,282	53,254	52,905	52,861
[17]	TOTE Contribution to Core Gas	(2,337)	(2,335)	(2,335)	(2,335)	(2,336)	(2,338)	(2,340)	(2,342)	(2,345)	(2,348)
[18]	Marketer Contribution to Core Gas	(346)	(356)	(365)	(375)	(385)	(396)	(406)	(417)	(429)	(440)
[19]	Revenues from Plant Operations	51,731	52,030	51,802	51,121	51,110	50,525	50,536	50,495	50,132	50,074
[20]	Distribution Transport Revenues	3,895	3,980	4,068	4,157	4,249	4,342	4,438	4,535	4,635	4,737
[21]	Distribution Revenues from Core Gas	3,536	3,244	2,959	3,673	4,083	3,765	3,455	3,150	2,845	2,540
[22]	Incremental Revenues from Distribution	7,430	7,224	7,027	7,830	8,332	8,107	7,893	7,685	7,480	7,277
[23]	**TOTAL Revenues**	**59,161**	**59,253**	**58,829**	**58,951**	**59,441**	**58,632**	**58,429**	**58,180**	**57,612**	**57,351**

B. Income Statement

The income statements on the following pages consider the incremental revenues and costs associated with the operation of the Tacoma LNG Facility and associated distribution system upgrades. It assumes perfect ratemaking and does not include any excess revenues collected from LNG fuel customers as a contract premium or as a portion of allocated A&G.

Revenues	Revenues include the incremental revenues required to support the operation of the LNG Facility and associated distribution upgrades. Revenues do not include short-term contract premiums or allocated A&G as those revenues are passed back to retail gas customers.
Expenses	Operating expenses include the incremental costs to operate the LNG Facility and associated distribution upgrades. The gas feedstock and electric costs to power the Facility are the largest operating expenses. These expenses are categorized as 'Energy Costs' on the income statement.
Ratebase	The LNG Facility is depreciated on a 25-year schedule that is determined by the initial term of the Port of Tacoma lease. Distribution plant is depreciated on a 50-year schedule.

INCOME STATEMENT (100% PSE OWNERSHIP; 0% MARKETER OWNERSHIP)

	Operating Year:	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
[1]	Revenues	102,179	102,267	101,865	101,527	102,141	100,998	100,923	100,806	100,092	99,916
	Expenses										
[2]	Plant Operational Expenses	7,721	7,923	8,130	8,343	8,562	8,787	9,017	9,254	9,498	9,748
[3]	Energy Costs	33,446	34,943	36,497	37,046	38,694	39,272	40,794	42,249	43,126	44,505
[4]	Depreciation and Amortization	15,402	15,402	15,402	15,672	15,672	15,672	15,672	15,672	15,672	15,672
[5]	Property Tax	5,251	5,251	5,251	5,251	5,251	5,251	5,251	5,251	5,251	5,251
[6]	Sales Tax	2,663	2,666	2,649	2,656	2,679	2,645	2,638	2,629	2,605	2,596
[7]	Income Tax	9,258	8,862	8,334	7,996	7,683	7,213	6,766	6,324	5,880	5,439
[8]	Operating Expenses	73,741	75,047	76,264	76,965	78,541	78,841	80,139	81,380	82,032	83,210
	Income										
[9]	Operating Income	28,438	27,220	25,601	24,563	23,600	22,157	20,784	19,426	18,060	16,706
[10]	Interest Expense	(11,243)	(10,762)	(10,122)	(9,712)	(9,331)	(8,761)	(8,218)	(7,681)	(7,141)	(6,605)
[11]	Net Income	17,194	16,458	15,479	14,851	14,269	13,396	12,566	11,745	10,919	10,100
[12]	EBITDA	53,097	51,484	49,337	48,231	46,955	45,042	43,222	41,422	39,612	37,817
	Ratebase										
[13]	LNG Plant Ratebase	317,013	303,263	284,236	266,035	248,984	232,491	216,801	201,250	185,570	170,023
[14]	Distribution System Ratebase	49,225	47,301	45,471	50,304	54,960	52,869	50,875	48,942	47,030	45,138
[15]	Total Ratebase	366,238	350,564	329,707	316,339	303,944	285,359	267,676	250,192	232,601	215,162
[16]	Equity Capitalization of Ratebase	175,794	168,271	158,259	151,843	145,893	136,973	128,485	120,092	111,648	103,278
[17]	Return on Equity	9.78%	9.78%	9.78%	9.78%	9.78%	9.78%	9.78%	9.78%	9.78%	9.78%

INCOME STATEMENT (69% PSE OWNERSHIP; 31% MARKETER OWNERSHIP)

	Operating Year:	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
[1]	Revenues	80,385	80,905	80,831	80,953	81,891	81,096	81,314	81,442	81,020	81,120
	Expenses										
[2]	Plant Operational Expenses	5,310	5,447	5,588	5,732	5,880	6,033	6,189	6,350	6,515	6,685
[3]	Energy Costs	29,890	31,337	32,678	33,178	34,673	35,150	36,535	37,814	38,563	39,800
[4]	Depreciation and Amortization	11,006	11,006	11,006	11,276	11,276	11,276	11,276	11,276	11,276	11,276
[5]	Property Tax	3,869	3,869	3,869	3,869	3,869	3,869	3,869	3,869	3,869	3,869
[6]	Sales Tax	2,554	2,559	2,544	2,553	2,578	2,546	2,540	2,531	2,510	2,501
[7]	Income Tax	6,817	6,554	6,176	5,979	5,800	5,458	5,134	4,814	4,491	4,172
[8]	Operating Expenses	59,446	60,772	61,861	62,587	64,076	64,332	65,544	66,655	67,225	68,304
	Income										
[9]	Operating Income	20,939	20,133	18,970	18,366	17,815	16,764	15,770	14,787	13,795	12,816
[10]	Interest Expense	(8,279)	(7,960)	(7,500)	(7,262)	(7,044)	(6,628)	(6,235)	(5,847)	(5,455)	(5,067)
[11]	Net Income	12,660	12,173	11,470	11,104	10,771	10,136	9,535	8,940	8,341	7,748
[12]	EBITDA	38,762	37,693	36,153	35,621	34,892	33,499	32,181	30,878	29,563	28,264
	Ratebase										
[13]	LNG Plant Ratebase	220,441	211,980	198,844	186,227	174,482	163,042	152,232	141,505	130,648	119,923
[14]	Distribution System Ratebase	49,225	47,301	45,471	50,304	54,960	52,869	50,875	48,942	47,030	45,138
[15]	Total Ratebase	269,666	259,281	244,316	236,531	229,442	215,910	203,107	190,447	177,679	165,062
[16]	Equity Capitalization of Ratebase	129,440	124,455	117,271	113,535	110,132	103,637	97,491	91,415	85,286	79,230
[17]	Return on Equity	9.78%	9.78%	9.78%	9.78%	9.78%	9.78%	9.78%	9.78%	9.78%	9.78%

INCOME STATEMENT (56% PSE OWNERSHIP; 44% MARKETER OWNERSHIP)

	Operating Year:	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
[1]	Revenues	59,161	59,253	58,829	58,951	59,441	58,632	58,429	58,180	57,612	57,351
	Expenses										
[2]	Plant Operational Expenses	4,257	4,365	4,476	4,591	4,708	4,829	4,953	5,081	5,212	5,347
[3]	Energy Costs	16,986	17,810	18,577	18,861	19,715	19,987	20,777	21,508	21,936	22,642
[4]	Depreciation and Amortization	9,122	9,122	9,122	9,392	9,392	9,392	9,392	9,392	9,392	9,392
[5]	Property Tax	3,276	3,276	3,276	3,276	3,276	3,276	3,276	3,276	3,276	3,276
[6]	Sales Tax	2,028	2,024	2,001	2,010	2,025	1,992	1,977	1,960	1,935	1,918
[7]	Income Tax	5,770	5,564	5,250	5,114	4,992	4,705	4,434	4,166	3,896	3,629
[8]	Operating Expenses	41,438	42,161	42,702	43,244	44,108	44,181	44,809	45,383	45,646	46,204
	Income										
[9]	Operating Income	17,723	17,092	16,126	15,708	15,334	14,451	13,620	12,797	11,966	11,147
[10]	Interest Expense	(7,007)	(6,758)	(6,376)	(6,211)	(6,063)	(5,714)	(5,385)	(5,060)	(4,731)	(4,408)
[11]	Net Income	10,716	10,334	9,750	9,497	9,271	8,737	8,235	7,737	7,235	6,739
[12]	EBITDA	32,614	31,778	30,498	30,213	29,718	28,548	27,445	26,355	25,254	24,168
	Ratebase										
[13]	LNG Plant Ratebase	179,023	172,829	162,220	151,996	142,525	133,252	124,535	115,876	107,087	98,429
[14]	Distribution System Ratebase	49,225	47,301	45,471	50,304	54,960	52,869	50,875	48,942	47,030	45,138
[15]	Total Ratebase	228,248	220,130	207,691	202,300	197,485	186,120	175,409	164,818	154,118	143,568
[16]	Equity Capitalization of Ratebase	109,559	105,662	99,692	97,104	94,793	89,338	84,197	79,113	73,976	68,912
[17]	Return on Equity	9.78%	9.78%	9.78%	9.78%	9.78%	9.78%	9.78%	9.78%	9.78%	9.78%

C. Balance Sheet

The balance sheet includes all assets of the Tacoma LNG Project including the LNG Facility and the upgrades to the distribution system that are required to serve the Facility. The distribution system upgrades are required to be in place prior to Facility operations in order to support Facility commissioning, start up and testing. In the following table, the distribution system upgrades go into service in year 0 and the LNG Facility begins service in year one.

BALANCE SHEET (100% PSE OWNERSHIP; 0% MARKETER OWNERSHIP)

	Year:	-6	-5	-4	-3	-2	-1	0	1	2	3	4
	Assets											
[1]	Gross Plant	-	-	-	-	-	-	51,548	369,897	369,897	369,897	369,897
[2]	Accumulated Depreciatior	-	-	-	-	-	-	(1,031)	(16,433)	(31,835)	(47,237)	(62,909)
[3]	CWIP	1,332	3,476	10,274	42,905	139,695	296,222	318,348	-	-	-	-
[4]	Net Plant	1,332	3,476	10,274	42,905	139,695	296,222	368,866	353,464	338,062	322,660	306,987
[5]	Gas Inventory	-	-	-	-	-	-	-	3,286	3,473	3,620	3,677
[6]	Working Capital	-	-	-	-	-	-	10	2,779	2,854	2,931	3,010
[7]	**Total Assets**	**1,332**	**3,476**	**10,274**	**42,905**	**139,695**	**296,222**	**368,875**	**359,528**	**344,389**	**329,210**	**313,674**
	Liabilities											
[8]	Deferred Tax	-	-	-	-	-	-	316	1,799	8,198	13,449	17,751
	Capitalization											
[9]	Debt	693	1,807	5,342	22,310	72,641	154,035	191,651	186,019	174,819	164,196	153,880
[10]	Equity	640	1,668	4,931	20,594	67,054	142,186	176,909	171,710	161,371	151,565	142,043
[11]	**Total Capitalization**	1,332	3,476	10,274	42,905	139,695	296,222	368,559	357,729	336,190	315,761	295,923
[12]	**Total Liabilities and Equity**	**1,332**	**3,476**	**10,274**	**42,905**	**139,695**	**296,222**	**368,875**	**359,528**	**344,389**	**329,210**	**313,674**

BALANCE SHEET (69% PSE OWNERSHIP; 31% MARKETER OWNERSHIP)

	Year:	*-6*	*-5*	*-4*	*-3*	*-2*	*-1*	*0*	*1*	*2*	*3*	*4*
	Assets											
[1]	Gross Plant	-	-	-	-	-	-	51,548	272,525	272,525	272,525	272,525
[2]	Accumulated Depreciatior	-	-	-	-	-	-	(1,031)	(12,037)	(23,044)	(34,050)	(45,327)
[3]	CWIP	925	2,477	7,423	30,153	99,150	221,384	220,976	-	-	-	-
[4]	Net Plant	925	2,477	7,423	30,153	99,150	221,384	271,494	260,487	249,481	238,474	227,198
[5]	Gas Inventory	-	-	-	-	-	-	-	3,286	3,473	3,620	3,677
[6]	Working Capital	-	-	-	-	-	-	10	1,299	1,334	1,370	1,406
[7]	**Total Assets**	**925**	**2,477**	**7,423**	**30,153**	**99,150**	**221,384**	**271,503**	**265,072**	**254,288**	**243,464**	**232,281**
	Liabilities											
[8]	Deferred Tax	-	-	-	-	-	-	316	1,633	6,334	10,209	13,425
	Capitalization											
[9]	Debt	481	1,288	3,860	15,679	51,558	115,120	141,018	136,988	128,936	121,293	113,805
[10]	Equity	444	1,189	3,563	14,473	47,592	106,265	130,170	126,450	119,018	111,962	105,051
[11]	**Total Capitalization**	925	2,477	7,423	30,153	99,150	221,384	271,188	263,438	247,954	233,255	218,856
[12]	**Total Liabilities and Equity**	**925**	**2,477**	**7,423**	**30,153**	**99,150**	**221,384**	**271,503**	**265,072**	**254,288**	**243,464**	**232,281**

BALANCE SHEET (56% PSE OWNERSHIP; 44% MARKETER OWNERSHIP)

	Year:	*-6*	*-5*	*-4*	*-3*	*-2*	*-1*	*0*	*1*	*2*	*3*	*4*
	Assets											
[1]	Gross Plant	-	-	-	-	-	-	51,548	230,773	230,773	230,773	230,773
[2]	Accumulated Depreciation	-	-	-	-	-	-	(1,031)	(10,153)	(19,274)	(28,396)	(37,788)
[3]	CWIP	750	2,049	6,200	24,685	81,764	189,295	179,225	-	-	-	-
[4]	Net Plant	750	2,049	6,200	24,685	81,764	189,295	229,742	220,620	211,499	202,377	192,985
[5]	Gas Inventory	-	-	-	-	-	-	-	3,286	3,473	3,620	3,677
[6]	Working Capital	-	-	-	-	-	-	10	654	672	690	709
[7]	**Total Assets**	**750**	**2,049**	**6,200**	**24,685**	**81,764**	**189,295**	**229,752**	**224,560**	**215,644**	**206,687**	**197,371**
	Liabilities											
[8]	Deferred Tax	-	-	-	-	-	-	316	1,562	5,534	8,820	11,570
	Capitalization											
[9]	Debt	390	1,065	3,224	12,836	42,517	98,434	119,307	115,959	109,257	102,891	96,616
[10]	Equity	360	983	2,976	11,849	39,247	90,862	110,129	107,039	100,853	94,976	89,184
[11]	**Total Capitalization**	750	2,049	6,200	24,685	81,764	189,295	229,436	222,998	210,110	197,867	185,801
[12]	**Total Liabilities and Equity**	**750**	**2,049**	**6,200**	**24,685**	**81,764**	**189,295**	**229,752**	**224,560**	**215,644**	**206,687**	**197,371**

Attachment 1. Capital Cost Allocation Table

Item	Sub-Total	TOTAL	Liquefaction	Storage	Bunkering	Truck Loading	Vaporization	Common
Development	*$ 11,072,093*							
Engineering		$ 4,403,515	0%	0%	0%	0%	0%	100%
Permitting/Legal		$ 3,333,094	0%	0%	0%	0%	0%	100%
Site/Real Estate		$ 766,934	0%	0%	0%	0%	0%	100%
PSE Labor		$ 2,178,807	0%	0%	0%	0%	0%	100%
Communication/Outreach		$ 389,743	0%	0%	0%	0%	0%	100%
Development Contingency		$ 444,769	0%	0%	0%	0%	0%	100%
Contingency and OH's	*$ 25,762,547*							
Contingency: EPC Initial Scope of Work [3]	5%	$ 8,749,646	39%	43%	0%	3%	9%	5%
Contingency: Civil/In water/Direct Pipeline/Sub [3]	50%	$ 13,900,000	4%	0%	49%	0%	0%	47%
Construction OH	3%	$ 7,830,237	35%	37%	6%	3%	7%	12%
NON Construction During Execution Phase	*$ 13,333,193*							
1). PSE Labor		$ 5,801,193	0%	0%	0%	0%	0%	100%
2). Construction/Legal Support		$ 1,400,000	0%	0%	0%	0%	0%	100%
3). Rent - Lease		$ 6,132,000	0%	0%	0%	0%	0%	100%
Site, Civil, Foundations, Buildings & Structural [4]	*$ 19,854,833*							
1). All Foundations		$ 6,857,538	40%	20%	0%	10%	15%	15%
2). Buildings (includes PDC)		$ 4,268,449	30%	30%	0%	10%	15%	15%
3). Earthworks		$ 2,742,098	20%	20%	0%	10%	10%	40%
4). Structural		$ 5,986,748	40%	30%	0%	5%	10%	15%
Receiving Equipment [4]	*$ 7,343,566*							
1). Feed Gas Compressor		$ 6,133,504	100%	0%	0%	0%	0%	0%
2). Plant Inlet Filter Separator		$ 220,438	100%	0%	0%	0%	0%	0%
3). Feed Gas Compressor Aftercooler		$ 237,026	100%	0%	0%	0%	0%	0%
4). Gas Chromatograph		$ 752,597	100%	0%	0%	0%	0%	0%

Item	Sub-Total	TOTAL	Liquefaction	Storage	Bunkering	Truck Loading	Vaporization	Common
Pretreatment System [4]	*$ 17,999,831*							
1). Amine Pretreatment System		$ 17,587,988	100%	0%	0%	0%	0%	0%
2). Piping		$ 411,843	100%	0%	0%	0%	0%	0%
LNG Liquefaction Train & Compressors [4]	*$ 20,469,372*							
1). Liquefaction HX		$ 4,342,168	100%	0%	0%	0%	0%	0%
2). MRL Compressor		$ 13,227,501	100%	0%	0%	0%	0%	0%
3). MRL Condenser		$ 1,521,162	100%	0%	0%	0%	0%	0%
4). MRL Storage Vessel		$ 1,378,540	100%	0%	0%	0%	0%	0%
LNG Tank Storage and Boil Off Gas System [4]	*$ 57,269,136*							
1). Tank Concrete (double, wall, rf)		$ 35,426,322	0%	100%	0%	0%	0%	0%
2). Tank Seismic Isolators		$ 1,025,255	0%	100%	0%	0%	0%	0%
3). LTC Tank		$ 14,270,648	0%	100%	0%	0%	0%	0%
4). BOG Compressor		$ 5,219,482	0%	100%	0%	0%	0%	0%
5). Storage Piping		$ 476,847	0%	100%	0%	0%	0%	0%
6). BOG Piping		$ 850,582	0%	100%	0%	0%	0%	0%
Vaporization Train [4]	*$ 7,411,794*							
1). LNG Vaporizer		$ 4,008,318	0%	0%	0%	0%	100%	0%
2). LNG IN-tank Loading Pumps		$ 1,733,637	0%	0%	0%	0%	100%	0%
3). Vaporization Pumps		$ 734,466	0%	0%	0%	0%	100%	0%
4). Piping		$ 935,373	0%	0%	0%	0%	100%	0%
Truck Loading System [4]	*$ 3,591,792*							
1). Loading Station		$ 934,746	0%	0%	0%	100%	0%	0%
2). Truck Weigh Scale		$ 934,746	0%	0%	0%	100%	0%	0%
3). Piping		$ 1,722,301	0%	0%	0%	100%	0%	0%
Electrical, Instrumentation and Control Systems [4]	*$ 22,147,283*							
1). Instrumentation		$ 6,522,132	30%	25%	5%	5%	25%	10%
2). Electrical		$ 15,425,152	50%	25%	0%	0%	15%	10%
3). Electrical to Facilities		$ 200,000	0%	0%	0%	0%	0%	100%

Item	Sub-Total	TOTAL	Liquefaction	Storage	Bunkering	Truck Loading	Vaporization	Common
Balance of Plant (Utilities, Safety, Security and Telecom) [4]	*$ 11,663,081*							
1). Essential Generator		$ 2,440,053	0%	35%	5%	5%	25%	30%
2). Flare		$ 1,879,847	50%	50%	0%	0%	0%	0%
3). Flare Piping		$ 6,105,306	50%	50%	0%	0%	0%	0%
4). WPG Cooling Exchanger		$ 686,271	70%	30%	0%	0%	0%	0%
5). Instrument Air System		$ 265,223	25%	25%	5%	20%	20%	5%
6). Water Treatment Unit		$ 286,382	100%	0%	0%	0%	0%	0%
Start Up and Commissioning [4]		$ 6,042,235	20%	25%	5%	5%	5%	40%
Capital Spares (based off of Yankee Gas Comp) [5]		$ 1,200,000	0%	0%	0%	0%	0%	100%
Demo and Civil Work (Soil Stabilization) [5]		$ 13,000,000	0%	0%	0%	0%	0%	100%
Substation [5]		$ 3,000,000	90%	10%	0%	0%	0%	0%
Direct Line to TOTE [5]		$ 8,000,000	0%	0%	100%	0%	0%	0%
In water Work at TOTE Site [5]		$ 4,000,000	0%	0%	100%	0%	0%	0%
Balance of Plant (Utilities, Safety, Security and Telecom) [4]	*$ 2,700,000*							
Builders Risk Insurance [6]		$ 1,200,000	0%	0%	0%	0%	0%	100%
Pollution Insurance [6]		$ 1,500,000	0%	0%	0%	0%	0%	100%
Plant Sales Tax	*$ 12,953,772*							
Sales Tax [2]		$ 8,960,494	41%	11%	12%	2%	6%	28%
Additional $4 Million to City of Tacoma [1]		$ 4,000,000	0%	0%	0%	0%	0%	100%

Sources

[1] Draft Tax Agreement with City of Tacoma

[2] Sales Tax Exemptions from Section 303 of SB 6440.

[3] Contingencies Based on Project Management Estimates

[4] Plant Capital Costs Estimates from CBI FEED Study

[5] Miscellaneous Capital Costs Estimates Compiled by Project Management

[6] Preliminary Insurance Estimates from Insurance Department

Tacoma LNG Project

PUGET SOUND ENERGY

Board Update

January 22, 2015

Roger Garratt
Clay Riding

Project Description

Site: Port of Tacoma at corner of E. 11 St. and Alexander Ave. E.

In-Service Date: January 1, 2019

Liquefaction: 250,000 gallons/day

On-Site Storage: 8 million gallons

Vaporization: 66 MDth/Day (onsite)

Peaking Capacity[1]: 85 MDth/day

Gas System Upgrades Location:

1) Port of Tacoma Pipeline
2) South Tacoma Pipeline
3) Regulation Facilities

Total Project Cost[2]: $325 million

Tacoma LNG Facility in Tacoma, Washington

Project Execution:

- PSE will build the Facility under an Engineer Procure Construct (EPC) contracting methodology.
- EPC contracts place the cost and schedule risk on the firm building the Facility.

[1] Peaking Capacity includes vaporization plus 19 MDth/day of firm pipeline diversion
[2] Project costs include both the LNG Facility at the Port of Tacoma and the gas system upgrades throughout Pierce County, excluding AFUDC.

Commercial

TOTE

- TOTE Fuel Supply Agreement signed October 27, 2014
- Discussions around interim supply are progressing
  - Liquefaction agreement close with FortisBC
  - TOTE supply agreement in draft form; first draft to be sent to TOTE next week

TOTE LNG Initiative

Jacksonville (Supply provided by Pivotal/WesPac)

- Executed a fuel supply agreement effective January 1 (Jan 6th press release)
- WesPac building LNG facility adjacent to Port of Jacksonville – completion in mid-2016
- Ships under construction in San Diego (NASSCO) – delivery in late 2015 and early 2016

Tacoma

- Ship conversion – two shipyards in competition; design will be finalized and submitted to the shipyards for bid over the next three weeks
- Delivery of ships expected to be March 2016 and March 2017
- Contractual commitments made for engines and other major components (Wartsila and GE)

Barge

- Contract “imminent” (Conrad Industries / WesPac / TOTE)
- 2,200 cubic meter barge
- 3 years in Tacoma, then moved to Jacksonville

Commercial

POTENTIAL PARTNERS

Avista

- Avista is evaluating co-ownership
- Interested in LNG for serving SE Alaska communities and serving marine markets
- Could offer attractive terms to shorter-term markets (e.g., Matson)
- Several meetings/discussions held in December

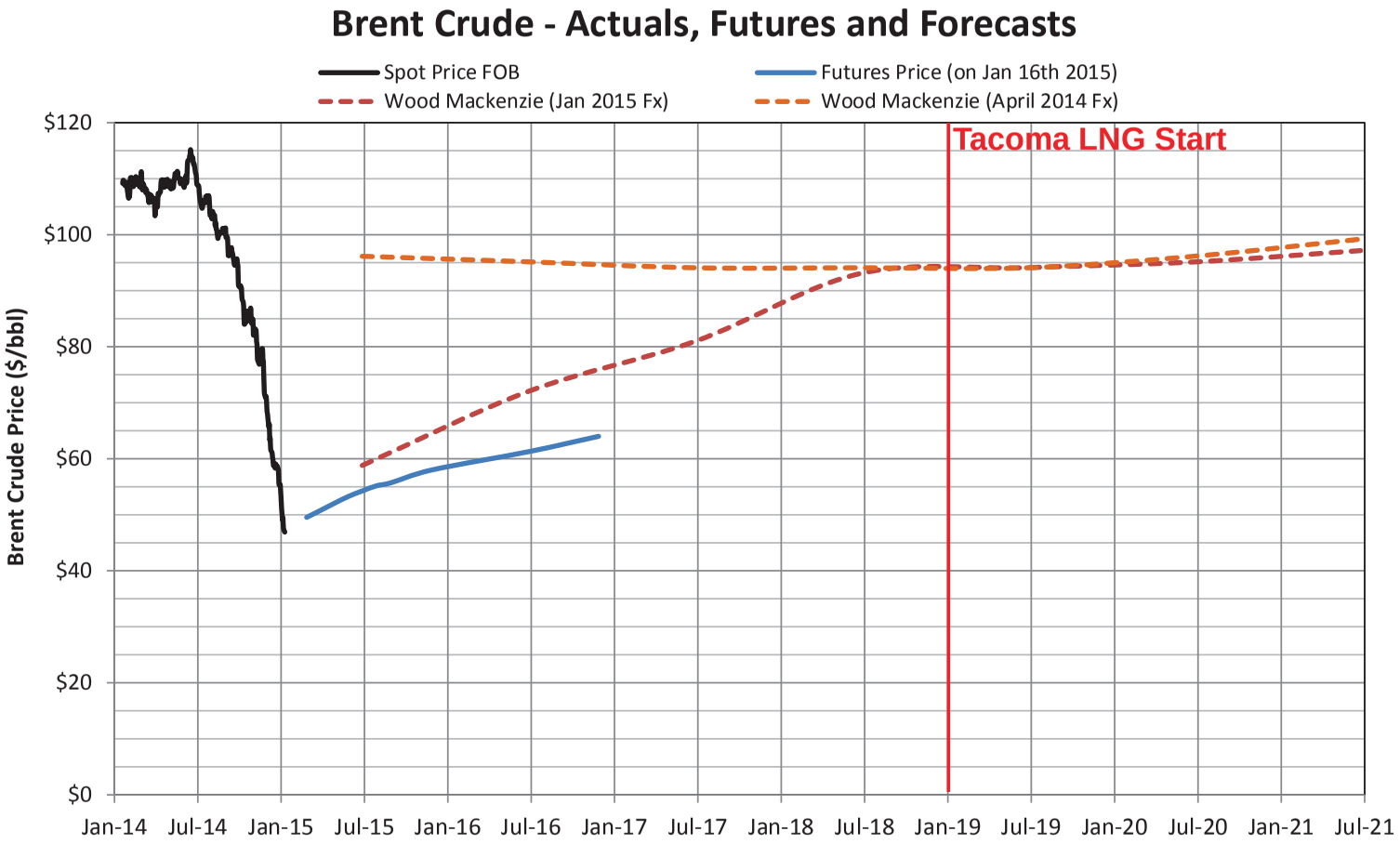
BP / Shell *(separate but similar discussions)*

- BP/Shell would like a non-binding term sheet
- BP/Shell are looking to secure customers prior to committing and are pursuing deals with customers.
- The earliest a commitment could be made is likely Q2 2015

Potential End-use Customers – (Served by Marketers or PSE)

- Matson – Shipping company similar in volume to TOTE

Brent Crude Prices

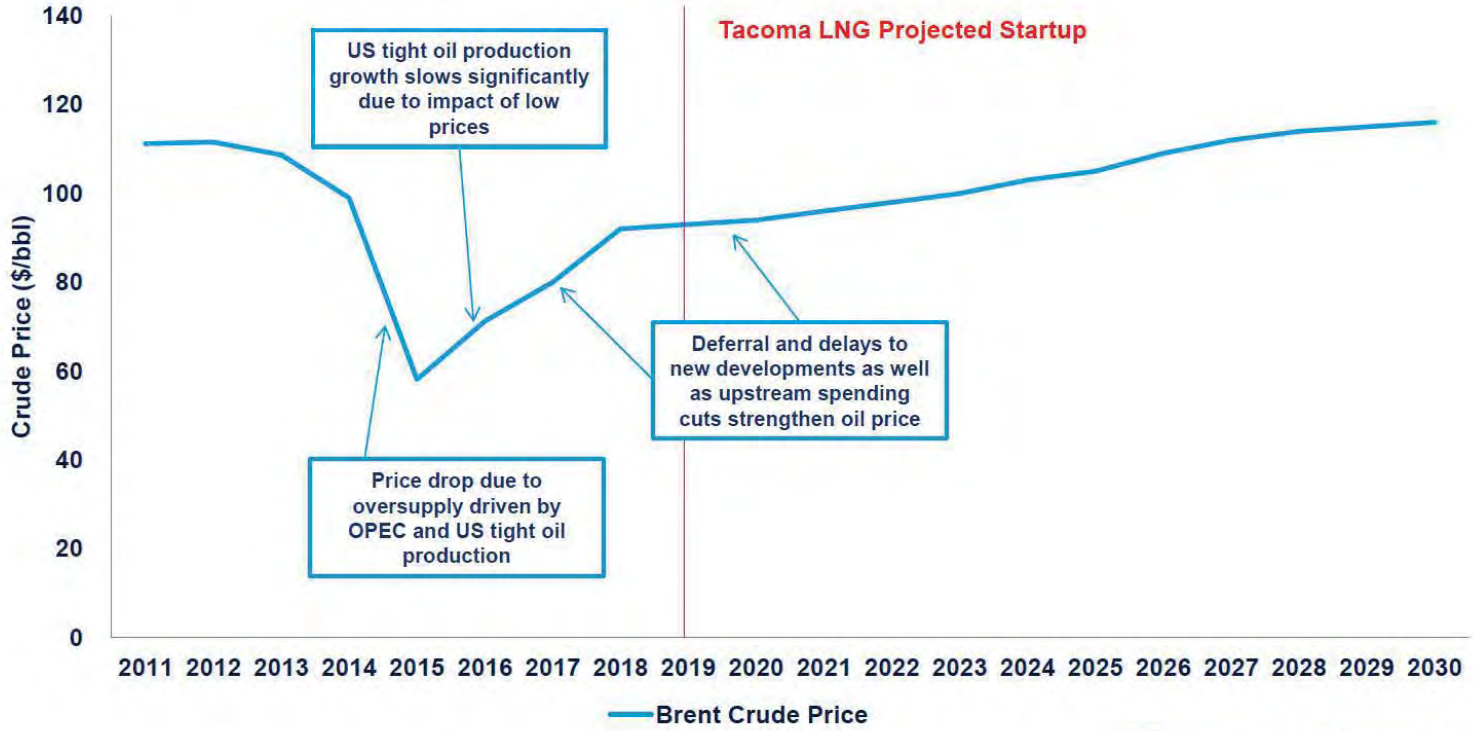


PUGET SOUND ENERGY

Wood Mackenzie Crude Forecast

Brent Crude Price Dynamics

Figure 5: Brent Crude Average Annual Price Forecast



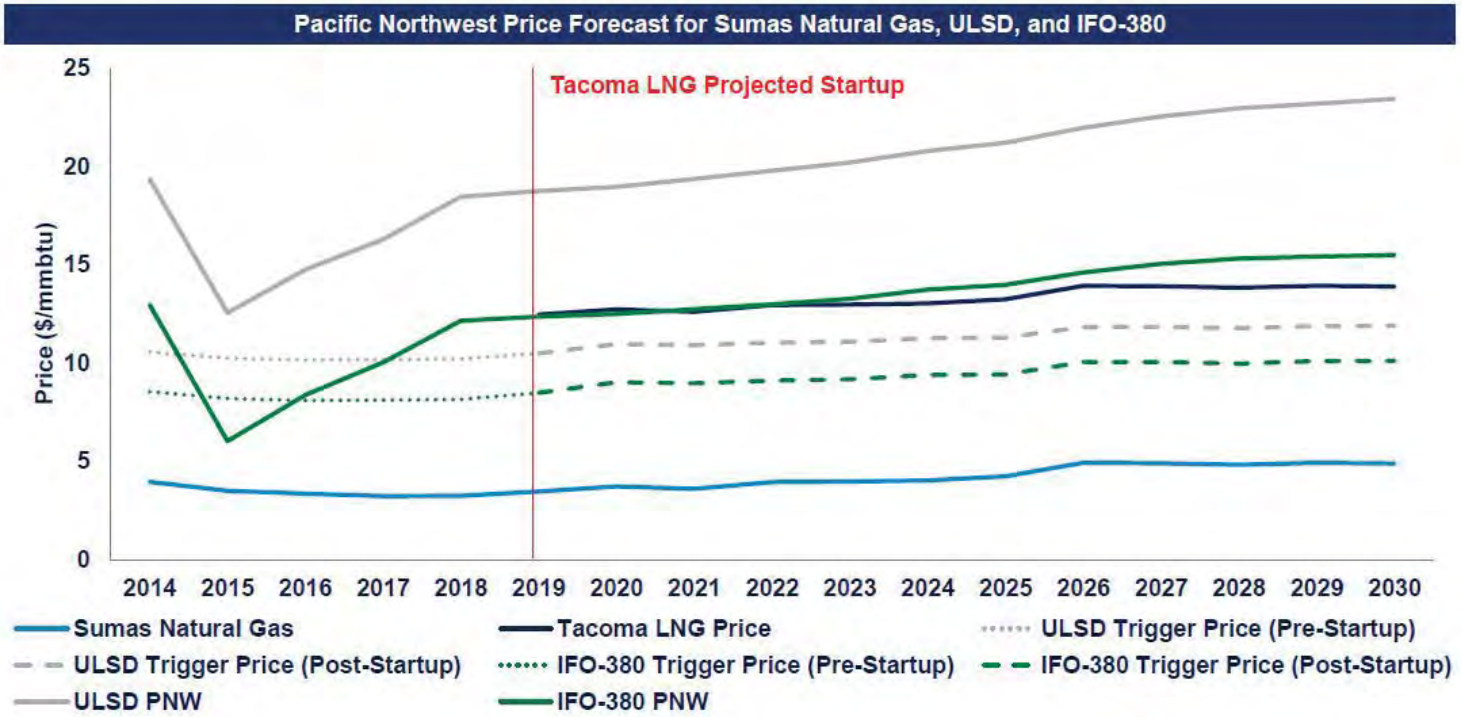
Wood Mackenzie

PSE PUGET SOUND ENERGY

Updated Wood Mackenzie Forecast

ULSD AND IFO-380 PRICE DYNAMICS AND RISKS

Wood Mackenzie expects the basis spread between natural gas to ULSD and IFO-380 to be sustained following Tacoma LNG startup



Wood Mackenzie

PUGET SOUND ENERGY

Project Updates

Budget and Schedule

- Total 2014 capital spend equaled $5.1 million, $1.1 million below the revised 2014 budget. Total spend for project development (through August 2015) is forecasted to be $13.8 million.

Permitting

- 'Resource reports' that serve as the basis for the draft EIS are being internally reviewed and will be delivered to the City of Tacoma in January. CUP permit for the limit station was submitted in December.
- Letter of Intent and Preliminary Waterway Suitability Assessment submitted to USCG in December. Follow on meetings with USCG and emergency response stakeholder scheduled for January.

Real Estate

- PSE continues to work with Port of Tacoma on other real estate rights needed for the project at the Port
- Team is investigating expired Tacoma franchise agreement and evaluating alternative options to secure street use rights

Distribution Upgrades

- Land for limit stations needed for pressure increase was purchased in December 2014. Team developing route alignment and construction method for Port of Tacoma pipeline section.

Outreach

- Supporting permitting process by engaging with the City of Tacoma and key stakeholders. Andy Wappler spoke at Tacoma Chamber event in January 2015.

Wood Mackenzie

Jan 2015

Natural Gas, ULSD and Fuel Oil Dynamics Update

Background

Puget Sound Energy (PSE) is requesting a follow-up to Wood Mackenzie's previous study on the price spreads of ULSD and IFO-380 to Sumas natural gas. The intent is to provide analysis under the current oil price scenario as well as to update the figures provided in the previous study. In particular, PSE has asked for updated commodity price projections (Sumas natural gas, Brent crude, PNW ULSD, IFO-380 PNW) with comparison to LNG prices out of the Tacoma LNG facility, as well as an analysis of the macroeconomic and industry phenomena driving Brent price dynamics.

ULSD and IFO-380 prices are currently being driven by Brent crude price, which is underpinned by global crude supply/demand dynamics, while Sumas natural gas price is dependent on regional supply/demand dynamics in US PADD V and Western Canada (Figure 1: Map of US PADD V and Western Canada). PADD V covers the US West Coast and consists of Alaska, Arizona, California, Hawaii, Nevada, Oregon, and Washington. Western Canada is defined as the provinces of British Columbia and Alberta for the purposes of this study.

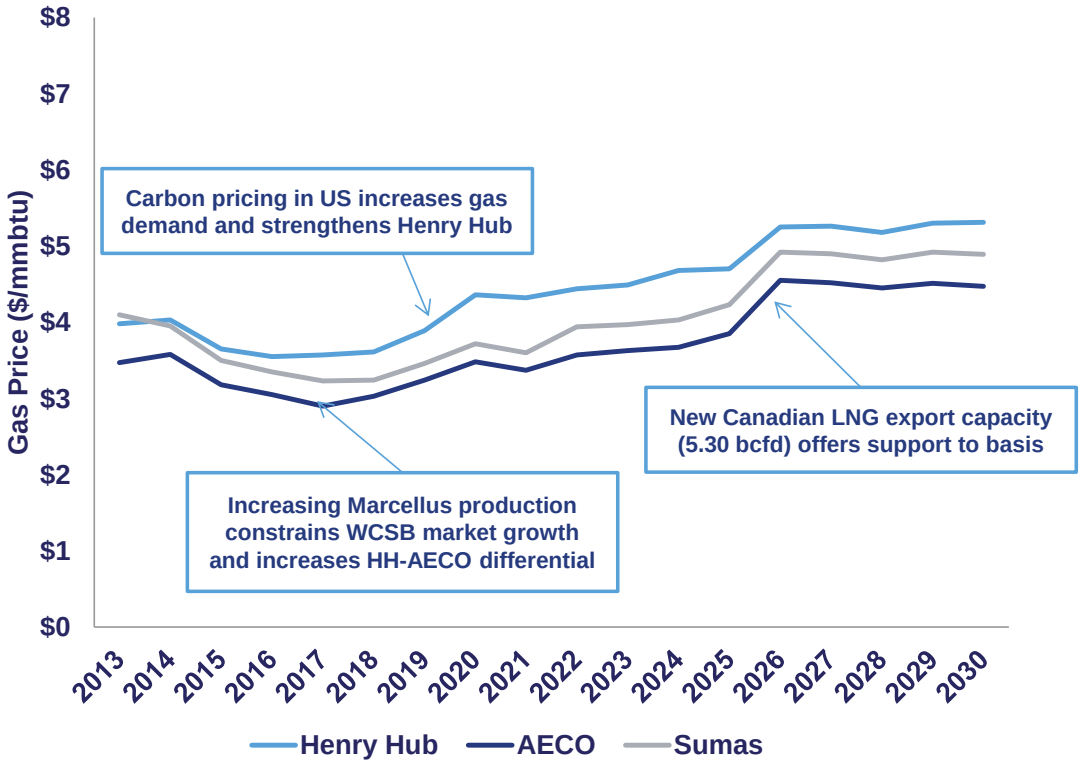
All prices used in this study are in nominal terms, with an inflation assumption range of 2%-2.5%.

Figure 1: Map of US PADD V and Western Canada

Sumas Gas Price Dynamics

Natural Gas Hub Prices

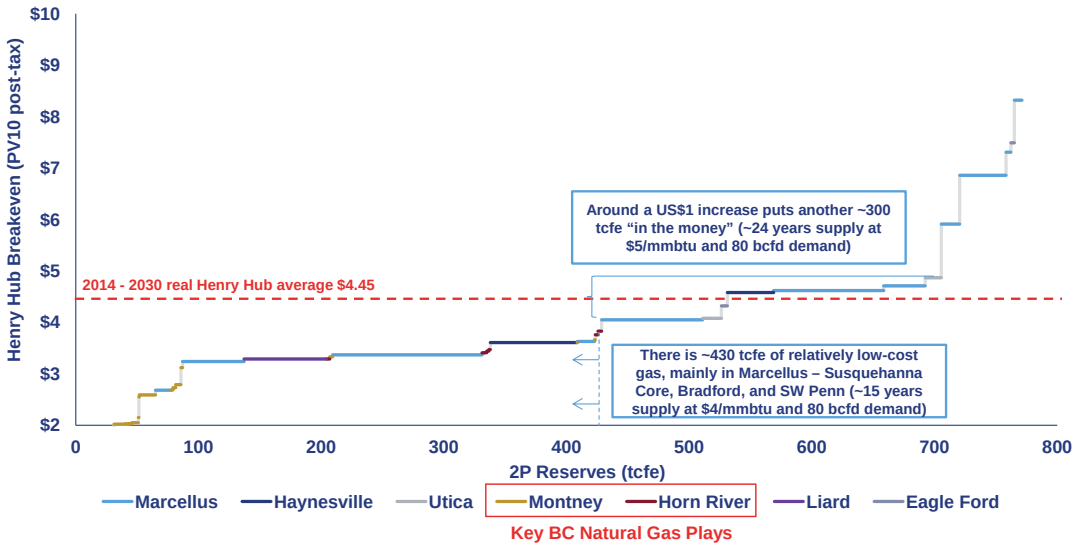
Figure 2: North American Natural Gas Prices



Natural gas prices in the US have remained low since 2009, driven by the advent of shale gas. Wood Mackenzie does not forecast a significant recovery of gas prices and expects Sumas gas price to remain in the $3.20-$4.95/mmbtu range throughout the study period (Figure 2: North American Natural Gas Prices). Despite price support to Henry Hub due to LNG exports coming online in the Gulf Coast as well as robust industrial demand growth, Sumas sources the majority of its natural gas from British Columbia, which prices its volumes off of AECO. At the AECO hub, price increases are constrained due to limited demand access as well as increasing competition from sources of supply in North America flowing into current end markets (i.e. Marcellus). Consequently, upside to Sumas gas price is limited.

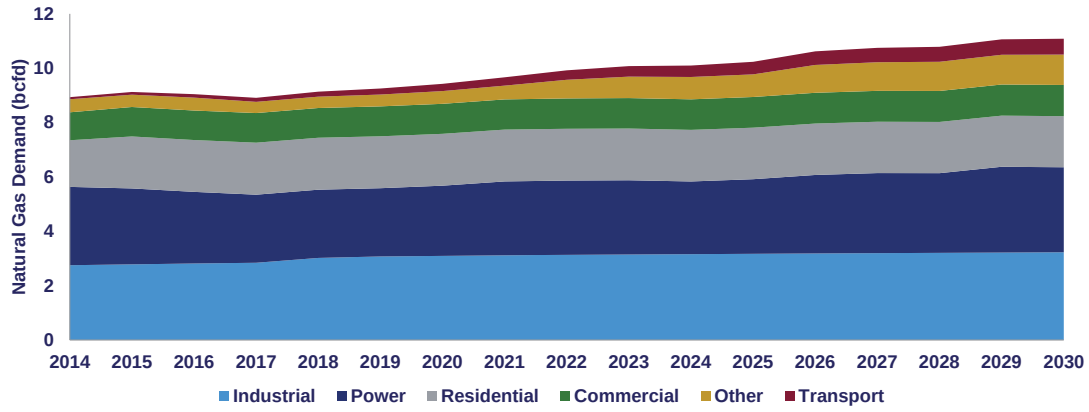
Natural Gas Supply/Demand Dynamics

Figure 3: PV10 Breakeven Gas Price by Sub-Play



Natural gas price dynamics continue to be driven by the rise of North American unconventionals and the associated increase in volumes of relatively low-cost gas. At prices of $4/mmbtu, there is ~430 tcf of economic reserves in unconventional plays alone with another ~300 tcf of gas available with just a $1/mmbtu increase, enough to supply North America for another 24 years at 2014 demand levels (Figure 3).

Figure 4: North American Pacific Coast Natural Gas Demand



North American gas demand is expected to grow through the study period, driven by increases in the power generation sector and LNG export facilities coming online. However, the North American Pacific Coast is expected to contribute very little of this growth, with only an increase of ~2 bcfd of demand by 2030 (Figure 4). Industrial growth demand is forecast to be negligible due to a dearth of established industrial projects in the pipeline. NGV penetration is also expected to have little effect as the lack of re-fuelling infrastructure has constrained NGV uptake and competition with hybrid / electric vehicles has further eroded their market share. Opportunity for long-term upside in British Columbia LNG (BCLNG) exists, but high deliverability risk makes the timing and cost of these projects very uncertain. A number of issues must be resolved on technical, political, and fiscal aspects for these projects to move forward. Most tellingly, a large number of these concerns are dependent on regulation and thus can be considered high-risk projects.

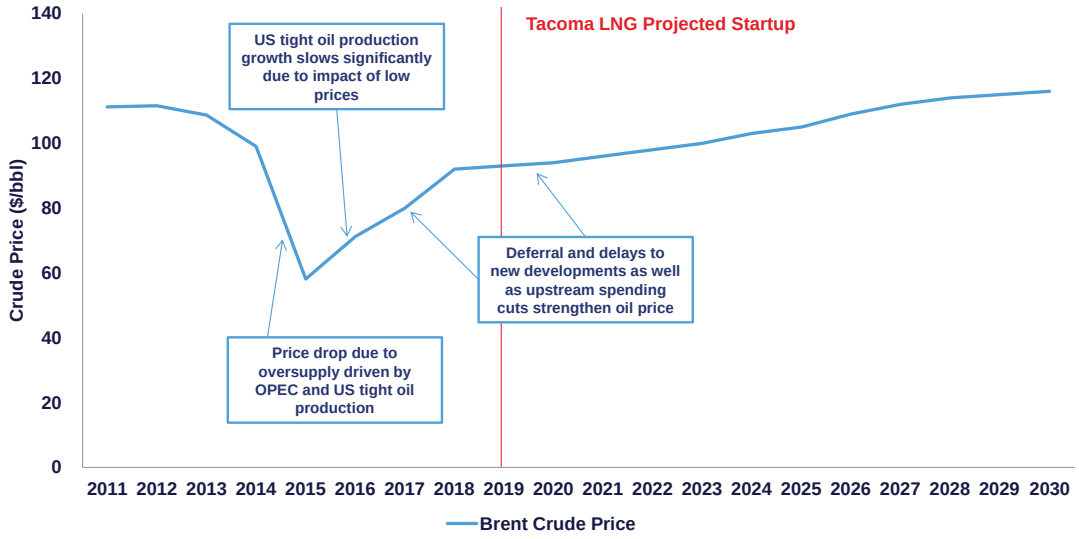
ULSD and IFO-380 Price Dynamics

ULSD and IFO-380 prices reflect an extremely liquid and global market for these fuels. As such, prices in the Pacific North West simply reflect the price that local refiners charge for their supply, which is ultimately constrained by competition from other refiners. If they price their production too high, it will encourage imports to the region from slightly more distant refiners. If they price too low, they will forgo some margin on the crude that they refine. This competitive pricing environment ensures that all refined product prices ultimately reflect the marginal cost of global supply and hence are very strongly correlated to crude prices.

We therefore first consider the outlook for global crude oil prices (i.e. Brent) before then assessing the corresponding prices for USLD and IFO-380.

Brent Crude Price Dynamics

Figure 5: Brent Crude Average Annual Price Forecast



The recent drop in Brent crude price, which currently sits around ~$50/bbl, underpins lower petroleum product prices. This drastic decrease has been caused by a combination of factors:

- World oil demand growth has slowed markedly in the last year, making it difficult to absorb non-OPEC production gains. Lower than expected Chinese demand combined with sluggish economies and recessions in Europe and Japan as well as slow US demand growth have all contributed to the problem, making it difficult to support oil prices
- In an effort to protect their market share, the Gulf Arab nations have not scaled back their output in the hopes of forcing other producers to scale back their output and letting the market rebalance through stimulation of demand growth and slowing of supply from high-cost producers. Saudi Arabia oil minister has said recently that output will not be cut no matter how low prices fall
- US crude production has been driven by onshore tight oil and is expected to continue increasing into mid-2015, reflecting the strong pace of recent drilling and the backlog of well completions as well as additional growth in the Mid-Continent, Permian Basin, and Rockies combined with continued output from the key Eagle Ford and Bakken plays

Consequently, Brent crude price is expected to remain low in 2015; however, Wood Mackenzie expects crude price to begin recovering and reach ~$92/bbl by 2018 (Figure 5). This recovery is caused by a number of developments:

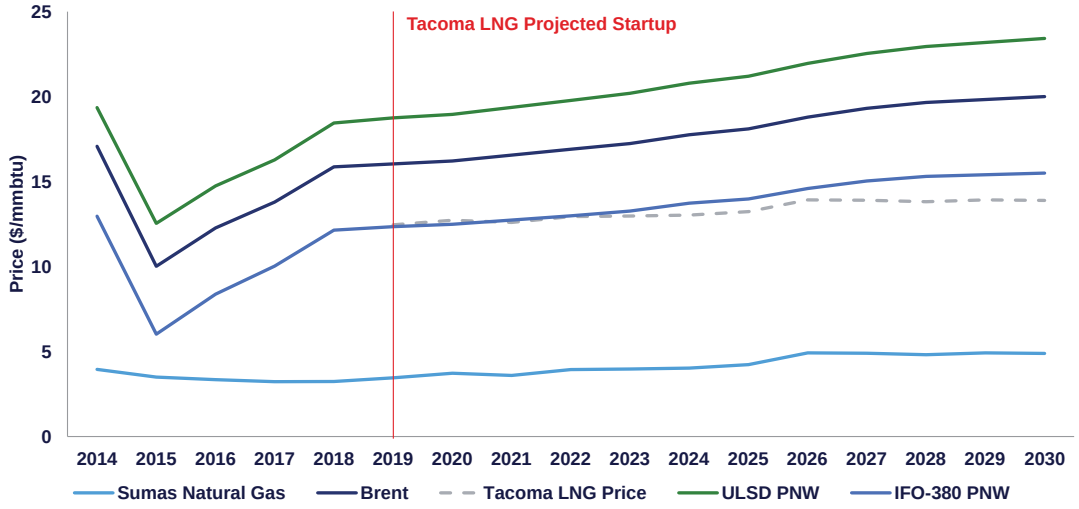
- US tight oil production growth slows significantly due to the impact of low prices as activity levels drop and rigs are idled; producers are likely to retrench and refocus only on core assets that are still economic while slowing or ceasing activity in higher cost areas
- Deferrals and delays to new developments are expected during 2015 and 2016 under lower prices, as higher cost sources of supply such as in deepwater are now deemed to be uneconomic
- Although world oil demand has slowed recently, it is still expected to continue increasing driven by robust annual GDP gains, especially in non-OECD countries still undergoing development (5% GDP growth in the long-term). Even at this slowed pace, demand growth is expected to keep pace with non-OPEC production (especially US tight oil) The Brent forecast considers a global slowdown in the near-term driven by weaker than expected Asian economies, but global output is expected to increase in the medium term, reaching 3.2% real GDP growth by 2020.
- Lower oil prices will present significant upside in demand, helping to tighten the global supply/demand balance

In addition, oil industry players were announcing upstream spending cuts well before the oil price drop, laying the groundwork for less supply growth in the medium term to 2020.

ULSD and IFO-380 Price Dynamics

Pricing relationships for ULSD and IFO-380 relative to Brent in the Pacific North West are developed based on an extrapolation of historic trends. Tacoma LNG price has been assumed as a $9.25/mmbtu adder to the Sumas gas price, accounting for transport, liquefaction, storage, and delivery costs.

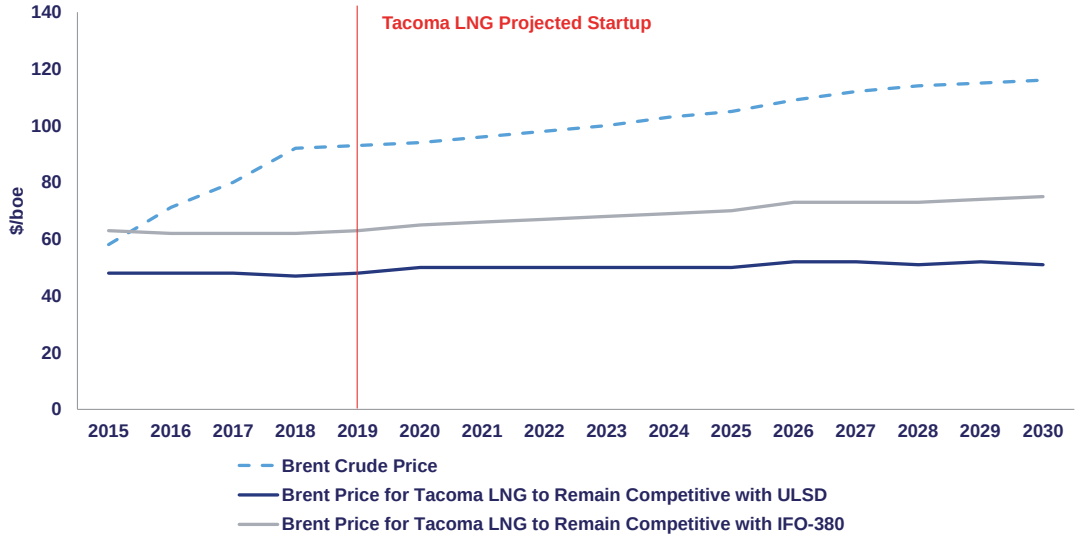
Figure 6: PNW Price Forecast for Sumas Natural Gas, ULSD and IFO-380



Under the current oil price environment, Wood Mackenzie now expects the basis spreads between natural gas to ULSD and IFO-380 to remain low before recovering in 2018 (Pricing relationships for ULSD and IFO-380 relative to Brent in the Pacific North West are developed based on an extrapolation of historic trends. Tacoma LNG price has been assumed as a $9.25/mmbtu adder to the Sumas gas price, accounting for transport, liquefaction, storage, and delivery costs. Figure 6). ULSD and IFO-380 prices are especially low in 2015 and 2016, with IFO-380 at discounts of $6.47/mmbtu and $3.98/mmbtu, and ULSD at slight premiums of $0.04/mmbtu and $2.39/mmbtu, respectively.

Conclusions and Risk Factors

Figure 7: Competitive Analysis



Wood Mackenzie has also considered project breakevens to further analyze the market opportunity for Tacoma LNG. ULSD and IFO-380 price spreads to Sumas gas are expected to remain low in the short-term but to recover by 2019, the projected startup date for the Tacoma LNG facility. Figure 7 shows the Brent breakeven prices for Tacoma LNG to be priced at a 15% discount to PNW ULSD and IFO-380 (inclusive of capital recovery and operating costs of marine end users installing scrubbers[1]); Brent crude is expected to rise to a premium of $45/bbl and $30/bbl for ULSD and IFO-380, respectively, at project startup. Tacoma LNG remains competitive at a 15% discount to ULSD so long as Brent remains above ~$47/bbl; however, breakevens are higher for IFO-380, for which Brent must remain above ~$62/bbl to remain at a 15% discount.

Natural gas price growth is expected to remain muted due to the ability to access significant volumes of economic reserves; Sumas will grow even less due to AECO-priced volumes struggling to find end market. ULSD and IFO-380 prices are expected to decrease in the short-term due to global crude oversupply driving down oil prices, but as the supply/demand balance tightens through muted supply growth and continuing demand growth, prices are expected to recover in the medium to long-term.

Wood Mackenzie has identified a number of risk factors to the study. On the gas side, prices are likely to remain low. Wood Mackenzie's forecast currently includes four BCLNG facilities coming online; even if all projects proposed in the queue were to be constructed, price upside to Sumas natural gas is limited. Therefore, NGV demand would need to increase by an extreme amount (greater than current North American diesel demand) before prices begin to approach trigger prices due to substitution for long-haul trucks and potentially rail. However, the narrowing of the ULSD-Sumas gas spread would impair substitution economics, since increased gas price increases cost of NGV use, making it unlikely a large enough volume swap will occur to drive prices towards each other.

On the refined products side, risk factors revolve around the global crude supply/demand balance and its subsequent impact on the price of Brent. Thus, these risks fall mainly into one of two categories: supply risks, such as:

[1] A $22/boe adder to IFO-380 captures the capital recovery and operating costs of marine end users installing scrubbers. The $22/boe is an estimate contractually agreed to by TOTE and PSE.

- Higher than expected production from OPEC as it strives to protect its market share and curtail production from non-OPEC sources; current Wood Mackenzie forecasts project a rise from 29.58 mmbl/d in 2014 to 30.00 mmbl/d in 2016 of OPEC crude production

- Slower decrease of US tight oil production growth; activity immediately prior to the oil price drop were at record levels and the recent growth may be maintained longer than forecast. The low price environment is expected to curtail growth, but it is possible that some companies may choose to keep producing from high-cost assets if they have no alternative. Wood Mackenzie currently forecasts an increase of 540 kb/d from December 2014 to July 2015 (to >9 mmbl/d), reflecting the strong pace of recent drilling and the backlog of completions

- Higher than expected production growth from Brazil as the Campos Basin and Santos Basin continue to be developed; Wood Mackenzie projects an increase from 2.34 mmbl/d in 2014 to 2.5 mmbl/d in 2015 of liquids production

And demand risks, which include:

- Lower Russian oil demand due to economic sanctions and falling oil prices. A large proportion of the economy is dependent upon the oil and gas industry; continued low oil prices could have a considerable detrimental effect on the country. In addition, the Rouble has declined sharply against the Dollar and the Euro, while inflation has gathered pace. Oil demand has remained high throughout 2014, but it is unclear whether this is sustainable in the future

- Lower Chinese oil demand due to manufacturing slowdown as well as a sustained downturn in housing prices; a weaker Chinese GDP would have considerable negative effects on Chinese oil demand growth

- Lower Middle East oil demand as the regional economy takes a hit under the low oil price environment

- Lower European oil demand as the region undergoes a weakening industrial outlook. The demand profile for heating oil across residential and commercial oil markets in Northwest Europe is shrinking, and the petrochemical sector has also seen losses due to reductions in ethylene cracker capacity in Italy and France

While a recovery in oil price is expected, the above risk factors may serve to delay the recovery process and lower the price forecast, which may have adverse effects on Tacoma LNG startup in early 2019. However, in the long-term, oil supply cost fundamentals ultimately will support project economics for Tacoma LNG.

Tacoma LNG Project

June Board Update

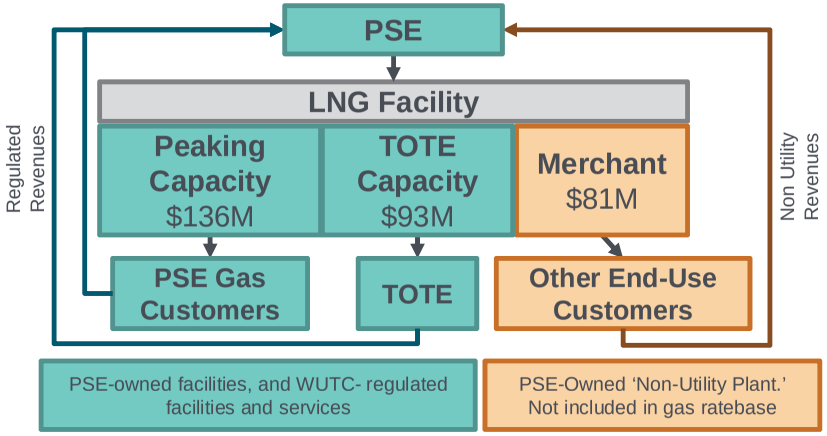
Roger Garratt
Director, Strategic Initiatives

June 25, 2015

LNG Development Strategy

PSE proposing larger plant (250k gpd) with cost allocated based on utilization of facility services and merchant revenues protected

Commercial Structure:



Note: Dollar figures represent project capex (excluding AFUDC)

Capital Allocation:

Facility Services	Peak Shaving	TOTE	Merchant	Capex
Liquefaction	10%	44%	46%	**$89**
Storage	79%	6%	15%	**$96**
Bunkering	0%	100%	0%	**$30**
Truck Loading	25%	0%	75%	**$6**
Vaporization	100%	0%	0%	**$17**
Common	46%	25%	30%	**$73**
Allocated Capital	**$136**	**$93**	**$81**	**$311**
% of plant	44%	30%	26%	
Gross Plant (w/AFUDC)	$162	$110	NA	

Updated Analysis:

Updates to the analysis in the May 18th memo include:

- Revised capex based on recent CBI FEED,
- Revised O&M 'fixed' costs such that fixed electric and gas delivery expenses align with growth in sales

In addition, returns are now based on project 50 year cash flows (as opposed to 25 year cash flow with a terminal value based on an allowed return).

	Unlevered Returns[1]			
	5/18/15 Memo	Updated Returns	Delta	*Weights*
Crash Case	< 0%	< 0%		10%
Low Case[2]	4.9%	5.2%	0.3%	15%
Management's Forecast	10.0%	9.0%	-1.0%	30%
Medium High Forecast	10.7%	9.6%	-1.1%	25%
High Forecast	15.7%	13.6%	-2.1%	20%
Weighted Avg Cash flow	9.8%	8.9%	-1.0%	

[1] Unlevered returns are after tax and comparable to PSE's regulated allowed return of 6.69%.

[2] In the low case, the benefits of revised O&M costs and terminal value calculation outweighed the impact of higher capital cost resulting in a higher unlevered return.

PUGET SOUND ENERGY

Project Budget Update

Updated Capital Budget

- Chicago Bridge and Iron submitted revised EPC pricing on June 1, 2015
- Revised bid came in $20M higher than the 2013 FEED
- Cost estimates for demolition and geotechnical work increased by $3M ($4.5M with contingency)
  - PSE will have bids for demo and geotechnical work in August 2015
- Substation costs increased by $2M ($3M with contingency)
  - PSE will have revised estimates by August 2015
- In water work at TOTE site increased by $1M ($1.5M with contingency)
  - Revised estimates will not be available until detailed engineering is finalized in 2016
- Other updates included revised estimates for support from outside services as well as permitting mitigations

Tacoma LNG Capital Budget *($ millions)*	Current Total	Previous Estimate	Delta
Development	14	12	2
Fixed Price EPC	194	174	20
Miscellaneous Construction	37	29	8
PM & Outside Services	16	13	3
Insurance	2	3	(1)
Sales Tax	16	13	3
Contingency and OH	32	30	2
LNG FACILITY TOTAL	**311**	**274**	**37**
Gas System Improvements	**54**	**49**	**4**
PROJECT CAPITAL TOTAL	**364**	**323**	**41**
AFUDC	46	47	(1)
Capitalized Interest	5	-	5
CLOSING GROSS PLANT	**415**	**370**	**46**

PUGET SOUND ENERGY

Regulatory Strategy

Regulatory Next Steps

Phase 1: Commences June 2015

Consult WUTC on new Commercial Strategy
Seek WUTC Approval of:

- **TOTE Fuel Supply Agreement Approval as a Special Contract**
- **Seek waiver of certain special contract rules**
- **Any necessary Accounting Petition/Treatment/Procedures**

PSE will demonstrate:

Rates in the Special Contract recover all costs to provide service as the TOTE Fuel Supply Agreement and contribute to other Facility fixed costs.

Satisfactory commercial terms and conditions of the TOTE Fuel Supply Agreement.

The TOTE Fuel Supply Agreement does not impose unreasonable preference for/rate discrimination to the counterparties.

Phase 2: General Rate Case in Q3/Q4 2018
WUTC Prudence Determination and Rate Recovery of the Tacoma LNG Facility.

PSE will demonstrate:

Need for the Facility.

Facility is cost-effective.

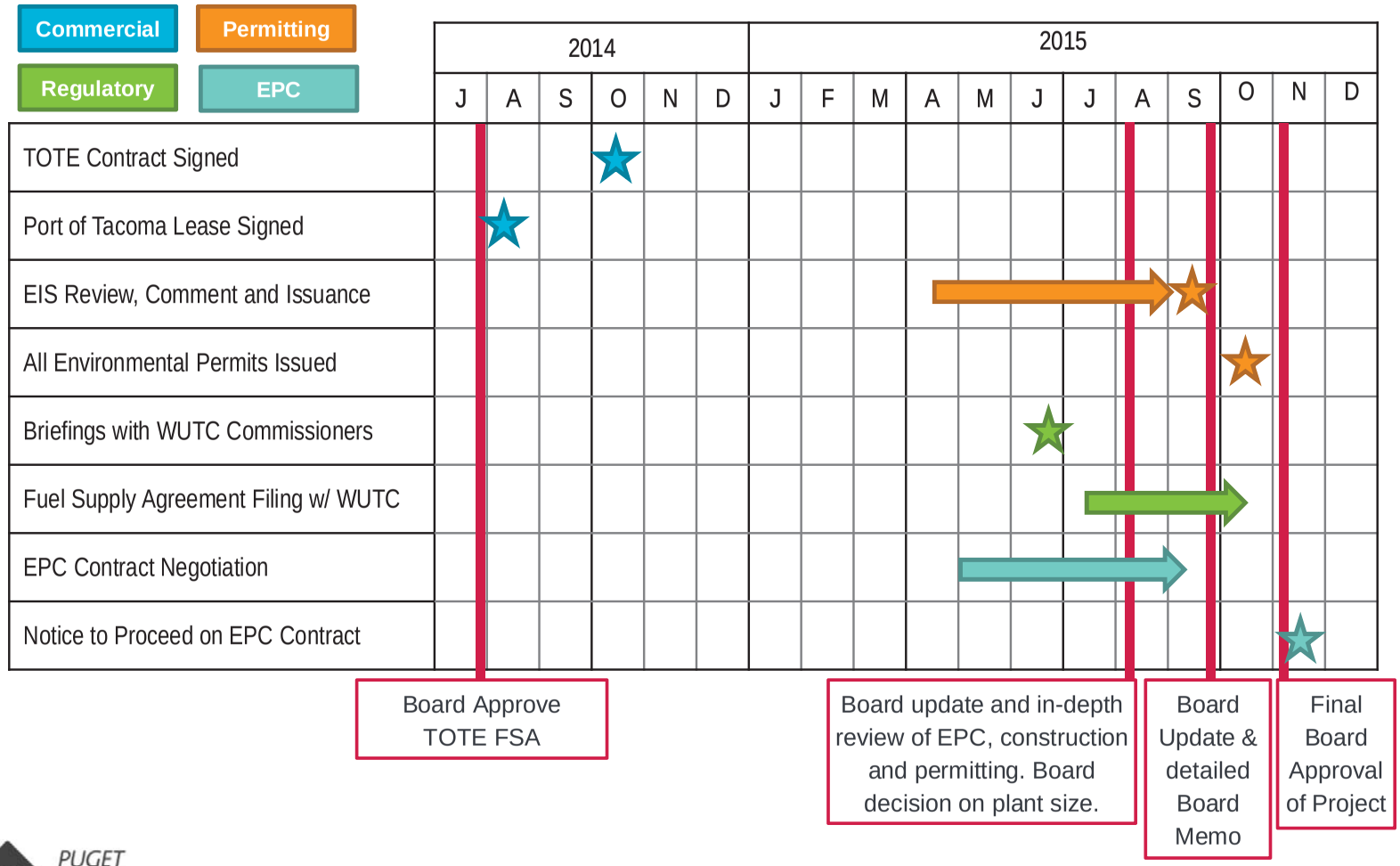
Alternatives considered and analysis conducted.

Contemporaneous information used by the Board to make acquisition decision.

Contemporaneous records kept by PSE.

PUGET SOUND ENERGY

LNG Project Decision Timeline



PUGET SOUND ENERGY

Tacoma LNG Project

August Board Update

PUGET SOUND ENERGY

Roger Garratt
Director, Strategic Initiatives

August 6, 2015

Background and Requested Board Action

Background:

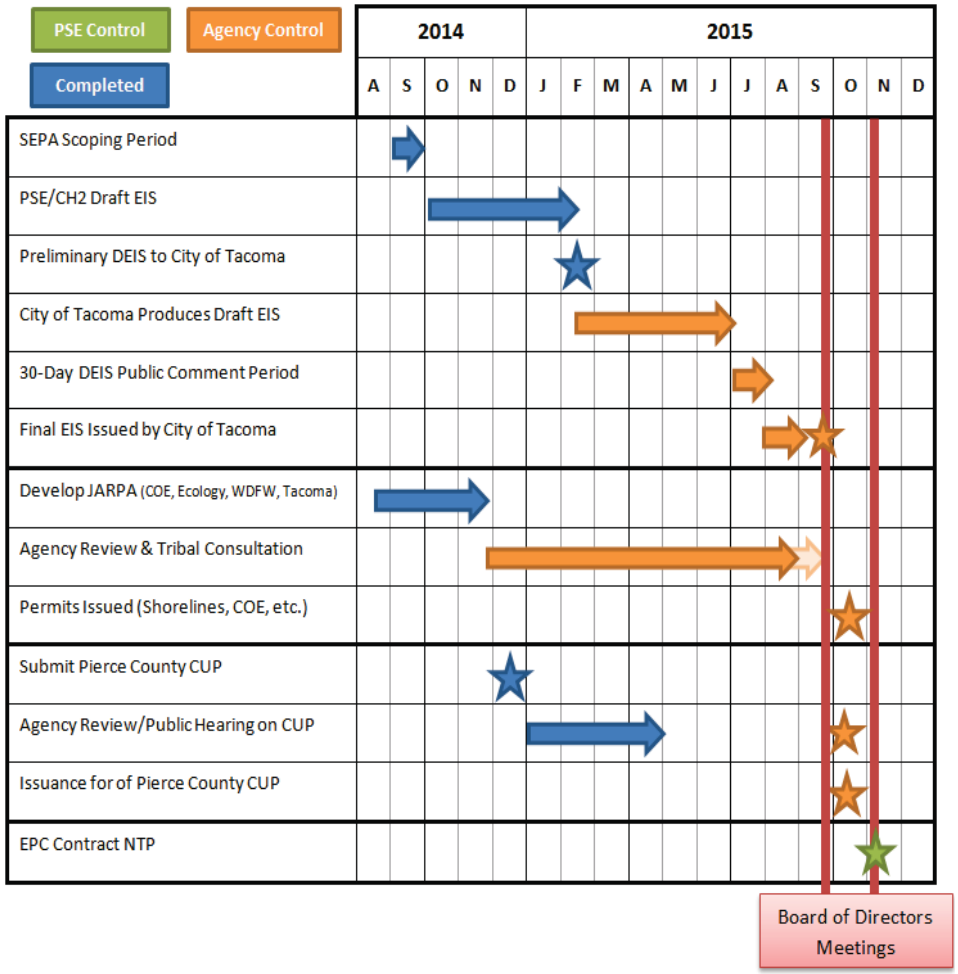
This is a continuation of ongoing Board discussions regarding the Tacoma LNG Project. In order to keep the Project on schedule for a final approval decision in November, we need approval regarding the Project's EPC contractor and facility size.

Requested Board Action:

Provide approval for PSE to enter into negotiations with Chicago Bridge & Iron (CBI) for an engineering, procurement and construction (EPC) contract for a 250,000 gallons-per-day LNG facility at the Port of Tacoma.

Permitting Update

Permitting effort largely on schedule but open issues remain



EPC Decision Points

Management recommends selection of CBI and a 250k gpd facility

EPC Selection

Although pricing was similar, Chicago Bridge and Iron (CBI) was the hands down winner with a more responsive proposal

Facility Size Recommendation

Price reduction was only $4.2 million to build a 140k gpd facility vs. a 250k gpd, which is an 2% reduction in facility cost for a 44% reduction in production capacity

- Total Project Cost*:
  - *250k gal/day: $365M*
  - *140k gal/day: $361M*

* *Project costs include both the LNG Facility at the Port of Tacoma and the gas system upgrades throughout Pierce County.*

Regulatory Strategy/Next Steps

Phase 1: Commences August 2015

Seek WUTC Approval of:

- TOTE Fuel Supply Agreement Approval as a Special Contract
- Any necessary Accounting Petition/Treatment/Procedures

Phase 2: General Rate Case in Q3/Q4 2018

WUTC Prudence Determination and Rate Recovery of the Tacoma LNG Facility.

Background and Requested Board Action

Background:

This is a continuation of ongoing Board discussions regarding the Tacoma LNG Project. In order to keep the Project on schedule for a final approval decision in November, we need approval regarding the Project's EPC contractor and facility size.

Requested Board Action:

Provide approval for PSE to enter into negotiations with Chicago Bridge & Iron (CBI) for an engineering, procurement and construction (EPC) contract for a 250,000 gallons-per-day LNG facility at the Port of Tacoma.

Future Board Updates and Decisions

Decision / Update	Assumption	Date
Project update	Detailed Board report covering all aspects of the LNG Project will be provided prior to September CEO telephonic update.	Sept. 24, 2015
Final project approval; execute all project construction agreements including requisite engineering, procurement and construction (EPC) agreement with the lead contractor; and issue Notice to Proceed.	PSE anticipates receipt of a final non-appealable EIS, Section 10/404 Permits, Shoreline and Pierce County CUP; execution-ready construction contracts and all required real-estate rights prior to November Board meeting.	Nov. 5, 2015

Appendix

Project Specifications & Alternatives

Unsold capacity results in two alterative project development approaches

Site: Port of Tacoma, Pierce County

In-service Date: January 1, 2019

Liquefaction:

Alterative 1: 250,000 gallons/day
Alterative 2: 140,000 gallons/day

Onsite storage: 8 million gallons

Vaporization: 66 MDth/Day (onsite)

Alterative 1: 19 MDth/Day (pipeline)
Alterative 2: 9 MDth/day (pipeline)

Gas System Upgrades:

1) Port of Tacoma
2) South Pierce County
3) Frederickson Gate Station

Total Project Cost*:

Alterative 1: $365M
Alterative 2: $361M

Tacoma LNG Facility in Tacoma, Washington

Project Execution:

PSE will build the Facility under an Engineer Procure Construct (EPC) contract, which places cost and schedule risk on the contractor.

**Project costs include both the LNG Facility at the Port of Tacoma and the gas system upgrades throughout Pierce County.*

Underground LNG Pipeline

LNG fuel will be delivered to TOTE on the Blair Waterway via underground pipeline for safety & operability

Commercial Terms

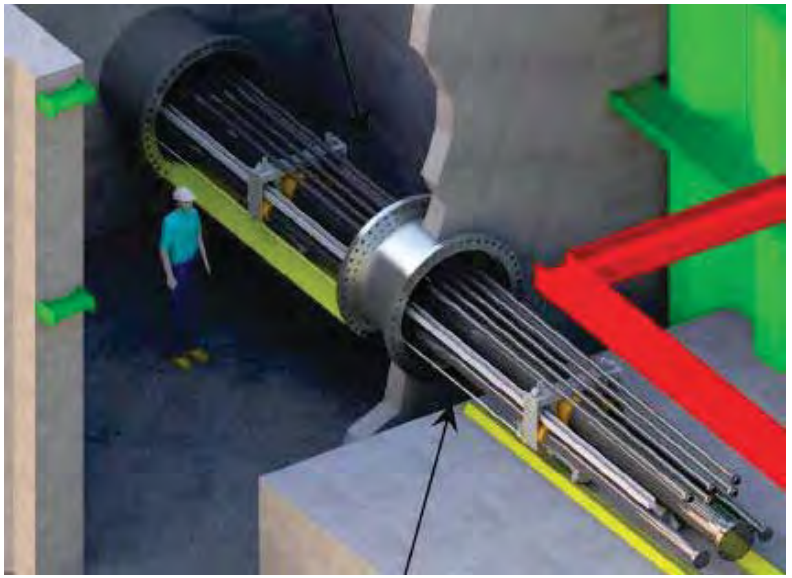
- Pipeline to be constructed by CBI on a time and materials basis
- PSE will carry contingency

Design Details

- Two vacuum insulated LNG pipes, a vacuum insulated natural gas pipe, a nitrogen supply pipe, and control circuits on a pipe rack assembly
- Entire assembly is contained within a steel casing and purged with nitrogen in order to maintain a non-explosive atmosphere
- Constant leak detection
- Pipeline assembly is 11 feet below grade

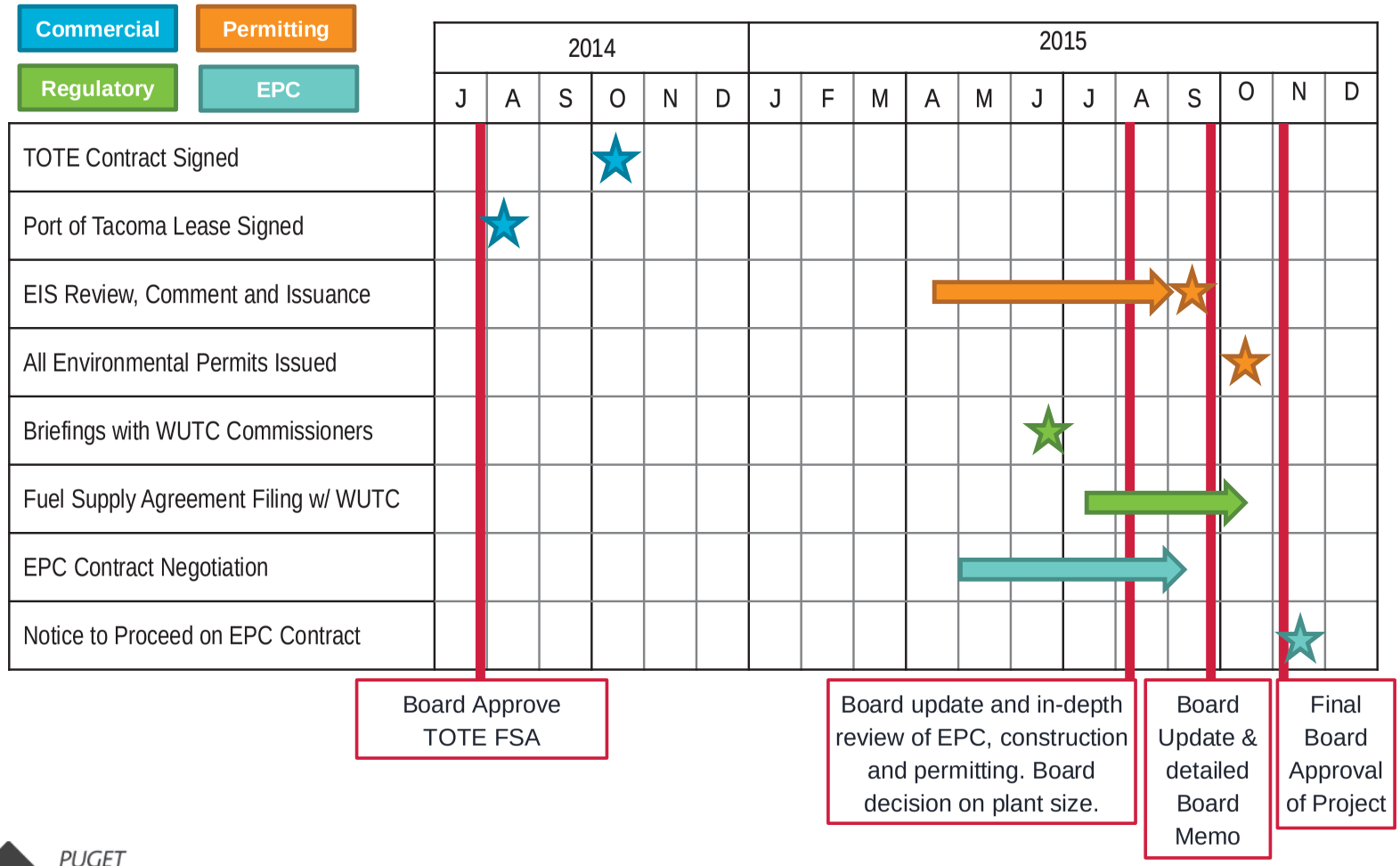
Regulatory Reviews

- State and Federal regulators have provided positive comments on the design
  - Formal approval process underway



PUGET SOUND ENERGY

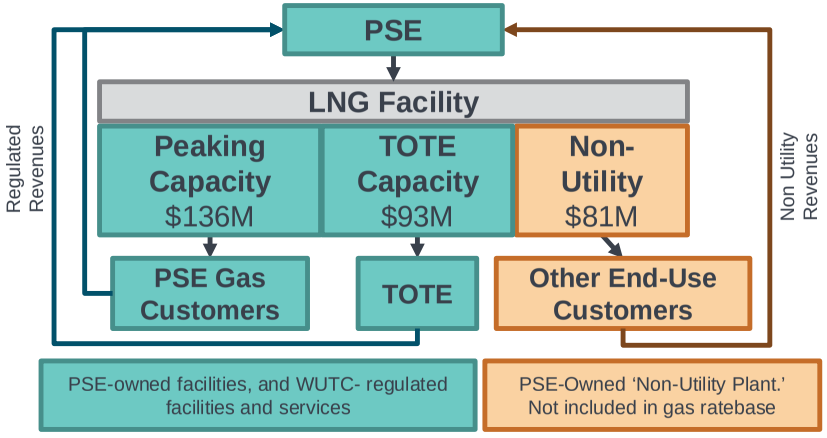
LNG Project Decision Timeline



LNG Development Strategy

PSE proposing larger plant (250k gpd) with cost allocated based on utilization of facility services and non-utility revenues protected

Commercial Structure:



Note: Dollar figures represent project capex (excluding AFUDC)

Capital Allocation:

Facility Services	Peak Shaving	TOTE	Non Utility	Capex
Liquefaction	10%	44%	46%	**$89**
Storage	79%	6%	15%	**$96**
Bunkering	0%	100%	0%	**$30**
Truck Loading	25%	0%	75%	**$6**
Vaporization	100%	0%	0%	**$17**
Common	46%	25%	30%	**$73**
Allocated Capital	**$136**	**$93**	**$81**	**$311**
% of plant	44%	30%	26%	
Gross Plant (w/AFUDC)	$162	$110	NA	

	May 18th Memo		Updated Returns	
	Unlevered Returns[1]	*Weights*	Unlevered Returns[1]	*Weights*
Crash Case	< 0%	10%	< 0%	5%
Low Case[2]	4.9%	15%	5.2%	15%
Management's Forecast	10.0%	30%	9.0%	35%
Medium High Forecast	10.7%	25%	9.6%	25%
High Forecast	15.7%	20%	13.6%	20%
Weighted Avg Cash flow	**9.8%**		**9.1%**	

Notes:

[1] Unlevered returns are after tax and comparable to PSE's regulated allowed return of 6.69%.

[2] In the low case, the benefits of revised O&M costs and terminal value calculation outweighed the impact of higher capital cost resulting in a higher unlevered return.

PUGET SOUND ENERGY

Project Budget Update

Project budget remains at level reported at June 25 CEO update

Updated Capital Budget

- Chicago Bridge and Iron submitted revised EPC pricing on June 1, 2015
- Revised bid came in $20M higher than the 2013 FEED
- Cost estimates for demolition and geotechnical work increased by $3M ($4.5M with contingency)
  - PSE will have bids for demo and geotechnical work in August 2015
- Substation costs increased by $2M ($3M with contingency)
  - PSE will have revised estimates by August 2015
- In water work at TOTE site increased by $1M ($1.5M with contingency)
  - Revised estimates will not be available until detailed engineering is finalized in 2016
- Other updates included revised estimates for support from outside services as well as permitting mitigations

Tacoma LNG Capital Budget *($ millions)*	Current Total	Previous Estimate	Delta
Development	14	12	2
Fixed Price EPC	194	174	20
Miscellaneous Construction	37	29	8
PM & Outside Services	16	13	3
Insurance	2	3	(1)
Sales Tax	16	13	3
Contingency and OH	32	30	2
LNG FACILITY TOTAL	**311**	**274**	**37**
Gas System Improvements	**54**	**49**	**4**
PROJECT CAPITAL TOTAL	**364**	**323**	**41**
AFUDC	46	47	(1)
Capitalized Interest	5	-	5
CLOSING GROSS PLANT	**415**	**370**	**46**

Memorandum

August 6, 2015

To: PSE Board of Directors

cc:

From: Roger Garratt, Director Strategic Initiatives
Clay Riding, Director Natural Gas Resources

Subject: Tacoma LNG Project Update

The purpose of this memo is to provide an informational update on three key areas of the Tacoma LNG Project: permitting matters (Attachment A); engineering and operations matters, including the recommended EPC contractor and a recommendation for the size of the facility (Attachment B); and an updated review of the below-the-line ("BTL") portion of the facility (Attachment C).

Project Overview

The Tacoma LNG Project ("the Project") is a development project to build a liquefied natural gas (LNG) storage facility at the Port of Tacoma in Pierce County. PSE will build the Project under an engineering, procurement and construction (EPC) contract, which shifts risks associated with cost and schedule to the contractor. At the recommended size, the Project will be capable of liquefying 250,000 gallons of LNG per day and storing approximately 8 million gallons of LNG on site. The Project will be capable of injecting 66,000 Dth per day of vaporized gas and diverting 19,000 Dth per day of gas to PSE's distribution system to provide 85,000 Dth per day of peak-day supply. It will also dispense LNG to other end-use customers via marine loading facilities located on the water and a tanker truck loading system.

Total cost for the project is estimated to be approximately $365 million. This includes both development and construction of the LNG Project at the Port of Tacoma and associated gas system upgrades throughout Pierce County, but excludes AFUDC and capitalized interest.

Recommendations

EPC contractor. PSE Management recommends selecting Chicago Bridge & Iron (CBI) to be the EPC contractor for the Project. Upon completion of a competitive front end engineering design (FEED) process in which CBI and Black & Veatch each submitted EPC contract proposals, the project team determined that CBI's proposal is the best fit for the Project. While the two proposals quoted similar plant costs, CBI's design more effectively meets the needs of the Project. CBI also demonstrated a much stronger understanding of LNG code and siting issues, and has a proven track record of building similar plants in the U.S. and Canada. Black & Veatch has not designed or constructed a comparable facility in North America, and failed to demonstrate a firm understanding of all project requirements and challenges.

See Attachment B for a more in-depth discussion of the EPC contractor recommendation.

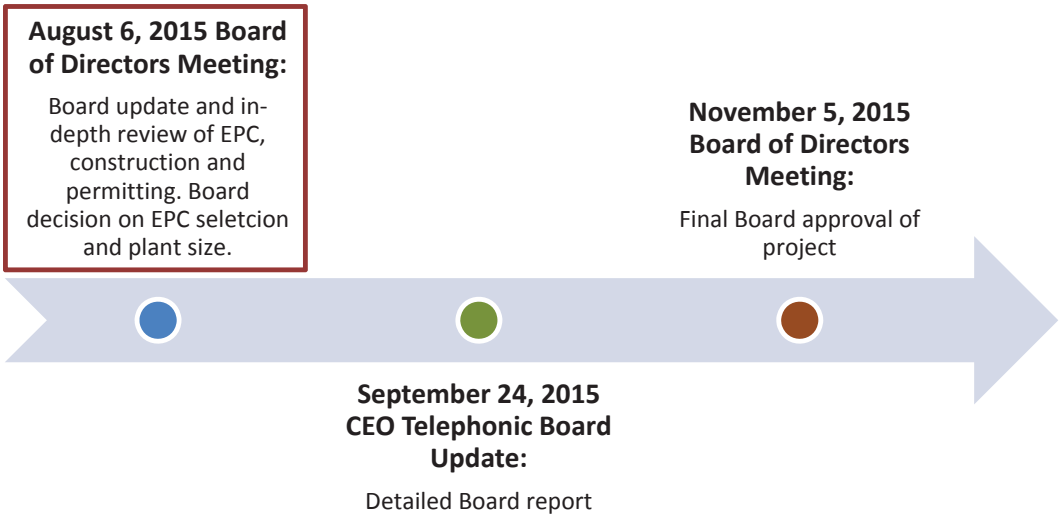
Facility size. PSE Management recommends selecting the larger of the two potential Project alternatives summarized in the table below.

	Recommended Alternative	Other Alternative Considered
Liquefaction (gallons/day)	250,000	140,000
Onsite storage (gallons)	8 million	8 million
Onsite vaporization (MDth/day)	66	66
Additional pipeline capacity (MDth/day)	19	9
Total cost	$365 million	$350 million

The larger facility, which would be capable of liquefying 250,000 gallons of natural gas per day, is sufficient to meet PSE's obligations under its existing supply agreement with Totem Ocean Trailers Express (TOTE) and to supply additional capacity for below-the-line merchant sales. Attachment C demonstrates that returns calculated for the below-the-line portion of the larger build are commensurate with the additional risk associated with merchant sales. Furthermore, pursuing this strategy allows PSE the opportunity to generate new sources of revenue by expanding to include a new line of business within the Company's existing core competencies.

Board Decision Timeline

The timeline below is a quick snapshot of upcoming Board communications and final approval for the Tacoma LNG Project.



We look forward to a robust discussion regarding this project over the next few months and remain available to address any questions from the Board.

PUGET SOUND ENERGY

Attachment A.

Environmental and Permitting Matters

Environmental and Permitting Matters

For a discussion of environmental and permitting matters associated with the Tacoma LNG Project, refer to the confidential attorney-client privileged memo from Steve Secrist to the Board of Directors, dated July 20, 2015.

PUGET SOUND ENERGY

Attachment B.

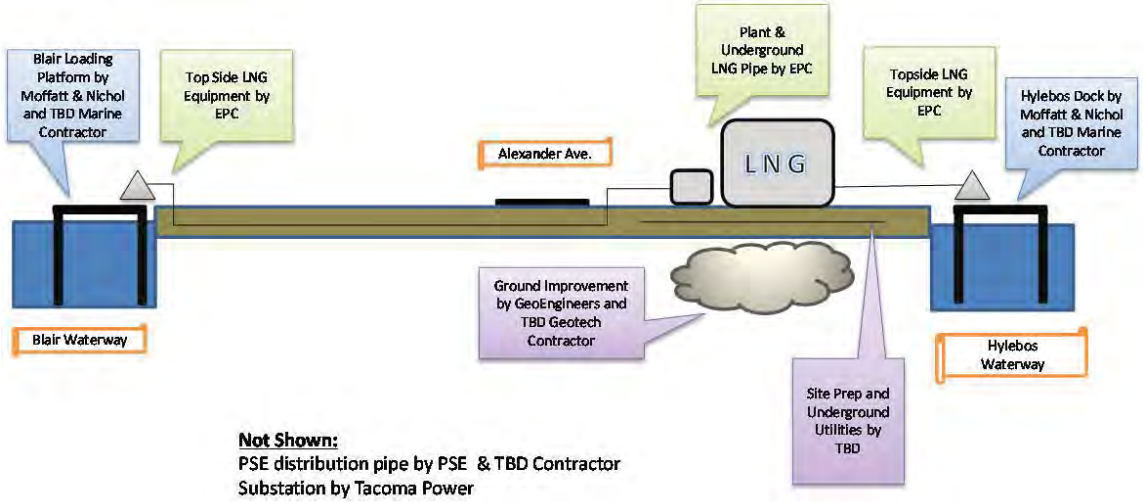
Engineering and Construction

Contents

Engineering and Construction

The Project will be engineered and constructed using a combination of two execution methodologies to obtain the best value for PSE. The LNG Facility work (including pre-treatment, liquefaction, storage tank, truck rack, vaporization system, and balance of plant) will be performed according to an engineering, procurement and construction (EPC) contracting methodology. Site preparation (including demolition, ground improvement, and underground utilities) and marine facilities construction will be performed by PSE using a design-bid-build contracting methodology.

Figure 1. Plant Engineering and Construction Responsibilities



Engineering, Procurement and Construction

PSE originally retained the national engineering firm CH-IV to assist with feasibility studies for the Project. In 2012, based upon input from CH-IV and a study of the marketplace, PSE determined that an EPC contracting methodology would be the preferred method for contracting the LNG production portion of the Project. Under this contract, we will set specific performance criteria (i.e., production quantity, storage quantity, and send-out requirements).

The EPC contractor is therefore responsible for process design, including specifying, procuring, installing, and commissioning all elements of the project as required to meet performance specifications and guarantees stipulated by the owner in the contract, providing PSE with a single point of contact throughout the construction and warranty phase of the project. Also, because a single entity holds responsibility for both design and construction, a more active consideration of constructability and construction efficiency in the design of the project is more likely than it would be with alternative contracting methodologies such as design-bid-build, or even design-build.

The EPC contract will provide PSE with a fixed price contract with performance guarantees and liquidated damages. In exchange for control of all elements of the project (engineering, procurement, and construction), the EPC contractor retains cost and schedule risks during project delivery.

During the development phase of the Project, PSE selected a single EPC contractor to perform an initial front end engineering design (FEED) study to develop the plant to a conceptual level and provide budgetary pricing. PSE selected an international leader in LNG plant and tank engineering and construction, Chicago Bridge & Iron (CBI). CBI was selected from a field of seven candidate firms or teams to perform the FEED for the Project in January 2013, with the expectation that the EPC contract would most likely be executed with it based upon satisfactory completion of the FEED.

Due to the commercial uncertainty of this Project, CBI completed an initial FEED study, which culminated in an open book price review and firm bid price in fall 2013. Although PSE did not intend to execute on the firm price proposal at that time, the work product has been used to support continued project development, including permitting, regulatory oversight and business origination.

Since completing the first FEED study and pricing, CBI has been retained to continue value engineering and other plant design changes, as required, to support ongoing changes to the Project (e.g., TOTE direct loading line, permit preparation, developments in regulations, etc.). CBI also played an active role in permitting activities, including providing content for the Draft Environmental Impact Statement and attending meetings with city and state regulators. CBI has continued to refine and improve the design since the 2013 FEED study and submitted a revised formal proposal for the plant in June, 2015. This design reflected the many scope changes and value engineering improvements developed collaboratively with PSE since the 2013 proposal. An open book cost review was conducted in June, 2015, which resulted in over $2 million of additional value engineering savings.

The target Project completion date of January 1, 2019 provided the opportunity to seek a competitive bid for the EPC contract. In fall 2014, PSE contracted with Black & Veatch to perform a parallel FEED effort to develop pricing for a plant based upon the same design criteria as used by CBI. Black & Veatch was a top contender for the original FEED contract and has experience designing and building LNG facilities outside the US, as well as a domestic presence in the power generation and water treatment industries. Black & Veatch does not have the capability to build an LNG tank, so the tank scope of work remained with CBI regardless of contractor selection. Given the relatively small cost of a FEED study (approximately 0.5 percent of the plant cost), a competitive proposal was viewed as valuable from a commercial and prudency standpoint.

In early 2015, PSE directed CBI to initiate a design and proposal for a 140,000-gallon-per-day (gpd) liquefier in addition to the 250,000-gpd plant already in development. The smaller plant size represented the currently-subscribed capacity of the plant (PSE and TOTE needs only). PSE did not engage Black & Veatch in this alternate design because CBI has shown a greater willingness and capability to design to meet PSE-specific needs (as opposed to offering only standardized options).

In July 2015, CBI provided a proposal for the plant with a smaller liquefier, but it equated to only an 8% reduction in overall cost for a 44% reduction in production capacity. This small price decrease is due to the fact that the pre-treatment and liquefaction portion of the plant represents just 21% of the plant cost. Additionally, most of the components that could be de-rated for the smaller production capacity (compressors, electrical equipment, etc.) do not scale down linearly in price. The smaller production level still requires nearly the same equipment footprint, thus it does not significantly reduce the linear footage of piping, pipe rack and foundations, electrical cabling, or instrumentation. Even the reduction of gas flow did not offer a linear savings, as only a 25% reduction in pipe diameter is required for a 44% reduction in flow.

After comparing proposals from both CBI and Black & Veatch, PSE management recommends moving forward with contract and price negotiations with CBI for the 250,000 gpd facility. The two proposed plants that differed in production capacity - 250,000 gpd as specified from CBI and 300,000 gpd from Black & Veatch (they were proposing a standardized liquefaction design), but on an adjusted basis (installed cost/production capacity) were within 5% of each other.

CBI's strengths were as follows:

- Demonstrated success in designing and building similar plants in the United States.
- Fully engaged in the Project since early 2013 and demonstrated a complete grasp of the project requirements.
- Thorough knowledge and experience with applicable codes and standards, as well as navigating the regulatory process.
- Strong project team with decades of experience who will stay with the Project through completion.
- Their ability to build both the tank and the plant results in a single EPC contractor and negates the risk of design and construction conflicts between two companies.
- CBI was transparent with their pricing and hosted a multi-day open book review of all vendor and subcontractor quotes, labor estimates, and contingencies.

Black & Veatch presented the following challenges that made them less competitive:

- No experience building similar plants in the United States.
- Inexperienced project team and lack of involvement from B&V senior staff. Little to no continuity between the proposal project team and the execution project team.
- Did not demonstrate a thorough comprehension of regulatory issues or the seismic issues at the project site.
- Lacked creativity in their design or the willingness to deviate from their "standard" package. Their proposal is based upon a design that has been used in China, but never built domestically.
- Poor engagement with PSE, TOTE, or our other engineering firms to really understand the unique requirements of the project.
- No transparency in price breakdown.
- Several components of their final design do not meet project requirements and would have to be further developed (LNG pipeline to TOTE, control building, seismic design, and fire protection system).

During the construction period, the EPC contractor will maintain responsibility for the site and all sub-contractors working on the plant scope of work (pre-treatment, liquefaction, storage, send out, and balance of plant). PSE staff will be co-located onsite and provide overall project management, quality assurance of EPC work product, and project management of ancillary activities occurring in parallel on the Facility site (i.e., marine construction, Tacoma Power substation construction, and PSE-provided metering and odorization at the pipeline tie-in point). PSE will also manage and coordinate with TOTE for construction activities taking place at the TOTE terminal (direct LNG line to TOTE and the loading platform on the Blair waterway).

Work Performed by PSE

PSE will perform all design and construction work necessary to ready the site for the EPC contractor (demolition, soil improvement, and underground utilities), as well as all marine work (TOTE loading platform), minor building modifications, and landscaping. PSE is choosing to perform these project elements because they are outside the value-added capability of an EPC contractor and can be more cost effectively managed by PSE using local resources.

The design team for the work performed by PSE includes the following firms:

- ***GeoEngineers (Geotechnical Design).*** GeoEngineers is a regional engineering firm that has worked on projects with PSE for over 25 years. GeoEngineers also has extensive experience working in the Port of Tacoma and other port facilities in the Northwest. Their scope of work includes developing ground improvement strategies to meet federal and local seismic design requirements, coordinating structural and foundation requirements with the EPC firm and providing contracting and quality assurance support for the execution of the ground improvement program.

- ***Moffatt & Nichol (Marine Design).*** Moffatt & Nichol is an international engineering firm specializing in infrastructure projects on coastlines, harbors, and rivers. Moffatt & Nichol has been involved in many of the LNG import/export terminal projects in North America and has ongoing working relationships with the Port of Tacoma, GeoEngineers, and our proposed EPC contractor. Moffatt & Nichol also successfully participated in two prior projects for PSE (both the Upper and Lower Baker Dam Floating Surface Collectors). Moffatt & Nichol's scope of work includes development of a demolition plan for the existing timber pier and design of a new concrete pier on the Hylebos Waterway, the design of a new loading platform on the Blair Waterway, and marine construction oversight as necessary.

- ***Sanborn Head & Associates (Owner's Engineer).*** Sanborn Head is a regional engineering company located in New England with experience consulting on a number of LNG projects on the east coast and has worked on projects with CBI, PSE's proposed EPC contractor. Sanborn Head has been retained to: review EPC design work product, perform a peer review of GeoEngineers work product, assist with EPC contract preparation, and provide support on permitting and community outreach efforts, as needed.

- ***Sitts & Hill Engineers (Site Civil Design).*** Sitts & Hill is a local Tacoma civil engineering and surveying firm that is responsible for design of all elements of site preparation (abatement, demolition, site grading, and utility re-configuration), storm water system design, fire water system design, and permitting assistance.

- ***Tacoma Power (Substation Design/Construction).*** Tacoma Power will design and construct the utility substation located on the site. It has already completed an initial preliminary power supply study and is currently engaged in preliminary design and budget estimating. PSE will provide the substation power transformers in order to provide ready access to PSE spares in the event of a transformer failure (as a smaller utility, Tacoma Power could not guarantee that they would always have a spare station transformer available).

Construction work performed by PSE will be contracted to a minimum of three firms. The site soil improvement work can only be performed by a limited number of specialized contractors, some of which use proprietary soil improvement techniques. The initial request for qualifications (RFQ) was "performance-based" in nature, which allowed contractors to bid different techniques to meet final design requirements. As an outcome of the RFQ process, four ground improvement contractors will be bidding the project with a total of three different methodologies.

General site construction performed prior to the arrival of the EPC contractor is being performed by Diamond B Constructors. Diamond B is a regional construction company that specializes in industrial projects. They were the general contractor for the Fredonia 3 & 4 combustion turbines, as well as the Gig Harbor LNG facility. They currently perform work at a number of PSE Generation facilities and have also been selected by Chicago Bridge & Iron to perform work under the EPC contract. The work is being executed on a time and materials basis with negotiated rates. Their work scope includes remodeling the existing control/administration building, re-configuring site utilities, managing spoils generated by the ground improvement contractor, and final site grading.

Site demolition and abatement is being bid out to a number of local demolition contractors and will be performed on a lump-sum basis. Underground utility work will either be bid out for a lump-sum contract or done as negotiated time and materials with Diamond B Constructors.

The marine elements of the project will have designs finalized in spring 2016, and immediately bid to local marine construction companies for an August 2016 construction start date.

EPC Contract

CBI presented a proposed contract with the June, 2015 proposal. Contract negotiations are currently underway in order to provide an agreed upon contract at the November Board of Directors meeting.

Key elements of the contract are as follows:

Pricing

The contract price is presented as a firm, fixed-price, lump sum that includes all engineering, materials, construction, overhead, contingency, and markup, subject to exclusions as follows:

- ***Key Material Escalation*** on nine percent nickel plate and aluminum plate: due to worldwide fluctuations of raw material prices, plating for the steel plate is quoted based upon pricing on the London Metals Exchange on a given day. PSE will see a material cost adjustment up or down based upon the actual price on the day of the material order. This has been accounted for as part of the contingency line item in the budget.

- ***Builder's Risk Insurance:*** PSE generally elects to procure this insurance, rather than the contractor. This cost is included in the budget.

- ***Soil removal or hazardous materials:*** The contract assumes that PSE provides a clean and ready site for construction, that no hazardous materials will be encountered during foundation construction and any spoils created during construction can be disposed of elsewhere onsite or removed by PSE. PSE is in the process of completing environmental sampling that will help characterize the soil that would be expected to be disturbed during construction activities. In the event that hazardous materials are found, the anticipated cost for disposal of these materials will be taken into account in the plant contingency, and/or accounted for in discussions with the Port of Tacoma as "historical contamination" that could perhaps be disposed of under the existing planned remediation program.

- ***Underground LNG pipeline to TOTE:*** This element of the project is presented as a Time and Materials (T&M) reimbursable provision estimated to be approximately $10 million (5% of overall contract price). CBI presented this element of the project as T&M due to uncertainties regarding installation methods and risks that could not be fully quantified in time to meet the proposal due date. Due to the fact that CBI did not have to carry excess contingency in their lump sum price, this separate T&M element of the work should reduce PSE's overall cost.

The underground LNG pipeline to TOTE represents one of CBI's design strengths (as compared to Black & Veatch). CBI has designed a circular pipe rack containing LNG, vapor, nitrogen, and control conduits that will fit inside of a 48 in diameter sealed casing. One of the most unique factors of this design is that it allows the entire 800 foot long assembly to be constructed above ground at the PSE LNG facility and then rolled into the casing like a train going into a tunnel. This design allows the entire assembly to be pulled back out of the casing for maintenance in the future if there were every any need to make repairs to any of the components (although the system is designed to be maintenance free for 25 years or more). Since the TOTE LNG pipeline components are inside a sealed 1 inch thick steel casing eleven feet below the surface, excavating down to the pipeline from above to make repairs is not feasible. Both the Washington State Office of Pipeline Safety and the federal Pipeline and Hazardous Materials Safety Administration (PHMSA) are in the process of reviewing the design and have provided positive verbal comments.

PSE completed an open book review of CBI's pricing in June, 2015. During this multi-day review CBI shared every vendor and subcontractor quote, labor estimates, contingencies, and mark up. During and after this review, PSE worked collaboratively with CBI to make equipment and scope changes which resulting in over $2 million of cost reductions.

Payment

Payments will be made according to an agreed-upon milestone schedule based upon actual work completion.

Performance guarantees and liquidated damages

The contract will include performance guarantees and associated penalties for completion delay, liquefaction, vaporization, utilities consumption, power factor, LNG tank volume, truck loading rate, and marine loading rate.

Warranty: 12 months

Owner obligations: Requirements for PSE to provide utilities, consumables, feed stock, and plant personnel at times specified in the contract.

Attachments

PUGET SOUND ENERGY

Attachment B-1.

EPC Selection Presentation

Tacoma Future Fuels

EPC Contractor Selection Presentation

Jim Hogan

January 22, 2013

Procurement Overview

- PSE has completed the selection process for the Tacoma Future Fuels LNG plant project, which consists of designing and constructing a natural gas liquefaction and storage plant with

- A Request for Proposals was sent to 7 possible Engineering, Procurement, and Construction (EPC) firms:
  - Air Products
  - Black and Veach
  - Chart/Bechtel team
  - Chicago Bridge and Iron
  - Linde
  - Matrix
  - Skanska/Tetra Tech/Foster Wheeler team

Contractor Selection Process

- The EPC selection team consisted of:
  - Clay Riding, Director of LNG
  - Nathan Adams, Strategic Initiatives
  - Charley Daitch, Strategic Initiatives
  - Jim Hogan, Project Management
- 4 of the 7 firms submitted proposals based upon the RFP, however one proposal was for storage and send out only.
- The selection team met with all of the firms in Bellevue and/or at their offices.

Contractor Selection Process

- The three finalist firms were:

C B & I	• Most LNG experience in the US; has participated in half of the plants in North America • Expertise with respect to project management, tanks, regulations and exclusion zones • Prefers the open-book method of development that PSE is seeking • Extensive knowledge of DOT regulations that govern citing and design of LNG plants. • Competitive budgetary estimate. • In house construction services.
Black & Veatch	• Most experience with recent LNG peak shaving plants of this size (mainly in China) • Competitive budgetary estimate • Long history of working with PSE on other infrastructure projects • Would hire third party construction contractor • PSE would need to engage in a separate contract for the LNG storage tank
The Linde Group	• LNG bunkering and fueling experience in Europe • Marketing and distribution experience LNG and other cryogenics • One small U.S. LNG plant built to date; lack of understanding around U.S. regulations • PSE would need to engage in a separate contract for the LNG storage tank • Budgetary estimate was NOT competitive

Selection

- The team unanimously concluded that CB&I is the preferred EPC contractor based upon the following:
  - Most experience building comparable LNG facilities.
  - Since CB&I is also a leader in the design and construction of LNG tanks, we avoid having to deal separately with a tank manufacturer.
  - CB&I's open book contracting preference aligns with PSE contracting preferences.
  - CB&I demonstrated the most knowledge of regulatory issues and strategies to face regulatory hurdles associated with our project.
  - CB&I supports our design and construction schedule.

Conclusion

- The team recommends Chicago Bridge & Iron.
- The team recommends moving forward with a Time & Materials contract for Front End Engineering Design (FEED).
  - Not to Exceed $750,000
  - 20 week duration
  - Open book format
- Upon completion of FEED, PSE and CB&I will negotiate a firm priced lump sum contract for construction of the plant.
- A Project Action Change Tool Form formalizes this request.

PUGET SOUND ENERGY

Attachment B-2.

Project Action Change Tool

PUGET SOUND ENERGY

PSE Project Phase Approval
Project Action Change Tool (PACT)

Project Name: Tacoma Future Fuels	**Date: 1/22/13**	☒ Approved ☐ Denied
Location: Tacoma	**WBS #: S.01731.03.02**	**Reason:**
Completed by: Jim Hogan	**Change Control #:**	
Title: Senior PM		

Note: If you require additional space for explanation, please attach to this sheet along with support materials.

Current Condition or Status:

PSE desires to enter into the liquefied natural gas (LNG) fuel market by constructing a gas liquefaction plant in the Port of Tacoma.

Proposed Change or Requested Action:

This PACT approves award of a contract for Front End Engineering and Design (FEED) to an Engineering, Procurement, and Construction (EPC) contractor. The FEED contract will support permitting and regulatory efforts, and will lead to a firm fixed price construction contract in approximately 20 weeks. The construction contract will be approved via a separate PACT document.

Justification or Impact of Delaying Action:

The FEED activity is on the critical path for this project, as several design decisions must be made in order to support the permitting timeline and firm-up facility cost estimates. Additionally, long lead materials and components must be specified and ordered in 2013 and are dependent on the FEED activities. Delay of this contract may construe a week by week delay of the project finish date.

Phase:	☒ **Planning Phase:**	☐ **Execution & Control Phase:**	☐ **Close-Out Phase:**
	☒ Scope Definition ☒ Selection of Engineering Firm & Budget ☐ Selection of Construction Firm & Budget	☐ Significant Deviations from Scope, Schedule or Budget	☐ Project Completion

Description: ***(include Cost, Schedule, Quality, Scope and Other Impact)***

This PACT requests permission to award the FEED contract to Chicago Bridge and Iron (CB&I).

The contract is T&M, NTE $750,000 with an expected 20 week duration.

A presentation outlining the selection process is attached to this document.

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PSE Project Phase Approval
Project Action Change Tool (PACT)

Signature			
Submitted by: Jim Hogan		**Date:** 1/22/13	

Signatures
Clay Riding, Director of Natural Gas Services
Doug Loreen, Director of Project Delivery
Nathan Adams, Manager – Resource Acquisition

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Attachment C.

Updated Projected Returns from the Below-the-Line Portion of the LNG Facility

CONFIDENTIAL per Protective Order in
WUTC Docket No. UG-151663

Updated Projected Returns from the Below-the-Line Portion of the LNG Facility

For an update on project returns associated with the unsubscribed portion of the LNG Facility, refer to the confidential attorney-client privileged memo from Steve Secrist to the Board of Directors, dated July 28, 2015.

Tacoma LNG Project

September Board Update

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Roger Garratt
Director, Strategic Initiatives

September 24, 2015

Safe. Dependable. Efficient.

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Project Description

PSE is developing an LNG facility to serve as a peaking resource for its core natural gas customers and to provide fuel to marine and on-road transportation markets.

Site: Port of Tacoma at corner of E. 11 St. and Alexander Ave. E.

Project In-service Date: January 1, 2019

LNG liquefaction capability: 250,000 gallons/day

On-site storage: 8 million gallons

Vaporized gas injection capability (into PSE's system)[1]: 66,000 Dth/day

Gas delivery to PSE's system: Northwest Pipeline

Electricity for facility: Provided by Tacoma Power at a Mid-C Market based rate.

Total Project CapEx: $364 million

Tacoma LNG Facility in Tacoma, Washington

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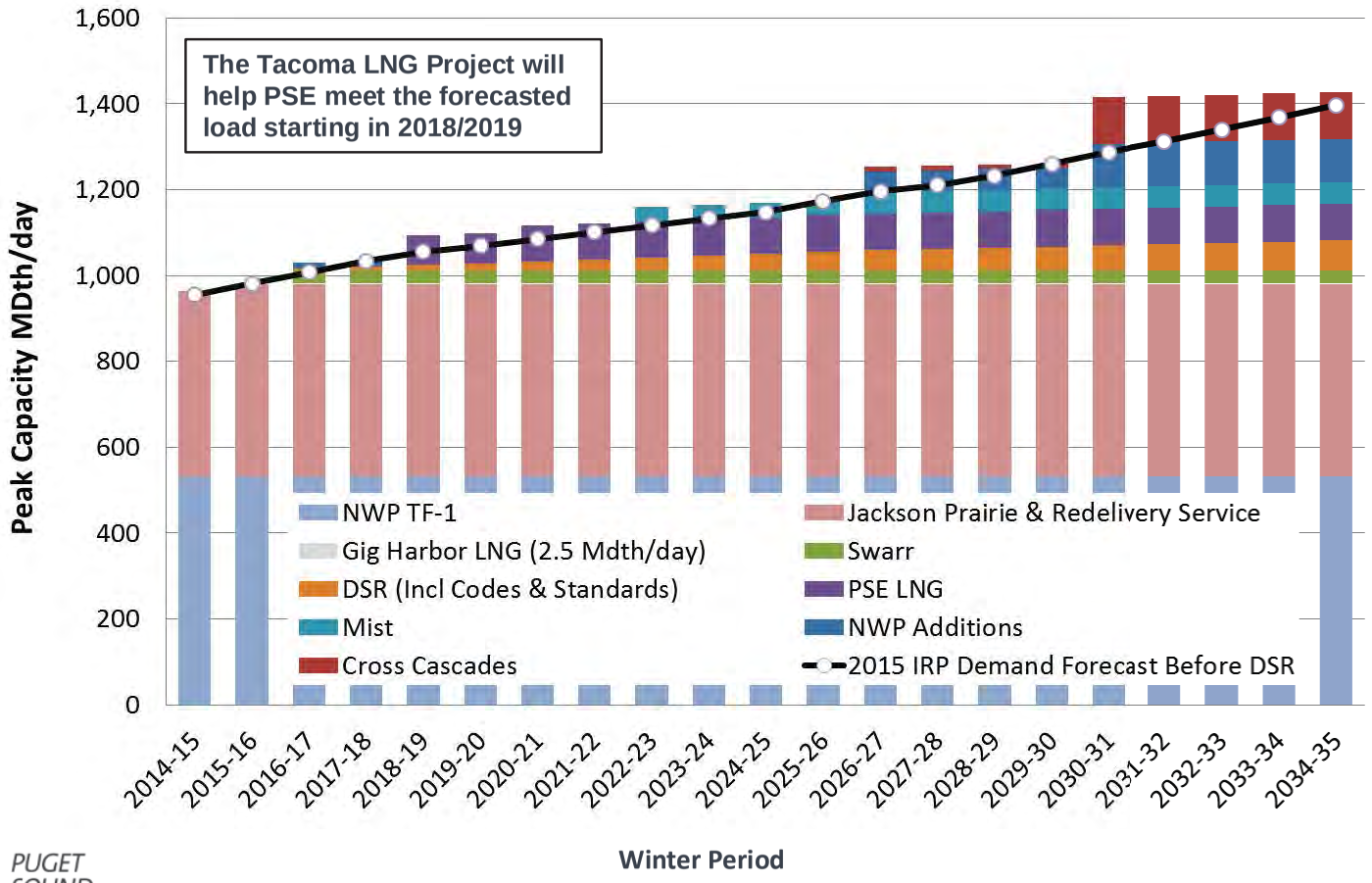
[1]To meet peak-day demand of PSE retail gas customers

PSE Natural Gas Resource Need

Source: 2015 IRP Gas Sales Portfolio Peak Day Load/Resource Balance (Base Case)



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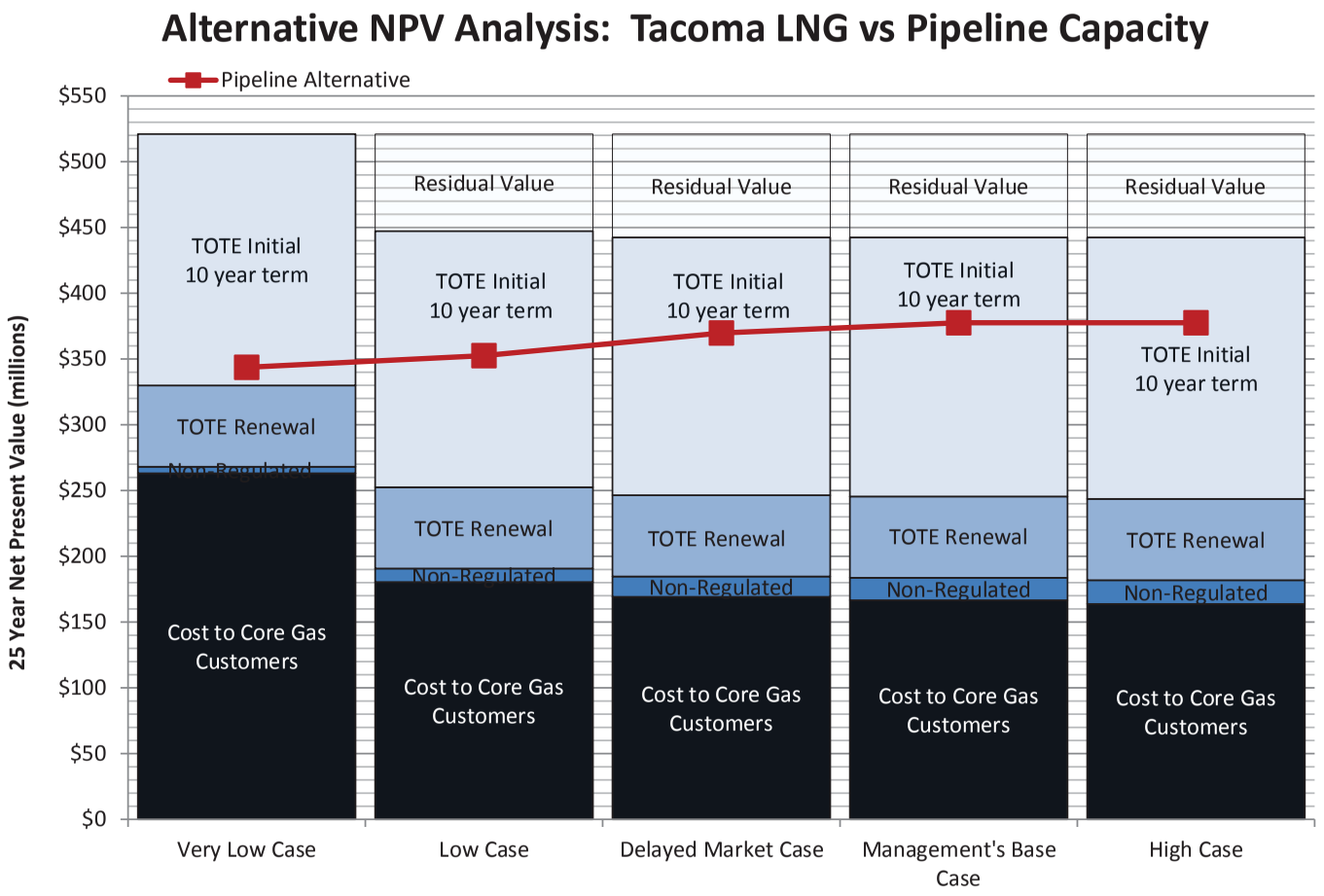
Comparison of Resource Alternatives

LNG Remains Lowest Cost Option



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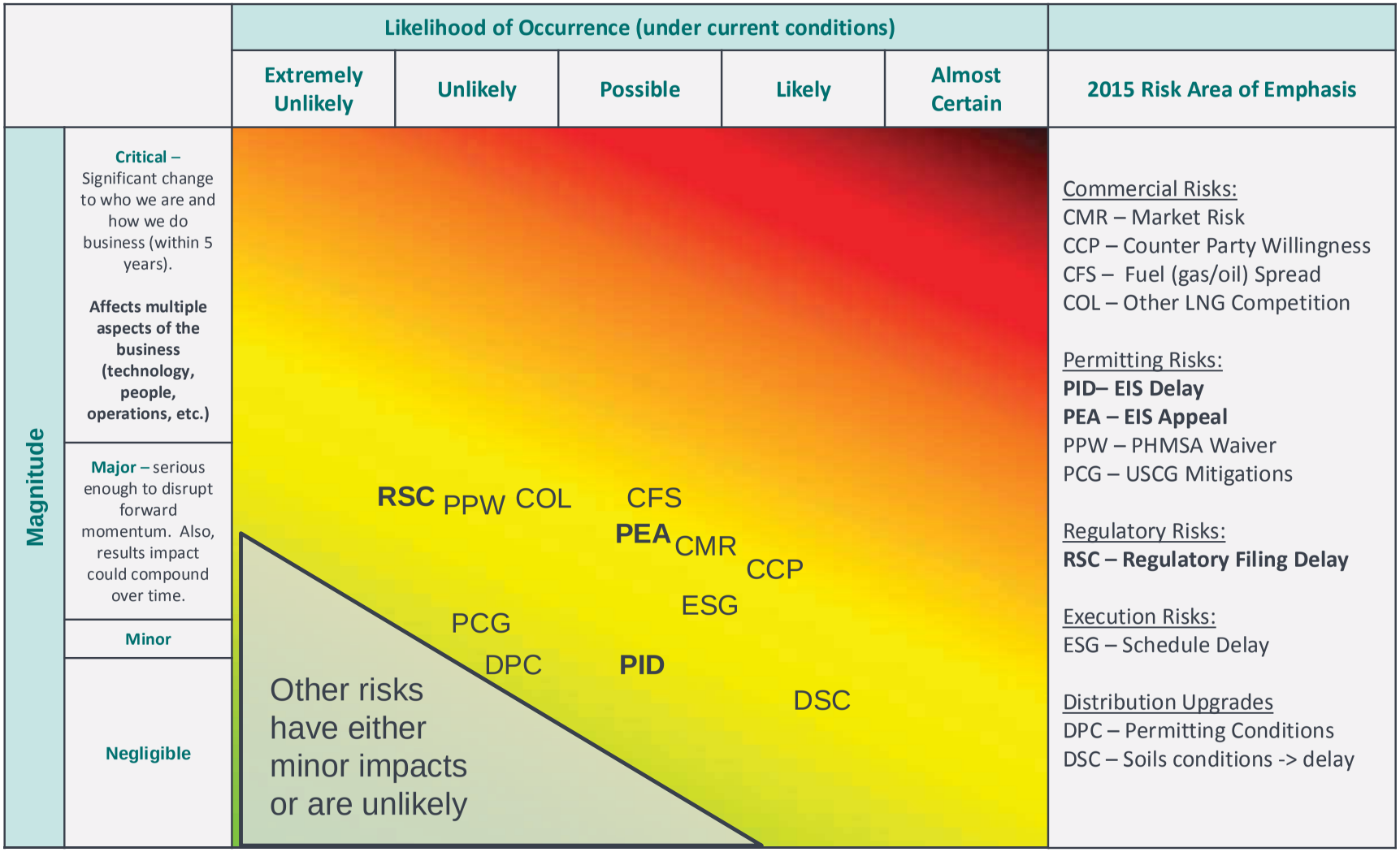
Project Risks



Project Risk Mitigation: EIS Delay (PID)

The City of Tacoma has agreed in principle to EIS mitigations

Tentative mitigations agreement reached with City of Tacoma:

1. Fixed contribution to repave of Taylor Way (with temporary restorations for distribution upgrades construction)
2. Fixed contribution for Tacoma Tideflats Emergency Response & Intelligent Transportation System (ER/ITS)
3. Fixed contribution for remodeling Tacoma Fire Station 15
   - Adjacent to project site
   - Operations budget of the Fire station will come from tax revenues generated by the project
4. City and Port agreed to work together on an agreement for any additional funding needed to Taylor Way or ER/ITS

Risk of schedule delay remains:

- Delayed Issuance of the FEIS (needed for issuance of any permits)
  - City of Tacoma staff indicated that they may require signed agreements (with Port and PSE) to be included in the FEIS issuance. This could delay the FEIS issuance while the agreements are finalized.
  - PSE is working with the City to issue a FEIS by end of September 2015 with a mitigation commitment but no executed agreements.
- Appeal of the FEIS or Shoreline permit
  - The FEIS appeal period starts to run when the first substantive permit is issued (at least 7 days after issuance of the FEIS).
  - Appeal period for FEIS will follow the appeal permit for the first substantive permit is issued (so 21 days if Pierce County CUP; 30 days if Tacoma shoreline permit).

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Project Risk Mitigation: Puyallup Tribe & EIS Appeal (PEA)

The Puyallup Tribe registered two letters with the City in opposition to the Project

Background on Puyallup letters and engagement:

- Tribe letters to the City of Tacoma focused on safety concerns
- City met with tribal staff to attempt to allay technical concerns after the first letter
- Tribal concerns may be related to non-Project actions and could include concerns over the sale of Electron
- PSE has solicited support from City, Port, TOTE and other elected officials to work with tribe in support of this project
- PSE intends to meet with Tribal Council and their technical committee

Appeals Process and Mitigation Efforts:

- Courts generally defer to agencies regarding EIS analysis. City of Tacoma relied on credible outside LNG experts to analyze LNG safety, design and citing portions of the EIS.
- A higher probability risk is an appeal related to a procedural error. PSE has taken great efforts to ensure proper procedures have been followed.
- Nonetheless, an appeal to Superior Court could push substantive permit issuance into late Q2 2016, with significant schedule impacts to the Project.

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Project Risk Mitigation: Regulatory Filing Delay (RSC)

Uncertainty remains with schedule related to WUTC Filings

Filing Background:

- On August 11, 2015, PSE filed a petition with the WUTC for:
  - (i) Approval of a Special Contract for Liquefied Natural Gas Fuel Service with Totem Ocean Trailer Express, Inc. and;
  - (ii) a Declaratory Order Approving the Methodology for Allocating Costs Between Regulated and Non-regulated Liquefied Natural Gas Services
- Approvals will allow PSE to serve TOTE as part of the regulated services and confirm PSE's proposed methodology for allocating costs

Schedule

- PSE filed August 11, 2015
- On September 9 the Administrative Law Judge issued an order with a procedural schedule that includes:
  - Technical conferences for the parties on September 18 and 21, and October 8
  - The parties will reconvene on October 13, 2015 and establish further process and procedural dates as are appropriate to bring the docket to conclusion
- On October 13 parties will reconvene to discuss progress in a prehearing and the Administrative Law Judge will establish procedural dates as appropriate to bring the docket to conclusion
- PSE anticipates resolution in 2015 or early 2016 at the latest; however, the schedule above was set to potentially facilitate a settlement with the other parties (Staff, Public Counsel and NWIGU) prior to November 5.

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Construction Schedule

Schedule contingent on permitting and timely issuance of Notice to Proceed

- Critical path is demolition – ground improvement – LNG tank
  - Currently exploring concurrent work, night and weekend work, and increased staffing in order to maintain or gain schedule float

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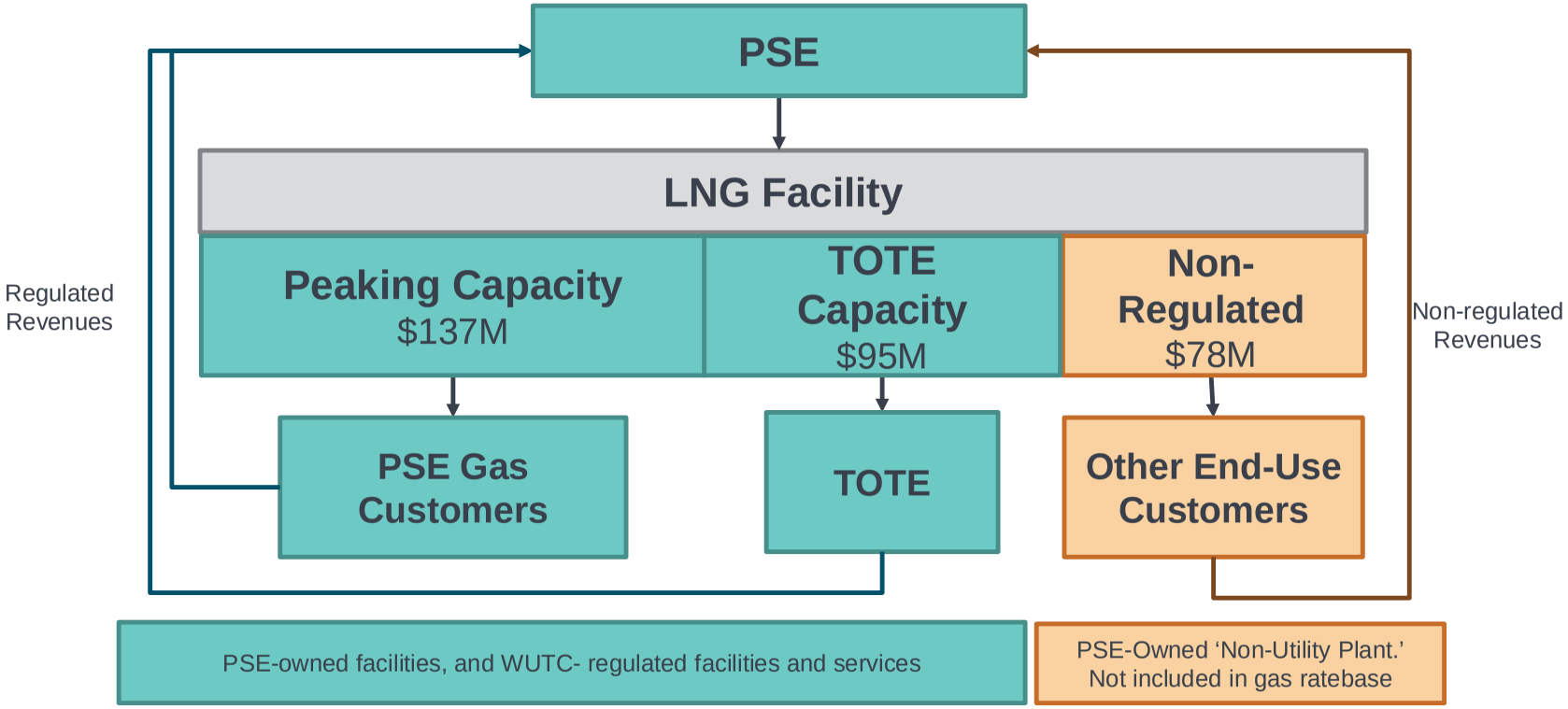
Project Structure

Proposed Project structure assumes allocation of costs based on utilization of services and non-regulated costs and revenues are ring-fenced



Notes: Dollar figures represent project capex (excluding AFUDC) allocated based on customer utilization of the Facility.

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Marketing Strategy

Marketing Strategy:

- Focus on large marine shippers that:
  - Operate in the ECA
  - Have new ships on order or are in the market for replacement vessels
  - Make regular local calls within Puget Sound
  - Have regularly scheduled routes
  - Typically refuel (or are capable of refueling) in Tacoma or Seattle or other Puget Sound ports
- Medium to long-term contracts (5+ years), with tailored terms
- Leverage relationships with ports of Tacoma and Seattle and the newly formed Seaport Alliance
- Engage marine market and LNG technical experts, and/or hire proven LNG business developer

Updated Returns:

- Returns reflect most recent estimates used in the pro forma
- Updated 'Management's Base Case' such that 100% subscription is reached in 2021 (consistent with pending emissions regulations)

Forecasted Returns from Non-Regulated Sales Under Different Market Scenarios:

	Very Low Case	Low Case	Delayed Market Case	Management's Base Case	High Case
Unlevered Return	< 0%	5.59%	10.27%	12.58%	14.65%
ROE (PSE Level)	< 0%	7.50%	17.24%	22.06%	26.38%
ROE (PE Level)	< 0%	7.30%	18.99%	24.78%	29.96%
Probability	5%	15%	25%	35%	20%

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Next Steps

- **Commercial**: Grow business development team and strategy to market the balance of the plant.
- **Permitting**: Aggressively pursue timely issuance of necessary permits to finalize EIS mitigations agreement and issue Final EIS. Coordinate with other agencies to issue other substantive permits.
- **Regulatory**: Obtain regulatory approvals outlined in the current filling. PSE anticipates resolution on the schedule at an October 13 prehearing.
- **Government & Community Outreach**: Address concerns of the Puyallup Tribe to mitigate threat of appeal of permits or EIS.
- **Engineering and Construction:** EPC, general contractor, and demolition contractors have been selected. Ground Improvement contractors shortlisted to two. Preparing for mid-November mobilization.

Future Board Updates and Decisions

Decision / Update	Assumption	Date
Final project approval; execute all project construction agreements and issue Notice to Proceed.	Receipt of a final non-appealable EIS and permits; execution-ready construction contracts and all required real-estate rights.	Nov. 5, 2015

Appendix

- Permitting – Agency Approvals Schedule
- Project Budget

Permitting – Agency Approvals Schedule

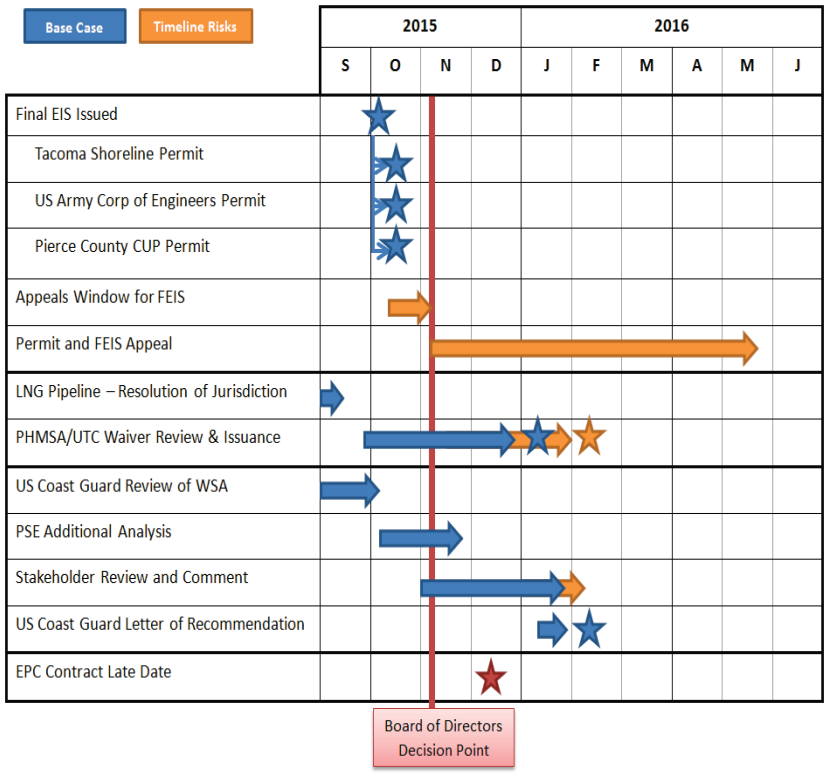
Permitting effort largely on schedule but open issues remain

Open Issues

- Puyallup criticism that the DEIS inadequately addresses siting and safety concerns
  - PSE and City of Tacoma expect to fully address the Tribes issues in the FEIS.
  - PSE is seeking a meeting with the Tribal Council and their technical staff.
- PSE reached an agreement in principle with the City of Tacoma on project impacts and associated mitigation; including financial contributions to:
  - Re-pave Taylor Way
  - Remodel and reopen a Tideflat-area fire station
  - Phase 1 Implementation for the ER&ITS
- PSE has been directed to apply for a state pipeline waiver with WUTC Office of Pipeline Safety for the cryogenic line to TOTE
  - All parties PHMSA, WUTC OPS and Coast Guard are in agreement
  - Process expected to take 90 days in review

Resolved Issues

- Endangered Species Act informal consultation process with NMFS and USFWS nearly complete with satisfactory terms
- All other permit processes are progressing well with permit issuance expected in 2015 or 2016



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Project Budget

No change to overall budget

EPC Contract:

- Chicago Bridge and Iron submitted revised EPC pricing on June 1, 2015:
- Revised bid came in $20M higher than the 2013 FEED estimate primarily due to additional scope and design certainty (particularly TOTE fueling system and geotechnical issues)
- PSE believes contract price can be negotiated down by $2 million (reflected in the budget)

Geotech and Ground Improvement:

- Cost estimates for 'Miscellaneous Construction' increased with higher than anticipated bids for ground improvement
- Minimal impacts to the total budget as contingency was reduced with the reception of firm bids

Tacoma LNG Capital Budget *($ millions)*	
Development	$13
Fixed Price EPC	$192
Miscellaneous Construction	$49
PM & Outside Services	$14
Insurance	$2
Sales Tax	$13
Contingency	$19
Construction OHs	$9
LNG FACILITY TOTAL	**$311**
Gas System Upgrades	$41
Contingency	$8
Permitting Mitigations	$5
GAS SYSTEM IMPROVEMENTS TOTAL	**$54**
PROJECT CAPITAL TOTAL	**$364**
AFUDC (less reserve)	$55
CLOSING GROSS PLANT	**$419**
O&M (for development & construction)	$1.5

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Report to the Board of Directors:

Tacoma LNG Facility

September 24, 2015

Table of Contents

List of Exhibits

1. Executive Summary

The purpose of this report to the Board of Directors ("Report") is to inform the Board of the details of the Tacoma LNG Project (the "Project") prior to recommending final approval, which is expected to take place at the November, 5 2015 Board of Directors meeting. At that meeting, PSE will be seeking approval to enter into contracts to engineer and construct the Facility. The most substantial contract will be with Chicago Bridge and Iron ("CBI") to engineer, procure and construct ("EPC") the LNG production and storage facilities. Approval will also be sought to authorize PSE to enter into smaller contracts for demolition and ground improvement.

This Report follows a series of reports, updates and request for approvals from management to the Board of Directors. In July 2014, the company prepared a comprehensive review of the Project, which included discussions about the development, construction and operations of the Facility and associated upgrades to PSE's natural gas distribution system. Since July 2014, the company has entered into contracts with TOTE, prepared environmental studies, submitted permit applications, received a Draft EIS for the project, submitted a filing with the Washington Utilities and Transportation Commission ("WUTC" or "Commission") for approval of the TOTE contract and confirmation of accounting methodologies, and negotiated construction contracts.

As part of the final Project approval, management will ask the Board of Directors to approve a commercial structure that allocates a portion of the liquefaction facility to non-regulated operations. The portion of the Facility placed into non-regulated operations (approximately $80 million of capital) would not be recoverable through regulated rates. Instead, the company would be at risk for the recovery of capital and operating costs for that portion of the Facility. PSE would contract for the non-regulated capacity at market rates and there is an opportunity for returns on this portion in excess of PSE's allowed regulated return. The details surrounding this proposed structure are discussed in the body of this Report and the cash flow analysis can be found in ***Exhibit G***.

PSE is still awaiting the Final EIS and regulatory approvals from the WUTC. Material permits and approvals that PSE may not have prior to November 5, 2015 include:

1. Unappealable Final EIS:

   There is a risk that issuance of the Final EIS is delayed or that the EIS is appealed. PSE has reached tentative agreement with the City of Tacoma on mitigation; however the terms of the mitigation have yet to be formalized. In addition, the Puyallup Tribe of Indians has submitted two letters to the City

of Tacoma in opposition to the Project and there is a risk that the Puyallup Tribe could appeal the final EIS. See ***Exhibit I*** for a detailed discussion.

2. Approval of the Direct LNG Pipeline to TOTE:

   The WUTC Office of Pipeline Safety (with concurrence of the Pipeline and Hazardous Materials Safety Administration (PHMSA)) will need to issue a waiver to allow PSE to construct the direct LNG pipeline to TOTE. PSE is designing the LNG pipeline to the most up-to-date national LNG safety codes, however, the federal law points to an outdated code. To build the line, PSE will need the Office of Pipeline Safety to issue a waiver approving the design. It is unlikely that a waiver will be issued until Q1 2016. See ***Exhibit I*** for a detailed discussion.

3. Regulatory Approvals from the WUTC:

   In August 2015, PSE filed for approval of the TOTE Fuel Supply Agreement as a special contract and a declaratory order approving the proposed accounting methodology for allocating costs. PSE had anticipated approval by November 5, 2015, but the final schedule will not be set until the October 13, 2015 hearing. See ***Section 5*** of this report for a more detailed discussion of the regulatory process.

Assuming there are no appeals or other legal actions to hold up issuance of substantive permits or regulatory approvals, management will seek final project approvals, including authorization to enter into key construction contracts at the November 5, 2015 Board of Directors meeting. However, depending on the status of these items, management may delay the request for final approval beyond November 5, 2015, or recommend approval with the assumption of certain risks based on the status at that time.

The body of this Report describes development progress for the Project over the last 14 months and provides a comprehensive update to the detailed report presented in July 2014. Details include the commercial aspects of the Project, the construction plan, anticipated financial performance, updated risks and mitigation plans, and an analysis of Project costs and benefits.

2. Project Description

The Project will enable PSE to produce, store and dispense LNG. The Project will be an integral part of the PSE gas business by providing:

1. Peak day capacity to serve PSE's core gas customers; and
2. LNG as a fuel to the market.

Project components include development, construction and operations of the LNG Facility, and associated upgrades to PSE's gas distribution system.

What is meant by Tacoma LNG Facility vs. Tacoma LNG Project?

Tacoma LNG Facility (the "Facility")

- Buildings, gas processing, storage and support equipment, and foundations located on PSE's leased site at the Port of Tacoma
- Underground LNG fuel line connecting the LNG tank to TOTE's berthing area, marine fueling system and in-water platform at TOTE's site
- LNG tanker truck loading racks
- Ground lease from the Port of Tacoma

Tacoma LNG Project (the "Project")

- Development, construction and operations of the Facility
- Improvements to PSE's gas distribution system needed to support the Facility
- Commercial contracts to sell LNG to customers
- Regulatory approvals to approve the TOTE special contract, operate the Facility and sell LNG

The Facility

The Facility will be located at the Port of Tacoma, adjacent to the Hylebos waterway, on the corner of East 11th Street and Alexander Avenue East (see ***Figure 1***). It will be capable of liquefying 250,000 gallons of LNG per day and storing approximately 8 million gallons of LNG on site. The Facility will be capable of injecting 66,000 Dth/day of vaporized gas and diverting up to 19,000 Dth/day of gas into PSE's distribution system to provide up to 85,000 Dth/day of peak-day supply. The Facility will also dispense LNG to other end-use customers via a tanker truck loading system and marine loading facilities located on the water at the TOTE terminal.

Northwest Pipeline's ("NWP") interstate system will deliver natural gas to PSE's distribution system, which will in turn deliver the gas to the Facility. PSE's distribution system will require improvements to support the Facility, including construction of a new limit station,

modification of an existing gate station and adding approximately five miles of new higher pressure pipe. Project execution for the distribution improvements will be overseen by PSE's Gas Engineering and Project Management departments. The Facility sits in Tacoma Power's service territory and PSE will contract with Tacoma Power for electricity at a market-based rate. The main energy consumer at the Facility will be the liquefaction compressor, which will draw approximately 14 MW of electricity.

See ***Exhibit C*** for a more detailed description of the Project.

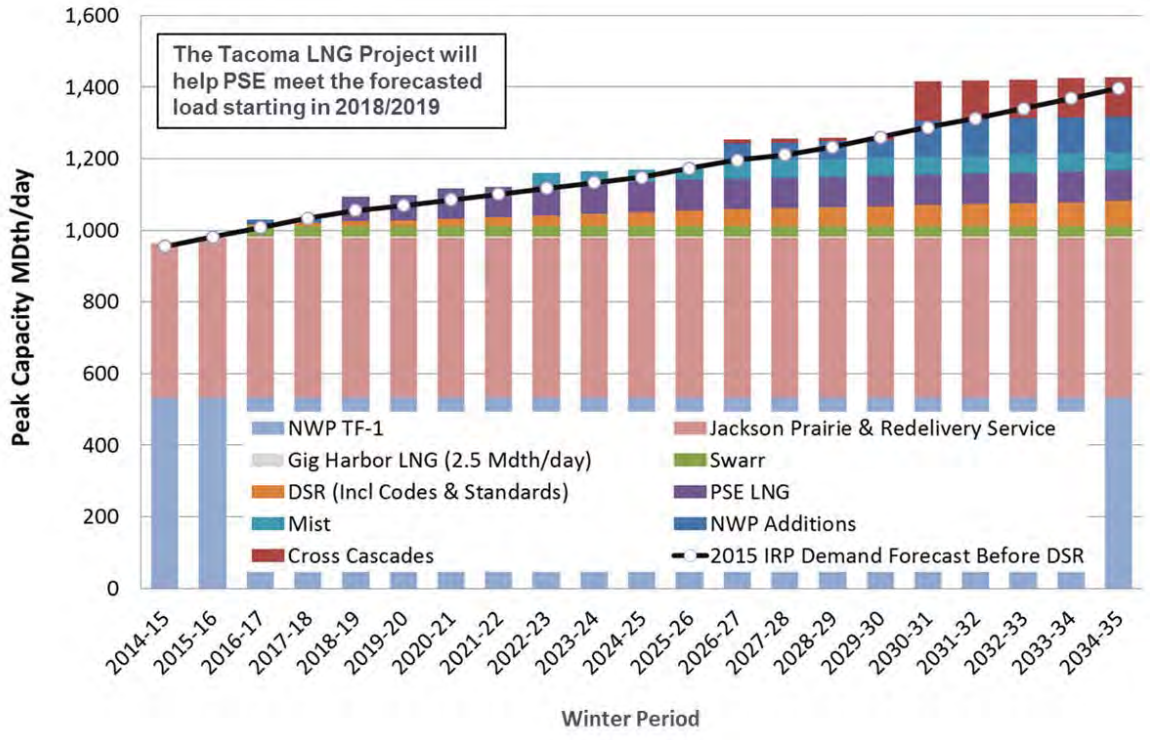
Figure 1. Tacoma LNG Facility Plot Plan

3. Determination of Need

PSE Resource Need

PSE's need for new peak-day resources to serve its retail natural gas customers is set forth in the 2013 Integrated Resource Plan (IRP) and most recently the draft 2015 IRP. The IRP considers expected customer loads, including the effect of demand-side resource programs, based on expected regional economic growth. The draft 2015 IRP demonstrates a need for peaking resources beginning in 2016 to 2017 that is expected to grow to a deficit of approximately 73,000 Dth per day by 2018 to 2019, and 119,000 Dth per day by 2021 to 2022. PSE will meet the resource needs with a combination of resource additions including the Tacoma LNG Project and an upgrade of the SWARR propane-air facility. ***Figure 2*** shows the most recent load resource balance, including the Tacoma LNG Project.

Figure 2. PSE's Peak Gas Resource Need (Tacoma LNG Project shown in purple)[1]



[1] *Source: PSE's 2015 IRP gas sales portfolio peak day load-resource balance (Base Case).*

PSE evaluates various resource alternatives available to reliably meet customer demand and determines which resource, or set of resources, most cost effectively meets such customer demand. PSE evaluated the Tacoma LNG Project in comparison with long-haul interstate pipeline capacity as well as regional underground natural gas storage service and interstate pipeline storage redelivery service. Since interstate pipeline capacity in PSE's service territory is generally fully subscribed, especially considering the level of PSE's resource needs, the resource alternatives analysis evaluated expansion of the regional pipeline grid. Due to the significant revenue contribution from marine and large scale truck fuel markets, the Tacoma LNG Facility is selected as a least-cost resource in PSE's analysis of resource alternatives.

A more detailed summary of the analysis of peak-day resource alternatives can be found in ***Exhibit M***.

LNG Fuel Customers

While the primary purpose of the Tacoma LNG Facility is to provide peak-day supply for PSE's retail natural gas customers, the Project's benefits are significantly enhanced by serving additional markets. LNG facilities are capital intensive and, therefore, costs for all customers are reduced by the economies of scale associated with larger facilities. The peak-shaving component of the plant requires significant storage and relatively small liquefaction capacity, while the marine, heavy-duty trucking and other fuel markets require significant, steady liquefaction and minimal storage. By combining these complementary load profiles, PSE can optimize the Facility and minimize peaking-resource costs for PSE's retail natural gas customers. The Facility costs will be allocated between regulated and non-regulated LNG fuel sales. The regulated portion will be further allocated between core gas customers and TOTE. The portion of the Facility allocated to serve PSE and TOTE will be part of PSE's regulated gas operations. The portion of the Facility allocated to serve LNG fuel customers under non-regulated rates will be categorized as non-utility operations and transactions will be "below the line".

Totem Ocean Trailer Express (TOTE)

The TOTE Fuel Supply Agreement ("FSA") was executed in October 2014. The FSA provides for fixed payments to be made to PSE over an initial term of 10 years. PSE anticipates serving TOTE as part of its regulated gas business. The FSA has been submitted to the WUTC as a Special Contract. The schedule for Commission approval will be set at an October 13, 2015 hearing (see ***Section 5***).

The FSA includes conditions precedent that PSE must either meet or waive prior to January 1, 2017. These conditions include regulatory approvals that PSE has not yet received but anticipates receiving in the coming months, including:

1. All permits and approvals in a form satisfactory to PSE (PSE anticipates having all substantive permits by November 5, 2015 barring any appeal); and
2. Regulatory approvals from the WUTC to serve TOTE as a regulated;
3. Approvals necessary to build an underground LNG line from PSE's Facility to the bunkering station at the TOTE terminal (PSE anticipates receiving a waiver from PHMSA and the WUTC Office of Pipeline Safety in Q1 2016).

For a detailed discussion of the mitigations and consequences of the risks associated with these conditions precedent, see ***Exhibit F.***

If PSE does not achieve any of these conditions, PSE could exit the contract by paying TOTE $15.3 million, which would be payable January 1, 2019 through December 31, 2021. In addition, PSE would have to write off approximately $15 million of development costs plus any construction costs incurred. Of the $15 million of development costs, approximately $10.5 million would have been allocated to the regulated service and therefore may be recoverable in rates (assuming the expenditure is deemed prudent).

Non-Regulated LNG Fuel Sales

The portion of the Facility that is not allocated to serve PSE's peaking resource need or TOTE will be allocated to the non-regulated sale of LNG. PSE will focus its marketing efforts on large marine customers that operate out of the Port of Tacoma and Port of Seattle. The Tacoma LNG Facility holds natural advantages when it comes to serving large marine customers and there are several pending emissions regulations that will force marine customers to consider different compliance actions including conversion to LNG. See ***Exhibit G*** for a detailed discussion of PSE's marketing strategy.

PSE considered several sales scenarios for the non-regulated portion of the plant and the associated returns for each scenario. The assumptions and results of this analysis can be found in ***Exhibit G***.

4. Project Development

This section of the Report summarizes PSE's development work to date and demonstrates the necessary due diligence required for final approval at the November Board meeting. To date, PSE has executed a ground lease for the Facility at the Port of Tacoma and completed two full front-end engineering and design ("FEED") studies with Chicago Bridge & Iron (CBI) and Black & Veatch. Subsequent to the selection of CBI, a leading firm in the design and construction of LNG facilities, PSE is negotiating with CBI to establish terms for an EPC contract. PSE has also received bids and estimates for other key construction components. (see ***Engineering and Construction*** on page 10 for more information) Additionally, PSE has garnered support from local and state elected officials and has successfully supported legislation that achieved tax parity between natural gas and diesel as a transportation fuel. PSE is awaiting the release of the Final EIS from the City of Tacoma and substantive permits will follow. PSE has also filed the TOTE FSA as a Special Contract with the WUTC and requested a Declaratory Order for approval of an allocation methodology (see ***Section 5*** of this report for more details on the regulatory process).

Siting

PSE conducted an exhaustive site review of locations throughout Puget Sound. There were three primary siting criteria considered in the analysis:

1. Appropriate placement on PSE's gas distribution system to effectively provide peaking service;
2. A parcel large enough to support regulatory and other siting requirements, particularly to accommodate the level of storage needed to provide peaking service;
3. Proximity to marine and other fuel markets.

Selected Site

After exploring multiple locations, the development team selected a 33-acre parcel at the Port of Tacoma as the most suitable site. The Facility is located on the Hylebos waterway, on the corner of East 11th Street and East Alexander Avenue. The site will be connected to PSE's North Tacoma high pressure system with approximately four miles of new 16-inch pipe, allowing it to inject gas directly into PSE's distribution system.

The Pipeline and Hazardous Materials Safety Administration ("PHMSA") is the branch of the U.S. Department of Transportation that is responsible for regulating LNG facilities. PHMSA defines siting requirements based on two criteria. The first criterion is that in the event of a spill, all vapor must be contained on or near the property and cannot drift onto neighboring property upon which building can occur. The second criterion is that in the event of a fire, heat from the fire at the property line must be below a prescribed level. To satisfy these PHMSA requirements, the parcel must be appropriately sized. There are few parcels in areas zoned for industrial use that are both large enough to satisfy these regulations and capable of supporting PSE's resource needs.

The selected site at the Port of Tacoma is ideally situated for serving LNG fuel markets. Providing service to LNG fuel customers optimizes use of the Facility and generates revenues that significantly lower the cost of the peaking resource for PSE's gas customers. The site is located across Alexander Avenue from the TOTE terminal. This location will allow PSE to meet TOTE's needs directly and at an inherent cost advantage over a network of LNG barges and bunker stations, which may be available in the future. The Facility will also be able to serve other marine customers from this location. PSE anticipates loading LNG bunker barges using the same facilities that will be used to load the TOTE vessels (as the TOTE vessels are only in Port for eight hours twice per week).

The Port of Tacoma is also centrally located to serve regional trucking demand concentrated in the Tacoma, Federal Way and Kent areas. The selected site has access to an existing rail spur that connects to Tacoma Public Rail's system. While LNG is not currently railed in the U.S., this may prove a viable option for transporting large volumes of LNG in the future.

Port of Tacoma Lease

PSE has leased the 33-acre Facility site from the Port of Tacoma under a 25-year lease with extension rights for a second 25-year term, provided certain conditions are met.

PSE will also obtain two easements for an LNG pipeline and a bunkering station to be located on TOTE's leased property. In addition to giving PSE the rights to construct, own and operate an LNG pipeline, the pipeline easement provides for "control measures" that allow PSE to restrict access in the event of an LNG leak and ensure that any structures in the dispersion area meet applicable codes. The bunkering station easement gives PSE an exclusive easement at the TOTE terminal on the Blair Waterway to construct bunkering facilities, including a small pier and loading arm. The bunkering station easement also give PSE preferential use (secondary only to

TOTE) for up to 300 feet of shoreline to load LNG barges or bunker vessels. Vessels larger than 300 feet can be easily accommodated, but will require approval by the Port of Tacoma.

Details of the lease can be found in ***Exhibit H***.

Permitting

For a discussion of the permits and approvals required for the Tacoma LNG Project, refer to ***Exhibit I***.

Community and Government Outreach

A coordinated communications and outreach strategy has been deployed for local and state government, the Tacoma community, special interest groups, commercial partners, regulators and PSE customers. The plan, which includes a discussion of potential risks and mitigations, is designed to maintain and grow public support for the Project by educating stakeholders about the regional benefits of LNG and the Project. Plan details are summarized in ***Exhibit J***.

Engineering and Construction

The Facility will be engineered and constructed using a combination of two execution methodologies to obtain the best value for PSE. The Facility work (including pre-treatment, liquefaction, storage tank, truck rack, vaporization system, and balance of plant) will be performed under an engineering, procurement and construction ("EPC") contracting methodology. Site preparation (including demolition, ground improvement, and underground utilities) and marine facilities construction will be performed by PSE using a design-bid-build contracting methodology.

PSE considered several methodologies for engineering and constructing the Facility before selecting a strategy. Ultimately, PSE relied upon input from national engineering firm CH-IV and on market research in its determination of the preferred option.

<u>Engineering, Procurement and Construction</u>

The Project will be engineered and constructed using a combination of two execution methodologies to obtain the best value for PSE. The LNG Facility work (including pre-treatment, liquefaction, storage tank, truck rack, vaporization system, and balance of plant) will be performed according to an engineering, procurement and construction (EPC) contracting methodology. Site preparation (including demolition, ground improvement, and underground

utilities) and marine facilities construction will be performed by PSE using a design-bid-build contracting methodology.

PSE originally retained the national engineering firm CH-IV to assist with feasibility studies for the Project. In 2012, based upon input from CH-IV and a study of the marketplace, PSE determined that an EPC contracting methodology would be the preferred method for contracting the LNG production portion of the Project. Under this contract, PSE will set specific performance criteria (i.e., production quantity, storage quantity, and send-out requirements). The EPC contractor will be responsible for process design including specifying, procuring, installing, and commissioning all elements of the Project, as required to meet the performance specifications and guarantees stipulated by the owner in the contract. This will provide PSE with a single point of contact throughout the construction and warranty phase of the Project. Also, because a single entity will hold responsibility for both design and construction, a more active consideration of constructability and construction efficiency in the design of the Project is more likely than it would be with alternative contracting methodologies, such as design-bid-build, or even design-build.

The EPC contract is a fixed price contract that includes performance guarantees and liquidated damages. In exchange for control of all elements of the Project, the EPC contractor retains cost and schedule risks during project delivery.

PSE considered a pool of seven candidate firms and selected Chicago Bridge & Iron ("CBI") to perform an initial front end engineering design ("FEED") study that developed the Facility to a conceptual level and provided budgetary pricing. CBI completed this work, which culminated in an open book price review and firm bid price in fall 2013. This design and pricing has been used to support commercial, permitting and regulatory efforts. CBI is an international leader in LNG plant and tank engineering and construction, and has four decades of experience. CBI has designed and built peak-shaving LNG plants around the world. Projects have included complete peak shaving facilities that include pre-treatment, liquefaction, storage and send-out systems; stand-alone liquefaction systems; plant revamps; retrofits and expansions. In addition, CBI has extensive experience with the key processes and equipment that are utilized in baseload natural gas liquefaction plants, including gas metering, CO_2 removal, dehydration, liquefaction, boil-off/flash gas recovery, gas vaporization, truck loading and unloading, and fire protection. CBI is one of the leading contractors for LNG storage and loading systems. This experience includes the design and construction of approximately 220 LNG storage tanks, the majority of which were double-wall, single containment storage tanks up to 200,000 cubic meters. In addition to the LNG sector, CBI provides engineering and construction solutions in the

petrochemical, wastewater treatment, mining, nuclear power, and heavy infrastructure sectors. CBI has nearly 50,000 employees worldwide.

To ensure a competitive bid for the EPC contract, PSE engaged Black & Veatch to perform a parallel FEED study. This FEED was based upon the same design criteria used for the proposed CBI plant and provided another price point for the Facility. Black & Veatch was a top contender for the original FEED contract and has experience designing and building LNG facilities globally. The value of having competitive options for the EPC contract is significant, particularly when compared with the relatively low cost of a second FEED study (approximately 0.5 percent of the plant cost).

Both CBI and Black & Veatch submitted final EPC proposals in June 2015. PSE selected CBI as the preferred EPC contractor and this decision was approved by the Board in the July 30, 2014 Meeting. PSE is currently finalizing price and contract negotiations with CBI and expects to have a final contract by early October 2015. ***Exhibit K*** summarizes the selection process and the contract features indicative of CBI's proposed contract form.

Work Performed by PSE

PSE will perform all design and construction work necessary to ready the site for the EPC contractor (site demolition, ground improvement, and some underground utilities), as well as all marine work (TOTE loading platform). PSE is choosing to perform these Project elements because they are outside the value-added capability of an EPC contractor and can be more cost effectively managed by PSE using local resources.

The list below summarizes the team PSE will use to complete its design and construction work, as well as each firm's scope of work. Many of the firms have experience with LNG facility development and several have experience working with the Port of Tacoma and/or other engineering and consulting firms retained by PSE for the Project. The qualifications and benefits of each firm are discussed in detail in ***Exhibit K.***

- ***GeoEngineers (Geotechnical Design).*** Develop ground improvement strategies to meet federal and local seismic design requirements, coordinate structural and foundation requirements with the EPC firm and provide contracting and quality assurance support for the execution of the ground improvement program.

- ***Moffatt & Nichol (Marine Design).*** Develop a demolition plan for the existing timber pier and design a new concrete pier on the Hylebos Waterway, design a new loading platform on the Blair Waterway, and provide marine construction oversight as necessary.

- ***Sanborn Head & Associates (Owner's Engineer).*** Review EPC design work product, perform a peer review of GeoEngineers work product, assist with EPC contract preparation, and provide support on permitting and community outreach efforts, as needed.

- ***Tacoma Power (Substation Design/Construction).*** Design and construct the utility substation located on the site. Tacoma Power has completed a Facilities Study, and cost and schedule elements have been included in the overall Project schedule and budget.

- ***Sitts & Hill – Site Civil Design.*** Design site stormwater facilities (for both construction and operation), grading plans to support construction and final configuration, and specifications for abatement and demolition of existing buildings and utilities.

The site abatement and demolition contractor has been selected, and final interviews are taking place for the ground improvement contractor. General site construction work occurring prior to CBI's scope (utilities, civil work, etc.) is being performed on a time and materials basis, with a general contractor operating under a PSE master services agreement. The marine construction contractor will be selected in spring 2016 after the TOTE loading platform design is completed. See ***Exhibit K*** for additional details about the bid and selection process for the construction work.

Gas Distribution Upgrades

The PSE distribution system will require improvements to support the Tacoma LNG Facility, including approximately five miles of new pipeline in the cities of Fife/Tacoma and Pierce County, a new limit station and existing gate station modifications. A detailed discussion of the gas distribution upgrades can be found in ***Exhibit L***.

The design, engineering and execution of this work will be managed by PSE's Project Management and Gas Engineering organizations. The work is expected to be completed by the end of 2017 to support plant startup and commissioning in 2018. The cost of the upgrades, estimated to be $54 million, will be incorporated into PSE's gas ratebase and recovered through rates, including revenues collected from LNG fuel customers for gas transportation service across the PSE distribution system. PSE included the cost of the distribution upgrades, which will be significantly offset by incremental revenue recovered from LNG fuel customers, as part of the analysis of the prudence of the Facility. The results of this analysis are discussed in detail in ***Exhibit M***.

Natural Gas Supply

PSE will provide natural gas supply for liquefaction services, unless a customer selects a tolling arrangement. The natural gas required for the initial design capacity of the plant is relatively modest, approximately 21,000 Dth per day[2], which is roughly two percent of PSE's current peak-day requirement and approximately five percent of PSE's annual daily average demand. Natural gas supply for turn-key customers will be provided under a market-sensitive pricing mechanism tied to the monthly Sumas index (with "Sumas" being the interconnection point between Spectra Energy's BC pipeline system and the NWP interstate system, at the international border near Sumas, Washington). With this structure, PSE will carry no natural gas supply price risk.

Sufficient firm NWP interstate pipeline service will be procured to transport the natural gas to PSE's system. LNG customers will pay for the interstate pipeline service. The natural gas will generally be managed as a part of PSE's portfolio, but will not utilize PSE's underground storage resources because the Facility will have storage on site.

The Project will be completed in two distinct phases: development and construction. The development phase is concluding and will be considered complete upon issuance of environmental permits, approval of the TOTE special contract and upon successful negotiation of all construction contracts, including the EPC contract. Barring any appeals or legal action during the permitting process, PSE anticipates completing this phase of the project in Q4 2015 at a cost of $15 million. The majority of the development phase costs are associated with preliminary engineering, permitting studies and permit application preparation.

The construction phase of the Project will begin with execution of the EPC contract and consist of detailed engineering, procurement, construction and commissioning of the Facility and the gas system upgrades. Capital construction costs for the Project are estimated to be $364 million ($311 million for the Facility and $54 million for the gas system upgrades). The majority of the Facility costs will be covered under a fixed price EPC contract. Other significant components include demolition and soil work. Projected Project costs include a construction contingency, which is determined by the level of engineering design and based on industry standards. PSE anticipates construction will be complete in late 2018, with plant commissioning to follow. The in-service date for the Project is expected to be January 1, 2019 at the latest.

[2] The Tacoma LNG Facility will require 21,000 Dth per day to meet the 250,000 LNG gal per day output. The capacity of the Facility to divert natural gas typically used during liquefaction is 19,000 Dth per day. This difference is attributed to the fact that PSE will not hold firm, year-round, pipeline capacity for the gas needed for peak shaving (approximately 10 percent of the liquefaction capacity).

The figure on the following page shows a high level summary of the Tacoma LNG Project budget.

A detailed Project budget by quarter and a Project schedule can be found in ***Exhibit D.*** Project costs are described in detail in ***Exhibit N***.

Figure 3: Tacoma LNG Project Budget (1,000s)

Tacoma LNG Facility Capital Budget	
Development Budget	$13,012
CBI Milestone Payments	$191,941
Construction Work Outside of Fixed Price EPC Scope:	
Capital Spares	$1,200
Demolition	$2,473
Soil Stabilization	$20,620
Substation & Utilities	$8,365
Direct Bunkering Line to TOTE Facility	$9,884
In-water Work at the TOTE Site	$6,300
Project Management and Outside Services	
PSE Labor	$4,905
Outside Services and QA	$2,479
Port of Tacoma Lease Payments	$5,110
Permitting Support and Mitigations	$1,250
Insurance	$1,576
Sales Tax	$13,471
Contingency	$19,038
PSE Construction OH's	$9,149
Facility Sub-Total	**$310,773**
Gas System Upgrades Capital Budget	
General Development	$310
South Tacoma Upgrades	$11,061
Port of Tacoma 4 Mile 16"	$29,290
Contingency	$8,343
Permitting Mitigations	$4,500
Gas System Upgrades Sub-Total	**$53,504**
PROJECT CAPITAL COSTS	**$364,277**
AFUDC (less reserve)	$54,696
CLOSING GROSS PLANT	**$418,973**
O&M During Construction	
In Support of Regulated LNG Service	$926
In Support of Non-Regulated LNG Service	$534

Pro Forma Financial Statements

The Project pro forma models the 25-year revenue requirement to recover all capital investment made during development and construction of the Tacoma LNG Project, and the subsequent 25 years of O&M expenses to operate the Facility and associated distribution upgrades. The pro forma considers revenue contributions from other Facility customers that purchase LNG as a fuel. The revenue contributions are calculated based on the regulated revenue requirement for the Facility, revenues from TOTE as projected under the terms of the FSA, and non-regulated sales under different commercial scenarios. In addition to contributing revenue needed to pay for the incremental cost of the Facility, LNG fuel customers will also contribute revenues to cover PSE administrative and general costs, and TOTE will pay a short-term contract to compensate for a term less than the depreciable life of the Facility. The costs for Project construction and operation, as well as projected revenues, are discussed in detail in ***Exhibit N***.

The pro forma for the Tacoma LNG Facility assumes that the initial investment has a depreciable life of 25 years. This assumption is based on the primary lease term that PSE executed with the Port of Tacoma.[3] PSE's unilateral right to extend the lease will be conditional as discussed in ***Exhibit H***. By assuming a 25-year life, the Facility will fully depreciate by the time the lease expires. The engineering life of certain plant components (control systems, IT systems, etc.) may be less than 25 years; however, to simplify the analysis, the shorter life of these items is included in the pro forma as a more conservative O&M estimate, rather than a calculation of depreciation expenses on a more granular basis. The natural gas distribution system upgrades are depreciated over 50 years, which is typical for PSE distribution system facilities.

The pro forma assumes the gas distribution system upgrades go into service on January 1, 2018 and the Facility goes into service on January 1, 2019. The gas system upgrades must be in place to support plant startup and commissioning. The pro forma assumes perfect ratemaking. The LNG Facility and gas system distribution upgrades will be placed in ratebase at the conclusion of a general rate case timed to coincide with the in-service date of the LNG Facility. Revenues from LNG service customers will commence upon plant start-up for both LNG and distribution service.

Commercial Structure

PSE explored several potential structures for the Tacoma LNG Project, and ultimately selected a commercial structure where:

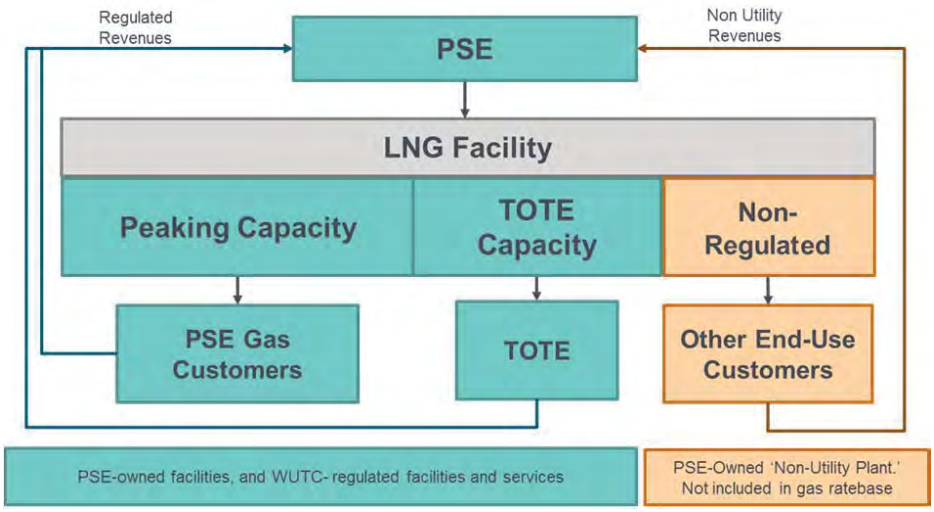
[3] The 25-year depreciable life of the Tacoma LNG Facility will begin when the Facility goes into operation.

1. PSE retains full ownership of the entire LNG Facility and does not include any co-owners or equity partners;
2. The entire Facility is under the control of PSE and not under a subsidiary of PSE or PE; and
3. A portion of the Facility will be treated as non-utility and will not be subjected to regulated cost recovery, rates or returns.

This structure provides the most benefit to PSE gas customers while simultaneously providing a reasonable risk profile to PSE shareholders. PSE gas customers are allocated the portion of the Facility needed to serve the peaking resource. In addition, the portion of the Facility needed to serve TOTE is also included as part of PSE's regulated business. While there are some risks associated with the TOTE contract (see ***Exhibit F***), gas customers receive a benefit in lower costs by including the TOTE capacity as part of the regulated portion of the Facility (see ***Exhibit M***).

The costs associated with the non-regulated portion of the Facility will not be recoverable through regulated rates and PSE shareholders will bear that risk. By not including the non-regulated capacity as part of PSE's regulated business, PSE ensures that core gas customers do not absorb risks associated with the development of the LNG fuels market. In exchange, all revenues associated with non-regulated sales will accrue to PSE shareholders. The non-regulated operation will transfer revenues to the core gas book for the use of regulated facilities and resources, and these transfers will be priced at Commission-approved tariffed rates and corporate overhead allocations.

Figure 4. Tacoma LNG Commercial Structure



5. Regulatory Process

The regulatory process for the Tacoma LNG Facility will occur in two phases that will take place over several years. In the first phase, PSE is seeking approval from the WUTC of a Special Contract for Liquefied Natural Gas Fuel Service with Totem Ocean Trailer Express, Inc., and a Declaratory Order approving the methodology for allocating costs between regulated and non-regulated liquefied natural gas services. In the second phase, PSE will seek a prudence determination and rate recovery of the regulated portion of the Facility.

Phase 1: Approval of a Special Contract for Liquefied Natural Gas Fuel Service with Totem Ocean Trailer Express, Inc.

The first phase of the regulatory process commenced on August 11, 2015, when PSE filed a petition with the WUTC for: (i) Approval of a Special Contract for Liquefied Natural Gas Fuel Service with Totem Ocean Trailer Express, Inc. and (ii) a Declaratory Order Approving the Methodology for Allocating Costs Between Regulated and Non-regulated Liquefied Natural Gas Services. On September 8th a Prehearing Conference was conducted and subsequently on September 9th the Administrative Law Judge issued an order with a procedural schedule that includes technical conferences for the parties on September 18 and 21, and October 8. The parties will reconvene in prehearing and discuss their progress on the afternoon of October 13, 2015. Based on discussions with the parties during the October 13 conference, the Commission will establish such further process and procedural dates as are appropriate to bring the docket to conclusion.During this process, PSE will need to demonstrate that:

1. The rates charged under the Special Contract recover all costs resulting from providing the LNG Fuel Service and contribute to PSE's other fixed costs associated with the Tacoma LNG Facility;
2. The existing, Commission-approved methodology for allocating costs between its existing regulated and non-regulated business that PSE would apply to the regulated and non-regulated operations of the Tacoma LNG Facility is appropriate.
3. Satisfactory commercial terms and conditions are within the Special Contract, including but not limited to an explanation of the basis and derivation of the proposed rates charged for such service; and
4. The Special Contract does not provide an unreasonable preference for, or rate discrimination with respect to, the counterparties.

Phase 1 will not be the process by which PSE will seek a prudence determination or rate recovery for the Tacoma LNG Facility. Those issues will be addressed during the second phase.

Phase 2: Prudence Determination and Rate Recovery of the Regulated Portion of the Tacoma LNG Facility

PSE will seek a prudence determination and rate recovery for the Tacoma LNG Facility in a General Rate Case ("GRC") filed with the WUTC in Q2 or Q3 2018. Construction is estimated to be completed by January 2019. The filings may occur before all construction costs are known with certainty. If necessary, cost estimates may be updated during the filing. The figure below lists the major milestones associated with the second phase.

Figure 5. Projected Rate Recovery Milestones Based on Current Permitting and Construction Timelines

Projected Date	Milestone
Q2/Q3 2018	PSE files GRC with rate recovery for Tacoma LNG Facility
Q2/Q3 2019	WUTC order with new rates

The GRC would seek a prudence determination for the Tacoma LNG Facility (as well as other potential resource acquisitions or contract restructurings for unrelated resources). To demonstrate the prudence of the Tacoma LNG Facility, PSE will need to address:

1. The necessity of the Tacoma LNG Facility;
2. The cost-effectiveness of the Tacoma LNG Facility;
3. The resource alternatives considered by PSE to meet its need, including consideration of factors such as capital costs, impact on the utility's credit quality, dispatchability, transportation costs, and other need-specific analysis at the time of the acquisition decision;
4. The contemporaneous information provided to and used by the Board of Directors in making the acquisition decision and its costs; and
5. The contemporaneous records of PSE to allow the WUTC to evaluate PSE's actions with respect to the decision process.

6. Project Execution

PSE will execute this Project in a similar manner to other large infrastructure projects recently undertaken. PSE will finance the Project on balance sheet and will recover the investment allocated to regulated service as it would any other ratebased asset. Project construction will largely be completed by outside contractors with PSE's oversight. Ultimately, PSE anticipates operating the Project as part of the Energy Operations organization. In accordance with PSE's corporate policies, PSE has conducted a risk analysis and believes that risks for the Project can be appropriately mitigated.

Financing

The Project will be financed consistent with past utility financing practices, employing a combination of funds from operations, short-term debt drawn from the Company's capital expenditure facility, long-term debt and, as needed to balance debt, equity provided from PSE's parent company Puget Energy.

Development and Construction Execution

PSE's Strategic Initiatives team has led the development of the Project with support from other internal departments including Natural Gas Resources, Project Management, Rates, Regulatory, and Accounting. PSE continues to rely on legal and engineering expertise from outside firms (discussed further in the exhibits) to work through various elements of the development phase of the Project, including permitting, negotiating long-term fuel supply agreements and filing an LNG tariff with the WUTC. PSE anticipates seeking approval of the Project along with approval of the EPC contract and other contracts at the November 5, 2015 Board of Directors meeting, but acknowledges that permitting and regulatory risks could delay this schedule.

PSE will oversee the execution and construction of the Project. All Project elements will be managed by PSE's Project Management organization, which includes project managers and support staff, a project controls organization (cost and schedule tracking), and a ready network of supporting engineering, construction management, and quality assurance resources. The gas distribution upgrades will be executed in a similar manner to other projects regularly performed by PSE in its role as a natural gas utility. PSE's strategy for construction of the Facility includes a combination of an EPC contract for plant construction and commissioning, and direct contracting for ancillary features (site preparation and marine work).

Marketing Strategy

PSE expects LNG to be a viable transportation fuel, with demand growing due to stricter emission regulations and the eventual return of favorable LNG-marine fuel oil price spreads. PSE will focus on direct sales to large marine customers, and will broaden its reach into the marine fuel community by targeting corporate decision makers, leveraging relationships with the ports of Tacoma and Seattle to gain access to target markets, and participating in industry forums to promote the fuel.

PSE's primary advantage is its location on the waterfront of a major port and its proximity to the ports of Tacoma and Seattle, and efforts will be focused on marine customers that routinely call on those ports. PSE will work with potential customers in evaluating conversion to LNG and tailor contract terms to meet their specific needs. Contract terms of five or more years will be sought, but customers will be offered multiple pricing alternatives (cost-of-service, market-based, term differentiated, etc.), depending on each customer's specific needs. PSE offers flexible gas supply solutions (full requirements contract or tolling service) and will partner with a bunkering company to offer a turn-key delivered service. As necessary, PSE will partner with trading companies to provide hedged products (fixed, collared, tied to other commodities, etc.) and financing companies to facilitate conversions, and will work with customers to understand their options.

Markets and PSE's marketing strategy are discussed in more detail in **Exhibit G**.

Management and Operations of the Project

The Tacoma LNG Facility will be managed and operated by PSE's Energy Operations group, under the direction of Natural Gas Resources, which also manages the Jackson Prairie underground storage facility. The Facility will operate and be staffed 24 hours per day, 365 days per year. Onsite management and operations staff will include: plant manager, plant engineer, operations and maintenance supervisor, maintenance planner, controls technician, office administrator and 10 represented gas operators.

Staff will be located onsite, housed in an existing building that will be retrofitted for use by the Tacoma LNG Facility. Most work will be conducted within the boundaries of the leased property; however, PSE staff will also be responsible for operating and maintaining the direct pipeline and fuel loading equipment that will be located on TOTE's property. Maintenance and operating protocols will be developed, taking into account regulations, PSE policies and practices, and best industry practices.

In addition to the listed staff, PSE may contract for security service as required to meet regulatory requirements, and stevedoring services to bunker TOTE's ships and load other marine vessels.

Estimates of future Tacoma LNG Facility expenses are reflected in ***Exhibit N***, the pro forma financial statements, and an operations organization chart can be found in ***Exhibit O***.

Insurance

PSE and our insurance broker are in the process of obtaining and evaluating insurance quotes for the construction and operational phases of the Project. These quotes include builders risk insurance for the materials on site and any work in progress, and cover risks such as fire, wind, theft, vandalism, earthquake, flooding and others. Quotes include insurances for general liability, pollution liability, marine liability, excess workers compensation and cargo. Insurance quotes are reflected in ***Exhibit N***, the Project pro forma, which includes a detailed description of the coverages.

Quotes received to date are within the budgeted range. PSE is preparing to bind coverage as soon as November 5, 2015.

When the plant becomes operational, it will be covered by PSE's existing insurance program. The costs to add the completed plant to PSE's insurance program are incremental. PSE's existing policy limits and retentions remain appropriate.

Risk Analysis

Consistent with past resource acquisition and development activity, PSE staff has identified incremental risks associated with the development and execution of the Project.

The principle project risks include the remaining permitting and regulatory approvals and PSE's ability to sell the non-regulated capacity at the plant. PSE anticipates either receiving remaining permits and approvals, or appropriately mitigating those risks prior to moving forward with construction. The LNG market risk will remain through construction and operations.

PSE has prepared a detailed description of the principle risks for each phase of the Project and has identified mitigation plans to address these risks. Risks and mitigations are discussed in detail in ***Exhibit F***.

Project Benefits

PSE's development and construction of the Tacoma LNG Project benefits PSE customers, the Pacific Northwest and the natural environment. The principle benefits of this new resource include:

1. The Tacoma LNG Project will help ensure continued dependable service and additional benefits to PSE natural gas customers:
    - The Tacoma LNG Facility will be an integral part of PSE's strategy for serving its gas customers on the coldest days of the year
    - The Tacoma LNG Facility provides critical infrastructure more cost-effectively for PSE customers
    - Construction of the Tacoma LNG Project will bring upgrades to local natural gas lines ahead of schedule, improving reliability to Tacoma customers
2. Serving new commercial markets–like transportation—helps lower costs for existing and future natural gas customers. The Tacoma LNG Project will provide important environmental benefits to the Puget Sound region:
    - Switching from petroleum fuels to LNG reduces carbon dioxide emissions by up to 30 percent
    - Clean-burning LNG eliminates harmful particulate emissions
    - Converting to LNG will help companies like TOTE comply with new, stricter federal low-sulfur emission standards
    - The Project reduces the potential for harmful fuels spills that could damage Puget Sound
    - Driving innovative uses for natural gas demonstrates PSE's leadership in delivering cleaner energy options to customers
3. The Tacoma LNG Project will generate important economic benefits for all South Sound residents:
    - Switching to clean, abundant natural gas will help local employers remain competitive and protect local jobs
    - The Tacoma LNG Project helps the Port of Tacoma diversify its customer base, support new industries, and enhance its position as a driver of job creation and economic activity

- Having LNG as a marine fuel readily available will give the Port of Tacoma and Port of Seattle a competitive advantage over other west coast ports
- Construction and operation of the Tacoma LNG Facility will create many direct and indirect jobs in the area

4. Utilizing LNG reduces reliance on foreign fuels, using North America's natural resources here at home to benefit human health, the environment and the economy.

Recommendation

Based on the determination of need, the identification and analysis of alternatives and the established benefits of the Project, management expects to recommend final approval of the Tacoma LNG Project at the Board of Directors meeting on November 5, 2015. Final approval would authorize PSE to enter into construction contracts and smaller contracts for demolition and ground improvement. An update on the status of the development work will be presented at the meeting.

PUGET SOUND ENERGY

Exhibit A.

Board Presentation

Tacoma LNG Project

September Board Update

PSE PUGET SOUND ENERGY

Roger Garratt
Director, Strategic Initiatives

September 24, 2015

Safe. Dependable. Efficient.

Project Description

PSE is developing an LNG facility to serve as a peaking resource for its core natural gas customers and to provide fuel to marine and on-road transportation markets.

Site: Port of Tacoma at corner of E. 11 St. and Alexander Ave. E.

Project In-service Date: January 1, 2019

LNG liquefaction capability: 250,000 gallons/day

On-site storage: 8 million gallons

Vaporized gas injection capability (into PSE's system)[1]: 66,000 Dth/day

Gas delivery to PSE's system: Northwest Pipeline

Electricity for facility: Provided by Tacoma Power at a Mid-C Market based rate.

Total Project CapEx: $364 million

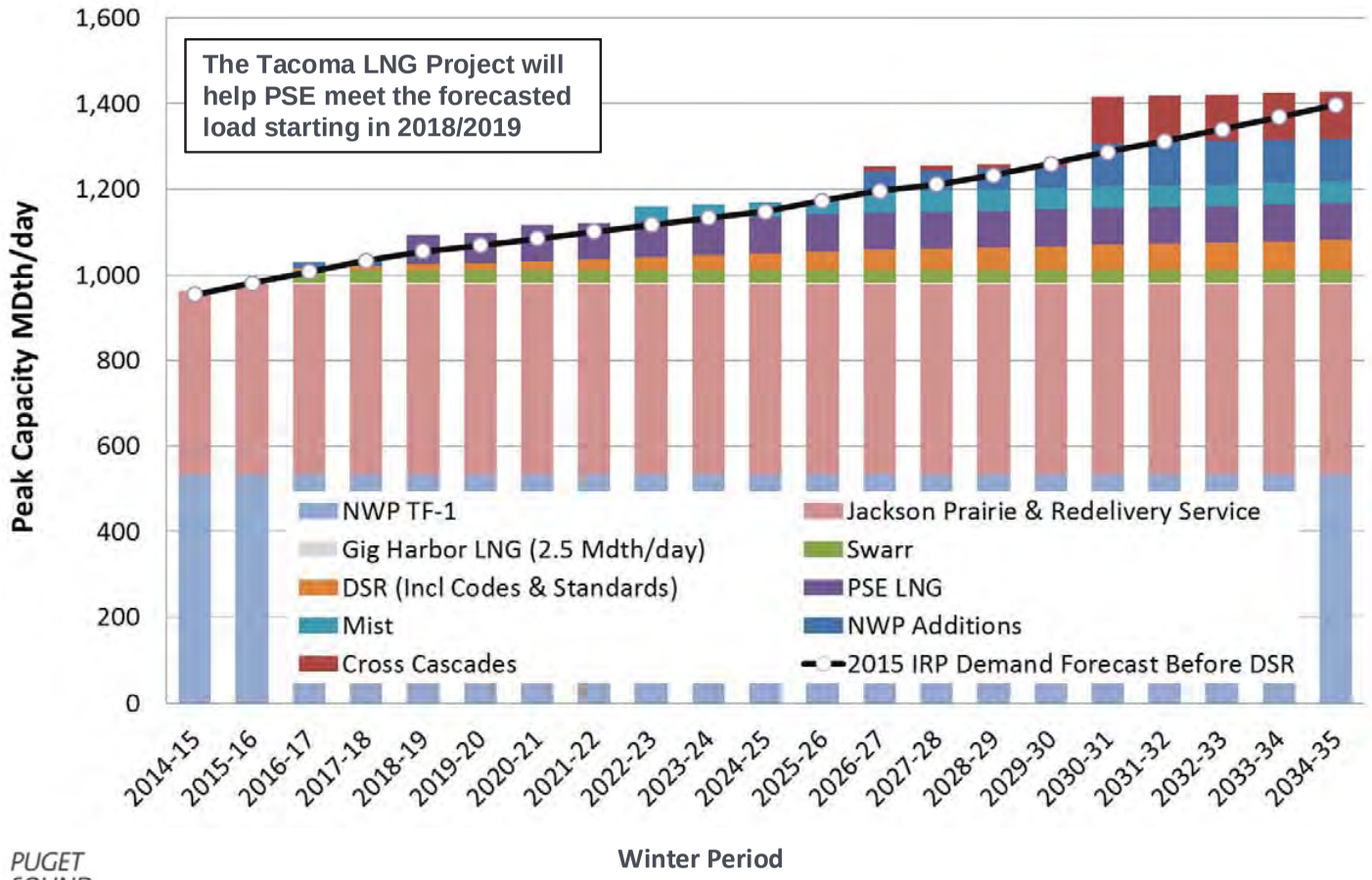
Tacoma LNG Facility in Tacoma, Washington

PUGET SOUND ENERGY

[1]To meet peak-day demand of PSE retail gas customers

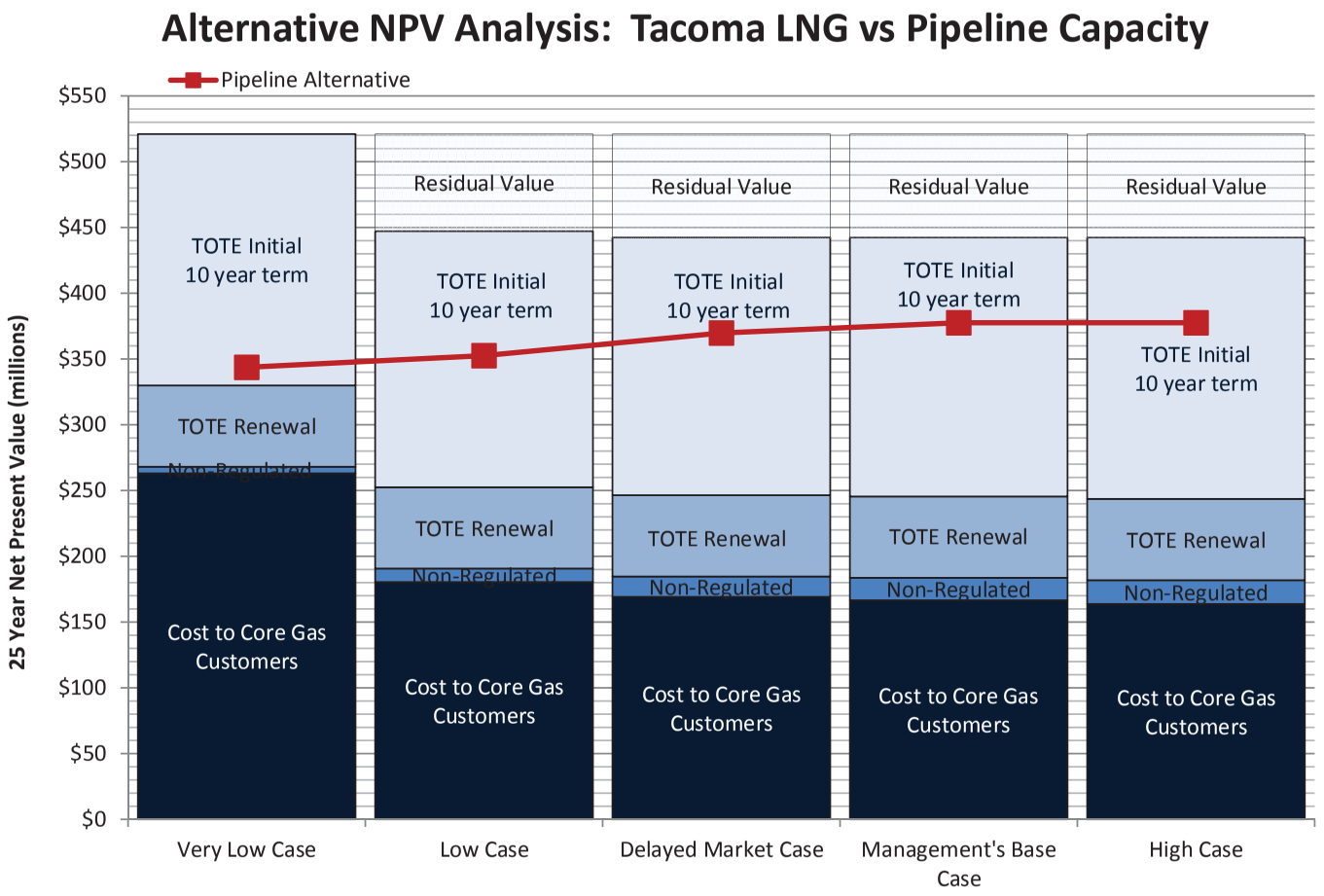
PSE Natural Gas Resource Need

Source: 2015 IRP Gas Sales Portfolio Peak Day Load/Resource Balance (Base Case)

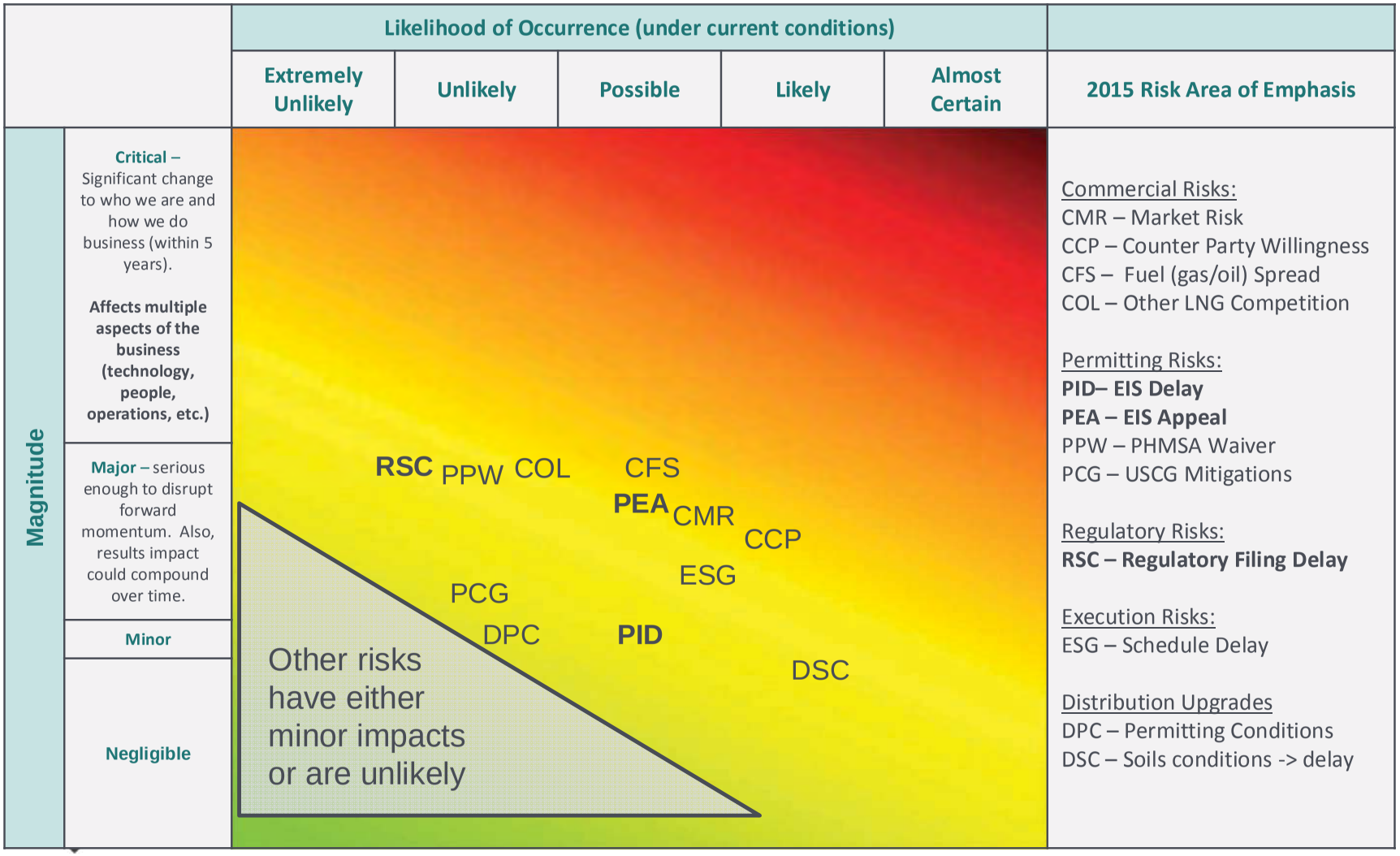


Comparison of Resource Alternatives

LNG Remains Lowest Cost Option



Project Risks



Project Risk Mitigation: EIS Delay (PID)

The City of Tacoma has agreed in principle to EIS mitigations

Tentative mitigations agreement reached with City of Tacoma:

1. Fixed contribution to repave of Taylor Way (with temporary restorations for distribution upgrades construction)
2. Fixed contribution for Tacoma Tideflats Emergency Response & Intelligent Transportation System (ER/ITS)
3. Fixed contribution for remodeling Tacoma Fire Station 15
   - Adjacent to project site
   - Operations budget of the Fire station will come from tax revenues generated by the project
4. City and Port agreed to work together on an agreement for any additional funding needed to Taylor Way or ER/ITS

Risk of schedule delay remains:

- Delayed Issuance of the FEIS (needed for issuance of any permits)
  - City of Tacoma staff indicated that they may require signed agreements (with Port and PSE) to be included in the FEIS issuance. This could delay the FEIS issuance while the agreements are finalized.
  - PSE is working with the City to issue a FEIS by end of September 2015 with a mitigation commitment but no executed agreements.
- Appeal of the FEIS or Shoreline permit
  - The FEIS appeal period starts to run when the first substantive permit is issued (at least 7 days after issuance of the FEIS).
  - Appeal period for FEIS will follow the appeal permit for the first substantive permit is issued (so 21 days if Pierce County CUP; 30 days if Tacoma shoreline permit).

Project Risk Mitigation: Puyallup Tribe & EIS Appeal (PEA)

The Puyallup Tribe registered two letters with the City in opposition to the Project

Background on Puyallup letters and engagement:

- Tribe letters to the City of Tacoma focused on safety concerns
- City met with tribal staff to attempt to allay technical concerns after the first letter
- Tribal concerns may be related to non-Project actions and could include concerns over the sale of Electron
- PSE has solicited support from City, Port, TOTE and other elected officials to work with tribe in support of this project
- PSE intends to meet with Tribal Council and their technical committee

Appeals Process and Mitigation Efforts:

- Courts generally defer to agencies regarding EIS analysis. City of Tacoma relied on credible outside LNG experts to analyze LNG safety, design and citing portions of the EIS.
- A higher probability risk is an appeal related to a procedural error. PSE has taken great efforts to ensure proper procedures have been followed.
- Nonetheless, an appeal to Superior Court could push substantive permit issuance into late Q2 2016, with significant schedule impacts to the Project.

Project Risk Mitigation: Regulatory Filing Delay (RSC)

Uncertainty remains with schedule related to WUTC Filings

Filing Background:

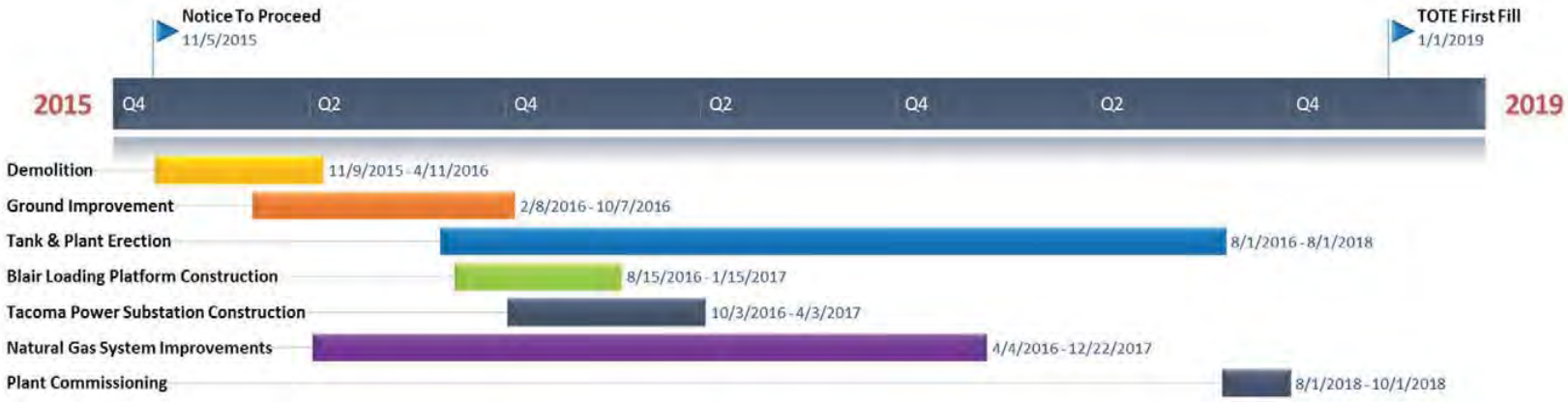
- On August 11, 2015, PSE filed a petition with the WUTC for:
  - (i) Approval of a Special Contract for Liquefied Natural Gas Fuel Service with Totem Ocean Trailer Express, Inc. and;
  - (ii) a Declaratory Order Approving the Methodology for Allocating Costs Between Regulated and Non-regulated Liquefied Natural Gas Services
- Approvals will allow PSE to serve TOTE as part of the regulated services and confirm PSE's proposed methodology for allocating costs

Schedule

- PSE filed August 11, 2015
- On September 9 the Administrative Law Judge issued an order with a procedural schedule that includes:
  - Technical conferences for the parties on September 18 and 21, and October 8
  - The parties will reconvene on October 13, 2015 and establish further process and procedural dates as are appropriate to bring the docket to conclusion
- On October 13 parties will reconvene to discuss progress in a prehearing and the Administrative Law Judge will establish procedural dates as appropriate to bring the docket to conclusion
- PSE anticipates resolution in 2015 or early 2016 at the latest; however, the schedule above was set to potentially facilitate a settlement with the other parties (Staff, Public Counsel and NWIGU) prior to November 5.

Construction Schedule

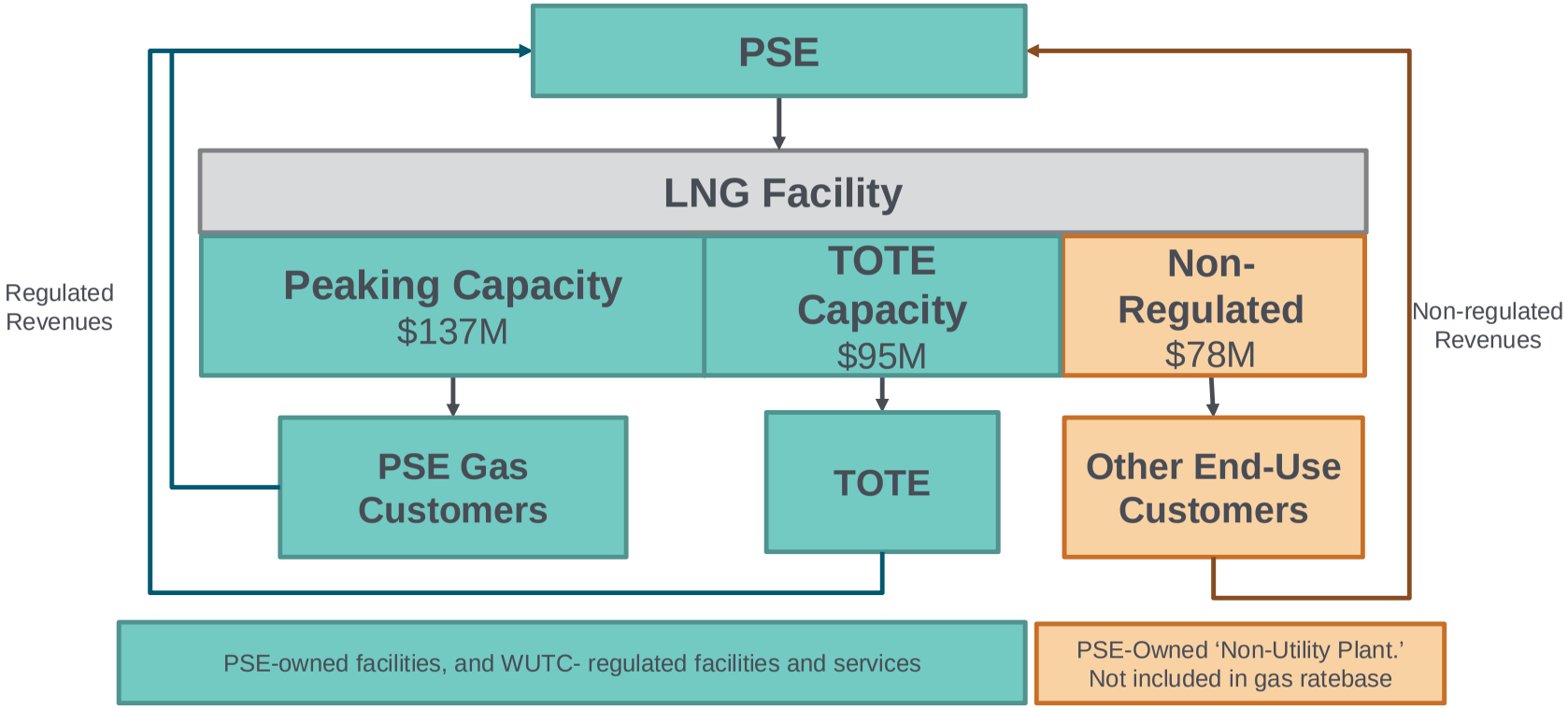
Schedule contingent on permitting and timely issuance of Notice to Proceed



- Critical path is demolition – ground improvement – LNG tank
  - Currently exploring concurrent work, night and weekend work, and increased staffing in order to maintain or gain schedule float

Project Structure

Proposed Project structure assumes allocation of costs based on utilization of services and non-regulated costs and revenues are ring-fenced



Notes: Dollar figures represent project capex (excluding AFUDC) allocated based on customer utilization of the Facility.

Marketing Strategy

Marketing Strategy:

- Focus on large marine shippers that:
  - Operate in the ECA
  - Have new ships on order or are in the market for replacement vessels
  - Make regular local calls within Puget Sound
  - Have regularly scheduled routes
  - Typically refuel (or are capable of refueling) in Tacoma or Seattle or other Puget Sound ports
- Medium to long-term contracts (5+ years), with tailored terms
- Leverage relationships with ports of Tacoma and Seattle and the newly formed Seaport Alliance
- Engage marine market and LNG technical experts, and/or hire proven LNG business developer

Updated Returns:

- Returns reflect most recent estimates used in the pro forma
- Updated 'Management's Base Case' such that 100% subscription is reached in 2021 (consistent with pending emissions regulations)

Forecasted Returns from Non-Regulated Sales Under Different Market Scenarios:

	Very Low Case	Low Case	Delayed Market Case	Management's Base Case	High Case
Unlevered Return	< 0%	5.59%	10.27%	12.58%	14.65%
ROE (PSE Level)	< 0%	7.50%	17.24%	22.06%	26.38%
ROE (PE Level)	< 0%	7.30%	18.99%	24.78%	29.96%
Probability	5%	15%	25%	35%	20%

Next Steps

- **Commercial**: Grow business development team and strategy to market the balance of the plant
- **Permitting**: Aggressively pursue timely issuance of necessary permits to finalize EIS mitigations agreement and issue Final EIS. Coordinate with other agencies to issue other substantive permits.
- **Regulatory**: Obtain regulatory approvals outlined in the current filling. PSE anticipates resolution on the schedule at an October 13 prehearing.
- **Government & Community Outreach**: Address concerns of the Puyallup Tribe to mitigate threat of appeal of permits or EIS.
- **Engineering and Construction:** EPC, general contractor, and demolition contractors have been selected. Ground Improvement contractors shortlisted to two. Preparing for mid-November mobilization.

Future Board Updates and Decisions

Decision / Update	Assumption	Date
Final project approval; execute all project construction agreements and issue Notice to Proceed.	Receipt of a final non-appealable EIS and permits; execution-ready construction contracts and all required real-estate rights.	Nov. 5, 2015

Appendix

- Permitting – Agency Approvals Schedule
- Project Budget

Permitting – Agency Approvals Schedule

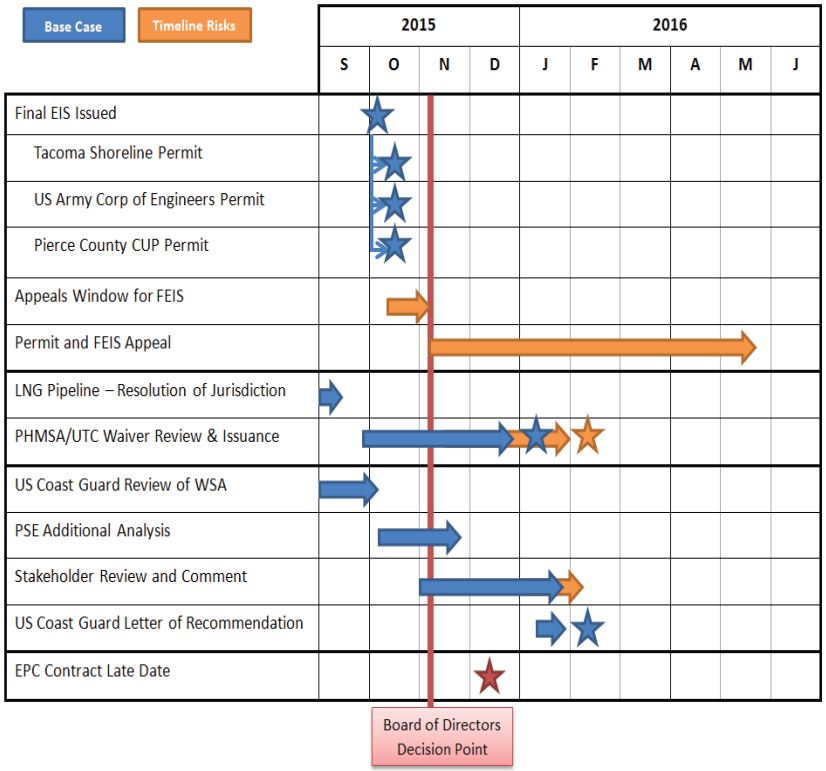
Permitting effort largely on schedule but open issues remain

Open Issues

- Puyallup criticism that the DEIS inadequately addresses siting and safety concerns
  - PSE and City of Tacoma expect to fully address the Tribes issues in the FEIS.
  - PSE is seeking a meeting with the Tribal Council and their technical staff.
- PSE reached an agreement in principle with the City of Tacoma on project impacts and associated mitigation; including financial contributions to:
  - Re-pave Taylor Way
  - Remodel and reopen a Tideflat-area fire station
  - Phase 1 Implementation for the ER&ITS
- PSE has been directed to apply for a state pipeline waiver with WUTC Office of Pipeline Safety for the cryogenic line to TOTE
  - All parties PHMSA, WUTC OPS and Coast Guard are in agreement
  - Process expected to take 90 days in review

Resolved Issues

- Endangered Species Act informal consultation process with NMFS and USFWS nearly complete with satisfactory terms
- All other permit processes are progressing well with permit issuance expected in 2015 or 2016



Project Budget

No change to overall budget

EPC Contract:

- Chicago Bridge and Iron submitted revised EPC pricing on June 1, 2015:
- Revised bid came in $20M higher than the 2013 FEED estimate primarily due to additional scope and design certainty (particularly TOTE fueling system and geotechnical issues)
- PSE believes contract price can be negotiated down by $2 million (reflected in the budget)

Geotech and Ground Improvement:

- Cost estimates for 'Miscellaneous Construction' increased with higher than anticipated bids for ground improvement
- Minimal impacts to the total budget as contingency was reduced with the reception of firm bids

Tacoma LNG Capital Budget *($ millions)*	
Development	$13
Fixed Price EPC	$192
Miscellaneous Construction	$49
PM & Outside Services	$14
Insurance	$2
Sales Tax	$13
Contingency	$19
Construction OHs	$9
LNG FACILITY TOTAL	**$311**
Gas System Upgrades	$41
Contingency	$8
Permitting Mitigations	$5
GAS SYSTEM IMPROVEMENTS TOTAL	**$54**
PROJECT CAPITAL TOTAL	**$364**
AFUDC (less reserve)	$55
CLOSING GROSS PLANT	**$419**
O&M (for development & construction)	$1.5

PUGET SOUND ENERGY

Exhibit B.

Project Description

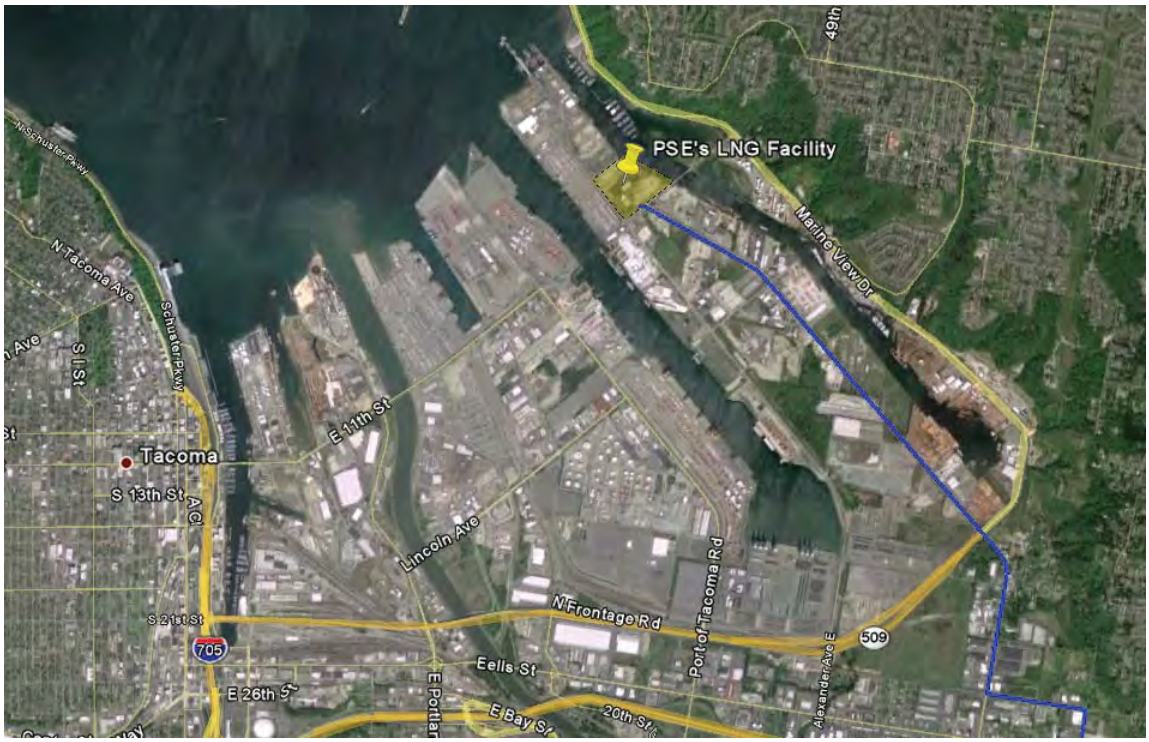
Contents

Project Description

The Tacoma LNG Project (or the "Project") consists of the permits, land lease, other real estate rights, commercial contracts, upgrades to PSE's gas system and other necessary rights, agreements, equipment and work to develop, construct, own and operate a liquefied natural gas ("LNG") facility at the Port of Tacoma in Pierce County, Washington.

The project will enable the construction of the Tacoma LNG Facility (or the "Facility") which will liquefy natural gas, and store and dispense LNG. The Facility will be located on a 33-acre parcel located at the Port of Tacoma, on the Hylebos waterway, on the corner of East 11th Street and Alexander Avenue East. ***Figure 1*** shows the location of the Tacoma LNG Facility.

Figure 1. Tacoma LNG Facility Location (new high pressure pipeline shown in blue).



Plant Capacity

The Facility will be capable of producing 250,000 gallons of LNG per day and will have onsite LNG storage capacity of approximately 8 million gallons. The Facility will be capable of injecting 66,000 Dth/day of vaporized gas into PSE's system and when combined with the diversion of 19,000 Dth/day of delivered gas, will provide 85,000 Dth/day of peak-day demand supply. The Facility will dispense liquefied natural gas to LNG fuel customers via ship/bunker vessel loading facilities located on the water and tanker truck loaders.

Purpose

The Tacoma LNG Project is being developed to achieve the following objectives:

1. Provide PSE's gas system with a cost effective resource to meet peak-day loads; and

2. Provide LNG as a transportation fuel to large maritime and trucking customers as well as industrial users and other gas markets in the region.

LNG plants have a long history as a natural gas resource used by utilities to manage peak-day loads. Natural gas is liquefied over the summer months and stored in a large cryogenic tank. During peak winter days, the liquefied gas is vaporized and injected into the distribution system. This resource will allow PSE to avoid purchasing 365-day pipeline capacity to meet a peak demand for a few days that may only occur once every few winters. PSE has compared the cost of this peak-day resource with other available peak-day resource alternatives and has determined that the Tacoma LNG Facility is the most cost-effective resource option under a wide range of scenarios (see ***Exhibit M***).

The Facility will also help meet the demand for LNG as a fuel by regional maritime, heavy duty trucking, industrial and other customers. The development of an LNG facility to provide fuels for the transportation market is consistent with the regional and state efforts of the Puget Sound Clean Air Agency, U.S. EPA and the Washington Department of Ecology, to establish strategies and programs aimed at reducing impacts to the Puget Sound air shed. In order to meet the demands of the maritime market, the Facility will be located adjacent to the water at the Port of Tacoma and will be capable of filling TOTE ships and other vessels or bunker barges. The Facility will also be capable of filling LNG tanker trucks that will supply regional truck fleets and other customers.

Project Infrastructure

Project infrastructure includes the equipment and foundations located at the Port of Tacoma, as well as associated improvements to PSE's natural gas distribution system.

At a high level, the Project infrastructure includes the following components:

Site Improvement and Foundations	The Project will require significant ground improvement work to meet federal seismic guidelines for an LNG plant. The ground improvement will consist of 3,000 – 6,000 injected grout columns (depending on pile diameter selected). In addition, the storage tank will be built upon a foundation with seismic isolators.
Buildings and Structures	The Project will repurpose an existing building as the control room, office space, maintenance area, and indoor housing for weather-sensitive equipment. Other structures will include a compressor building, power distribution center building, an existing warehouse, and potentially sound walls around the liquefaction heat exchangers.
Receiving Equipment	Receiving equipment includes inlet gas compression, particulate filtration, and metering.
Pretreatment System	The pretreatment system removes carbon dioxide and sulfur compounds. The pretreatment system also removes any entrained water in the gas stream that had not been previously removed. The gas that is eventually liquefied is mainly methane with a small amount of nitrogen.

Liquefaction Train and Compressors	The gas is cooled to -260 degrees Fahrenheit, using a heat exchanger to transfer heat from the gas to a refrigerant loop. In the early stages, heavy hydrocarbons that have a higher freezing point than methane are condensed out of the gas stream so they don't freeze and foul the downstream components. These hydrocarbons are predominately used for process fuel at the plant. The refrigerant loop is comprised of a blend of methane, iso-pentane, propane, and ethane and requires a large compressor, which consumes the majority of the electric load at the Facility (approximately 14 MW). The system used at the Facility will be a single mixed-refrigerant (or "SMR") system.
LNG Tank	LNG will be stored onsite in a full-containment field-erected tank, which consists of an inner nickel-steel tank and an outer concrete tank that share a common roof. In the event of a failure of the inner tank, the outer tank will contain the LNG. LNG is removed from the tank via submersed pumps that pump LNG out through the roof. There are no wall penetrations in either tank. The tank is designed to withstand a 2,500-year earthquake, which greatly exceeds the earthquake design used for roads, bridges and most other commercial structures. LNG in full-containment tanks is stored at slightly above atmospheric pressure. The fact that the tanks are not kept under pressure is a key safety feature of the plant.
Vaporization Train	The vaporization train includes the facilities that PSE will need on a peak day to convert LNG in the storage tank to a gas vapor and inject it into the distribution system to serve PSE's retail gas customers.
Truck Loading System	The Facility will have two truck loading racks capable of filling tanker trucks simultaneously.
Underground Pipeline to TOTE	The Facility will include a cryogenic pipeline that will connect the onsite storage tank to a fueling station located at TOTE's berthing location. This line will be buried, crossing beneath a public road, rail line and TOTE's property.

Marine Fueling System	The marine fueling system will be located near the stern end of TOTE's berthing location. The system consists of an articulated loading arm with connections for both LNG and vapor.
In-Water Work	PSE must construct a small platform near the stern end of TOTE's berthing location to support TOTE's bunkering operations. The platform will support parts of the marine fueling system and will be large enough to meet federal standards for operators and emergency access.
Balance-of-Plant Equipment	Balance-of-plant equipment includes an onsite backup generator for essential loads, a gas flare, instrument air system, water treatment unit, power distribution systems, safety and security equipment, and an integrated plant control system.
Substation	Tacoma Power will construct and own a substation onsite that connects to their 115 kV transmission system.
Improvements to the Gas Distribution System	In addition to the Facility (located on PSE and TOTE's leased property), the Project will include improvements to PSE's distribution system required to support the Facility. These upgrades include four miles of new pipe at the Port of Tacoma, one mile of new pipe and a new limit station in south Tacoma, and improvements at the Frederickson gate station.

Facility Expansion

The Tacoma LNG Project has been designed to allow for capacity expansions in the future. The site can accommodate two or possibly three additional liquefaction trains, each with capacities of up to 500,000 gallons per day. These expansions would provide up to 1.5 million gallons per day of liquefaction capacity. The amount of fuel PSE can logistically accommodate on the site is limited by the size of the tank. For example, at one million gallons of liquefaction per day, the onsite storage tank will only hold eight days of production.

The Facility's current design does not include rail loading capability. However, there are railroad tracks that enter the site and facilities to load rail cars could be added later, if the market for LNG by rail develops. The Facility has access to the Hylebos waterway and facilities could be

developed to load LNG barges from that side of the site. However, at this point the only marine loading facilities included in the design are located at TOTE's site on the Blair waterway. Both marine facilities are addressed in environmental review and site-specific permits.

The parcel adjacent to the Facility is currently an EPA Superfund clean-up site undergoing long-term remediation. While the timeline for remediation is unclear, we do know that it will not be complete prior to construction of the Facility. In the event that the market for LNG in the Northwest develops beyond the capacity the current site can accommodate, there may be an opportunity to expand into this adjacent parcel.

There are also known areas of contamination on and adjacent to the Facility site and in the area that may be used for the new high pressure pipeline that extends to the Facility. Cooperation and consensus will be required among the cleanup agencies to ensure that construction and operation of the Tacoma LNG Facility will not impede cleanup efforts nor affect compliance with established cleanup agreements. PSE has been working closely with cleanup staff from EPA, WDOE and the Port to ensure that our construction is not impacted or delayed by these issues, and that the Project's construction and operations will not impede future cleanup.

PUGET SOUND ENERGY

Exhibit C.

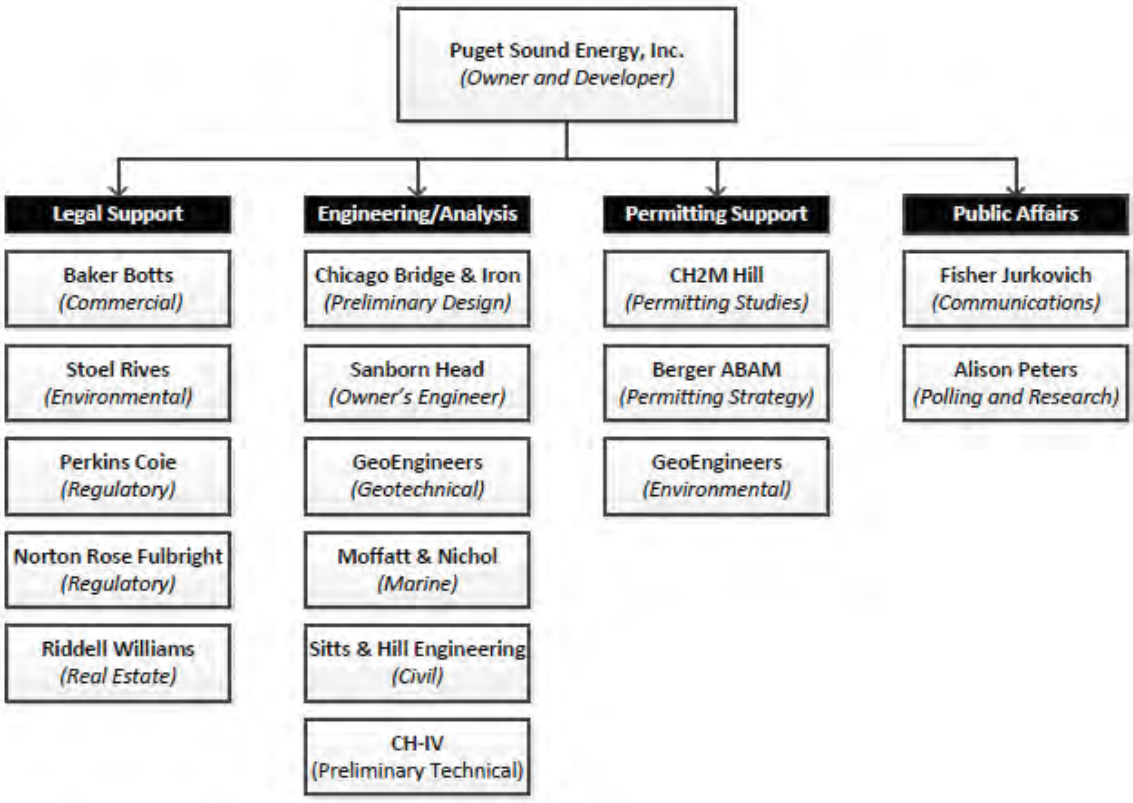
Principal Contractual Relationships

Contents

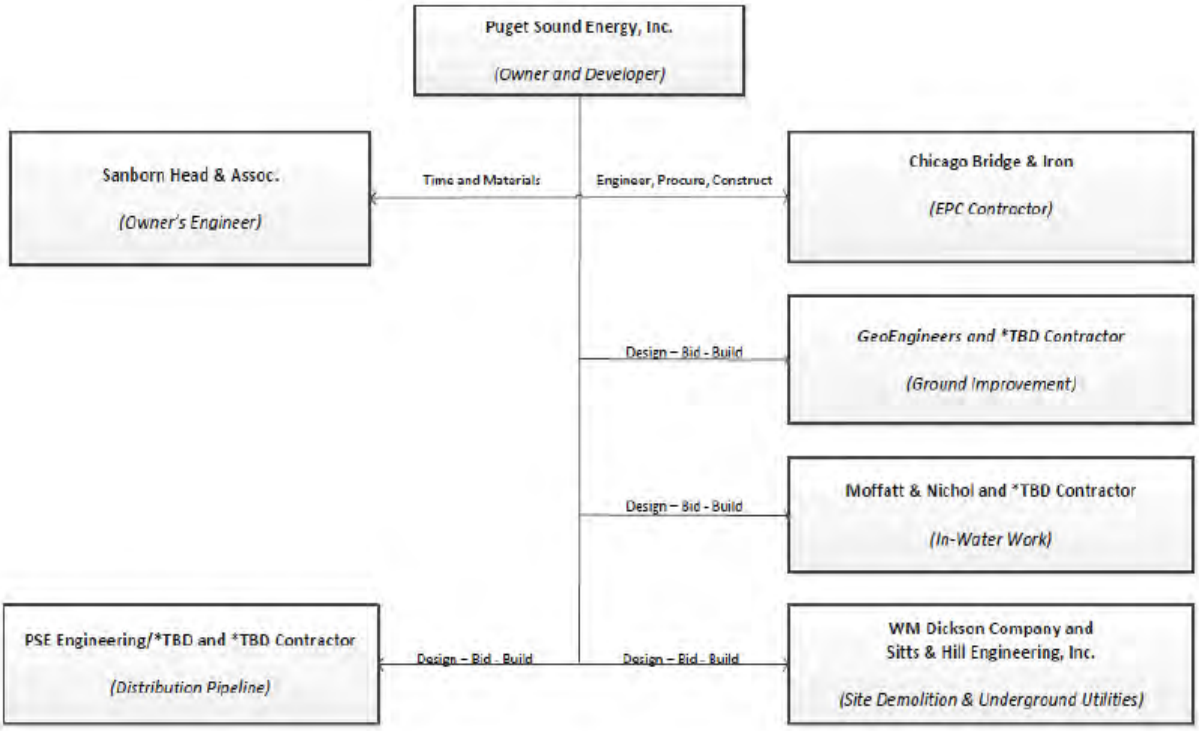
Principal Contractual Relationships

This exhibit presents the principal contractual relationships for each of the three phases of the Project: Development, Design and Construction, and Operations.

Development



Design and Construction



**Ground Improvement contractor to be selected in September 2016.*
**In-Water Work contractor to be selected in the spring of 2016.*
**Distribution Pipeline contractors to be selected in 2016.*

Operations

PSE expects to operate the Facility. Contracts may be pursued with service providers for security, stevedoring and other minor services; however, this is not expected to represent a significant portion of the operations and maintenance of the Facility. See ***Exhibit O*** for a diagram that depicts PSE's Operations organization.

PUGET SOUND ENERGY

Exhibit D.

Project Schedule and Budget

Contents

Project Schedule and Budget

The Tacoma LNG Project is divided into two distinct phases: development and construction. Development activities include the work PSE has undertaken to date and is expected to continue at least until November 2015 when PSE will enter into the construction contracts to build the Facility. The construction phase begins with the execution of the EPC contract and other construction contracts, and continues through the commercial operations date (COD).

As discussed in the main report, PSE is still awaiting regulatory and permitting approvals that could cause project delays and an extension of the development phase. The budget and schedule included in this exhibit assume that PSE enters into construction contracts in November 2015.

Project Development

Project development work began in 2012. Since that time, PSE has completed several milestones and is now ready to enter into the construction phase of the Project. The major project development work includes:

- Commercial and technical feasibility and due diligence
- Identifying and securing the Facility site and procuring all required Project real estate rights
- Preliminary Facility design
- Preliminary distribution upgrades design
- Contracting with TOTE
- Permitting
- WUTC Regulatory Filings

The development budget could change if permits are appealed or delayed (for a full description of permitting timeline and appeals risk see ***Exhibit I***). A delay in permit issuance will likely not add material costs to the budget, however, a long appeals process could add significant cost (relative to the $3.4 million permitting budget in the development phase).

To date, PSE has spent $14.1 million on the Project and anticipates spending an additional $1.1 million to complete the development phase.

Project Construction

Construction activities will commence immediately after final Board approval of the Project, including approval of the EPC contract with additional contracts awarded for building demolition, ground improvement, general site work, and underground utilities.

The critical path for the Project is demolition, ground improvement, and tank erection. ***Figure 5*** provides a high level project construction schedule.

A complete environmental assessment of the site was completed and is accounted for in the building abatement and demolition contract. The structures on site contain lead paint and asbestos building materials that must be abated prior to physical demolition of the buildings. After abatement, the buildings will be demolished and, to the maximum extent possible, be reused or recycled. The demolition contractor is estimating that over 75 percent of the building materials (by weight) will be reused or recycled. Some concrete material may actually be ground and used on site as a cost saving measure.

Demolition is scheduled such that the buildings over the future LNG tank and process area are demolished first. This will allow the ground improvement contractor to mobilize on site to begin work in the tank area. The field-erected LNG tank is the long-lead element of the Project.

Ground improvement work will involve two drill rigs working two 10 to 12 hour shifts, five days per week (with maintenance on Saturdays) for approximately seven months. While installation of grout displacement piles is significantly quieter than driven piles, noise from associated equipment (heavy equipment, trucks, and cement pumps) may possibly limit construction hours to a 13 or 14 hour day. Contingencies for increasing productivity (such as working seven days per week and/or using more rigs) are being evaluated as part of the ground improvement contractor selection process.

Chicago Bridge & Iron will also likely mobilize at the site and begin work on the LNG tank foundation before all ground improvement work is complete. Tank and plant erection and commissioning is expected to take 25 to 27 months, although LNG is being produced during the two month commissioning process.

Independent activities that are not on the critical path include in-water construction activities on the Blair Waterway, construction of the Tacoma Power substation on site, and upgrades to the PSE natural gas distribution system.

Figure 1. Total Project Budget ($1,000s)

	2012	2013	2014	2015	2016	2017	2018	TOTAL
Tacoma LNG Facility Capital Budget								
Development Budget	520	2,672	4,743	5,077	-	-	-	**13,012**
CBI Milestone Payments	-	-	-	33,590	70,058	66,220	22,073	**191,941**
Construction Outside of EPC Scope:								
Capital Spares	-	-	-	-	-	400	800	**1,200**
Demolition	-	-	-	824	1,649	-	-	**2,473**
Soil Stabilization	-	-	-	-	20,620	-	-	**20,620**
Substation & Utilities	-	-	-	-	3,673	4,692	-	**8,365**
Direct Bunkering Line to TOTE	-	-	-	-	1,977	7,907	-	**9,884**
In-water Work at the TOTE Site	-	-	-	200	5,217	883	-	**6,300**
Project Management & Outside Services								
PSE Labor	-	-	-	120	853	853	3,080	**4,905**
Outside Services and QA	-	-	-	167	1,000	750	563	**2,479**
Port of Tacoma Lease Payments	-	-	-	292	1,752	1,752	1,314	**5,110**
Permitting Support & Mitigations	-	-	-	-	1,250	-	-	**1,250**
Insurance	-	-	-	231	604	424	318	**1,576**
Sales Tax	-	-	-	745	4,965	5,243	2,519	**13,471**
Contingency	-	-	-	1,855	9,790	6,289	1,104	**19,038**
PSE Construction OH's	-	-	-	1,153	3,787	2,948	1,261	**9,149**
Facility Sub-Total	**520**	**2,672**	**4,743**	**44,253**	**127,194**	**98,359**	**33,031**	**310,773**
Gas System Upgrades Capital Budget								
General Development	45	203	-	63	-	-	-	**310**
South Tacoma Upgrades	-	-	282	390	3,539	6,851	-	**11,061**
Port of Tacoma 4 Mile 16"	-	-	170	656	2,845	25,619	-	**29,290**
Contingency	-	-	-	146	1,347	6,850	-	**8,343**
Permitting Mitigations	-	-	-	-	4,500	-	-	**4,500**
Gas System Upgrades Sub-Total	**45**	**203**	**452**	**1,255**	**12,230**	**39,320**	**-**	**53,504**
PROJECT CAPITAL COSTS	**565**	**2,875**	**5,195**	**45,509**	**139,424**	**137,679**	**33,031**	**364,277**
AFUDC (less reserve)	22	157	483	1,324	9,444	20,542	22,723	**54,696**
CLOSING GROSS PLANT	**587**	**3,032**	**5,678**	**46,833**	**148,868**	**158,221**	**55,754**	**418,973**
O&M During Construction								
Regulated LNG Service	-	-	440	336	50	50	50	**926**
Non-Regulated LNG Service	-	-	-	84	150	150	150	**534**

Figure 2. Development Budget – Shaded cells indicate actuals ($1,000s)

	TOTAL	2012 Total	2013 Total	2014 Total	2015 Jan	2015 Feb	2015 Mar	2015 Apr	2015 May	2015 Jun	2015 Jul	2015 Aug	2015 Sep	2015 Oct
Development														
Facility														
Engineering	**7,429**	357	1,836	2,205	66	505	304	330	575	82	790	205	87	87
Permitting/Legal	**3,368**	136	698	1,700	96	141	142	52	108	24	27	70	88	88
Site/Real Estate	**1,078**	10	53	384	59	87	55	43	78	14	69	74	72	79
Community & Gov.	**852**	17	86	453	22	24	26	21	55	20	40	34	35	20
OH and Expenses	**284**	*OH's Included in Above Totals*			16	34	33	23	35	14	41	34	28	28
Facility Sub-Total	**13,012**	**520**	**2,672**	**4,743**	**258**	**791**	**560**	**468**	**851**	**154**	**966**	**417**	**310**	**302**
Distribution System														
Port of Tacoma	**924**	45	203	170	23	29	25	87	26	27	23	53	107	107
South Tacoma	**538**	-	-	282	6	18	11	28	15	26	10	10	66	66
Contingency	**73**	-	-	-	-	-	-	-	-	-	-	-	37	37
Distribution Sub-Total	**1,535**	**45**	**203**	**452**	**29**	**47**	**36**	**115**	**41**	**53**	**34**	**62**	**210**	**210**
TOTAL Capital	**14,547**	**565**	**2,875**	**5,195**	**287**	**838**	**596**	**583**	**892**	**207**	**999**	**479**	**520**	**511**
TOTAL O&M	**702**	**-**	**-**	**440**	**-**	**21**	**51**	**22**	**3**	**-**	**22**	**93**	**30**	**20**

Figure 3.1. Facility Capital Budget by Month ($1,000s)

	2015 Nov	2015 Dec	2016 Jan	2016 Feb	2016 Mar	2016 Apr	2016 May	2016 Jun	2016 Jul	2016 Aug	2016 Sep	2016 Oct
CBI EPC Milestone Payments	27,831	5,758	6,718	2,879	4,799	3,839	6,718	7,678	4,799	6,718	6,718	7,678
Miscellaneous	412	612	2,901	2,901	2,901	2,901	2,289	2,289	2,289	3,172	3,172	3,641
Capital Spares	-	-	-	-	-	-	-	-	-	-	-	-
Demo and Civil Work (Soil Stabilization)	412	412	412	412	412	412	-	-	-	-	-	-
Geotechnical	-	-	2,062	2,062	2,062	2,062	2,062	2,062	2,062	2,062	2,062	2,062
Substation	-	-	-	-	-	-	-	-	-	-	-	469
Direct Line to TOTE	-	-	-	-	-	-	-	-	-	-	-	-
In water Work at TOTE Site	-	200	200	200	200	200	-	-	-	883	883	883
Utilities	-	-	227	227	227	227	227	227	227	227	227	227
Project Management & Outside Services	289	289	300	300	300	1,550	300	300	300	300	300	300
PSE Labor	60	60	71	71	71	71	71	71	71	71	71	71
Outside Services/QA	83	83	83	83	83	83	83	83	83	83	83	83
Rent - Lease	146	146	146	146	146	146	146	146	146	146	146	146
Permitting Support and Mitigation	-	-	-	-	-	1,250	-	-	-	-	-	-
Insurance	196	35	215	35	35	35	35	35	35	35	35	35
Builders Risk Insurance	-	35	35	35	35	35	35	35	35	35	35	35
Pollution Insurance	196	-	-	-	-	-	-	-	-	-	-	-
Marine Insurance	-	-	180	-	-	-	-	-	-	-	-	-
Plant Sales Tax	584	161	424	368	401	395	383	389	338	481	481	540
Sales Tax	584	161	424	368	401	395	383	389	338	481	481	540
Payment in Lieu of Sales Tax	-	-	-	-	-	-	-	-	-	-	-	-
Contingency and OH's	2,375	633	1,167	847	1,004	963	1,017	1,095	859	1,352	1,352	1,519
5% Contingency: EPC Initial Scope of Work	1,392	288	336	144	240	192	336	384	240	336	336	384
10%-15% Contingency: Substation, Demo & Geotech	54	54	364	364	364	364	310	310	310	310	310	380
25% - 40% Contingency: TOTE Line & In-Water Work	-	67	119	119	119	119	51	51	51	349	349	349
Construction OH: 3% (PSE Labor at 13%)	929	224	348	220	282	289	320	350	258	358	358	406

Figure 3.2. Facility Capital Budget by Month ($1,000s)

	2016 Nov	2016 Dec	2017 Jan	2017 Feb	2017 Mar	2017 Apr	2017 May	2017 Jun	2017 Jul	2017 Aug	2017 Sep	2017 Oct
CBI EPC Milestone Payments	5,758	5,758	1,919	8,637	8,637	5,758	6,718	5,758	5,758	4,799	5,758	4,799
Miscellaneous	2,341	2,341	2,341	1,458	1,458	1,458	1,458	1,458	1,458	1,458	469	469
Capital Spares	-	-	-	-	-	-	-	-	-	-	-	-
Demo and Civil Work (Soil Stabilization)	-	-	-	-	-	-	-	-	-	-	-	-
Geotechnical	-	-	-	-	-	-	-	-	-	-	-	-
Substation	469	469	469	469	469	469	469	469	469	469	469	469
Direct Line to TOTE	988	988	988	988	988	988	988	988	988	988	-	-
In water Work at TOTE Site	883	883	883	-	-	-	-	-	-	-	-	-
Utilities	-	-	-	-	-	-	-	-	-	-	-	-
Project Management & Outside Services	300	300	280	280	280	280	280	280	280	280	280	280
PSE Labor	71	71	71	71	71	71	71	71	71	71	71	71
Outside Services/QA	83	83	63	63	63	63	63	63	63	63	63	63
Rent - Lease	146	146	146	146	146	146	146	146	146	146	146	146
Permitting Support and Mitigation	-	-	-	-	-	-	-	-	-	-	-	-
Insurance	35	35	35	35	35	35	35	35	35	35	35	35
Builders Risk Insurance	35	35	35	35	35	35	35	35	35	35	35	35
Pollution Insurance	-	-	-	-	-	-	-	-	-	-	-	-
Marine Insurance	-	-	-	-	-	-	-	-	-	-	-	-
Plant Sales Tax	382	382	306	345	337	283	315	298	2,541	264	181	161
Sales Tax	382	382	306	345	337	283	315	298	291	264	181	161
Payment in Lieu of Sales Tax	-	-	-	-	-	-	-	-	2,250	-	-	-
Contingency and OH's	1,201	1,201	886	1,102	1,101	865	944	866	933	786	578	499
5% Contingency: EPC Initial Scope of Work	288	288	96	432	432	288	336	288	288	240	288	240
10%-15% Contingency: Substation, Demo & Geotech	70	70	70	70	70	70	70	70	70	70	70	70
25% - 40% Contingency: TOTE Line & In-Water Work	544	544	544	247	247	247	247	247	247	247	-	-
Construction OH: 3% (PSE Labor at 13%)	299	299	175	352	352	260	291	260	327	229	220	189

Figure 3.3. Facility Capital Budget by Month ($1,000s)

	2017 Nov	2017 Dec	2018 Jan	2018 Feb	2018 Mar	2018 Apr	2018 May	2018 Jun	2018 Jul	2018 Aug	2018 Sep
CBI EPC Milestone Payments	4,799	2,879	1,919	3,839	2,879	4,799	3,839	-	-	-	4,799
Miscellaneous	200	200	200	200	200	200	-	-	-	-	-
Capital Spares	200	200	200	200	200	200	-	-	-	-	-
Demo and Civil Work (Soil Stabilization)	-	-	-	-	-	-	-	-	-	-	-
Geotechnical	-	-	-	-	-	-	-	-	-	-	-
Substation	-	-	-	-	-	-	-	-	-	-	-
Direct Line to TOTE	-	-	-	-	-	-	-	-	-	-	-
In water Work at TOTE Site	-	-	-	-	-	-	-	-	-	-	-
Utilities	-	-	-	-	-	-	-	-	-	-	-
Project Management & Outside Services	280	280	551	551	551	551	551	551	551	551	551
PSE Labor	71	71	342	342	342	342	342	342	342	342	342
Outside Services/QA	63	63	63	63	63	63	63	63	63	63	63
Rent - Lease	146	146	146	146	146	146	146	146	146	146	146
Permitting Support and Mitigation	-	-	-	-	-	-	-	-	-	-	-
Insurance	35	35	35	35	35	35	35	35	35	35	35
Builders Risk Insurance	35	35	35	35	35	35	35	35	35	35	35
Pollution Insurance	-	-	-	-	-	-	-	-	-	-	-
Marine Insurance	-	-	-	-	-	-	-	-	-	-	-
Plant Sales Tax	130	81	559	96	80	125	73	-	500	-	1,086
Sales Tax	130	81	59	96	80	125	73	-	-	-	86
Payment in Lieu of Sales Tax	-	-	500	-	-	-	-	-	500	-	1,000
Contingency and OH's	418	260	231	374	295	453	367	52	67	52	475
5% Contingency: EPC Initial Scope of Work	240	144	96	192	144	240	192	-	-	-	240
10%-15% Contingency: Substation, Demo & Geotech	-	-	-	-	-	-	-	-	-	-	-
25% - 40% Contingency: TOTE Line & In-Water Work	-	-	-	-	-	-	-	-	-	-	-
Construction OH: 3% (PSE Labor at 13%)	178	116	135	182	151	213	175	52	67	52	236

Figure 4. Distribution Upgrades by Month ($1,000s)

	2015 Nov	2015 Dec	2016 Jan	2016 Feb	2016 Mar	2016 Apr	2016 May	2016 Jun	2016 Jul	2016 Aug	2016 Sep	2016 Oct	2016 Nov
Gas Distribution Upgrades													
Fredrickson Gate Station Expansion	21	21	21	21	22	22	22	22	416	394	394	394	394
Golden Given Limit Station	17	17	17	17	18	18	18	18	18	18	18	18	18
Golden Given Pig Launcher	4	4	4	4	5	5	5	5	5	5	5	50	45
Golden Given 1 Mile 12"	18	18	18	18	19	19	19	19	19	19	19	19	19
Port of Tacoma 4 Mile 16"	107	107	107	107	112	112	112	112	112	112	632	620	620
Clover Creek Limit Station	6	6	6	6	7	7	7	7	47	41	41	41	41
Contingency	37	37	37	37	38	38	38	38	130	124	234	241	240
Permitting Mitigations	-	-	-	-	4,500	-	-	-	-	-	-	-	-
TOTAL	**210**	**210**	**210**	**210**	**4,720**	**220**	**220**	**220**	**747**	**712**	**1,342**	**1,383**	**1,377**

	2016 Dec	2017 Jan	2017 Feb	2017 Mar	2017 Apr	2017 May	2017 Jun	2017 Jul	2017 Aug	2017 Sep	2017 Oct	2017 Nov	2017 Dec
Gas Distribution Upgrades													
Fredrickson Gate Station Expansion	394	-	-	-	-	-	-	-	-	-	-	-	-
Golden Given Limit Station	18	18	18	161	143	143	143	143	143	143	143	143	143
Golden Given Pig Launcher	45	45	45	48	48	48	48	48	48	-	-	-	-
Golden Given 1 Mile 12"	19	19	19	20	20	20	20	20	1,643	1,622	1,622	-	-
Port of Tacoma 4 Mile 16"	100	100	100	105	105	105	4,305	4,200	4,200	4,200	4,200	4,200	-
Clover Creek Limit Station	41	41	41	43	43	43	-	-	-	-	-	-	-
Contingency	130	47	47	80	76	76	953	931	1,273	1,258	1,258	916	30
Permitting Mitigations	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	**748**	**270**	**270**	**457**	**434**	**434**	**5,468**	**5,341**	**7,306**	**7,223**	**7,223**	**5,259**	**173**

Figure 5. Project Schedule

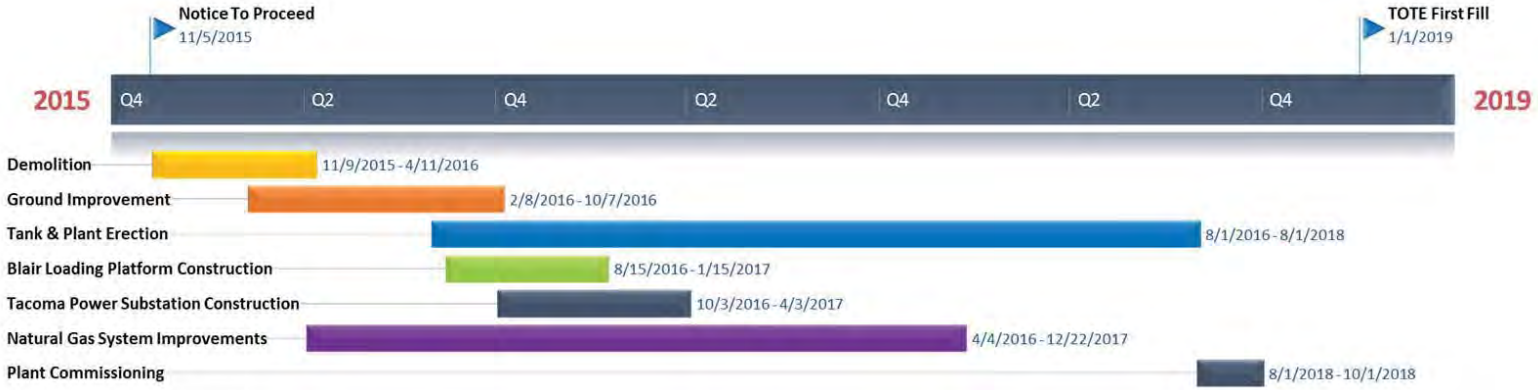


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Exhibit E.

Tacoma LNG Project Checklist

Tacoma LNG Project Checklist

Development Checklist:

Item	Description	Status	Comments
Commercial			
Marketing Customers			
TOTE	Fuel Supply Agreement	X	Executed October 2014
TOTE	Interim Supply Agreement	X	Executed July 2015
Permitting			
City of Tacoma	SEPA EIS		City is SEPA EIS lead agency; FEIS anticipated late September 2015. Required before other permits can be issued
	EIS Mitigation Agreement		Agreement currently in draft form; anticipated mid- to late October 2015.
	Shoreline Substantial Development Permit		Permit for shoreline development at LNG Facility and Blair Waterway Bunkering Station anticipated mid-late October 2015
	Wetlands and Critical Areas Review (FWHCA) Permit Review		In queue with Shoreline permit: expected mid- to late October 2015
	Floodplain Development Permit Review		Development required because of City's participation in National Flood Insurance Program and LNG projects development within identified floodplain. In queue with the Shoreline permit: expected mid-late October 2015
	Clear and Grade Permit/Demolition Permit		Site clearing and demolition of existing structures at Facility site. Permit expected early October 2015
Pierce County	Conditional Use Permit		For Golden Givens Limit Station: anticipate CUP permit in mid- to late October 2015

Item	Description	Status	Comments
Department of Ecology	Coastal Zone Consistency Determination in concert with Shoreline Permit issuance		Applicable in coastal counties for purpose of determining compliance with: Shoreline Management Act, SEPA, Clean Water Act, Clean Air Act, EFSEC, and Ocean Resource Management Act anticipated October 2015
	Section 401 Water Quality Certification		Certification to conduct any activity that requires excavation in or might result in a discharge of dredge or fill material into water or non-isolated wetlands. Required before USACE permits can be issued and anticipated late October 2015
	Spill Prevention and Spill Response Plan (CWA, 33 U.S.C.§1321(j))		Spill response plan complete in October 2015
Department of Fish and Wildlife	Hydraulic Project Approval		Permit for work that uses, diverts, obstructs, or changes the natural flow or bed of any salt or fresh waters of the State. Ready for issuance pending release of FEIS
U.S. Army Corp of Engineers	NEPA, review by adoption of SEPA EIS		USACE will be NEPA EIS lead agency. NEPA review is concurrent with issuance of the USACE permits; expected October 2015
	Section 10 (Rivers and Harbors Act)		Dept. of Ecology, WDFW and City of Tacoma review with permit issuance anticipated in late October 2015
	Section 404 (Clean Water Act) Individual Permit or Programmatic Nationwide Permit		In-water work at the pier/LNG loading facility with permit issuance expected late October 2015
	Section 106 NHPA Consultation		Nation to Nation consultation: USACE to Tribes: 106 consultation with DAHP and applicable tribes. Results in issuance of USACE Permit expected late October 2015
	Nationwide 3 Repair and Maintenance		Replacement of stormwater terminal end installation of inline tide valve expected late October 2015

Item	Description	Status	Comments
U.S. Coast Guard	Letter of Intent (33 CFR Part 127)	X	PSE sent letter of intent along with the Preliminary Waterway Suitability Assessment (WSA) in December 2014
	Submittal of Waterway Suitability Assessment (NVIC 01-2011)	X	Address requirements of 33 CFR Part 127: Coast Guard assessment of LNG Marine Operations. Submitted in July 2015
National Marine Fisheries Service and USFWS	Section 7 of Endangered Species Act	X	Provide biological concurrence on marine species that are federally listed as threatened or endangered and on managed fisheries. Oversight of activities associated with marine facilities construction and essential fish habitat. Informal consultation occurred here expediting permitting process
	Essential Fish Habitat, Magnuson-Stevens Fishery Management and Conservation Act		Underwater noise associated with pile driving for pier and dolphin installation. USFWS reviewing Underway Noise Monitoring Plan anticipated complete by October 2015
	Marine Mammal Protection Act. Level B harassment authorization, if required		Underwater noise associated with pile driving for dolphin installation. Federal Services reviewing monitoring plans; anticipated complete by October 2015
Engineering and Construction			
EPC Contract	EPC Contract with CBI ready for execution		Final price and contract negotiations are underway and nearing completion.
Site Demolition & Underground Utilities	Design-Bid Build Agreement ready for execution		Awarded to Diamond B Constructors and WM Dickson Co. Contracts nearing completion
Ground Improvement	Design-Bid Build Agreement		GeoEngineers and Contractor TBD. In discussions with two finalist contractors. To be awarded in September 2015

Item	Description	Status	Comments
Project Agreements			
City of Tacoma	PILOT Agreement	X	Executed 12/11/2014.
State Regulatory			
TOTE FSA Approval as a Special Contract	On 8/11/15, PSE submitted a filing with the WUTC to request approval of the TOTE FSA as a special contract. The WUTC will need to determine that the TOTE FSA meets the criteria of a special contract. This approval is necessary to serve TOTE as part of PSE's regulated service.		PSE submitted the filing on 8/11/15 and requested approval by 11/5/15. In a pre-hearing conference, the administrative judge set a schedule that includes technical conferences in the coming weeks and another hearing on 10/13/15 to determine a final schedule.
Allocation Methodology Approval	On 8/11/15, PSE submitted a filing with the WUTC and requested a declaratory order approving PSE's proposed accounting methodology for allocating regulated and non-regulated costs associated with the Tacoma LNG Facility.		
Real Estate Rights			
Port of Tacoma	Tacoma LNG Facility Lease	X	Executed in July 2014
	Bunkering Station Easement		Parties have agreed to terms for both of these agreements and the documents will go before the Port Commission on October 6, 2015. TOTE will also be a party to these agreements.
	LNG Direct Pipeline & Vapor Control Easement		
	Additional land required for Frederickson Gate Station upgrade	X	
TOTE	Shared access agreement for outlining use of preferential use area		PSE and TOTE have exchanged draft with no major disagreements. PSE anticipates executing this agreement in October.
City of Tacoma	Franchise Agreement	X	Franchise agreement applicable to both LNG pipeline and distribution upgrades. Unanimously approved by the Tacoma City Council September 15, 2015

Item	Description	Status	Comments
Private landowner	Land purchase - Golden Givens limit station	X	Purchased in December 2014
City of Fife	Franchise Agreement rights for distribution upgrades	X	Gas Franchise agreement is current; agreement expires January 1, 2018.
Pierce County	Franchise Agreement rights for distribution upgrades	X	Gas Franchise agreement is current; agreement expires on March 19, 2027.
Insurance			
Construction insurance coverage	Purchase Builders Risk, Supplemental Pollution and Marine Coverages	X	PSE has received bids for construction insurance coverages and is ready to bind the coverage pending final Board approval.

Construction Checklist

Item	Description	Status	Comments
Permitting			
City of Tacoma	Building Permit will be required for each structure		Ensure compliance with IBC and city and state policies and regulation, including fire codes. Permits will be issued during construction phase.
City of Fife	Flood permit		For distribution upgrades activities proposed to be constructed within the 100-year floodplain. Permit anticipated in Q2 2016
	Critical Areas Review		Required for distribution upgrades construction activities within a critical area: City review in Q2 2016
Pierce County	Construction (Clear & Grade) Permit		Allows for site clearing and demolition of existing structures in compliance with local, state and federal regulations at existing Frederickson gate station. Anticipate permit in Q2 2016

Item	Description	Status	Comments
Pierce County	Building Permit		Project compliance with IBC, Pierce County, and state policies and regulations at limit station and Frederickson gate station. Permits: Q2 2016 for Fredrickson Gate Station; Q4 2016 for Golden Given Limit Station
	Critical Areas Review		Required for distribution upgrade construction activities within a critical area. Review concurrent with Clear and Grade/Building Permit Review
Puget Sound Clean Air Agency	Notice of Construction/Order of Approval		Requires further design for permit issuance: Q1 2016. Project will be minor source.
Department of Ecology	NPDES Construction Stormwater General Permit. Pipeline NPDES		Two permits for all soil-disturbing activities where disturbance will have stormwater discharge to a receiving water; LNG facility permit received; pipeline permits anticipated Q1 2016
	NPDES Industrial Stormwater General Permit		Permit for operation of an industrial facility with stormwater discharge to surface waters or a street sewer. Operational Permit anticipated Q 1 2018.
	NPDES Individual Permit or State Waste Discharge Permit		Individual permit applies to any discharge of wastewater directly into surface waters through a conveyance system. State waste permit applies for planned discharge of wastewater to the ground or to municipal treatment plant. Permit anticipated November 2015
Department of Ecology	Hazardous Chemical Inventory Reporting Requirements		Facilities with hazardous substances on-site are required to provide information on the type, quantities, and storage locations. Operational Permit required for plant operation, and anticipated in 2018.

Item	Description	Status	Comments
Department of Archaeology and Historic Preservation	Archaeological Excavation Permit, if required		Permit for excavation altering or removing archaeological resources. DAHP would also consult directly with USACE on Section 106 review and cultural resource issues under SEPA.
U.S. Coast Guard	U.S. Coast Guard Issues Letter of Recommendation		USCG has verbally informed PSE of mitigations to reduce risk in the waterways. A formal list is expected by the end of September 2015. PSE will need to incorporate suggested mitigations into the WSA then circulate the WSA with the marine risk stakeholder group that met in Spring 2015 to identify hazards. Expected Q2 2016
WUTC Office of Pipeline Safety	Waiver for Underground LNG Pipeline to the TOTE Terminal		PHMSA/US Coast Guard/WUTC have settled jurisdictional issues and have no significant technical issues with the design. Currently working towards formal request for waiver from WUTC OPS. Expected Q1 2016
	Agency approval of design elements consistent with 49 CFR Parts 192 and 193, the federal safety standards		WUTC OPS administers U.S. DOT/PHMSA review of standards governing siting, design, installation, personnel qualifications and training. Review process expected to continue through design and construction process. Ongoing through Q1 2017
Project Agreements			
In-Water Work	Design-Bid Build Agreement		Moffatt & Nichol and Contractor TBD
Tacoma Public Utilities	Substation Construction Agreement		Facilities study complete. Construction contract will be executed after Board approval.
	Power Supply Agreement		Indicative terms proposed and modeled in Project pro forma. Supply Agreement will be executed in 2017.

Item	Description	Status	Comments
State Regulatory			
Project Prudence	The prudence determination will happen when the Facility is put into service (likely in the 2018 GRC).		The prudence determination will not occur until the Facility is put into service. However, the case for prudence involves a determination of need that is identified in the 2013 and 2015 IRPs, contemporaneous records which the company is documenting through the development and construction process, and continuous re-evaluation of the costs.
Real Estate Rights			
Tacoma Rail	LNG pipeline crossing permit		Permit is administrative and will require final engineering design before issuance. PSE is arranging a follow up meeting with Tacoma Rail to confirm there is not a material risk of not receiving the permit. Anticipated Q2 2016
City of Fife	Right-of-Way permit and Utility Permit		Fife is willing to work with PSE on timing of permit. Anticipated Q2 2016
Pierce County	Street Use Permit		Needed for distribution system upgrades. Pierce County willing to work with PSE on permit timing. Anticipated Q2 2016
Washington State Department of Transportation	State Highway Crossing Permit		Permit for the occupancy of highway rights-of-way, applicable to distribution upgrades. Anticipated Q2 2016
Commercial			
Marketing Customers			
Non-Regulated Sales	Fuel Supply Agreement		

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Exhibit F.

Risk Analysis

Contents

Risk Analysis

This exhibit summarizes the risks associated with the Tacoma LNG Project (the "Project") and describes the management actions PSE has developed to address them. Project scopes can be broadly categorized into three principle phases, each with a different risk profile:

- Development Phase
- Construction Phase
- Operations Phase

PSE has identified risks associated with each phase and developed plans to eliminate or mitigate them to the extent that it is reasonable and practicable.

Development Risks

Development risks include risks assumed prior to entering the construction phase of the Project. To date, PSE has completed a significant amount of development work and many development risks have either been eliminated or properly mitigated. There are many development risks that, while not resolved at this point, will likely be mitigated prior to final Project approval in November 2015. For example, PSE anticipates resolving risks associated with obtaining permits and WUTC approval of the TOTE contract before the November Board meeting. However, some risks associated with development will remain. This section identifies these risks and appropriate mitigations in the table below.

Construction Risks

Prior to requesting final approval for the Project, PSE will obtain all environmental permits necessary to begin construction of the Facility. Building permits and ongoing reviews by the WUTC Pipeline Safety Office, which are administrative in nature, will come after executing the EPC contract (and upon completion of detailed engineering). Construction risks can usually be categorized as cost, schedule, technology or performance risks. Most of the Plant costs and schedule are driven by the EPC scope of work, which is performed under a fixed-price contract with liquidated damages for both late completion and failure to meet performance guarantees. Nearly all of the PSE-performed work will be completed under fixed-priced contracts which will minimize the cost risks to PSE. A portion of the PSE work such as earthwork and disposal of

spoils from the site will be done on a time and materials basis at negotiated rates and has been conservatively budgeted. For the portion of the Facility that is allocated to regulated service, cost increases can generally be recovered in rates or through specific LNG tariffs, unless such overruns ultimately result in a regulatory disallowance. The company will absorb any additional costs allocated to the non-regulated portion of the Facility.

Site preparation and in-water work performed by PSE carries greater schedule risks. The demolition and ground improvement work carries the risk of discovering unanticipated contaminants. PSE has mitigated this risk by performing a prudent environmental assessment of the buildings and soil sampling throughout the site. The ground improvement work also requires after-hours work in order to meet the schedule required to allow mobilization by CBI in a timely manner. This risk is being mitigated by scheduling site work to allow concurrent work by the demolition and ground improvement contractor, followed by concurrent work of the ground improvement contractor and CBI. Additionally, PSE is investigating the possibility of adding additional equipment and manpower to the ground improvement effort and increasing the work day beyond the currently allowed construction work hours. The in-water work is limited to certain months of the year by regulation, however the duration and sequence of the work has been planned for and does not affect the critical path. Schedule risk that cannot be absorbed by float may result in liquidated damage payments due to TOTE under the fuel supply agreement. Performance risk will be managed by detailed specifications and definitions associated with the scope of work backed by contract warranties.

Operations Risks

The primary operating risk relates to PSE's ability to find customers for the non-regulated portion of the Facility. In order to generate favorable returns for the non-regulated portion, PSE will need to contract with a customer or customers that make up a significant portion of the unsubscribed capacity (volume risk) at a price that delivers a fair return (price risk). The factors that govern the commercial risks can be broken down into those that are within PSE's control to mitigate and those that are outside of PSE's control. The commercial risks are outlined in the table below and discussed in detail in ***Exhibit G.*** Additionally, ***Exhibit G*** identifies cash flows associated with different sales scenarios and the corresponding returns to shareholders.

Other than commercial risk, operations risk may result from performance, warranty or safety events. To mitigate performance, warranty and safety risks, PSE solicited EPC bids from Chicago Bridge & Iron and Black and Veatch, both established world leaders in LNG plant design and construction. PSE selected CBI, whose experience, along with the expected contract performance guarantees and liquidated damages, will limit PSE's exposure to Facility

performance risks. PSE will staff and operate the Facility according to established safety standards and the designer's operational procedures. Staff training, maintenance and operating protocols will be developed taking into account regulations, PSE policies and practices, and best industry practices.

Development Risks

Development Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
SEPA EIS	***FEIS Mitigations [PID]*** **-** The City of Tacoma is the lead agency for SEPA Review. The City and PSE have agreed in principle to mitigations. However, the agreement has not been signed.	The City of Tacoma has not yet agreed that the EIS can be finalized to address all comments received to date. They are inquiring as to the status of the PSE-Puyallup discussions.	Possible	Minor
	FEIS Appeal [PEA] **-** Potential appeal of the FEIS by the Puyallup Tribe of Indians. See ***Exhibit I*** for a more detailed discussion about the potential appeal timeline.	Appeal(s) of the EIS to the City of Tacoma/State Courts could be mitigated through further discussion or settlement with stakeholders to withdraw their opposition. PSE seeking opportunity to meet with the Tribe to address project safety, risks and other issues of concern.	Possible	Major
Permits Not Granted	Currently all permit processes are timely and necessary permits for November construction are expected to be issued.	PSE has been working closely with the permitting agencies during the development of the EIS and permit application review.	Extremely Unlikely	Major
Permits Appealed / Delayed [PEA]	Permitting delays may be caused by delayed agency action. An appeal of substantive permits by the Puyallup Tribe of Indians including the Tacoma Shoreline Permit, Pierce County CUP Permit or the USACE Section 10 or Nationwide Permit 3 permits is possible. See ***Exhibit I*** for a more detailed analysis of permitting delay risks.	Work closely with agencies during the permitting process. Early engagement of stakeholders (agencies and appellants) to explore global settlement of appeals.	Possible	Major

Development Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
LNG Pipeline [PPW] *Note: PSE is contractually obligated to deliver LNG to TOTE via an LNG Pipeline.*	***Regulatory Design Approval -*** Current LNG regulations have not been updated in many years and current LNG safety standards data back to 2001. Those regulations and safety standards did not anticipate a design such as that proposed for the TOTE LNG pipeline. As such, the proposed design of the LNG pipeline (which is designed consistent with the latest safety standards which were published in 2013) requires specific approval by the appropriate regulatory agencies. Depending on interpretations, PHMSA, the WUTC Pipeline Safety Office, and/or the US Coast Guard have jurisdiction over this pipeline.	PSE has held several meetings with both PHMSA and WUTC staff to review the design of the LNG Pipeline. To date, both agencies have been complimentary of the design features of the pipeline and have had little or no technical concerns. The greatest challenge has been for the agencies to agree on who has jurisdiction (state or federal – PHMSA or US Coast Guard) and the process PSE needs to undertake to seek approval. These jurisdictional questions were resolved in early September and PSE will now be applying for a state waiver for the design of the pipeline and ongoing operations will be under the purview of the US Coast Guard. PHMSA, which provides technical approval to the state, has requested that an additional "Quantitative Risk Assessment" that is not defined by code be included with the waiver request. PSE is investigating methodology and available consultants to perform this risk assessment and (continues on next page)	Unlikely	Major

Development Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
LNG Pipeline [PPW]		expects to submit a formal waiver request by January 2016. It is our understanding that the approval process should take 90 days or less. Approval to build the LNG delivery pipeline is specifically cited as a condition precedent in the TOTE contract. In the event that PSE is unable to obtain this approval, PSE could terminate with payments to TOTE made in years 2019 and 2020, not to exceed $15.3 million. Alternatively, PSE could move forward to serve TOTE under the Fuel Supply Agreement. PSE would be required to build a pier on the Hylebos waterway and find a barge solution to provide fuel to TOTE. Per the FSA, PSE must offer this service at the anticipated price of an LNG pipeline, which would result in additional project costs.		

Development Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
U.S. Coast Guard Letter of Recommendation [PCG]	The USCG will issue a Letter of Recommendation (LOR) that lists mitigation measures to ensure safe LNG operations on the Puget Sound waterways. PSE will not receive this letter prior to November and there is a small chance that required mitigations could be financial or operationally onerous.	PSE has been working with the USCG Sector Puget Sound for several years and the Captain of the Port has made it clear that the Coast Guard supports the development of LNG as a fuel on the Puget Sound. In July 2015, PSE submitted a Waterway Suitability Assessment (WSA), which characterizes the waterways and port environment, and details risks associated with transporting LNG on the waterways and mitigations. The WSA was developed in close consultation with the USCG and PSE has thoroughly discussed required mitigations with the USCG. All mitigations discussed to date are reasonable and can easily be incorporated into PSE operations. PSE will likely have the final LOR in the spring of 2017. TOTE will need the LOR to be issued before operating the converted ORCA class vessels on LNG.	Unlikely	Major
Air permit	PSE will need an air permit to operate the Tacoma LNG Facility. The air permit is expected in Q1 2016.	PSE has confirmed that emissions levels are below Department of Ecology thresholds making the air permit administrative in nature.	Extremely Unlikely	Minor

Development Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
Environmental contamination [DSC]	Environmental contamination at the Port of Tacoma or along the gas distribution system upgrades route delays the Project and/or increases Project costs.	PSE has performed environmental sampling and analysis at the site and along the pipeline route. The existing contamination has been characterized and PSE has worked with CBI and GeoEngineers to ensure that the Facility can be built with minimal disturbance to the contamination deep below the surface. The Port of Tacoma will bear the cost for any clean up and remediation for surface and near surface contamination (up to five feet below the surface level). Contractors Pollution Liability insurance will cover any disturbance of contaminated materials during construction; however it will not cover remediation of existing contamination.	Likely	Minor

Development Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
WUTC Approval of the TOTE FSA as a Special Contract [RSC]	In August 2015, PSE filed a request for approval of the TOTE FSA as a Special Contract and requested that the Commission approve it by November 4, 2015. There is a risk that one of the following could occur: i. the Commission delays their decision, ii. the Commission does not make a ruling either way, or iii. the Commission determines the TOTE contract cannot be part of PSE's regulated service.	PSE management has been briefing the Commissioners, the Commission staff, Public Counsel and other regulatory stakeholders over the past two years. These conversations have informed PSE of stakeholder positions and enabled the company to create a commercial structure in which the benefits to core gas customers can be demonstrated to regulators. PSE requested in its filing that a decision on the TOTE special contract be made prior to the November 2015 board meeting. Public Counsel and the Northwest Industrial Gas Users intervened requesting an adjudicative proceeding, which was granted, and additional time. The current schedule runs through mid-October and is focused on an understanding of the issues. The intent is to bring all parties to a similar understanding and, potentially, reach a settlement by early November. If the Commission decision is delayed, management's request for Board approval may be delayed. If the Commission rules unfavorably, then PSE must be prepared to serve TOTE as part of its non-regulated service. This will require amending the TOTE FSA. Alternatively, PSE could terminate the TOTE contract because (continued on next page)	Unlikely	Major

Development Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
		regulatory approval is a condition precedent to the contract. Terminating for failure to meet this CP would require PSE to pay TOTE damages up to $15.3 million over the years 2019 and 2020 (in addition to any other costs associated with terminating the project).		
Request for Declaratory Order for Approval of Cost Allocation Methodology [RSC]	In the same filing as the request for WUTC approval of the TOTE FSA as a Special Contract, PSE filed a request for a declaratory order for approval of a cost allocation methodology and requested that the Commission approve it by November 4, 2015. There is a risk that the Commission either delays the decision or decides not to rule at all on the issue. Without a clear way of delineating the allocation of above the line and below the line costs, the Company could be at risk of having additional costs allocated to below the line.	Similar to the above mitigations, PSE has held several meetings with key regulatory stakeholders. These conversations have allowed stakeholders to understand the legal and precedential basis for the cost allocation methodology prior to PSE's filing. Unlike the approval of the TOTE contract, there will always be some cost allocation risk, regardless of how the Commission rules at this time.	Unlikely	Major

Development Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
Prudence determination	When the Facility is put into service in late 2018, PSE will seek authorization to put the costs associated with the regulated service into natural gas customer rates in a subsequent GRC. Like any new natural gas capacity resource there is disallowance risk if the Commission deems part of the Facility to be imprudent and does not allow the company to recover certain costs in rates.	The current Docket (UG-151663), under which PSE has requested approval of the TOTE FSA and the cost allocation methodology provides PSE with a gauge of the Commission's position on the Project. The LNG Facility has now been evaluated in both the 2013 and 2015 IRPs and continues to be part of a least cost portfolio. PSE has and will continue to work with the WUTC to promote the cost and reliability benefits of the Project to PSE's gas customers, and the economic and clean air benefits for the region. PSE has garnered support from state and local elected officials. Additionally, PSE continues to support legislation that promotes a regulatory environment that encourages the development of alternative fuels.	Unlikely	Minor
Allocation of costs and revenues during initial General Rate Case (GRC)	When the Facility is put into service in late 2018, PSE will seek authorization to put the costs associated with the regulated service into natural gas customer rates in a subsequent GRC. Like any new natural gas capacity resource there is disallowance risk if the Commission deems part of the Facility to be imprudent and does not allow the company to recover certain costs in rates.	There will always be some future cost allocation risk, regardless of how the Commission rules at this time in this current Docket (UG-151663).	Unlikely	Minor

Development Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
Allocation of costs and revenues during operations	Even after the GRC where prudence is determined, the Commission would still have the ability to review allocation of costs and revenues during future GRCs. This risk may increase if the non-regulated portion of the Facility is successful.	PSE will have set a substantial regulatory record with approval of the cost allocation methodology in this current docket (UG-151663) and the prudence determination of the facility, in the subsequent 2018/2019 GRC. In the unlikely event that some costs are re-allocated the impact is expected to be minimal. Any major impacts to allocation will likely have been settled in the 2018/2019 GRC.	Unlikely	Minor
Franchise Agreement	Renewal of the Gas Franchise Agreement with the City of Tacoma is not a requirement for development of the LNG project. As long as parties are working in good faith on a new franchise the expired franchise is considered the valid franchise. The City had threatened to stop negotiations and pull the expired franchise if we did not resolve issues.	Franchise negotiations are complete and the Tacoma City Council unanimously approved the franchise on September 15, 2015.	Resolved	N/A
Gas distribution improvements real estate easements and crossing permits	***Frederickson Gate Station Easement and Limit Station Land Purchases***	PSE has acquired these real estate rights that are necessary for the distribution system build out required to serve the project.	Resolved	NA
	Tacoma Rail crossings – PSE will need to obtain permits from Tacoma Rail for all rail crossings.	These crossing permits are administrative in nature. PSE has been in discussions with Tacoma Rail and does not foresee any issues with rail crossing.	Extremely Unlikely	Minor

Development Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
Gas distribution improvements real estate easements and crossing permits	***Highway crossings*** **-** PSE will need permits from Washington State Department of Transportation (WSDOT) for major highway crossings at I-5, SR -509 and SR – 512.	PSE has met with WSDOT to discuss possible construction methodologies and mitigations. PSE does not foresee any issues with obtaining these permits and regularly obtains similar approvals throughout our service territory.	Unlikely	Minor
Tacoma Rail crossing for LNG pipeline	PSE will need a permit from Tacoma Rail for the LNG cryogenic pipeline that connects the LNG Tank at the Facility site to the bunkering station at the TOTE dock.	This crossing will require the same permit from Tacoma Rail as the gas distribution improvements. It is administrative in nature and PSE has been in contact with Tacoma Rail. In addition, before submitting an application for the permit, PSE will have received approval from both state and federal agencies for the pipeline design. Approval to build the LNG delivery pipeline and necessary permits are specifically cited as a condition precedent in the TOTE contract. In the event that PSE could not obtain this approval, PSE could terminate with payments to TOTE made in years 2019 and 2020, not to exceed $15.3 million. Alternatively, PSE could move forward to serve TOTE under the Fuel Supply Agreement. PSE would be required to build out a pier on the (continued on next page)	Unlikely	Minor

Development Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
Tacoma Rail crossing for LNG pipeline		Hylebos waterway and find a barge solution to provide fuel to TOTE. Per the FSA, PSE must offer this service at the anticipated price of an LNG pipeline, which would result in additional project costs.		
Other easements with Port of Tacoma	PSE will require an exclusive easement where the bunkering facilities are located on the TOTE terminal as well as a pipeline easement and vapor control easement. There is a risk of not obtaining these easements.	PSE, the Port of Tacoma and TOTE have all agreed to the terms of these easements. The easements will be presented for approval at the October 6, 2015 Port Commission meeting. Once the documents are approved and signed, this risk will be fully mitigated.	Resolved once approved by Port	High
Substation Agreement	PSE will be required to enter into a substation construction agreement with Tacoma Power for design and construction of a dedicated substation on the plant site. There is a risk that Tacoma Power will not complete the substation on time or that it will exceed the budget.	PSE has been working with Tacoma Power to define the substation requirements and options. Tacoma Power has completed a facility study with a proposed budget and schedule. Tacoma Power's schedule meets the project requirements with several months of float and adequate contingencies have been placed on their cost estimate.	Unlikely	Minor
Power Supply Agreement	PSE will enter into a power supply contract with Tacoma Power, which will supply power to the Facility. Tacoma Power provided indicative terms of the tariff-based contract. The primary risk is that Tacoma Power doesn't proffer or approve service at or near this level.	PSE has modeled power costs based on Tacoma Power's existing tariff. The developing rate would serve to improve delivered power costs and is expected to be proposed by Tacoma Power in September 2015. Furthermore, power costs are generally passed through to customers.	Unlikely	Minor

Construction Risks

Construction Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
LNG FACILITY				
Project Costs	***Marine and in-water work -*** Construction of the pier needed to serve TOTE exceeds estimated costs.	PSE has worked with Moffat and Nichols extensively on the pier design. PSE is holding a contingency of 40 percent on this scope, which is in line with engineering best practices given the level of design. PSE will have firm price bids for this work once engineering is complete in the spring of 2016. This work represents a small fraction of the total Project costs.	Unlikely	Minor

Construction Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
Project Costs	***Demolition and ground improvement –*** Demolition of existing buildings and ground improvements exceeds estimated costs.	PSE has received firm price bids for both the demolition and ground improvements, making these costs fairly well known. The bids and scopes of work are based on the assumed environmental and physical characteristics of the site. Once work begins, there is risk of additional costs if site conditions differ, resulting in additional scopes of work. To mitigate this risk, PSE is carrying a 10 percent contingency on demolition and a 20 percent contingency on ground improvement. Schedule constraints associated with these tasks are being mitigated by adding additional manpower and working hours, as well as scheduling concurrent work on different areas of the site.	Unlikely	Minor
	LNG Cryogenic Pipeline – The LNG Cryogenics Pipeline exceeds estimated cost. CBI will be responsible for the design and construction of the pipeline, but it will be outside of the fixed price lump sum cost associated with the rest of the project. PSE will pay for the pipeline based on actual costs and an agreed upon mark up.	PSE has worked with CBI extensively on the design of the LNG Cryogenic line. PSE is holding a contingency of 25 percent on this scope, which is in line with engineering best practices given the level of design, as well as indications from CBI on their perceived levels of risk. Exceedances above the 25 percent contingency would most likely represent a very small percentage of Project cost.	Possible	Minor

Construction Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
Project Costs	***CBI scope*** **-** Changes to plant design after the EPC contract is executed, or significant, unforeseen environmental contamination drive increased cost.	Facility construction will be executed via a lump-sum EPC contract. Remaining construction is accomplished by firm, fixed-price competitive bids. Scope control will be managed after contract execution. Environmental conditions have been evaluated and characterized and factored into contingency amounts.	Unlikely	Minor
	Market exposure – nickel **–** Prices fluctuate largely due to shortages, political unrest, or other factors.	The EPC contract calls for placing the nickel purchase order within four weeks of contract execution. PSE will be debited or credited against the assumed nickel cost included in the executed contract. Nickel prices have been historically stable in recent quarters and nickel may be sourced from multiple countries. The nickel cost represents approximately 0.25 percent of the total EPC value.	Unlikely	Minor
	Market exposure – euro **–** Economic factors in Europe create a fluctuation in the value of the euro.	PSE has no exposure to euro fluctuations in the EPC Contract	N/A	N/A

Construction Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
Schedule	***Construction delays [CP]*** - Supply chain disruptions, unforeseen site conditions, productivity issues, etc. delay project completion.	The overall construction schedule includes limited float to accommodate uncertain duration of demolition and site work. The EPC contract will have liquidated damages for late completion.	Possible	Minor
	Weather – Inclement weather could slow construction.	The greatest risk of delay would be snow that would impede ground improvement and foundation work. Current weather forecasts predict a warmer than usual winter during these activities and Tacoma only receives a few days of snow even in a normal weather year. The site construction stormwater management system is designed for extreme rains, as required by code.	Unlikely	Minor
	TOTE cooperation for bunkering facilities – TOTE operations hampers construction of LNG facilities at the TOTE terminal.	PSE has had numerous conversations with TOTE regarding the need to have access to their terminal on land and water for construction of LNG facilities. PSE, TOTE, and the Port are finalizing construction laydown easements to allow for PSE construction activity at the terminal.	Unlikely	Major

Construction Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
Contractor Performance	The Facility fails to meet required specifications or work quality requirements.	Contractors are pre-qualified and selected based upon best value and historical performance. PSE will use independent Quality Assurance inspection to validate contractor performance and require contract warranties to backstop risk. The EPC contract contains liquidated damages for failing to meet critical performance guarantees.	Unlikely	Minor
	Safety (construction) [SC] **–** Unsafe work practices lead to onsite accidents or worker injuries.	All contractors will be required to have rigid safety programs that meet or exceed PSE's standards.	Extremely Unlikely	Negligible
Environmental	Construction stormwater management plan does not adequately address weather and/or soil conditions found on site, or contractor poorly implements the plan.	Revise Best Management Practices to address site conditions. Daily inspections and revised remediation to address any implementation shortcomings.	Unlikely	Minor
	Discovery of unanticipated cultural resources	Requires notification to City of Tacoma, USACE, DAHP and others via the procedures in the Unanticipated Discovery Plan	Unlikely	Minor
	Public complaints (construction noise or light at night)	May require noise monitoring, equipment modification, and further discussion with the City staff	Unlikely	Minor

Construction Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
Environmental	Severe weather, offsite occurrences or security issues	Monitoring for changing conditions and working with local authorities and site security to maintain site integrity in a safe manner	Unlikely	Minor
Technology	***CBI*** **–** Plant fails to perform as required.	The design of the Tacoma LNG plant uses established and proven liquefaction and controls technologies. CBI has built more facilities of this size and type than any other EPC contractor. The EPC contract includes a warranty and liquidated damages for failure to meet critical performance guarantees.	Unlikely	Minor
	LNG pipeline **–** Pipeline fails to meet performance criteria.	Although the LNG pipeline is a new design, none of the incumbent technologies (vacuum jacketed pipe, nitrogen purge, or casing installation) are new – they just have not been used together in this particular application. The pipeline is covered by the EPC warranty.	Unlikely	Major
Tacoma Power Performance	***Cost related to substation*** **–** Substation exceeds budget.	Tacoma Power constructs and operates substations as part of their ongoing business. They have provided a cost breakdown by element and adequate contingencies have been applied.	Possible	Minor

Construction Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
Tacoma Power Performance	***Schedule related to substation –*** Substation is not completed on time.	The substation is not currently on the critical path and PSE will monitor to ensure Tacoma Power performs to schedule	Unlikely	Minor
DISTRIBUTION UPGRADES				
Distribution Upgrades Construction Risk [DU]	***Complexities associated with routes -*** The pipeline routes have been determined. The section of new pipe on the Tacoma peninsula will have multiple railroad crossings and will likely pass through contaminated soils. The railroad crossing and contamination increase schedule and costs risk (discussed below). Horizontal Directional Drill (HDD) at SR 509 and Interstate 5	Final route alignments will be finalized after more detailed analysis, engineering and soils testing are completed. Design considerations will be given to minimize disruption of contaminated soils to the extent possible. Geotechnical investigation will help in determining the appropriate construction techniques	Unlikely	Minor

Construction Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
Distribution Upgrades Construction Risk [DU]	***Permitting [DPC]*** **-** Environmental conditions and restoration requirements may require construction and /or plan revisions.	PSE will consider construction methods, hours of work, traffic impacts and restoration requirements as they relate to right-of-way use and other distribution permitting. PSE has been working with WA Department of Transportation on major highway crossings and has made significant progress to date. Once the final EIS is issued and plans are finalized all other permits for the distribution system will be submitted. PSE does not anticipate any permit delays with these fairly standard permits. (see ***Exhibit I***)	Unlikely	Minor
	Environmental [DSC] **-** There is existing soil contamination at the Port of Tacoma. PSE has planned to encounter a certain amount of contaminated soils; however there is a risk that contaminated soils lead to schedule delays or increased costs.	PSE has built contingency into the schedule and budget to handle contaminated materials. PSE has engaged an environmental firm to complete a Phase 1 review of the route to confirm the amount of contamination. The review will be completed prior to the November 5, 2015 board meeting. During construction, PSE will implement a special material handling, Health and Safety Plan (HASP) and HAZWOP[1] training.	Likely	Negligible

[1] Hazardous Waste Operations ("HAZWOP")

Construction Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
Distribution Upgrades Construction Risk [DU]	***WUTC approval for pressure increase*** – PSE will need Pressure authorizations from the WUTC to operate the new Golden Given pipeline and the limit station at the end of the line at an MAOP greater than 250 psi.	PSE has already received WUTC approvals to operate an adjacent pipe at an MAOP greater than 250 psi. This pressure increase would increase capacity and reliability for all PSE customers in South Pierce County and PSE has no reason to believe the WUTC would have concerns operating this new section at a higher pressure. If PSE does not receive approval to operate at a higher pressure, the company may need to expand the distribution system in other areas to support the full plant capacity. Additional work would pose schedule and costs risk. The Facility would still be able to operate, however, until the new work is complete, the Facility would not be able to liquefy at 100 percent capacity during cold winter weather.	Unlikely	Minor

Construction Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
Distribution Upgrades Construction Risk [DU]	***Cost Risk*** **–** PSE may exceed the project budget due to the risks stated above as well as unforeseen increases to material or labor costs.	PSE is carrying an appropriate amount of contingency based on the current level of design and the risks stated above. The costs of the distribution upgrades will be recovered in regulated gas rates if the Project is deemed prudent in the general rate case (expected in 2018). PSE's modeling that supports the Draft IRP as well as the analysis in this report indicates that PSE has a margin for costs to increase without jeopardizing Project prudency.	Possible	Minor
	Schedule Risk **-** PSE may encounter schedule delays due to the risks stated above and unforeseen events like poor contractor performance, weather delays or labor issues.	PSE has included schedule float to allow for short delays in construction. Significant schedule delays could delay the commissioning and operations of the LNG Facility. Schedule delays related to any of the work in South Tacoma and Frederickson may limit the amount of gas available to the Facility for commissioning and startup. If there are substantial schedule delays along the four miles at the Port of Tacoma, then the commissioning and startup of the Facility could be delayed.	Possible	Minor

Operations Risks

Operations Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
PLANT OPERATIONS				
Staffing	***Hiring / Contracting Plant Staff–*** Staffing the plant will require the creation of new job lines, job descriptions and approval of applicable union(s) • Union (UA, IBEW, Longshoremen, etc.), as applicable	PSE will be developing jobs lines and job descriptions in late 2016, and expects to begin hiring staff in late 2017, so that staff can be onboard and trained before commissioning begins in 2018. While the jobs associated with the LNG Facility are different, they are very similar to other PSE operations and there is no expectation that staff will be unavailable to onboard as necessary.	Unlikely	Minor
	Training – Staff are not adequately trained.	PSE will be staffing the plant prior to completion of the construction and commissioning. Training is included in the scope of the EPC contract.	Unlikely	Minor
	Developing procedures – Procedures do not exist to meet operational and regulatory requirements.	Operating procedures are included in the scope of the EPC contract. Additionally procedures (regulatory, security, safety, etc.) that are prudent or required by code will be developed by PSE organizations and/or consultants. Funding for this effort is included in the Project budget.	Unlikely	Minor

Operations Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
Liquefaction and Performance Efficiency	The Facility fails to meet design specifications and LNG quality requirements in the EPC Contract.	The EPC contract guarantees production capability; the contract will include warranty provisions to meet specifications and/or liquidated damages.	Unlikely	Minor
Safety	Equipment failure or operational error leads to onsite accidents and/or worker injuries.	The Facility will be designed, constructed, and inspected according to the latest safety standards. Extensive regulations govern required procedures and training for Facility personnel. The Facility will be operated consistent with PSE policies. In addition, the Facility will be insured under PSE's policy.	Extremely Unlikely	Minor

Operations Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
Operational Costs	***Maintenance*** **–** Maintenance and replacement costs are higher than PSE is currently forecasting. PSE does not have actual maintenance costs on which to base a forecast and current estimates are based on a 2012 study from LNG consultants CH-IV.	PSE has compared current maintenance forecasts for the LNG Facility with Jackson Prairie and even accounting for additional expenses at the LNG Plant, the current estimate is conservative. Maintenance costs allocated to regulated service will be fully recoverable through gas rates. Maintenance costs allocated to non-regulated fuel sales will not be recoverable rates and may not be passed onto customer depending on contract terms. In order to reduce maintenance and replacement costs, major components will be inspected and tested at the factory prior to installation. Only qualified suppliers will be used. The Facility will have full operations and maintenance manuals, and will maintain onsite spares for component parts with higher failure rates. The Facility will be maintained in accordance with PSE's policies.	Unlikely	Minor

Operations Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
Operational Costs	***Insurance*** **–** Insurance costs during operations are higher than anticipated.	PSE has received indicative quotes for insurance premiums during operations and is using these quotes for estimates in the Project pro forma. Insurance costs allocated to regulated service will be included in regulated rates. Insurance allocated to the non-regulated service will not be recoverable through rates. Insurance premiums are a small percentage of total operating costs and increases will not have a sizeable impact on Project returns.	Unlikely	Minor
	Power costs **–** Power costs during operations may be higher than forecast. PSE will contract with Tacoma Power and variable power costs will be based on market rates. PSE is currently using the Draft 2015 IRP base case Mid-C price forecast as a proxy for market rates.	Power costs allocated to regulated service will be included in regulated rates Power costs are a significant portion of operating costs at the facility. PSE intended to link variable charges to market rates in contracts for non-regulated sales. If PSE assumed all risk for market power, PSE could purchase a hedge. Ultimately, the mitigation strategy for non-regulated sales will depend on contract terms and the outlook for Mid-C prices at the time of contracting.	Unlikely	Minor

Operations Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
Operational Costs	***Disposal of Heavies –*** Prior to liquefaction, heavy hydrocarbons like butane, pentane and propane need to be removed from the gas stream. These 'heavies' will need to be disposed of properly.	The heavy hydrocarbons are used as fuel gas in the liquefaction process to the greatest extent possible. Any remaining heavies may have a market value and PSE will explore opportunities to sell the heavy hydrocarbons as an industrial fuel source.	Unlikely	Minor
	Plant operated below nameplate capacity **-** Plant customers take significantly lower volumes than anticipated, resulting in sub-optimal plant operations.	PSE has included contractual provisions such as deficiency payments or penalties to mitigate efficiency losses from running the Facility at a lower output. At lower utilization rates, PSE could operate the Facility with longer or more frequent outages and use the LNG storage tank to mitigate operational inefficiency.	Unlikely	Minor

Operations Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
Business interruptions	***General Business Interruptions*** **-**The LNG plant may have to cease operations resulting in lost revenues. In addition to mitigating for the specific cause of the interruptions (see the following risks), PSE will also put appropriate commercial mitigations into place to minimize the financial impacts of interruption on the company.	Mitigations for business interruptions are specific to facility customers: Peaking Resource: PSE will recover the cost of the Facility in rates and would only see lost revenues from core gas customers if the plant is no longer 'used and useful'. PSE does not anticipate a business interruption that could delay plant operations for so long that the Facility would need to be removed from ratebase. TOTE: The portion of the Facility allocated to TOTE will also be collected through gas rates and PSE would only realize lost revenues if the Facility were to be shut down for an extended period of time (which is not anticipated). In order to ensure full recovery of plant capital costs from TOTE, the TOTE FSA provides for an extension of the TOTE term if TOTE ceases to pay demand charges because the Facility is out of service. Non-regulated LNG Fuel Sales: PSE will consider contractual mitigations similar to the TOTE FSA. However, PSE will be competing with market substitutes (petroleum-based fuels) that are almost entirely variable in cost. Therefore, it may be difficult to fully mitigate interruptions contractually. Furthermore, if PSE is selling all or part of this capacity in short-term markets, there will be no way to mitigate the financial losses from interruptions.	Unlikely	Regulated Sales: None Non -Regulated Sales: Major

Operations Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
Business interruptions	***Technology (plant failures)*** **–** Certain equipment failures may cause prolonged outages at the Facility, resulting in an inability to serve plant customers.	PSE will keep certain spare components on site based upon expected failure rates. However, it would not be economical to keep spares for all equipment on site and failure of larger components may require down time on the order of weeks to months. These major equipment items have a history at other plants of decades of operation with proper maintenance. In order to reduce the risk of major failures, major components will be inspected and tested at the factory prior to installation. Only qualified suppliers will be used. The Facility will have full operations and maintenance manuals, and will maintain onsite spares for component parts with higher failure rates. The Facility will be maintained in accordance with PSE's policies and guidance from the EPC contractor and equipment vendors.	Unlikely	Minor
	Security **–** The plant may be shut down due to a security threat at either the Facility or the Port of Tacoma. The USCG may suspend waterway traffic at the Port in the event of a terrorist threat or action.	PSE will comply with all federal codes and regulations pertaining to LNG and maritime facilities. As part of this compliance, PSE will have emergency response procedures and policies in place. PSE has already completed risk analysis including security risks and mitigations with the U.S. Coast Guard and maritime stakeholders as part of the Waterway Suitability Assessment.	Unlikely	Minor

Operations Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
Business interruptions	***Labor –*** PSE may face labor issues at the Facility including strikes. Ports along the U.S. Westcoast have experienced several large labor strikes in recent years that have slowed down port operations.	PSE has historically had positive relationships with its unions and few labor disruptions, and expects that to continue into the future. Furthermore, labor disputes are covered under Force Majeure provisions in the FSA.	Port Wide Strike: Possible Strike only at PSE Facility: Extremely Unlikely	Port Wide Strike: Minor Strike only at PSE Facility: Minor

Operations Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
PUBLIC OPPOSITION				
Community concerns	The Project encounters an organized effort to address community concerns regarding: • LNG safety; • Any project involving fossil fuels; • Opposition to using "fracked" gas. While there is little the public can do to stop the Facility once it is in operations, PSE could risk damage to its brand.	PSE will continue to work proactively with communities to provide education about the benefits of LNG and the Project, and to address concerns. This will take the form of an outreach campaign, including community meetings and presentations, a web site and/or other forms of communication to help address any concerns the communities may have. Contingency plans for potential activism or protests will be in place prior to public rollout. We have closely monitored for these movements. To date, no formal opposition groups have formed; however, this remains an ongoing concern as activists have recently targeted other fossil fuel infrastructure such as coal and oil trains, and a recent Shell oil drilling platform undergoing maintenance at the Port of Seattle. (*See **Exhibit J** for details about PSE's plan to engage the community.)*	Unlikely	Minor

Operations Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
Community concerns	Public confusion about the LNG Facility and larger nearby proposed projects, including: • A proposed methanol plant at the Port of Tacoma	Messaging focuses on the characteristics that differentiate the facilities, highlighting the local partners and local benefit of the Tacoma LNG Project.	Unlikely	Minor
COMMERCIAL				
TOTE	***Counterparty risks (credit) –*** TOTE does not fulfill their obligations under the FSA. PSE has built in contractual minimum volumes with fees for TOTE taking less than their minimum, which is effectively a demand charge for recovery of capital and fixed operating expenses. If TOTE does not make these payments due to insolvency PSE may not fully recover the capital allocated to TOTE and be exposed to fixed operating costs.	The TOTE Fuel Supply Agreement includes a parental guarantee from TOTE's parent company, Saltchuk Resources. If PSE is unable to collect payments from TOTE or Saltchuk, PSE would attempt to remarket the capacity to other LNG Fuel users.	Unlikely	Major

Operations Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
TOTE	***Commodity price triggers*** **-** The spread between natural gas and ULSD or natural gas and USGC three percent could collapse to the point TOTE exercises their right under the Fuel Supply Agreement to exit the contract.	PSE engaged Wood Mackenzie to investigate the commodity pricing dynamics and determine the likelihood that commodity prices would enable TOTE to exit under the terms of the Fuel Supply Agreement. Wood Mackenzie concluded that it is highly unlikely the commodity prices reach the contractual trigger level for any sustained period of time. Should commodity prices fall to the trigger level, TOTE would have to pay an exit fee that would compensate PSE for a large portion of undepreciated plant. The exit fee would also impact TOTE's decision to exit as they would have to weigh that upfront cost with any future savings. Finally, if TOTE were to exercise their right to exit under the price trigger, PSE has the right in the Fuel Supply Agreement to reduce TOTE's rate such that the trigger is no longer under effect. PSE may realize some lost revenues but would not be out the entirety of the TOTE contract.	Extremely Unlikely	Major
	Contract extension **-** TOTE may decide not to renew their contract with PSE after the initial 10-year term, resulting in lost revenues.	PSE is giving TOTE very favorable renewal rates for years 11-15. PSE will have the opportunity to re-negotiate terms for a renewal to be competitive with the current market.	Unlikely	Minor

Operations Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
Unregulated fuel sales	***Market Risk*** **-** The market for LNG is just developing as the transportation sector faces increased emissions regulations and volatile commodity prices. There is a risk that the market for LNG does not develop or is not robust enough to support the currently unsubscribed capacity at the plant, resulting in lost revenues and lower returns than forecast in PSE's base case.	PSE has been in contact with industry leaders who are considering conversions to LNG (see ***Exhibit G***). It would only take one large maritime customer that is similar in volume to TOTE to fully sell the unregulated capacity. If the market for LNG as a fuel does not fully develop, PSE will pursue other markets (remote industrial customers and communities, for example); PSE will work to sell the LNG at reduced rates, if necessary, to minimize loss of revenues. PSE will also work to reduce all operating charges associated with this capacity to the extent that it is possible. For example, electric charges may be reduced with lower demand charges.	Possible	Major

Operations Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
Unregulated fuel sales	***Counterparty Willingness to Invest*** **-** In PSE's experience with TOTE and other maritime companies considering LNG conversion, the main barriers to entry are: • Lack of availability of internal resources (staff, financial, logistics, technology) • Concern over external resources (technology, supply chain, ship yards) These concerns may prevent customers from converting to LNG.	PSE will work with counterparties to offer solutions that address key concerns around supply chain, technology and financing, and bring in partners and industry experts that can provide solutions. PSE has developed relationships with marketing, financing, barging, and logistics companies that enable PSE to offer complete customer solutions.	Possible	Major

Operations Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
	Competition from Substitutes – The most serious competitive threat is from substitute fuels and associated technologies that marine consumers could use to meet existing and pending regulations.	The maritime industry is facing emissions regulations that will require a switch to a new fuel, capital investments in emissions reduction technology or both (see ***Exhibit R***). LNG has some advantages over substitute fuels, primarily reduced exposure to global commodity markets. PSE will also have more flexibility in contract pricing then substitute fuels which are fully reliant on global markets. For a complete discussion of the competitive advantages and disadvantages that LNG holds over substitutes see ***Exhibit G***.	Possible	Major
	Competition from other LNG facilities – PSE will face competition from other regional and proposed LNG facilities including Fortis's facility on the Tilbury River in British Columbia.	While other LNG facilities may pose a competitive threat, the only other regional facility on the water is Fortis's Tilbury facility. The Tacoma LNG Facility holds a natural advantage for Seattle and Tacoma markets due to closer proximity resulting in lower barging costs. Furthermore, Fortis is selling its LNG at published tariffed rates and contract terms. PSE will likely compete with Fortis for contracts; however, its contracting inflexibility and transparent pricing should allow PSE to put forward competitive proposals.	Unlikely	Major

Operations Risk	Cause	Mitigation	Mitigated Probability	Mitigated Magnitude
	Easing of environmental regulations **-** The market for LNG fuels is heavily dependent on both domestic and international emissions regulations. If these regulations are repealed, lapse, or are revised to be less stringent, the market for LNG would be unlikely to develop.	PSE will continue to work with legislatures to promote regulations and legislation that support cleaner air from the shipping industry. However, PSE will have little ability to impact regulatory changes in the global shipping industry and will likely have no recourse if regulations are repealed. While the magnitude of this risk is substantial, the probability is very low. Shipping companies have begun to make large capital investments and it seems very unlikely that regulations will become less stringent at this point.	Extremely Unlikely	Major

PUGET SOUND ENERGY

Exhibit G.

Marketing Strategy

Contents

Marketing Strategy & Non-Regulated Returns

Demand for LNG as a fuel is expected to grow substantially in the next five years as entities in the maritime arena look for ways to meet increasingly stringent environmental regulations on emissions. Moving forward with the 250,000 gallon per day plant puts PSE in a first-mover position to serve those markets, as well as serve the over-the-road clean fuel market as it develops in the Pacific Northwest.

Part I of this exhibit describes the current state of the LNG fuels market, the Tacoma LNG Facility's natural advantages and details PSE's marketing goal of securing intermediate-term contracts (5+ years), with a primary focus on large maritime customers.

Part II of this exhibit considers the cash flows that the non-regulated portion of the Facility would generate under five commercial scenarios. Each scenario is based on a percent of the open capacity sold at a price comparable to TOTE's projected price. Part II concludes that in the Delayed Market, Base and High scenarios the unlevered returns from the non-regulated portion of the plant exceed 9.7 percent or 300 bps above PSE's regulated unlevered return. Furthermore, given the expected likelihood of each case, the weighted average cash flow yields a 10.9 percent unlevered return (with a PSE ROE of 18.5 percent and a PE ROE of 20.5 percent).

Part I: Marketing Strategy

Market Dynamics

Regulatory Environment

Over the past several years, the U.S. EPA and the International Maritime Organization (IMO)[1] have imposed a series of regulations that limit emissions from ship engines. The regulations target SOx, NOx and PM. Following Northern Europe, the U.S. imposed an Emissions Control Area (ECA) within 200 miles of the coastline where emissions limits are even more stringent than the IMO. The full ECA limits for SOx went into effect on January 1, 2015. IMO regulations for Sox, which are enforced globally, are being phased in over time with the next phase coming

[1] The IMO is a UN organization and member states are bound to enforce and comply with IMO regulations.

in 2020 (pending a study on fuel availability in 2018). In addition, both the EPA and IMO have imposed regulations targeting NOx and PM.

Faced with more stringent emissions limits, the shipping industry cannot continue to burn traditional bunker fuel and is grappling with the best compliance option (there is no 'business as usual' alternative for these companies). Compliance options differ for SOx, NOx and PM. Burning lower sulfur (higher cost) fuels is a compliance option for SOx, but does not meet requirements for the other pollutants. Catalytic converters and engine modifications enable compliance with NOx but require capital investment. Converting to LNG offers the distinct benefit of meeting all existing and pending emissions limits. However, companies are weary to make the move to LNG in the short term due to the high upfront cost of conversion and uncertainty in the supply chain.

ABS Consulting prepared a memo that details the existing and pending emissions regulations facing the shipping industry as well as potential compliance options. This memo is included as ***Exhibit R.***

Fuel Prices

While the current price spread between low sulfur fuel oil and LNG prices has narrowed dramatically over the last year, dampening enthusiasm for fuel conversions from a financial perspective, leading economic analysts project that the spread will return over the next five years, albeit at lower levels. The current spread between North American Low Sulfur Marine Gas Oil (LSMGO) and Tacoma LNG has narrowed to $1.30 per MMBtu.[2] This spread is expected to recover in the coming years with the rise in crude oil (see the report from Wood Mackenzie in ***Exhibit Q***). Furthermore, while 0.1 percent LSMGO currently complies with ECA sulfur limitations,[3] it may not comply with more stringent NOx and PM regulations without additional capital investment in emissions reduction technology.

Puget Sound Energy as an LNG Fuel Provider

PSE is well-positioned to be an LNG fuel provider in the Pacific Northwest. The Company is well-known and respected within the region, is recognized as a safe and reliable energy provider,

[2] This spread is based on Tacoma LNG costs of $13.00/MMBtu, which is the forecasted price at the TOTE rate including a gas cost of $3.00/MMBtu delivered to PSE's system; and $14.3/MMBtu for LSMGO, which is the last month average North American price for 0.1 percent sulfur LSMGO as quoted by Bunker World (subsidiary of Platts).

[3] ECA, or Emissions Control Area, is a zone that extends 200 miles out from the U.S. and Canadian coast lines where higher emissions standards are being implemented. Northern Europe has had an ECA in place for several years and ECAs are anticipated to come into effect in several other parts of the world.

and controls the Pacific Northwest's largest natural gas portfolio. With the development of the Tacoma LNG project and its relationship with TOTE, PSE has established a presence in the LNG fuels community, both regionally and nationally. And while the marine fuel market is not a traditional utility player, utilities have owned and operated LNG facilities, so it is a natural fit. PSE's primary competition in this market region will be another utility, FortisBC.

The Tacoma LNG Project

PSE will have the first U.S. LNG facility on the west coast capable of loading marine vessels. The Project's location on the water provides significant value to marine customers because delivery by truck or rail is logistically challenging and cost prohibitive for large customers.

Moving forward with the 250,000 gallons-per-day plant puts PSE in a first-mover position to serve emerging markets, and liquefaction expansion capabilities enable PSE to respond more quickly to new markets and provide customers with contracts that include growth options. Pricing can be reduced and/or margins increased as the plant is expanded and common costs allocated over a broader base.

Markets

Target customers are all operating on petroleum-based fuels and will base their decision to switch fuels on (i) compliance with regulatory emission mandates, (ii) feasibility of alternatives, and (iii) the most economical solution considering items (i) and (ii). Options at this point are buying a compliant petroleum-based fuel, installing emissions control equipment or switching to a different, cleaner fuel like LNG. Decisions may vary, depending on the age and condition of the fleets. Operators can convert existing ships, if economically viable, or focus on moving to LNG as new ships are introduced into the fleet. Ship conversions are a relatively expensive proposition and can be logistically challenging without interrupting business; many shipping companies may be unable to obtain the capital or withstand the business disruption associated with conversion, and that may delay or inhibit conversions, unless the case is overwhelmingly compelling.

However, it is generally expected that most new ships will be capable of burning either oil or natural gas, since the incremental cost of dual-fueled engines is relatively minor. Most ships that will operate within the ECA will elect to install dual-fueled engines in new ships, but transpacific ships have been expressing interest as well, particularly Japanese carriers. Entities may delay the decision to make new ships fully LNG ready because the tanks and fuel management systems add significant incremental costs, but new ships will be designed to make the full conversion reasonably simple. For example, Matson has two new ships under

construction that will be LNG capable (with dual-fueled engines and structural enhancements), but has yet to make the decision to add the tanks and fuel management systems; these two ships will serve Matson's Oakland-Seattle-Honolulu and Oakland-Honolulu-Los Angeles routes.

Larger transpacific markets may require more storage. The current storage allocation of 1.2 million gallons may be insufficient for those large transpacific trade routes (e.g. a transpacific ship that takes more than two million gallons every three weeks). Creative solutions can be developed, such as optimized inventory management, additional bullet tank storage or floating storage (i.e., LNG barge), or additional field-erected storage on adjacent property.

Competition – Petroleum Based Fuels

The greatest competitive threat is that customers may not switch to LNG and may continue to burn petroleum fuels. The supply chain for existing fuels is robust, the market is liquid and technology across the value chain is developed and proven. However, marine operators are being forced to reconsider their fuel options with new emissions regulations (there is no 'do-nothing' option for this market). Marine customers can use scrubbers, burn low sulfur fuels to comply with SOx regulations and use catalytic converters for NOx (all of which comes with incremental costs and has not been proven to work for the marine industry) or switch to an alternate fuel, like LNG.

There has been some hesitancy among marine operators to make a move to LNG due to concerns about supply reliability, operational efficiency and safety, and wanting to avoid jeopardizing their cost structure vis-à-vis their competitors; and the recent drop in oil prices has solidified those concerns.

While petroleum fuels continue to have a stranglehold on the market, there are some concerns that increased demand for low sulfur fuels will increase prices and test refiners' capability to meet market demand. The price of petroleum fuels is based on global oil production and demand growth, and marine fuel may be further influenced by the refining capacity for low sulfur fuels.

One advantage LNG has is that the cost structure provides more stability than petroleum fuels. Roughly half of the cost of producing LNG comes from known, fixed liquefaction and storage costs, with the balance being the cost of natural gas. Therefore, LNG is less exposed to fluctuations in commodity markets. PSE's LNG pricing structure also allows it to compete in pricing against fuel oil since the price of fuel oil is closely tied to global commodity markets, not on the cost to produce.

Competition – Other LNG Suppliers

PSE will face competition from other LNG suppliers, principally FortisBC. FortisBC is offering a fully regulated, cost-of-service, tariffed rate so competing price and terms are known, and it essentially has pre-granted regulatory authority to roll the plant into its general natural gas business (granted by the province). It is expanding an existing facility on land it owns; the expansion that is underway will result in liquefaction capacity of approximately 500,000 gallons per day and LNG storage capacity of approximately 20 million gallons. FortisBC is also contemplating a second expansion targeted at serving Hawaii Electric (although, Hawaii's governor recently spoke in opposition of LNG imported for power generation). FortisBC's tariff rates are based on LNG production capacity, with lower rates as capacity is expanded.

PSE's LNG production costs will be higher than FortisBC's, but PSE does have a competitive advantage on at least two fronts: (i) location and (ii) contract flexibility. PSE is well-situated to provide service in the Ports of Tacoma and Seattle, due to the cost and logistical challenge of moving LNG from Vancouver. Customers other than TOTE will require bunkering barge service, but the barge can be smaller and more fully utilized, without 12+ hours of transit time each way. Consequently, PSE can be cost-competitive with FortisBC in the Tacoma and Seattle markets.

Furthermore, FortisBC's contract terms appear to be rather inflexible; for example, it is offering no renewal rights regardless of contract length, so customers cannot be assured of ongoing service. PSE can be more flexible with contract terms by offering renewal rights, term differentiated rates and other customer-specific terms that add value.

There are a few other LNG competitors in the region (NWP's Plymouth plant, NW Natural's Portland and Newport plants and Intermountain Gas' Nampa, Idaho plant), but none have ready marine access. Therefore, such competitors would have to truck LNG to the Seattle area, which would be costly and logistically challenging at the level of volume associated with large marine operations (for example, it would take 40 to 50 LNG tanker trucks to fill a TOTE ship).

There may eventually be some competitive risk from BC LNG export facilities, but none of the proposed projects appear to be gaining momentum at this time and all are located hundreds of miles from Puget Sound, which poses cost and logistical hurdles.

Ancillary Services

Other services will be required to facilitate LNG deliveries to other customers and accommodate unique customer needs. PSE will collaborate or contract with other entities to provide such services, including:

- Bunkering – Potential customers are concerned about the LNG supply chain from the tailpipe of the plant to their vessels (reliability, logistics, safety, etc.). PSE will collaborate or contract with a bunkering service provider to provide bunkering services. Discussions have been held with Maxum Petroleum, Crowley, Harley Marine, WesPac and Tenaska, all of which have spent time and money on barge design and development. PSE's disadvantage in this area is the Jones Act,[4] which will likely require a more expensive barging service.

- Price Hedging – As mentioned above, LNG should be less volatile than fuel oil; however, customers may want to reduce all volatility and find a way to hedge future commodity price fluctuations. Gas suppliers and financial firms can offer products that fix LNG prices or tie them to the price of fuel oil. PSE is not expecting to provide such hedging services, but can work with customers to put a hedging package together with a third party. Inexperience in dealing with gas commodity markets is a barrier to entry for some marine customers and PSE's role as an intermediary in connecting marine customers to suppliers will add value.

Marketing Objective

PSE will be looking to secure long-term contracts (5+ years), with a primary focus on large marine shippers (ideally container shipping companies) that have the following characteristics:

- Operate in the ECA
- Have ships near the end of their life and are in the market to contract for new-build vessels in the near future
- Make regular calls in the Port of Tacoma or Port of Seattle, or other ports within Puget Sound
- Have regularly scheduled routes

[4] The Merchant Marine Act of 1920, more commonly referred to as the 'Jones Act' requires that vessels which make calls between U.S. ports or locations be U.S. flagged, have U.S. crews and be constructed in the United States. Conversely, an LNG barge leaving from FortisBC's facility in Canada and delivering LNG to a U.S. port can have foreign crews and be built in Asia, presumably at a lower cost.

- Typically refuel in Tacoma or Seattle (or capable of refueling in Tacoma or Seattle).

Given the size of these customers, it is important to note that one additional large marine customer would fully subscribe the remaining capacity.

Currently, container shipping companies are complying with emission regulations by consuming LSMGO 0.1 percent fuel within 200 miles of the U.S. coast and switching to HFO beyond 200 miles. Some carriers, like TOTE, have waivers from the 0.1 percent fuel requirement for a defined timeframe while they develop a solution to move to a cleaner fuel. Only companies with older ships (like the former Horizon Line ships that Matson now owns) appear to be considering scrubbers, and it is unclear whether they are actually moving forward with scrubbers, or plan to simply run on the lower sulfur fuel while within the ECA.

LNG containerships are being ordered world-wide, but only Matson is known to have ordered LNG-capable ships for a U.S. west coast route.

Barriers to LNG Marine Conversion

There are a number of factors that stand in the way of a company's decision to change fuels. PSE will have to navigate the obstacles, some of which are outside of its control, to land the desired contracts. Obstacles include:

- Fuel Oil Prices – It will be challenging to convince a company to make the significant investment necessary to convert its ships, disrupt its business and jump out in front of its peers, if the project doesn't yield favorable returns in a timely manner. The current low price of oil has certainly delayed more wholesale conversions to cleaner fuels; and while most energy experts call for increased oil prices over the next five or so years, price uncertainty will prolong the delay.

- Access to Capital and Financial Strength – The container shipping business is very competitive and operates on thin margins. Some target customers may not be in position to dedicate capital to convert ships or have the balance sheet to support long-term contracts.

- Shipping Route – The ideal target customer is an operator that calls on the Port of Seattle or the Port of Tacoma on a regularly-scheduled basis. Operators that vary their routes and call on multiple ports will have difficulty making the requisite commitment for fuel and face supply uncertainty.

- Fuel Delivery Infrastructure – Fuel must be delivered to the customer, since not all customers can be served directly from a plant. First movers oftentimes bear the brunt of start-up costs. For example, barge services will have to be developed.

- Contract Terms – Marine operators want supply surety, but are hesitant to enter into long-term contracts for a variety of reasons (not least of which is "we buy oil under short-term or spot contracts"). Such a stance presents a dilemma because a short-term agreement puts supply surety at risk, and leaves pricing to the vagaries of the market, especially given the limited number of LNG suppliers. Discussions with several operators lead PSE to believe that a five-year deal would be palatable. Concerns about long-term contracts include:

    - Competitive threat – Operators don't want to be locked into a long-term contract that eventually results in them paying more than competitors for fuel.
    - Long-term exposure – Operators appear to be concerned that the market might become more liquid and they'll eventually be paying more than they otherwise might be able to negotiate (even if they are competitive in the market).
    - Fuel price volatility – Uncertainty about long-term commodity prices makes operators hesitant to enter into long-term contracts; the precipitous drop in oil over the last year has magnified that concern.
    - Credit ramifications – Long-term, fixed-price contracts encumber balance sheets and eat up credit lines.

Strategy

While PSE can't control what happens in the commodity markets, it does expect LNG to be a viable transportation fuel, with demand growing due to stricter emission regulations and the eventual return of favorable LNG-marine fuel oil price spreads. As discussed above, PSE will focus on direct sales to large marine customers, and will broaden its reach to the marine fuel community by targeting corporate decision makers, participating in industry forums to promote the fuel, and leveraging its relationship with the ports of Tacoma and Seattle to gain access to target markets. The ports of Seattle and Tacoma joined forces in August 2015 (forming the Seaport Alliance) to unify management of marine cargo facilities and business to strengthen the Puget Sound gateway and attract more marine cargo and jobs for the region. PSE expects that Tacoma LNG will become one of the advantages the Seaport Alliance can emphasize.

PSE will overcome the barriers detailed above by:

- Offering flexible contract terms –
    - Term:
        - PSE will be pushing the longest term possible, but plans to seek five-year minimum terms
    - Pricing (cost plus or market-based pricing):
        - Pricing will be term-differentiated and can be tailored to meet customer need
        - Could partner with trading companies to provide hedged products (fixed, collared, tied to other commodities)
    - Flexible gas supply solutions (full requirements contract, tolling service)
- Working with shipping companies to negotiate a waiver related to emission compliance in exchange for committing to convert to a cleaner fuel
- Partnering with a bunkering company to provide a delivered product
- Partnering with financing companies to facilitate conversions, if necessary

Strategy Risk and Mitigations

The key risk is that PSE would be unable to fully contract the capacity by the Tacoma LNG Facility's COD or shortly thereafter due to continued low oil costs or an easing of environmental regulations. While the probability of this risk is thought to be low, commodity pricing and regulations are beyond PSE's control. PSE will mitigate the risk by attempting to make sales to other markets (remote industrial applications or communities, for example). Alternatively, PSE may have to agree to pricing or terms that do not yield as favorable returns to compete with substitute fuels. However, PSE's ability to offer lower pricing may be limited due to TOTE's "most favored nations" clause. For a complete list of risks and mitigation, see ***Exhibit F.***

Implementation

Activity has dropped considerably during the summer as companies have waited to see where commodity prices will move. The companies that PSE has engaged continue to express interest and indicate that switching to a cleaner fuel is a matter of when, not if; however, most are treading water at this point—keeping options open but not actively pursuing anything. The

break gives PSE a chance to overhaul its approach to reflect a non-regulated strategy. PSE is working to develop a new proposal for long-term fuel supply contracts focusing on:

- Product – Package a turn-key delivered product with flexible supply solutions under five to 10-year firm contracts with renewal rights
- Price – Develop cost-based and market-based rate structures, considering the risks and returns associated with:
    - Pricing tied to petroleum indices under different crude pricing environments
    - Cost-based pricing with a market-based floor and ceiling
    - Fixed pricing
- Relationships – Continue to foster relationships with corporate decision makers at Matson, MOL, Alaska Tanker Company and Polar Tanker Company. Work to build relationships with decision makers at NYK, Evergreen, COSCO and Hamburg Sud.
- Promotions – Increase presence at conferences and industry forums and leverage relationships with the ports of Tacoma and Seattle and bunkering companies such as Maxum, Crowley, Harley Marine, BP and Shell to gain access to target markets.

Successfully attracting the right market will clearly be a business development undertaking. It will require the ability to help potential customers evaluate and understand their options and put various interests together to create solutions. PSE is expecting to manage the campaign internally, but is evaluating what additional resources and program structure may be required for success. Structures and resources under consideration include:

- Hire an experienced LNG business development representative—PSE could look to attract an individual (or individuals) with the requisite skills and experience to successfully deliver a customer or customers (while there is a large pool of individuals who have been working in the LNG space over the last several years, the candidate pool of individuals with proven track records in the U.S. marine market is quite small); or
- Develop a team focused solely on LNG business development with existing PSE employees—PSE has a few individuals with business development credentials in the energy arena; however, they do not have expertise in the marine market or LNG equipment.

Under either scenario, PSE will need to assemble a team of consultants to help with the technical aspects of LNG, including engineering and regulations. In the case of the internally-derived team, PSE will need a consultant or consultants that can assist PSE with market and relationship dynamics. The activities will be unregulated, so it will be necessary to establish a clear line of demarcation between utility and non-utility business lines. Finally, it will likely be necessary to develop a compensation program that drives results under any of the scenarios described above.

To the extent PSE is unable to develop the necessary expertise in-house, the fall back strategy will be to partner with a marketing company (e.g., Shell, BP, Clean Energy, Linde, WesPac, etc.).

Alternative Approaches

As stated above, PSE will be focused on large marine markets; however, we will not preclude alternative approaches as they become available. There is market interest in other sectors that may require modified strategies:

- Over-the-road transportation – Large truck fleets are still a potential market, but large-scale conversions will be mostly dependent on economics. Project payback requirements are relatively short given the lifespan of a truck, and fleet inventories are turned over a period of time, not all at once.

- Remote applications – It should be feasible to look at remote communities and industrial markets. In PSE's area it would likely be communities that cannot be or are not served by pipes, such as Port Townsend and Port Angeles.

- Trading companies (Sempra, BP, Shell, Marubeni, Sojitz, Tenaska, etc.) – Sempra and Shell continue to express interest, as well as a couple of the others listed; however, current market conditions have tempered the appetite for merchant risk, so they are less likely to enter into long-term agreements without having a customer—at that point, the primary value is credit. Further, some are likely interested only in an equity position.

Customer List and Current Status

Customer	Current Status
Matson (Hawaii route)	LNG-capable ships (engines will be dual-fuel) for its Hawaii route will be delivered in 2019. Matson has not given a timeline for making an investment decision for the fuel handling system and tanks. Matson has stated a preference for fueling these ships in Oakland, so it can use the ships on either of its west coast routes. (~100k gpd)
Matson (Alaska)	Tacoma to Alaska route recently purchased from Horizon. The Horizon ships are nearing the end of their useful life, so new ships will be required in approximately the next 5 to 10 years. It is expected that Matson will look at LNG ships. (~100k gpd)
WA State Ferries	The Governor and state legislators want the conversion to LNG to happen; however, no capital funding is being made available. WSF is expected to commence another RFP process in the not-too-distant future. Enacted legislation giving LNG tax relief includes a most-favored nation provision for WSF LNG costs. (15,000-45,000 gpd)
Potelco	The PSE service provider is converting its entire fleet to LNG and currently has approximately 100 trucks operating in Western Washington. (4,000-8,000 gpd)
MOL (Mitsui O.S.K. Lines)	MOL has placed orders for six new 20,000 TEU LNG-ready containerships. MOL currently plans to deploy these ships in the Asia Pacific to Europe routes, but has indicated it will begin looking at its Japan to U.S. routes as well (up to 350,000 gpd). (There are other trans-Pacific container ships that are purportedly exploring LNG that would have similar demand; however, MOL is the only such entity PSE has met. MOL owns and manages one of the world's biggest LNG carrier fleets.)
Interstate Trucking	The Saltchuk-owned company is currently running 20 LNG trucks (500-1,000 gpd) and has a total fleet of 1,500 tractors. (potential of up to 75,000 gpd)

Customer	Current Status
Salix/Sojitz	Salix is Avista's unregulated LNG marketing company and Sojitz is an investing partner. Salix and Sojitz are interested in taking an equity position in a West Coast LNG facility. They looked at the Tacoma LNG Project earlier this year, but have suspended further analysis due to weak oil prices and until more stringent emission regulations are known. They expressed interest in more than the remaining 110k gpd, so order-of-magnitude expansion costs have been provided.
Alaska Tanker Company & Polar Tanker Company	ATC and PTC move BP and Conoco crude from Alaska, respectively. Both have shown interest in LNG, but have asserted that they will not be first-movers (and have taken a stance of "show me the product works and will be reliable"). Both entities currently fuel in Port Angeles, so PSE may have a difficult time competing with FortisBC for these loads at that location, due to FortisBC's lower cost structure (larger plant, fully imbedded in ratebase with 40-year depreciation rates, owned land and expanding an existing plant) and closer proximity to Port Angeles. (ATC and PTC would each consume up to 75k gpd.)
Remote locals	Once LNG is available, PSE can explore the opportunity of providing local distribution service to remote locals, such as Port Townsend and Port Angeles. Both cities have a paper mill that could act as an anchor customer. (Port Townsend paper just concluded an RFP for CNG; approximately 30k gpd) If LNG can prove to be economically feasible, each community could eventually muster demand in the 100k gpd range.

Part II: Non-Regulated Returns

Part II of this exhibit summarizes the range and magnitude of potential returns from the non-regulated portion of the plant based on market development scenarios for LNG fuel in the Puget Sound region. This analysis updates the returns shown in the July 28, 2015 memo to the Board of Directors based on the most current assumptions and market forecasts.

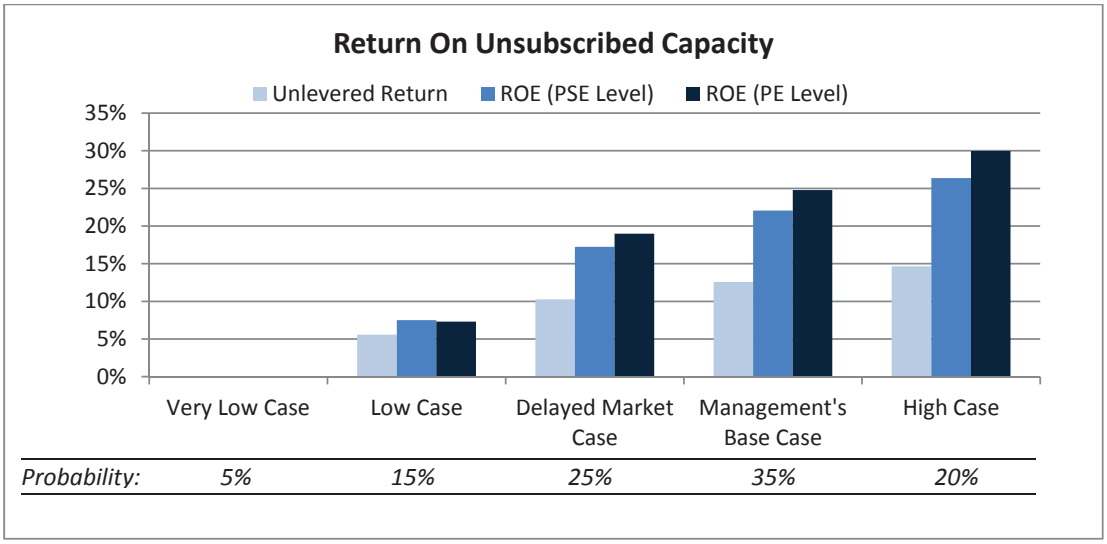
Summary of Results

Management considered five sales scenarios and the likelihood of each scenario to create a weighted average operating cash flow for the open capacity at the Tacoma LNG Plant. The unlevered and levered returns of the cash flows are:

	Very Low Case	Low Case	Delayed Market Case	Management's Base Case	High Case
Unlevered Return	< 0%	5.59%	10.27%	12.58%	14.65%
ROE (PSE Level)	< 0%	7.50%	17.24%	22.06%	26.38%
ROE (PE Level)	< 0%	7.30%	18.99%	24.78%	29.96%
Probability	5%	15%	25%	35%	20%

Based on the probabilities of each case, the expected unlevered return for the Project equals 10.9 percent and the PSE and PE ROE equals 18.5 percent and 20.5 percent, respectively.

The returns for the five scenarios are shown in the figure below:



Model Assumptions

Price

The unit price of LNG is based on the TOTE levelized price for the first 10 years of the Fuel Supply Agreement. Beginning in year 11, unit prices increase by 2.2 percent annually (operating costs are escalated at 2.5 percent annually and labor at three percent annually).

Assuming a $3.50/MMBtu gas commodity costs, the price of LNG out of the tailpipe of the plant would be approximately $13/MMBtu. Wood Mackenzie estimates that diesel costs in 2019 and early 2020s will range between $19/MMBtu and $21/MMBtu. While LNG will face higher supply chain costs, the 35 percent discount to diesel fuel should support a robust LNG fuels market in the Puget Sound region.

Capacity

The available LNG sales volume is assumed to be 41 million gallons annually. This figure is based on an allocated liquefaction capacity of 115k gallons per day (gpd) operating 359 days per year on average. The plant will be designed to operate above nameplate and there may be an opportunity to increase capacity up to 10 percent above nameplate under favorable operating conditions.

Timing

The analysis considers a full 50-year operating life from 2019 to 2068. In the Very Low Case (described in the following section), the Facility is decommissioned after the initial 25 years at a cost of $18 million allocated to the unsubscribed portion of the plant in year 25. Other sales scenarios assume a major upgrade (with $23.2 million allocated to the unsubscribed portion) in year 26 and a decommissioning cost of $30.5 million allocated to the unsubscribed portion of the plant in year 50.

Investment

The total construction costs for the non-regulated portion of the plant is $78 million. These costs assume an allocated capacity of 115,000 gpd of liquefaction and 1.2 million gallons of storage. These costs do not include allocated capital for bunkering and marine loading facilities. Capital costs associated with marine loading (dock, marine loading equipment, etc.) will be 100 percent allocated to TOTE. Other customers will pay a volumetric fee to utilize these facilities that will be credited to TOTE (consistent with the TOTE Fuel Supply Agreement). This fee is

treated as an expense to the non-regulated book and will be transferred to the regulated gas book to offset the credit received by TOTE.

Facility Expansions

This analysis does not include any expansion of the Facility to serve additional customers once the Facility is fully subscribed. This assumption leads to understating the potential upside value. If the market grows and the Facility is totally subscribed, additional liquefaction trains could be added for roughly $80 million for a 250k gpd train. An expansion of this size and cost results in a levelized cost of liquefaction capacity that is less than 50 percent of the cost of the initial build ($320/gpd of capacity compared to the $680/gpd of capacity in the initial build).

Operating Costs

Fixed operating expenses are allocated based on capital allocations (see ***Exhibit N*** for allocations and operating cost assumptions). The associated fixed operating costs and depreciation expense are the same in all scenarios. Operating costs include an A&G allocation to PSE's core gas. Operating costs also include payments to PSE's gas book for non-firm gas distribution service.

Sales Forecasts

Management considered five potential sales forecasts in this analysis. Each sales forecast is given a probability based on management's best judgement. The free cash flows associated with each case are weighted according to the probability to determine a weighted average cash flow that considers all the possible outcomes and the likelihood of those outcomes.

Very Low Case (5% probability)

The Very Low Case assumes the worst case scenario. Under this assumption, the market for LNG experiences muted growth and plateaus at 30 percent of available capacity (equal to about 34,000 gpd). Under this scenario, the price spread between natural gas and diesel does not support LNG truck and ship conversions. However, a few companies continue to pursue LNG fuel due to environmental and other benefits. The state ferry system would account for about 20 percent of the capacity with the additional 10 percent coming from trucking companies or other off-pipeline markets. In the Very Low Case, the plant is decommissioned in year 25.

Operating cash flows in this case are marginal or negative in the first 10 years before turning positive. The negative cash flow years are small with year one negative cash flow of ($730) and following years less than ($250k).

Low Sales Case (15% probability)

The Low Sales Case is modeled on the Concentric forecast, but with slightly delayed sales growth. In this scenario, the market for LNG fuels develops but is limited. Factors that could cause a slower LNG adoption rate might include delayed implementation of emissions regulation, a delayed recovery of petroleum prices, or a prolonged economic downturn. This scenario follows the same shape as the updated Concentric forecast, but the magnitude is muted. This case assumes that non-regulated capacity would never be subscribed above a 60 percent level (achieved in 2036), or about 70,000 gpd. This volume could support local tugs and barges, the state ferry system and one large trucking operation.

Delayed Market Case (25% probability)

The Delayed Market Case follows the Concentric forecast that is discussed in detail in Concentric's report (see ***Exhibit P***) at 85 percent of their projection for years 2019 through 2024. Beginning in 2025, this scenario assumes PSE sells 100 percent of the capacity (up from 34 percent sold in 2024). This scenario might occur if emissions regulations are delayed or if companies choose petroleum fuels in the short term (from 2020-2024) before building new LNG ships. This case assumes that PSE will be able to arrange short-term sales to smaller consumers (truck fleets or the State Ferries) for the first six years before contracting with a large marine shipping company in 2025. The timing of emissions regulations facing the shipping industry as well as the recovery of global oil prices suggest that at least some shipping companies will convert to LNG sooner than 2025. See ***Exhibit R*** for a detailed discussion on pending emissions regulations and compliance options.

Management's Base Case (35% probability)

Management's Base Case follows the Concentric forecast (see ***Exhibit P***) for years 2019 and 2020. Beginning in 2021, this forecast assumes PSE sells 100 percent of the capacity. Management believes that it is likely that demand for LNG in Puget Sound will occur in step changes. Large shipping companies (like TOTE) require significant volumes relative to the non-regulated capacity and it would only take one company similarly situated to TOTE to be fully subscribed. It is difficult to say when the next company will convert; however, the timing of pending emissions regulations and the projected recovery of global oil prices suggest shipping companies will convert in the early part of the next decade. See ***Exhibit R*** for a detailed discussion on pending emissions regulations and compliance options.

This scenario assumes that PSE will be able to arrange short-term sales to smaller consumers (truck fleets or state ferries) for the first two years before contracting with a large marine shipping company in 2021.

High Sales Case (20% probability)

The High Sales Case assumes that PSE sells all available capacity prior to the plant coming online in 2019. This scenario assumes a large marine customer or marketing entity would enter into a contract with PSE for the entire remaining capacity of the plant before that date. PSE anticipates that shipping companies that are ready to convert to LNG (and not just exploring the option) would begin to negotiate an LNG supply contract 18 to 36 months prior to the vessel being put into service (and therefore the start of the contract).[5]

[5] TOTE negotiated a deal with PSE that was executed roughly four years prior to delivery of LNG from the Tacoma LNG Facility. However, TOTE plans to have a vessel in service 16 months from execution and has arranged for interim supply. TOTE decision to commit to PSE so early was driven by a deal negotiated with the EPA for a waiver from the current ECA emissions requirements.

PUGET SOUND ENERGY

Exhibit H.

Real Estate Agreements

Contents

Real Estate Agreements

This exhibit describes key terms of the Facility lease and additional easements required to construct and operate the Tacoma LNG Project. The Facility lease has been executed and all easement agreements are expected to be completed prior to the November 2015 Board of Directors meeting when PSE Management will be seeking final approval of the Project.

Facility Lease

A lease between the Port of Tacoma, as Lessor, and Puget Sound Energy, Inc., as Lessee, was entered into on September 4, 2014. The lease covers approximately 30.15 acres of uplands and approximately three acres of submerged lands.

The lease term is 25 years, upon mechanical completion of the proposed LNG plant or 60months after the September 4, 2014 lease date. In addition, the lease can be extended for a second 25-year term subject to lease rental adjustments.

The lease is comprised of three basic time periods: Feasibility, Construction and Operations.

- The **Feasibility Period** started September 9, 2014 and continues for one additional year thereafter. The Feasibility Period can be extended on a month-to-month basis, but shall not exceed 24 months in total duration. The monthly rental rate for the first 12 months of the Feasibility Period is $49,725; beyond the first 12 months, the monthly fee increases by $7,000 per month for the duration of the Feasibility Period. During the Feasibility Period, PSE may terminate the lease upon payment of a lease termination fee of $50,000. If PSE was to terminate the lease due to environmental conditions not caused by PSE, the $50,000 termination fee would be waived.

- The **Construction Period** begins on the first day after the end of the Feasibility Period and no later than 24 months after September 4, 2014. Construction Period rent is $146,000 per month.

- The **Operations Period** begins on the Operations Date, which occurs upon completion of the Construction Period. Rent is again adjusted at the commencement of the Operations Period, to a rate of $212,445 per month and is subject to annual adjustments by the percentage change in the Consumer Price Index (CPI); however the rate shall never decrease. In addition to the Operations Period rent, a volume charge in the amount of $0.085 per barrel will be charged for all LNG leaving PSE's leased property. The volume charge will also be subject to annual CPI adjustments.

- There is one lease Extension Term available for an additional 25 years. The Operating Rent during the Extension Term would be calculated by the CPI adjusted monthly rental rate or via an appraisal, and the Port's discretion.

Easements

Additional real estate rights needed to provide Totem Ocean Trailer Express, Inc. (TOTE) with LNG include easements for an LNG pipeline, a bunkering facility, temporary construction areas and a control Measures area.[1]

The **LNG Pipeline and Control Measures Easement** will accommodate an underground pipeline for carrying LNG product from the LNG plant to the proposed bunkering facility within TOTE's leased property. The LNG Pipeline Easement is proposed to be 25 feet wide. According to PSE's Franchise Agreement with the City of Tacoma the LNG pipeline would be installed below grade and under Alexander Avenue. Additionally, the pipeline would cross under an existing Tacoma Rail railroad corridor. Thereafter, the pipeline would cross Port of Tacoma property that is leased by TOTE. The pipeline would be subsurface and, via the terms of the easement, PSE would retain the surface control necessary to safely and reliably operate the subsurface pipeline. The pipeline easement would be approximately 554 feet long. The easement term will begin upon 30-day notice of PSE's intent to begin construction and will terminate upon termination of the bunkering easement as described below. The Control Measures portion of the easement will allow for the control of those surface areas within the easement in order to comply with all LNG regulations and to protect the health and safety of people and property. There will be no charge for this easement.

[1] Final easements have yet to be executed. The terms described herein are based on the latest available information from what is presumed to be the final framework for the agreements; however, this information is subject to change.

The Bunkering and Temporary Construction Easements consist of the following:

- The **Bunkering Facility Easement** will consist of an approximately 1.38-acre fenced area and will include both upland facilities and a small pier. Upland facilities will include LNG piping, valves, a receiving pit and a sump. The LNG Pipeline Easement, as described above, will deliver LNG to the bunkering facility. Thereafter, the LNG will be conveyed to a marine loading arm or via LNG hoses located at the end of the pier. The fee for the easement will be based off of the current TOTE lease and is expected to be $4,000 to $5,000 per month.

- A **Temporary Construction Easement**, which includes areas of uplands as well as certain moorage rights, will allow for all necessary or incidental uses by PSE for the installation and construction of bunkering station infrastructure.

- The **Bunkering and Temporary Construction Easement** terms will terminate on the earlier of 1) termination of PSE's lease for the LNG plant or 2) termination by TOTE of its lease with the Port of Tacoma. There is no fee for this easement.

PUGET SOUND ENERGY

Exhibit I.

Permitting and Authorizations

Contents

Permitting and Authorizations

Features of the Tacoma LNG Project ("Project") that trigger permitting and other governmental authorizations (permits) include siting the Tacoma LNG Facility ("Facility") to meet exclusion zone requirements, construction of the Facility, the direct LNG fuel line to TOTE's facility, the in-water pier work in the Hylebos and Blair waterways, and gas distribution system upgrades. The primary areas of permitting are (1) WUTC approval that the Facility and fuel line to TOTE meet applicable LNG safety requirements; (2) state and federal environmental review as required prior to permit issuance; (3) substantive federal, state and local permits, and associated review of potential impacts to fish and marine mammals. These areas are discussed further below and a permit timeline and assessment is provided in figures 2 and 3 at the end of this exhibit.

Other factors that must be addressed in the environmental review process, as they could potentially affect construction timeframes and design, include contaminated groundwater, soil, sediments and associated cleanup efforts. Within the site are known areas of petroleum contamination subject to a Washington Department of Ecology (Ecology) cleanup effort. The Environmental Protection Agency (EPA) is the lead agency on a cleanup immediately northwest of the site that includes a contaminated (mainly chlorinated solvents) groundwater plume extending into the northern portion of the site. There is also known contamination in the areas that may be used for the new high pressure pipeline to the Facility. PSE has been working closely with cleanup staff from the EPA, Ecology and the Port to ensure that the Project's construction is not impacted or delayed by these issues, and that the construction and operations will not impede future cleanup.

LNG Safety Requirements

A key consideration for siting the Facility is meeting exclusion zone requirements under the U.S. Department of Transportation's Pipeline and Hazardous Material Safety Administration's (PHMSA) safety regulations (49 CFR 193). These regulations, which guide exclusion zones surrounding LNG facilities, are implemented by the WUTC Office of Pipeline Safety (OPS). The proposed site meets all exclusion zone requirements based upon final design and modeling. The Plant Siting Report and Fire Protection Evaluation were submitted to both OPS and the City of

Tacoma in July 2015, with no negative comments received from either agency. The Project also includes an LNG cryogenic pipeline from the Facility to TOTE, which uses a design not contemplated by current code or adopted standards, due to extensive regulatory lag at the federal level. The pipeline has been designed to newer safety standards, but those standards have not been adopted by code. PSE has been working with PHMSA, WUTC OPS, and U.S. Coast Guard (USCG) to gain approval of the pipeline. Although all parties have been complimentary of the pipeline's conservative design, there has been uncertainty among the regulators regarding the approval process. In early September PSE received agreement from the agencies that WUTC OPS will have design and construction oversight and USCG will have operational oversight. For formal approval, PSE has now been directed to apply for a state waiver with WUTC OPS. This waiver letter, along with recently added justification, is currently underway and expected to be complete by January 2016. It is PSE's understanding that the state waiver process should take less than 90 days from the time of submittal. WUTC OPS and the City of Tacoma Fire Department are finalizing a defined framework to ensure that each party performs their respective responsibilities while keeping the other party apprised of design status and permit review as necessary and appropriate to their respective jurisdictional authority.

Waterway Suitability Assessment

The U.S. Coast Guard has jurisdiction over the siting of LNG Facilities located on the water, the design of vessels that carry LNG and the coastal waterways where LNG vessels transit. The USCG is not an approving agency, but is responsible for writing a *Letter of Recommendation* (LOR) recommending the suitability of waterways that will be used to load and transit LNG and mitigations to reduce safety and security risks (as defined in 33 CFR 127). For a FERC regulated facility, the LOR is addressed to the FERC; however, for the Tacoma LNG Facility, the LOR will be addressed to the City of Tacoma and the WUTC OPS. Jurisdiction for review of the facilities and waterways (and ultimately the issuance of the LOR) falls to the captain of the Port, in this case the Commander of Sector Puget Sound.[1] The LOR process begins with submittal of a Letter of Intent (LOI) and Preliminary Waterway Suitability Assessment (WSA), is followed by the development of the complete WSA which involves detailed analysis and stakeholder engagement, and culminates in the issuance of the LOR.

PSE began working closely with Sector Puget Sound (the local USCG authority) in 2012. In Q3 of 2014, PSE engaged ABS Consulting to develop the WSA and associated documents and assist PSE in working through the USCG process. In December 2014, PSE submitted the LOI and

[1] Jurisdiction for review of LNG vessel design falls to the USCG Headquarters, as opposed to review of facilities and water ways which is under the jurisdiction of the local USCG Sector.

preliminary WSA to the USCG. In Q1 and Q2 of 2015, PSE and ABS Consulting went through the extensive process of creating the WSA. The WSA considers the incremental safety and security risks that an LNG Facility and LNG vessels pose to the Port and waterways, the mitigations and resources that are currently in place to address these risks and identifies new mitigations and resources that are needed to further mitigate risks. PSE's WSA considers the impacts to the Blair and Hylebos waterways at the Port of Tacoma as well as an LNG barge route through Puget Sound to the Canadian Border.

A key component of developing the WSA is stakeholder engagement. In March 2015, PSE and ABS Consulting hosted two full days of Safety and Security Risk Assessments which were attended by local emergency responders, the USCG, the Port of Tacoma and county emergency management coordinators. During the risk assessment workshops, stakeholders identified risks and mitigations. The topics addressed concern the loading operations for an LNG barge and the TOTE vessels, as well as operations of the LNG barge and tug when transiting through Puget Sound. All of the risks identified can be mitigated without significant impacts to the design or planned operations of the Tacoma LNG Facility. It is unlikely that the USCG would introduce new risks or require additional mitigations that would be onerous to the planned operations between now and COD of the Facility.

PSE submitted the WSA to the USCG for review in July 2015. The USCG reviewed the WSA and will instruct PSE to add additional analyses on portions of the route and barge operations (a formal letter is expected by the end of September). Upon completing the final WSA, the USCG will review the document with a stakeholder group and will issue an LOR which will attest to the suitability of the waterways. PSE anticipates issuance of the LOR in Q2 2016. While issuance of the LOR is an important milestone, it does not mark the end of the USCG process. By definition, the WSA is a living document and must be revisited throughout Facility operations. The risk of the USCG requiring resources or procedures that would be costly or onerous cannot be fully mitigated; however, the work PSE has done to date (including the risk assessment workshops and submittal of the WSA) has mitigated this risk to the extent possible at this time.

Environmental Review

Environmental review under the State Environmental Policy Act (SEPA) and the National Environmental Policy Act (NEPA) is required. These procedural laws require a detailed assessment of a project's environmental impacts before substantive permits are issued. Permit applications can be reviewed by agencies contemporaneously with SEPA/NEPA review, but permits themselves are issued only after SEPA/NEPA review is complete. The Project's SEPA/NEPA review can only be challenged concurrently with appeals of the substantive

permits. The City of Tacoma is the official SEPA lead agency and thus responsible for environmental review. The EIS is the highest level of SEPA/NEPA review. The federal NEPA lead agency will make use of the SEPA EIS to meet its NEPA obligations.

PSE prepared a preliminary Draft Environmental Impact Statement (DEIS) for consideration by the City of Tacoma in spring 2015. The City conducted independent engineering and safety peer review, revised the document and published a DEIS on July 7, 2015 for public comment and agency review. The City also held a public meeting on July 16 to discuss the Project and solicit questions. Comments on the DEIS were accepted through August 6, 2015. The City is currently addressing these comments, making appropriate changes and plans to publish the Final Environmental Impact Statement (FEIS) in late September 2015.

Controversy surrounding other Washington fossil fuel projects and public misinformation about LNG has been effectively managed to date through various outreach efforts. Of 27 total comment letters received by the City of Tacoma (two of which were submitted after the close of the comment period but reviewed by the City), 25 are generally supportive, and two comment letters[2] from the Puyallup Tribe were critical of the Project, asserting significant siting and safety concerns.[3] Since those letters were submitted, the City of Tacoma has met with the Tribe to hear their concerns and to respond. The City of Tacoma has told PSE that they believe the Tribe's comments will be sufficiently addressed in the final EIS, and there are no outstanding issues. Nevertheless, PSE is also seeking a meeting with the Tribe, and is preparing a formal response to the Tribe's comments.

PSE and the City of Tacoma have reached an agreement in principle regarding the Project's impacts and associated mitigations related to health and safety, emergency response, road restoration post-construction, and to a lesser degree visual and shoreline effects. The agreement will include partial funding to pave Taylor Way to a heavy haul standard, remodel and reopen an existing fire station in the area and implement a new Emergency Response/Intelligent Transportation System. The City will include a summary of measures that achieve global resolution of all Project-related impacts and mitigation in the Final EIS.

The adequacy of final SEPA/NEPA documents can be appealed, but substantive challenges have low success rates because SEPA/NEPA is focused on the *process* of disclosing a project's effects,

[2] The second Puyallup Tribe letter, dated August 17, 2015, was untimely but was nevertheless received and considered by the City.

[3] Puyallup Tribal concerns prior to submittal of their comment letter included only ensuring that Project construction avoids impacts to a tribal native restoration area on the opposite bank of the Hylebos waterway and the need for cultural resource monitoring during pipeline construction. PSE has prepared and shared copies of a Cultural Resources Survey, Unanticipated Discovery Plan and Archaeological Monitoring Plan.

rather than yielding permits. Procedural errors are more vulnerable to reversal. SEPA/NEPA appeals can cause significant delay notwithstanding lack of merit.

Substantive Environmental Permits

The first stage of construction—which includes demolition, clearing and grading—will require local and state permits, including a City of Tacoma issued shoreline permit and a construction stormwater permit issued by the Washington Department of Ecology. PSE is also pursuing a Pierce County Conditional Use Permit needed to begin work on the Golden Givens substation at this time.

The permits for in-water work represent a significant portion of the permitting requirements and include approvals from multiple federal and state agencies. In-water work consists of (1) work on the existing stormwater drainage outfalls on the Hylebos to support drainage of the Project site, (2) construction of a new fueling pier for TOTE on the Blair Waterway, and (3) removal and replacement of the existing Hylebos pier, in the event that the cryogenic line to TOTE is not approved. Approvals and permits for all the in-water work require consideration of Project impacts to fish and marine mammals during SEPA/NEPA review. PSE staff continues to diligently pursue timely agency review and action and the USACE.

Work on the Hylebos stormwater outfalls must be completed before work on the piers, and is authorized through a U.S. Army Corps of Engineers (USACE) Nationwide Permit. This permit's issuance and start of construction on these improvements is targeted for late fall/early winter 2015.

Construction of the in-water fueling pier in the Blair Waterway is planned for late summer 2016 pursuant to final USACE Section 10 and 404 permits. Hylebos pier in-water construction, if necessary for project development, will also require USACE Section 10 and 404 permits and will need EPA concurrence that construction will not affect the ongoing efforts to address existing sediment contamination on the Hylebos. PSE and the Port propose that the mitigation plan for all Blair impacts be addressed by removing overwater decking on the Hylebos pier. Fish and marine mammals concerns are being addressed through review by the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS). Standard in-water construction measures are proposed by NMFS to ensure minimization of impacts on fish and mammal species.

Other local permits include multiple building permits (one for each structure) requiring a fire protection plan approved by the Tacoma Fire Department (TFD). PSE has submitted a Fire Protection Evaluation to the Tacoma Fire Department for review. A separate siting report was

also submitted to TFD that addresses the results of thermal radiation and vapor dispersion modeling at the Facility site. PSE will continue to work closely with the TFD to communicate and demonstrate how our code-compliant Project design addresses safety concerns. On a tangential front, the Tacoma City Council unanimously approved a new franchise agreement with PSE on September 15, 2015.

Permitting Schedule Risks and Additional Environmental Permitting Considerations

Based on the most current design information, review with affected agencies, and review of other projects in the vicinity, the PSE permitting team believes that all necessary permits will be obtained—assuming no significant changes to the Project design and the Facility's ability to satisfy federal safety requirements and environmental permitting. All permits for Tacoma LNG, however, can be appealed.

Appeals of substantive environmental permits, their underlying SEPA/NEPA analyses or fish/mammal species assessment under the Endangered Species Act and the Marine Mammal Protection Act (ESA/MMPA) could result in significant delays. Courts generally defer to agencies regarding substantive analysis and conclusions on environmental analysis and permit issuance, so a more likely risk would be that a court could overturn a decision based on a procedural error. The PSE permitting team is using best efforts to ensure that proper procedures are followed such that the company can prevail under any such appeals.

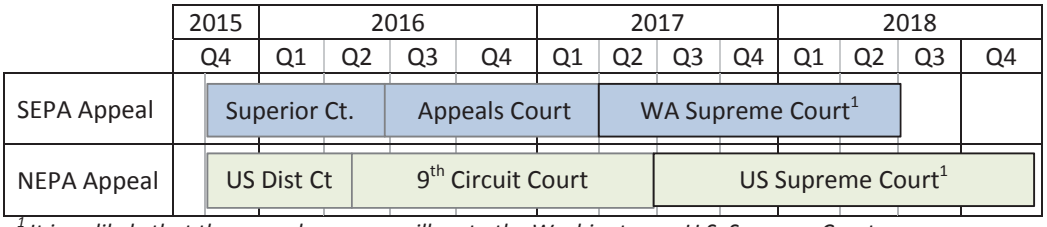
At the state level, the SEPA appeal period is triggered by the first local or state governmental agency permit issued after FEIS issuance. Under Washington state law, a SEPA appeal must attach to the appeal of a permit, and these appeals are processed together. Such land use permit/SEPA appeals receive expedited court review in Superior Court, where the body of evidence reviewed is limited to the public permitting record. As such, the local permitting jurisdiction's rules and the sequence of issuance for state and local permits can dictate whether a SEPA appeal must first go to an administrative hearings board, or may take an expedited path directly to judicial review in Superior Court. PSE expects that its first state or local permit will be a CUP from Pierce County, an authorization which will require a final EIS prior to issuance but which does not include an interim appeal step. Alternatively, if the shoreline permit is issued first the appeal will go to the Shoreline Hearings Board which is a state judicial entity.

For federal authorizations and associated reviews under NEPA and the ESA/MMPA, the most likely scenario is a challenge to a substantive federal permit as well as the associated NEPA

and/or ESA review processes.[4] Such claims would likely be alleged concurrently in a single lawsuit filed in federal court. In such a challenge, the court would apply the federal Administrative Procedure Act's standard of review, which provides that the court will uphold the agency decision unless it is arbitrary, capricious, or otherwise not in accordance with the law. Under this standard of review, courts generally defer to the technical or scientific analyses and conclusions of the agency, as long as they are supported by the record, reasoned, and rational. PSE expects that its first federal permit will be a USACE 404 permit.

The appeals of the environmental substantive permits and their associated environmental review processes (SEPA, NEPA and ESA consultation) can run concurrently and may largely overlap each other. Of the substantive permits, those with appeal potential include the City of Tacoma Shoreline Substantial Development Permit, the Pierce County Conditional Use Permit and the U.S. Army Corps of Engineers permits. Regarding appeals, as mentioned above, courts will generally defer to the issuing agency on substantive issues, and the PSE permitting team has used best efforts to work with agencies to minimize the risk of successful appeals based on procedural errors.

Figure 1. Environmental Review Processes for SEPA and NEPA



[1] *It is unlikely that the appeals process will go to the Washington or U.S. Supreme Court*

[4] Regarding the ESA review process, fish/mammal species assessment must be completed for the in-water portion of the permitted work. PSE has maintained continuous close contact with the USACE, FWS and NMFS, to provide information pertaining to the Project's potential environmental effects. Based on analysis of the Project's potential environmental effects, the agencies conducted informal consultation regarding Endangered Species Act (ESA) listed species. Informal consultation is being completed with a short concurrence letter from the consulting agency (NMFS) that a project is "not likely to adversely affect" a listed species. The conclusion of the information consultation could be challenged in the form of one or more ESA-based causes of action that are included in a lawsuit challenging the USACE's 404 permit.

Figure 2. Permitting Timeline for Tacoma LNG Facility (Updated 9-8-2015)[5]

June 2014	Due diligence sampling conducted to assess soil and groundwater conditions at Facility site at Port of Tacoma
July 2014	Formal pre-application meeting with City of Tacoma and PSE request that the City prepare an Environmental Impact Statement
July 2014	Pre-application joint multiple agency meeting; individual meetings with select agencies/tribes
Sept - Oct 2014	30-day SEPA scoping period for the EIS
November 2014	Submitted JARPA application to City of Tacoma, Ecology, state Fish and Wildlife, and U.S. Army Corps of Engineers to trigger Shorelines/Critical Area Review, 401 Water Quality Certification/Coastal Zone Consistency, Section 10 and 404 permitting/consultation with NOAA Fisheries and USFWS
July – Dec. 2014	Preparation and submittal of accompanying permit applications
December 2014	Purchased the property for the proposed limit station on/near Golden Given Road in Pierce County
December 2014	Submitted Conditional Use Permit application to Pierce County for limit station
January 2015	EIS technical reports and summary analysis shared with City of Tacoma
July 2015	City of Tacoma issues Draft EIS
July/August 2015	30-day EIS public comment period
Expected late Sept 2015	Final EIS issued by City of Tacoma
Expected mid-late Oct 2015	Issuance of the Pierce County Conditional Use Permit for the limit station, Tacoma Shoreline Substantial Development Permit and USACE Section 10/404 Permit followed by appeal period

[5] *These timeframes are heavily dependent on the agencies involved. Consequently, they will be periodically updated as agency relationships and permit issues evolve.*

	The Final EIS adequacy can be appealed at this point in conjunction with the first permit issued for the project. If not appealed, then SEPA is complete and no longer appealable
January - June 2016	Acquisition of Street Use and Right-of-Way Use permits for the Pipeline with Cities of Tacoma and Fife, and Pierce County
Nov 2015 – May 2016	Building demolition, soil stabilization, and installation of underground utilities
Spring 2016	Construction begins on Interstate 5 and State Route 509 Pipeline crossings and Frederickson Gate Station Rebuild
September 2016	Plant construction begins
Aug 2016 – Feb 2017	In-water work/fish window for construction at Blair Waterway
Late 2018	Plant is operational

** Remediation related to permit approvals may be triggered by existing clean-up agreements with Ecology and EPA. At this time, remediation is not contemplated in this timeline.*

Figure 3. Permitting Assessment

The following tables comprise a current list of the permits and approvals required for construction of the Project. Changes to Facility design may require additional permits or approvals.

Federal Agency	Permit/Approvals	Agency Action
U.S. Department of Transportation (DOT) as Administered by WUTC Office of Pipeline Safety	WUTC issues agency approval of design elements consistent with 49 CFR Parts 192 and 193, the federal safety standards	Must demonstrate that new LNG facility meets standards governing siting, design, installation, personnel qualifications and training. Incorporates requirements of NFPA 59A. DOT/PHMSA, WUTC OPS and PSE substantially in agreement on the design of the cryogenic pipeline as of September 2015.
U.S. Department of the Army Corps of Engineers, Seattle District (USACE) Permitting process now working to conclusion with expected permit issuance in October 2015.	Section 10 (Rivers and Harbors Act) NEPA Lead	Permit for placement of structures in, or affecting, navigable waters (e.g., LNG loading facility).
	Section 404 (Clean Water Act) Individual Permit	In-water work at the pier/LNG loading facility.
	Nationwide 3 (Repair and Maintenance) Permit	Modification of existing stormwater outfalls at the LNG facility site require a NWP 3 permit to install an inline tide valve and new terminal pipeline section in three outfalls.

Federal Agency	Permit/Approvals	Agency Action
U.S. Department of the Army Corps of Engineers, Seattle District (USACE) Permitting process now working to conclusion with expected permit issuance in October 2015.	Section 106 NHPA Consultation	The USACE is the federal agency responsible for conducting Section 106 Consultation with DAHP and applicable tribes (Puyallup Tribe, Muckleshoot Tribe). In support of this consultation, PSE prepared a cultural resources report and construction monitoring plan conformant with Section 106 consultation documentation guidelines established by DAHP.
U.S. Coast Guard (USCG) Letter of Recommendation expected Q2 2016.	Letter of Recommendation (33 CFR Part 127)	Captain of the Port issues Letter of Recommendation to City of Tacoma and WUTC OPS. LOR is issued after approval of WSA.
	Permission to establish Aids to Navigation required under 33 CFR Part 66	USCG must be notified and give permission to establish any navigational aids (buoys) associated with the LNG loading facility.
National Marine Fisheries Service (NOAA Fisheries) Informal consultation with federal agencies was acceptable, which helped minimize the time for agency review.	Section 7 of Endangered Species Act	Provide biological concurrence on marine species of wildlife that are federally listed as threatened or endangered, and on managed fisheries. Oversight of activities associated with marine facilities construction and essential fish habitat (EFH). Underwater noise could trigger consultation due to potential impacts to listed species of salmon.

Federal Agency	Permit/Approvals	Agency Action
National Marine Fisheries Service (NOAA Fisheries) Informal consultation with federal agencies was acceptable, which helped minimize the time for agency review.	Essential Fish Habitat (EFH), Magnuson-Stevens Fishery Management and Conservation Act	Underwater noise associated with pile driving for dolphin installation. Mitigation – PSE and TOTE prepared an Underwater Noise Monitoring Plan for the installation of 30-inch diameter steel piles.
	Marine Mammal Protection Act. Level B harassment authorization	Underwater noise associated with pile driving for dolphin installation.

Special Purpose District	Permit/Approvals	Agency Action
Port of Tacoma Port concurrently reviewing design modifications to existing buildings for reuse with PSE.	Tenant Improvement Procedure	Port of Tacoma review of tenant-proposed improvements at the leased site. The procedure defines the requirements to which the tenant and Port staff must adhere, with the intent to set review and approval standards, clarify decision making, ensure required deliverables are met and allow for a more efficient and cost-effective project completion.

State Agency	Permit/Approvals	Agency Action
Department of Ecology (Ecology)	Declined to be SEPA Lead Agency	Supplemental Environmental Impact Statement
	NPDES[6] – Construction Stormwater General Permit Issued 7-29-2015.	Permit for all soil-disturbing activities where one or more acres will be disturbed and have a discharge of stormwater to a receiving water and/or storm drains that discharge to a receiving water.

[6] National Pollutant Discharge Elimination System (NPDES)

State Agency	Permit/Approvals	Agency Action
Department of Ecology (Ecology)	NPDES Industrial Stormwater General Permit. TBD	Permit for public or private operation of an industrial facility with a stormwater discharge to surface waters or a storm sewer.
	NPDES Individual Permit or State Waste Discharge Permit TBD pending design requirements.	NPDES Individual Permit - Any discharge of wastewater directly into surface waters through a conveyance system. State Waste Discharge Permit - For a planned discharge of wastewater to the ground or discharge of wastewater to municipal treatment plant.
	Coastal Zone Consistency Determination Will be found consistent in review of Shoreline Permit	Determination for federal activity and development in coastal counties. Federal-state partnership: Ecology reviews projects to determine that the activities are compliant with six laws: Shoreline Management Act, SEPA, Clean Water Act, Clean Air Act, EFSEC, and Ocean Resource Management Act.
	401 Water Quality Certification Concurrent with USACE permit process.	Certification to conduct any activity that requires excavation in or might result in a discharge of dredge or fill material into water or non-isolated wetlands.
	Spill Prevention and Spill Response Plan (CWA, 33 U.S.C.§1321(j))	Plan for responding to spills. PSE intends to utilize the PSE/utility Emergency Spill Response Plan as part of the site Spill Prevention, Control and Countermeasure Containment Plan for the Project. Prepared with the Contractor once selected.
	Hazardous Chemical Inventory Reporting Requirements	Facilities that have hazardous substances on-site are required to provide information on the type, quantities, and storage locations for those substances. Date to be determined.
Department of Fish and Wildlife (DFW)	Hydraulic Project Approval application submitted in June 2015; issuance pending completion of FEIS	Permit for work that uses, diverts, obstructs, or changes the natural flow or bed of any of the salt or fresh waters of the state.

State Agency	Permit/Approvals	Agency Action
Washington State Department of Transportation (WSDOT)	State Highway Crossing Permit	Permit for the occupancy of highway rights-of-way. Application to be submitted to WSDOT in Q1, 2016.
Department of Archaeology and Historic Preservation (DAHP)	Section 106 Consultation in coordination with lead federal agency– USACE	See Section 106 review entry above. The DAHP would consult directly with the USACE.
	Archaeological Excavation Permit	Permit for excavation altering or removing archaeological resources or Native Indian grave sites. An Unanticipated Cultural Resource Discovery Plan has been prepared, although PSE does not anticipate cultural resources would be disturbed by development of the proposal.
Puget Sound Clean Air Agency	Notice of Construction/Order of Approval	Permit for any new air pollution sources. This permit is required prior to construction of facilities that affect the level of air contaminants. Further plant design inputs are required; PSCAA is expected to permit the facility as a minor source in Q1 2016.

State Agency	Permit/Approvals	Agency Action
Department of Archaeology and Historic Preservation (DAHP)	SEPA Review	Although not a permit or approval specifically, DAHP is designated as the agency with expertise under SEPA for cultural resource issues.

Tribes	Permit/Approvals	Agency Action
Puyallup Tribe of Indians	Ongoing Informal Coordination	Although no formal Tribal action is required, PSE will coordinate with the Puyallup Tribe/Marine View Venture (development arm of Tribe) to address any potential Tribal concerns. See above for description of formal consultation between the USACE, tribes and DAHP.

Local Government	Permit/Approvals	Agency Action
City of Tacoma	SEPA Lead Agency	Environmental Impact Statement
	Shoreline Substantial Development Permit	Expected permit issuance in October, 2015 by Tacoma for development on shorelines at the Tacoma LNG Facility Site and TOTE Fueling Site.
	FWHCA Permit	Wetlands and Critical Areas Review in queue with Shoreline permit review and issuance.
	Floodplain Development Permit	Local governments participating in the National Flood Insurance Program are required to review proposed development projects to determine if floodplains are shown on the NFIP maps. If a project is located in a mapped floodplain, the local government must require that a permit be obtained prior to development. Floodplain review in queue with Shoreline permit review and issuance.
	Clear and Grade Permit/Demolition Permit	Allows for site clearing and demolition of existing structures in compliance with local, state and federal regulations at the Facility. Application in preparation concurrent with design considerations.

Local Government	Permit/Approvals	Agency Action
City of Tacoma	Building Permit Initial Building Permit has been issued for Admin Bldg. Each structure will require its own building permit. Iterative process.	Ensure project complies with IBC and Tacoma/ state policies and regulations at the LNG Facility/TOTE Fueling Site. 2.02.010 Adoption of International Building, Residential, and Existing Building Codes (includes Tacoma adoption of federal fire code provisions related to LNG).
	Street Use or Right-of-Way Use Permit	Locating a pipeline or project element in road right-of-way. Short duration permit to be obtained closer to construction date.
Pierce County	Street use or Right-of-Way Use Permit	Allows for site clearing and demolition of existing structures in compliance with local, state and federal regulations. Short duration permit to be obtained closer to construction date.
	Conditional Use Permit	Locating limit station in a zone not outright permitted but allowed as a conditional use in the underlying zone. Required for the new limit station. Permit issuance pending a public hearing on the limit station use. Expected October 2015.
	Construction (Clear & Grade) Permit	Allows for site clearing and demolition of existing structures in compliance with local, state and federal regulations at the limit station and modifications at the existing Frederickson Gate Station. Requires additional design elements for the application but can be issued following issuance of the land use/CUP permit for the limit station.

Local Government	Permit/Approvals	Agency Action
Pierce County	Building Permit	Ensure project complies with International Building Code (IBC) and Pierce County and state policies and regulations at the proposed limit station and in the modifications to the Frederickson Gate Station. 17C.20 International Building Code. 17C.60 International Fire Code. Expected late 2015.
	Critical Areas Review	Conducting activities within a critical area. Concurrent with CUP review at limit station and any design review at Fredrickson Gate Station.
City of Fife	Right-of-Way Permit Utility Permit	Locating a pipeline or project element in road right-of-way. Application submittal anticipated in Q1 2016 for crossing of Interstate 5 and locales.
	Flood Permit	For activities proposed to be conducted within the 100-year floodplain. Concurrent with ROW Use Permit review.
	Critical Areas Review	Conducting activities within a critical area. Concurrent with ROW Use Permit review.

PUGET SOUND ENERGY

Exhibit J.

Public Affairs and Communications

Contents

Public Affairs and Communications

Joint Strategy and Messaging

This Public Affairs plan has grown support for the Project, with a specific focus on creating the necessary political and community support to enable the permitting and siting of the Facility. We leverage this support in partnership with the Permitting and Commercial teams in their negotiations with the City, Port, and other permitting decision makers.

Central to the plan is a coordinated communications and outreach strategy for local and state government, the Tacoma/Pierce County community and special interest groups, including environmental, commercial partners, regulators and PSE customers.

The key messages have included:

1. **The Tacoma LNG Project will help ensure continued dependable service and additional benefits to PSE natural gas customers.**

    a. Talking points include the substantial benefit for PSE natural gas customers during peak demand periods and the cost advantage of LNG compared to alternative resources such as diesel.

2. **The Tacoma LNG Project will generate important economic benefits for all South Sound residents.**

    a. Talking points include new job growth and existing job security due to the economic advantages of natural gas and the overall economic benefit for the Port of Tacoma, City of Tacoma and State. In addition, the Facility will generate millions of dollars in tax revenue for local schools and public services.

3. **The Tacoma LNG Project will provide important environmental benefits for the people of Tacoma and for the State of Washington.**

    a. Talking points focus on how the LNG provided by this Facility will help address the community's air quality issues as well as Washington state's ability to meet its

carbon emission goals. Other environmental benefits include minimizing the threat of marine spills and emphasizing PSE's leadership as an early adopter of environmentally progressive alternative fuel options for our customers.

4. **Natural gas is a proven, safe source of energy that reduces reliance on foreign fuels.**

    a. Talking points include the safe history of LNG use world-wide, PSE's experience with LNG and natural gas and the benefits of relying on an abundant, North American fuel source.

The Project communications tools, consistent with our messaging, include:

- Project webpage (see page J-11 for screenshot)
- Project fact sheets, brochure, and Frequently Asked Questions (FAQs)
- Graphics, including:
    - Visual simulations of the Facility
    - Maps of the Port and pipeline
    - Infographic illustrating the safety and environmental benefit of LNG
- A briefing packet for PSE messengers to use in their outreach activities

The coordinated outreach strategy includes but is not limited to:

- Ongoing, targeted stakeholder briefings, with:
    - Elected officials at the City of Tacoma, Port of Tacoma, Pierce County, Washington State Legislature, Washington Governor's Office, and Washington State delegation to the U.S. Congress.
    - Business Leadership in Greater Tacoma area including the Tacoma Chamber and economic Development Board.
    - Port of Tacoma Customers
    - The Tacoma Propeller Club
    - Organized Labor

- Northeast Tacoma Neighborhood Council (community leadership and community members)
- Citizens for a Healthy Bay
- Friends of Julia's Gulch
- Customers affected by new pipeline construction
- Local small businesses (Fife)

State Government

The Tacoma LNG Facility received strong proactive support from state legislators and the governor through 2014 legislation to provide an approximately $10 million carve out from the Manufacturing and Equipment tax and ongoing utility tax relief of approximately $4 million per year. These elected officials view the Project as a multifaceted win. The mayor and governor are especially attracted to the Project because it promotes state and local economic development and positions both governments as regional and national leaders in the low carbon transportation fuels arena. The Project also creates jobs, improves the environment through the reduction of greenhouse gas emissions and particulate matter, and provides infrastructure support for PSE's natural gas customers in the form of peaking resources and pipeline development.

Local Government

The goal of the Local Government Affairs strategy is to maintain support from elected officials and key community leaders in order to provide a platform for regulatory tax reforms, approval of the lease from the Port of Tacoma, timely permitting, successful mitigation negotiations with the City as part of the Environmental Impact Statement process, and successful construction of the LNG Facility.

Leaders view this Project as positive for the Port of Tacoma, for the environment and air, and as a driver of a new industry and fuel source.

Recruitment for Third-Party Support for Permitting and Siting

The Outreach Team has coordinated closely with the Project and Permitting teams to recruit third party support letters for 1) PSE's Shoreline Permit with the City of Tacoma, and 2) the

City's Draft Environmental Impact Statement (DEIS). This support demonstrates to the permitting authorities that broad political, civic leadership, and community support exists for the Project, which directly supports the impetus for timely and positive outcome on permitting and siting decisions. The results were broadly positive.

For the Shoreline Permit, PSE secured letters of support from:

- **John Parrott** — TOTE, President
- **Gary Brackett** — Tacoma Pierce County Chamber, Manager
- **Shelly Schlumpf** — Puyallup Sumner Chamber of Commerce, President & CEO
- **Lora Butterfield** — Fife Milton Edgewood Chamber of Commerce, President & CEO
- **Tony Warfield** — Port of Tacoma, Environmental Project Manager
- **Tanja Leek** — Citizen & Owner: Brown's Point Diner and The Sandbar, 20+ year lower Brown's Point resident
- **Mike Weinman** — Business owner, Weinman Consulting LLC

For the DEIS, PSE secured letters of support from:

- **John Wolfe** — Port of Tacoma, CEO
- **John Parrott** — TOTE, President
- **Pat McCarthy** — Pierce County Executive
- **John Ladenburg** — Former Pierce County Executive
- **Rick Talbert** — Pierce County Council
- **Bruce Kendall** — Tacoma-Pierce Economic Development Board
- **Tom Pierson** — Tacoma-Pierce County Chamber, President
- **Barbara Mead** – Past Chair of Tacoma-Pierce County Chamber
- **Mark P. Martinez** — Pierce Co. Building and Construction Trades Council, AFL-CIO, Executive Secretary
- **Jeanine Lee** – Owner: Salon at the Point, long-time community resident
- **Bill Anderson** – Former Executive Director of Citizens for a Healthy Bay
- **Troy Goodman** — TARGA Sound Terminals, President
- **Karen Vialle** — Tacoma School Board Member, Previous Mayor
- **Tanja Leek** - Citizen and owner: Brown's Point Diner and The Sandbar, 20+ year lower
- Brown's Point resident

Media Relations

Local media and trade journals covered PSE's partnership with the Port of Tacoma and TOTE with regards to the Tacoma LNG Facility. The Public Affairs plan includes news releases and interviews with local publications, including the Tacoma News Tribune, at certain Project milestones. The media's reaction to date is generally favorable and includes positive Project messages regarding economy, clean air and local customer benefit during periods of peak natural gas demand.

PSE responds to all requests for interviews and information with our consistent Project messaging strategy.

Speaking Engagements

Puget Sound Energy representatives testified at several state committee hearings in 2014 to support tax legislation needed to level the playing field regarding taxation for PSE to develop the Project. Additionally, PSE staff continues to meet individually with elected officials to provide update information in support of permitting and development of the Tacoma LNG Facility.

The Outreach Team has supported speaking engagements by the Project teams, which have included briefings for Northeast Tacoma Neighborhood Council, The Tacoma Propeller Club, and Citizens for a Healthy Bay.

Local Jurisdiction Outreach – Support for Project and Permitting Teams

PSE has leveraged political leadership with the goal of ensuring favorable outcomes in the permitting and regulatory arenas. Throughout the process we have coordinated with external partners to gather intelligence and then used that intelligence to formulate strategies with the Permitting team. Government Affairs has also leveraged external key constituent relationships to assist the Permitting team in identifying and bringing the right political and municipal staff players to the table (example: Fire Department leadership when needed at the negotiating table) and in supporting mitigation negotiations with the City.

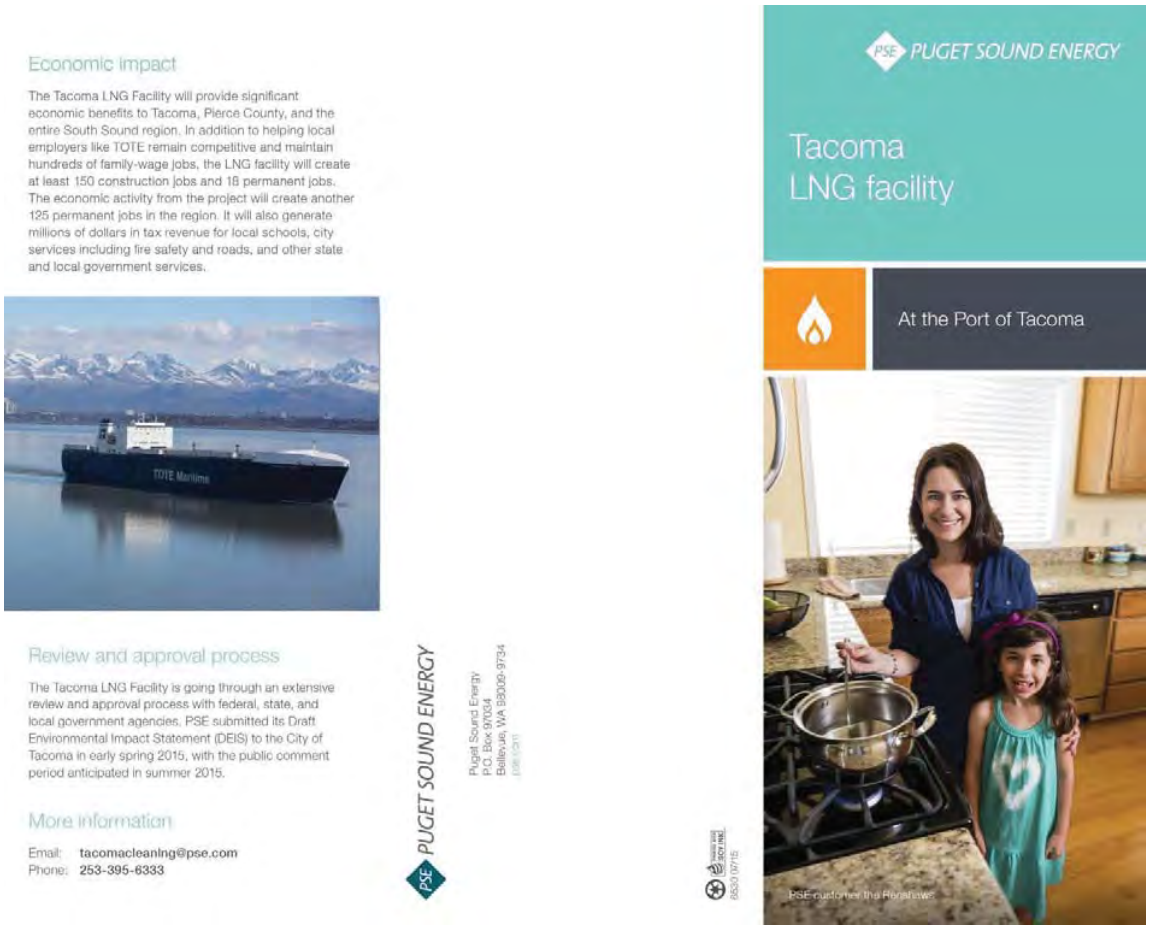
Community Involvement

The community outreach plan includes strategies for engaging with local community leaders, special interest groups and members of the public. The primarily grassroots approach includes such tactics as:

- Participation in public meetings (such as the Northeast Tacoma Neighborhood Council and local Chambers of Commerce) to educate groups about LNG and the Project.
- Seeking public support and mitigating any potential issues from community groups.
- Leveraging natural gas safety and education information at local events.

Sample Communication Tools

Project Brochure (trifold front/back)



Economic impact

The Tacoma LNG Facility will provide significant economic benefits to Tacoma, Pierce County, and the entire South Sound region. In addition to helping local employers like TOTE remain competitive and maintain hundreds of family-wage jobs, the LNG facility will create at least 150 construction jobs and 18 permanent jobs. The economic activity from the project will create another 125 permanent jobs in the region. It will also generate millions of dollars in tax revenue for local schools, city services including fire safety and roads, and other state and local government services.

Review and approval process

The Tacoma LNG Facility is going through an extensive review and approval process with federal, state, and local government agencies. PSE submitted its Draft Environmental Impact Statement (DEIS) to the City of Tacoma in early spring 2015, with the public comment period anticipated in summer 2015.

More information

Email: tacomacleaning@pse.com
Phone: 253-395-6333

PUGET SOUND ENERGY

Puget Sound Energy
P.O. Box 97034
Bellevue, WA 98009-9734

PUGET SOUND ENERGY

Tacoma LNG facility

At the Port of Tacoma

Project Brochure (trifold inside)

Project summary

Puget Sound Energy, Washington's oldest energy company, is planning a liquefied natural gas (LNG) facility at the Port of Tacoma to provide clean and cost-effective natural gas for PSE's customers and to provide a cleaner fuel for maritime vessels owned by TOTE and other local employers. The project is expected to be fully operational by late 2018.

tacomacleaning.com

Safety

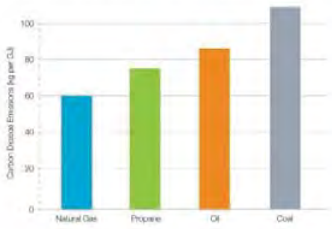
LNG is simply the liquid form of the same natural gas already used in millions of homes, businesses, and vehicles. When cooled, natural gas is reduced to a liquid with one six-hundredth the volume of gas, making it easier to store and transport. It is not explosive or flammable in its liquid state and when warmed, simply returns to a gas quickly dissipating in the atmosphere. More than 100 LNG production, storage, and fueling facilities currently operate in the U.S. – including one PSE has owned and operated in Gig Harbor for more than a decade.

When natural gas is liquified, it shrinks by more than 600 times.

The difference in size is similar to a **beach ball** compared to a **ping pong ball**.

Environmental benefits

LNG is a much cleaner alternative to conventional fuels, such as diesel or bunker oil. Switching from diesel to LNG reduces greenhouse gas emissions by up to 30 percent and eliminates particulate emissions. This helps improve air quality and reduces health risks. It also allows local employers like TOTE to comply with new, stricter low-sulfur emission standards. Use of LNG greatly minimizes the potential for harmful fuel spills that could damage the waters of Commencement Bay and Puget Sound.



Frequently Asked Questions (Page 1)

PSE PUGET SOUND ENERGY

Tacoma LNG Facility

Answers to Frequently Asked Questions

Q: What type of facility is Puget Sound Energy (PSE) proposing?

A: PSE plans to build a Liquefied Natural Gas (LNG) facility to provide PSE customers with natural gas reserves to maintain dependable service on the coldest days of the year. It will also provide commercial customers with a cleaner fuel alternative.

Q: Where will the facility be located?

A: It will be located at the Port of Tacoma on Taylor Way (see map).

Q: When will the facility be completed and operational?

A: A facility like this goes through an extensive review and approval process prior to construction. A thorough permitting process, with many opportunities for the public to comment, will be followed by site preparation work and construction. We expect the facility to be completed and operational in late 2018.

Q: What exactly is LNG?

A: LNG is simply another form of natural gas currently used in millions of homes and vehicles. When cooled, natural gas becomes a liquid that is one six hundredth the volume, making it easier to store and transport.

When natural gas is liquified, it shrinks by more than 600 times.

The difference in size is similar to a **beach ball** compared to a **ping pong ball**.

Q: Is LNG safe?

A: Yes. LNG is neither explosive nor flammable in its liquid state. When it returns to its gaseous state, it behaves as any natural gas and must be handled accordingly. LNG carrier vessels have completed over 135,000 voyages with no significant safety incidents.

tacomacleanlng.com

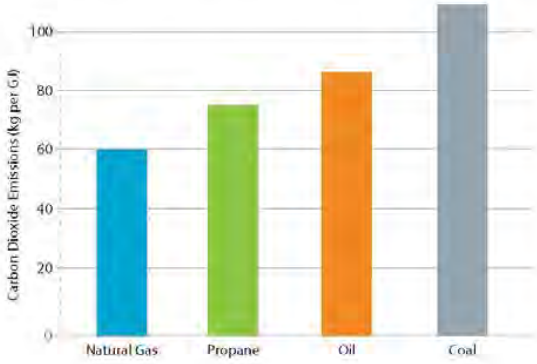
Frequently Asked Questions (Page 2)

Q: What are the environmental benefits from using LNG?

A: LNG offers many environmental benefits over conventional fuels, like diesel. Switching from diesel to LNG reduces greenhouse gas emissions by up to 30% and eliminates particulate emissions. This helps improve air quality and reduce health risks. Use of LNG also virtually eliminates the potential for harmful fuel spills that could damage the waters of Commencement Bay and Puget Sound.

Q: What customers will the LNG facility serve?

A: The facility will serve PSE's existing customers by providing a dependable natural gas source during times of peak demand. The LNG produced at the facility will also provide a cleaner fuel alternative for regional businesses, including TOTE, a local shipping company operating cargo ships between Tacoma and Alaska. This innovative step will help them comply with new, stricter federal low-sulfur emission requirements.



Q: Will LNG be exported from this facility to customers in other countries?

A: No. We do not plan to export any fuels from this facility and it will not be large enough to serve the export market. We will only be serving domestic customers from the facility.

Q: Are there any benefits for PSE natural gas customers beyond those being directly served by the facility?

A: Yes. The Tacoma LNG facility will benefit all PSE natural gas customers ensuring continued dependable natural gas service on the coldest days of the year. Having a reserve of available natural gas stored as a liquid will also allow PSE to reduce its gas purchases at times of peak demand, reducing costs that would otherwise be passed on to customers. Also, healthy growth of PSE's commercial customer base helps spread PSE's overhead costs, lowering costs for existing natural gas customers.

Q: How much will the facility cost to build?

A: We expect PSE's total investment in the project to be $275 million.

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Frequently Asked Questions (Page 3)

Q: How many jobs will be created at the facility?

A: Hundreds of family-wage jobs will be created, both directly and indirectly, by the construction and operation of the facility. An independent analysis of the project estimated that construction would create at least 150 construction jobs on site, and that the associated economic activity would generate more than 300 indirect jobs in the area. Once the facility is up and running, its operation will generate enough economic activity to support 125 jobs throughout the area as well as 18 jobs at the facility itself. These figures do not include the hundreds of local family-wage jobs that can be protected by helping TOTE and other local employers stay competitive.

Q: What role does the Port of Tacoma play in approving the facility or overseeing its operations?

A: PSE will be leasing land for the facility from the Port of Tacoma and the Port Commission will review the project proposal before signing the lease. Its ongoing role will be to ensure that PSE complies with the terms of that agreement.

Q: How much experience does PSE have with LNG?

A: In addition to providing natural gas service to some 800,000 customers throughout Western Washington, PSE has owned and operated an LNG storage facility in Gig Harbor for more than a decade. PSE also uses LNG reserves to meet increased gas demand on cold days.

Q: Does PSE need to make any upgrades to its gas system in the surrounding area to support this facility?

A: Yes. Approximately 5 miles of new natural gas pipeline and related infrastructure will be built to support this project, mostly at the Port of Tacoma. PSE maintains a regular schedule of upgrades to the natural gas lines throughout its service territory.

Q: Do other facilities like this exist elsewhere?

A: There are more than 100 LNG production, storage and fueling facilities currently operating across the United States.

Q: Where does PSE get the natural gas for this facility?

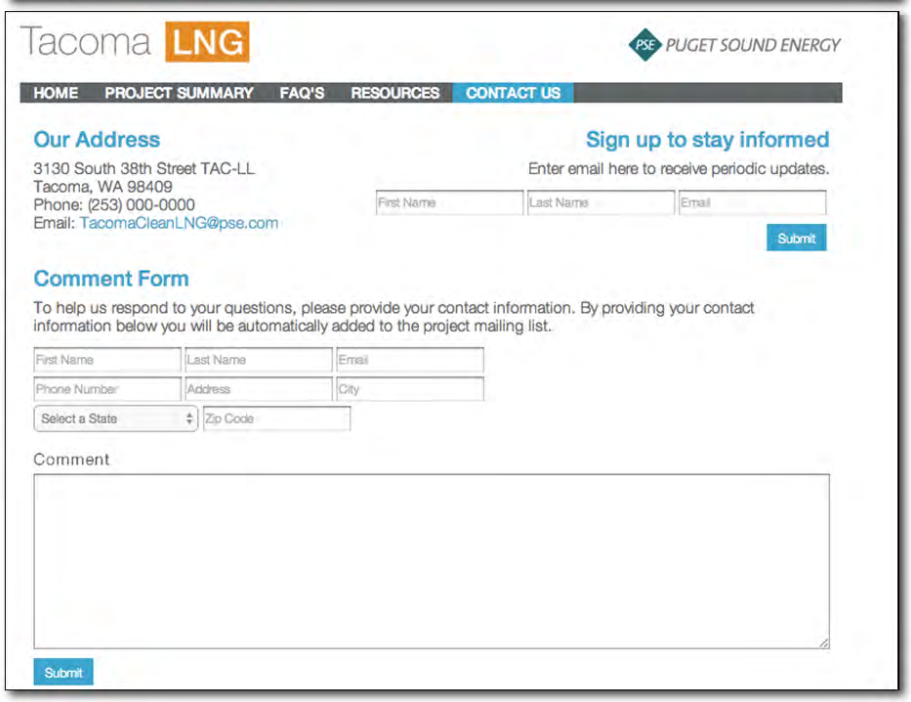
A: The natural gas for the Tacoma LNG facility will come from the same North American market which PSE buys the rest of its natural gas supplies. PSE does not own or operate any natural gas fields and mostly buys its gas from bulk distributors.

Q: Is PSE's Tacoma LNG facility similar to the methanol facility that has been proposed for the Tacoma area?

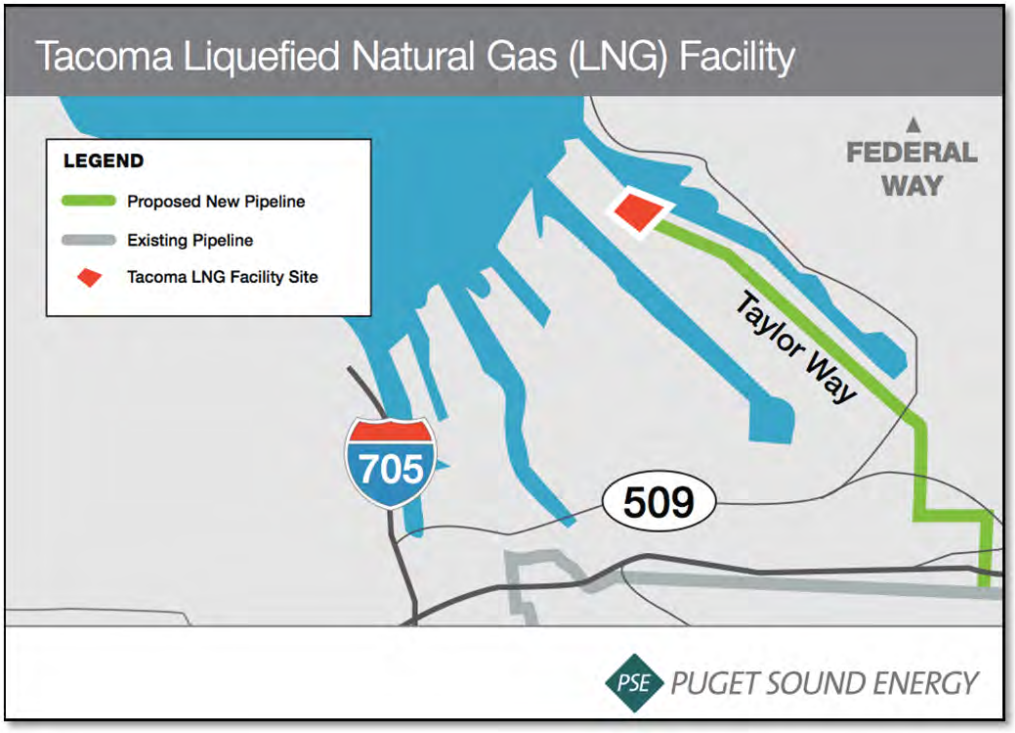
A: No. The facilities are very different in size, product and target customers. PSE's Tacoma LNG Facility will be smaller than the proposed methanol facility and will focus on serving local customers.

tacomacleanlng.com

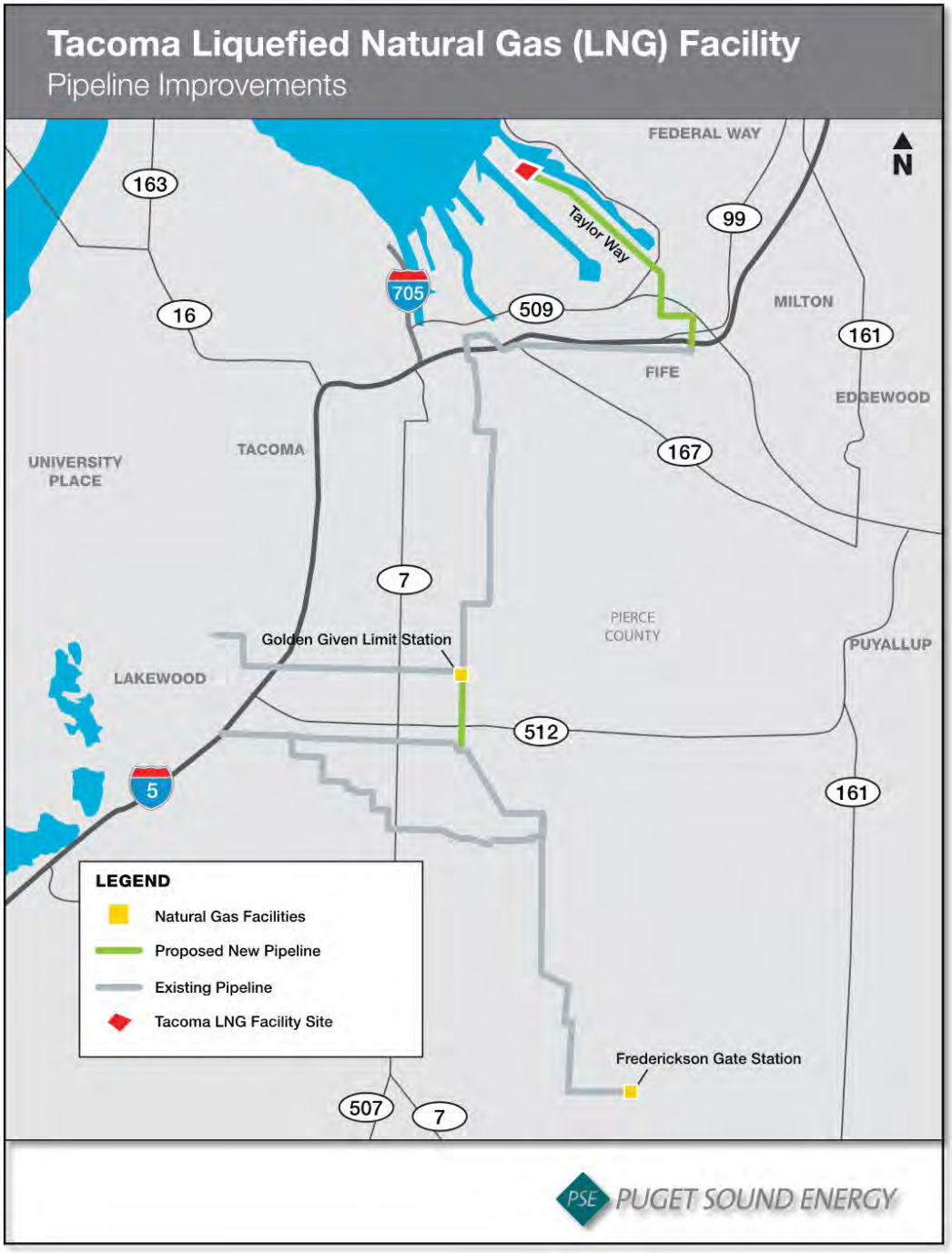
Website (www.TacomaCleanLNG.com)



Project Maps



Project Maps (continued)



PUGET SOUND ENERGY

Exhibit K.

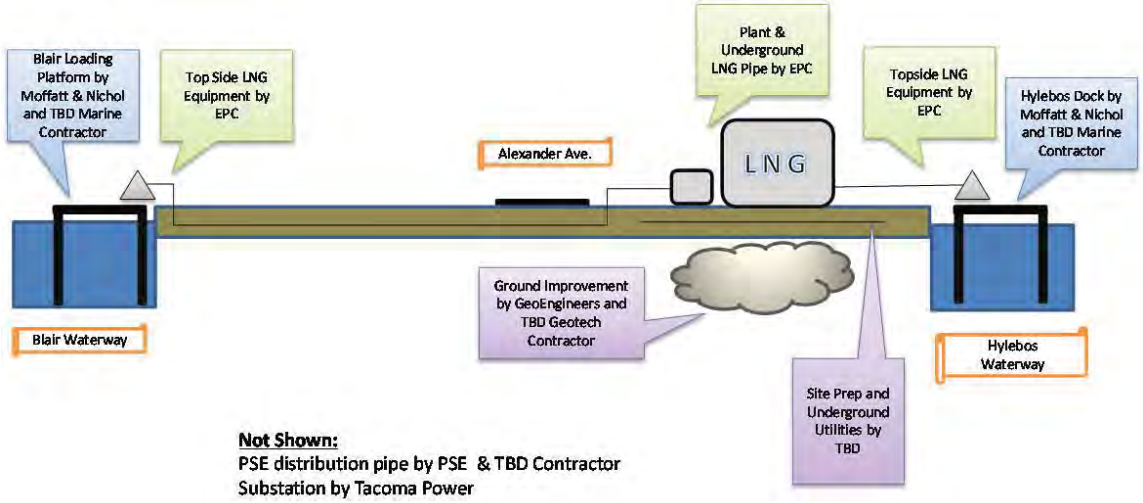
Engineering and Construction

Contents

Engineering and Construction

The Project will be engineered and constructed using a combination of two execution methodologies to obtain the best value for PSE. The LNG Facility work (including pre-treatment, liquefaction, storage tank, truck rack, vaporization system, and balance of plant) will be performed according to an engineering, procurement and construction (EPC) contracting methodology. Site preparation (including demolition, ground improvement, and underground utilities) and marine facilities construction will be performed by PSE using a design-bid-build contracting methodology.

Figure 1. Plant Engineering and Construction Responsibilities



Engineering, Procurement and Construction

PSE originally retained the national engineering firm CH-IV to assist with feasibility studies for the Project. In 2012, based upon input from CH-IV and a study of the marketplace, PSE determined that an EPC contracting methodology would be the preferred method for contracting the LNG production portion of the Project. Under this contract, we will set specific performance criteria (i.e., production quantity, storage quantity, and send-out requirements).

The EPC contractor is therefore responsible for process design, including specifying, procuring, installing, and commissioning all elements of the Project as required to meet performance specifications and guarantees stipulated by the owner in the contract, providing PSE with a single point of contact throughout the construction and warranty phase of the Project. Also, because a single entity holds responsibility for both design and construction, a more active consideration of constructability and construction efficiency in the design of the Project is more likely than it would be with alternative contracting methodologies such as design-bid-build, or even design-build.

The EPC contract will provide PSE with a fixed price contract with performance guarantees and liquidated damages. In exchange for control of all elements of the Project (engineering, procurement, and construction), the EPC contractor retains most cost and schedule risks during project delivery.

During the development phase of the Project, PSE selected a single EPC contractor to perform an initial front end engineering design (FEED) study to develop the plant to a conceptual level and provide budgetary pricing. PSE selected an international leader in LNG plant and tank engineering and construction, Chicago Bridge & Iron (CBI). CBI was selected from a field of seven candidate firms or teams to perform the FEED for the Project in January 2013, with the expectation that the EPC contract would most likely be executed with it based upon satisfactory completion of the FEED.

Due to the commercial uncertainty of this Project, CBI completed an initial FEED study, which culminated in an open book price review and firm bid price in fall 2013. Although PSE did not intend to execute on the firm price proposal at that time, the work product has been used to support continued project development, including permitting, regulatory oversight and business origination.

Since completing the first FEED study and pricing, CBI has been retained to continue value engineering and other plant design changes, as required, to support ongoing changes to the Project (e.g., TOTE direct loading line, permit preparation, developments in regulations, etc.). CBI also played an active role in permitting activities, including providing content for the Draft Environmental Impact Statement and attending meetings with city and state regulators. CBI has continued to refine and improve the design since the 2013 FEED study and submitted a revised formal proposal for the plant in June 2015. This design reflected the many scope changes and value engineering improvements developed collaboratively with PSE since the 2013 proposal. An open book cost review was conducted in June 2015, which resulted in over $2 million of additional value engineering savings.

The target Project completion date of January 1, 2019 provided the opportunity to seek a competitive bid for the EPC contract. In fall 2014, PSE contracted with Black & Veatch to perform a parallel FEED effort to develop pricing for a plant based upon the same design criteria used by CBI. Black & Veatch was a top contender for the original FEED contract and has experience designing and building LNG facilities outside the US, as well as a domestic presence in the power generation and water treatment industries. Black & Veatch does not have the capability to build an LNG tank, so the tank scope of work remained with CBI regardless of contractor selection. Given the relatively small cost of a FEED study (approximately 0.5 percent of the plant cost), a competitive proposal was viewed as valuable from a commercial and prudency standpoint.

In early 2015, PSE directed CBI to initiate a design and proposal for a 140,000-gallon-per-day (gpd) liquefier in addition to the 250,000-gpd plant already in development. The smaller plant size represented the currently-subscribed capacity of the plant (PSE and TOTE needs only). PSE did not engage Black & Veatch in this alternate design because CBI has shown a greater willingness and capability to design to meet PSE-specific needs (as opposed to offering only standardized options).

In July 2015, CBI provided a proposal for the plant with a smaller liquefier, but it equated to only an eight percent reduction in overall cost for a 44 percent reduction in production capacity. This small price decrease is due to the fact that the pre-treatment and liquefaction portion of the plant represents just 21 percent of the plant cost. Additionally, most of the components that could be de-rated for the smaller production capacity (compressors, electrical equipment, etc.) do not scale down linearly in price. The smaller production level still requires nearly the same equipment footprint, thus it does not significantly reduce the linear footage of piping, pipe rack and foundations, electrical cabling, or instrumentation. Even the reduction of gas flow did not offer a linear savings, as only a 25 percent reduction in pipe diameter is required for a 44 percent reduction in flow.

After comparing proposals from both CBI and Black & Veatch, PSE management recommended and the Board agreed to move contract and price negotiations forward with CBI for the 250,000 gpd facility. The two proposed plants differed in production capacity—250,000 gpd as specified from CBI and 300,000 gpd from Black & Veatch (they were proposing a standardized liquefaction design)—but on an adjusted basis (installed cost/production capacity), costs were within five percent of each other.

CBI's strengths are as follows:

- Demonstrated success in designing and building similar plants in the United States.
- Fully engaged in the Project since early 2013 and demonstrated a complete grasp of Project requirements.
- Thorough knowledge and experience with applicable codes and standards, as well as navigating the regulatory process.
- Strong project team with decades of experience who will stay with the Project through completion.
- CBI's ability to build both the tank and the plant results in a single EPC contractor and negates the risk of design and construction conflicts between two companies.
- CBI was transparent with their pricing and hosted a multi-day open book review of all vendor and subcontractor quotes, labor estimates, and contingencies.

Black & Veatch presented the following challenges that made them less competitive:

- No experience building similar plants in the United States.
- Inexperienced project team and lack of involvement from B&V senior staff. Little to no continuity between the proposal project team and the execution project team.
- Did not demonstrate a thorough comprehension of regulatory issues or the seismic issues at the project site.
- Lacked creativity in their design or the willingness to deviate from their "standard" package. Their proposal is based upon a design that has been used in China, but never built domestically.
- Poor engagement with PSE, TOTE, or our other engineering firms to really understand the unique requirements of the Project.
- No transparency in price breakdown.
- Several components of their final design do not meet Project requirements and would have to be further developed (LNG pipeline to TOTE, control building, seismic design, and fire protection system).

Since receiving approval at the August 2015 Board of Directors meeting, PSE management has been negotiating final price and contract terms with CBI. Contract discussions with CBI have been progressing smoothly and both parties anticipate agreeing on final terms by the end of the month.

During the construction period, the EPC contractor will maintain responsibility for the site and all sub-contractors working on the plant scope of work (pre-treatment, liquefaction, storage, send out, and balance of plant). PSE staff will be co-located onsite and provide overall project management, quality assurance of EPC work product, and project management of ancillary activities occurring in parallel on the Facility site (i.e., marine construction, Tacoma Power substation construction, and PSE-provided metering and odorization at the pipeline tie-in point). PSE will also manage and coordinate with TOTE construction activities taking place at the TOTE terminal (direct LNG line to TOTE and the loading platform on the Blair waterway).

Work Performed by PSE

PSE will perform all design and construction work necessary to ready the site for the EPC contractor (demolition, soil improvement, and underground utilities), as well as all marine work (TOTE loading platform), minor building modifications, and landscaping. PSE is choosing to perform these Project elements because they are outside the value-added capability of an EPC contractor and can be more cost effectively managed by PSE using local resources.

The design team for the work performed by PSE includes the following firms:

- ***GeoEngineers (Geotechnical Design).*** GeoEngineers is a regional engineering firm that has worked on projects with PSE for over 25 years. GeoEngineers also has extensive experience working in the Port of Tacoma and other port facilities in the Northwest. Their scope of work includes developing ground improvement strategies to meet federal and local seismic design requirements, coordinating structural and foundation requirements with the EPC firm and providing contracting and quality assurance support for the execution of the ground improvement program.

- ***Moffatt & Nichol (Marine Design).*** Moffatt & Nichol is an international engineering firm specializing in infrastructure projects on coastlines, harbors, and rivers. Moffatt & Nichol has been involved in many of the LNG import/export terminal projects in North America and has ongoing working relationships with the Port of Tacoma, GeoEngineers, and our proposed EPC contractor. Moffatt & Nichol also successfully participated in two prior projects for PSE (both the Upper and Lower Baker Dam Floating Surface Collectors). Moffatt

& Nichol's scope of work includes development of a demolition plan for the existing timber pier and design of a new concrete pier on the Hylebos Waterway, the design of a new loading platform on the Blair Waterway, and marine construction oversight as necessary.

- ***Sanborn Head & Associates (Owner's Engineer).*** Sanborn Head is a regional engineering company located in New England with experience consulting on a number of LNG projects on the east coast and has worked on projects with CBI, PSE's proposed EPC contractor. Sanborn Head has been retained to: review EPC design work product, perform a peer review of GeoEngineers work product, assist with EPC contract preparation, and provide support on permitting and community outreach efforts, as needed.

- ***Sitts & Hill Engineers (Site Civil Design).*** Sitts & Hill is a local Tacoma civil engineering and surveying firm that is responsible for design of all elements of site preparation (abatement, demolition, site grading, and utility re-configuration), storm water system design, fire water system design, and permitting assistance.

- ***Tacoma Power (Substation Design/Construction).*** Tacoma Power will design and construct the utility substation located on the site. It has already completed an initial preliminary power supply study, as well as preliminary design and budget estimate. The Tacoma Power substation is not in the critical path of the Project schedule.

Construction work performed by PSE will be contracted to a minimum of three firms. The site ground improvement work can only be performed by a limited number of specialized contractors, some of which use proprietary soil improvement techniques. The initial request for qualifications (RFQ) was "performance-based" in nature, which allowed contractors to bid different techniques to meet final design requirements. As an outcome of the RFQ process, four ground improvement contractors were invited to bid on the Project with a total of three different methodologies. Bid responses were received on August 28, 2015 and are currently being evaluated by the PSE Project team, with two of the contractors shortlisted for further interviews and value engineering. Currently we anticipate providing the selected contractor a limited notice to proceed by late September, with full contract award following Board approval of the Project.

General site construction performed prior to the arrival of the EPC contractor is being performed by Diamond B Constructors. Diamond B is a regional construction company that specializes in industrial projects. It was the general contractor for the Fredonia 3 & 4 combustion turbines, as well as the Gig Harbor LNG facility. It currently performs work at a number of PSE generation facilities and has also been selected by CBI to perform work under the EPC contract. The work is being executed on a time and materials basis with negotiated

rates. Diamond B's work scope includes remodeling the existing control/administration building, re-configuring site utilities, managing spoils generated by the ground improvement contractor, and final site grading.

Site demolition and abatement was bid to five regional demolition contractors and will be performed on a lump-sum basis. Four contactors submitted bids and PSE selected W.M. Dickson Company of Tacoma as the winning bidder. W.M. Dickson Company was founded in 1937 and performs hazardous abatement (asbestos, lead, mercury, PCBs, and radiological) and demolition throughout the Pacific Northwest for projects for clients including Joint Base Lewis-McChord, University of Washington, and the Hanford Nuclear Facility.

Designs for the marine elements of the project will be finalized in spring 2016. These elements will then be immediately bid to local marine construction companies with an August 2016 construction start date.

Engineering, Procurement and Construction Contract

CBI presented PSE with a proposed Engineering, Procurement and Construction ("EPC") contract as part of its June 2015 proposal.[1] Contract negotiations are currently underway and we anticipate reaching final agreement on terms shortly. The EPC contract sets forth the terms upon which CBI will perform certain work and services and provide certain equipment, materials, supplies, labor and services for the Project. Some of the principal provisions the EPC Agreement includes are summarized briefly below, subject to the caveat that, as stated above, the particulars of certain legal, commercial and technical provisions remain subject to further negotiation.

Notice to Proceed. Execution of the EPC contract shall serve as a full and complete Notice to Proceed to CBI for the initiation of its work. PSE will not execute the EPC contract prior to the receipt of all material approvals, permits and licenses and the tolling of all appeal periods for such permits.

Scope of the Work. CBI will be obligated to provide PSE with a fully operational LNG Facility, designed, engineered, procured, constructed and completed in accordance with the terms of the EPC contract. The scope of the work includes the construction of all facilities (except as described above in this attachment), all aspects of the Project's design, and the scheduling and project coordination of the Project as a whole. The work is to be completed pursuant to a

[1] PSE's counterparty to the EPC contract is CBI Services, Inc., a wholly owned subsidiary of Chicago Bridge & Iron Company N.V., a Netherlands company. For purposes of this summary, CBI Services, Inc. is referred to herein simply as CBI.

project schedule, beginning upon execution of the EPC contract, which shall serve as issuance of a Notice to Proceed, with pre-determined milestones. CBI will provide PSE with as-built drawings, spare parts lists, operating manuals and job books.

Owner obligations: PSE is required under the contract to provide utilities, consumables, feed stock, and plant personnel at times specified in the contract.

Subcontractors. CBI will be obligated to identify all major subcontractors; shall plan, schedule and coordinate the activities of all subcontractors; and shall provide PSE the right to inspect all aspects of the work.

Pricing

The contract price is presented as a firm, fixed-price, lump sum that includes all engineering, materials, construction, overhead, contingency, and markup, subject to exclusions as follows:

- ***Key Material Escalation*** on nine percent nickel plate and aluminum plate: due to worldwide fluctuations of raw material prices, plating for the steel plate is quoted based upon pricing on the London Metals Exchange on a given day. PSE will see a material cost adjustment up or down based upon the actual price on the day of the material order. This has been accounted for as part of the contingency line item in the budget.

- ***Builder's Risk Insurance:*** PSE generally elects to procure this insurance, rather than the contractor. This cost is included in the budget.

- ***Soil removal or hazardous materials:*** The contract assumes that PSE provides a clean and ready site for construction, that no hazardous materials will be encountered during foundation construction and any spoils created during construction can be disposed of elsewhere onsite or removed by PSE. PSE is in the process of completing environmental sampling that will help characterize the soil that would be expected to be disturbed during construction activities. In the event that hazardous materials are found, the anticipated cost for disposal of these materials will be taken into account in the plant contingency, and/or accounted for in discussions with the Port of Tacoma as "historical contamination" that could perhaps be disposed of under the existing planned remediation program.

- ***Underground LNG pipeline to TOTE:*** This element of the project is presented as a Time and Materials (T&M) reimbursable provision estimated to be approximately $10 million (5 percent of the overall contract price). CBI presented this element of the project as T&M due to uncertainties regarding installation methods and risks that could not be fully quantified in time to meet the proposal due date. Due to the fact that CBI did not have to carry excess contingency in its lump sum price, this separate T&M element of the work should reduce

PSE's overall cost. PSE is carrying an appropriate contingency in the overall Project budget based upon discussions with CBI and their perceived levels of risk associated with the pipeline installation.

The underground LNG pipeline to TOTE represents one of CBI's design strengths (as compared to Black & Veatch). CBI has designed a circular pipe rack containing LNG, vapor, nitrogen, and control conduits that will fit inside a 48-inch diameter sealed casing. A unique factor of this design is that it allows the entire 800 foot long assembly to be constructed above ground at the PSE LNG facility and then rolled into the casing like a train going into a tunnel. This design allows the entire assembly to be removed from the casing for maintenance in the future if there is ever any need to repair any of the components (although the system is designed to be maintenance-free for 25 years or more). Since the TOTE LNG pipeline components are inside a sealed one-inch thick steel casing that is eleven feet below the surface, excavating down to the pipeline from above to make repairs is not feasible. Both the Washington State Office of Pipeline Safety and the federal Pipeline and Hazardous Materials Safety Administration (PHMSA) are in the process of reviewing the design and have provided positive verbal comments.

PSE completed an open book review of CBI's pricing in June 2015. During this multi-day review CBI shared every vendor and subcontractor quote, labor estimates, contingencies, and mark up. During and after this review, PSE worked collaboratively with CBI to make equipment and scope changes which resulted in cost reductions of more than $2 million.

Payment

Payments will be made according to an agreed-upon milestone schedule based upon actual work completion.

Parent Guaranty. In order to secure performance by CBI Services, Inc. under the EPC Contract (including possible payment of liquidated damages for delay or performance shortfalls), Chicago Bridge & Iron Company N.V., the corporate parent, will provide a guaranty of all CBI obligations.

Completion. CBI is obligated to perform its duties in accordance with a project schedule. Project mechanical completion is anticipated to occur no later than 24 months after PSE provides CBI with full access to the Project Site (currently anticipated to occur in August 2016), which shall serve as the Project's Guaranteed Completion Date. Commissioning, start-up and testing shall follow mechanical completion, and substantial completion shall be achieved upon the satisfaction of various specified conditions and the Facility is complete but for punch list items.

Force Majeure. The project schedule and the amount of possible liquidated damages for delay could be affected if a force majeure event (the definition of which is standard for construction contracts) occurs during construction.

Warranties: CBI will warrant its Work, excluding only the implied warranty of merchantability, and shall enforce for PSE's benefit all warranties of its subcontractors, and all of CBI's and its subcontractors warranties shall have a term of at least twelve (12) months.

Delay Liquidated Damages. CBI will be obligated to pay liquidated damages in a fixed amount for each day that substantial completion has not been achieved by the date required under the construction schedule. The maximum amount of such liquidated damages for delay payable under the EPC contract is 15 percent of the contract price.

Performance guarantees. The contract includes performance guarantees and associated penalties for liquefaction, vaporization, utilities consumption, power factor, LNG tank volume, truck loading rate, and marine loading rate.

Default and Termination. The EPC contract contains events of default, termination provisions and remedies typical for similar agreements. Also, in the event that PSE terminates the EPC contract without cause prior to completion of the work, PSE will be obligated to pay CBI an amount equal to the difference between the sum of its compensation for Work performed through the date of termination, its actual costs to cancel subcontracts and its actual demobilization costs, less the total of all payments made for Work through the date of termination.

Limitation of Liability: Neither party shall be liable to the other for indirect or consequential damages, and CBI's maximum liability under the EPC contract shall not exceed a specified percentage of the total contract price (this percentage is currently the subject of negotiation).

Title and Risk of Loss. Title to all work and project equipment under the scope of the EPC contract will pass to PSE upon the PSE's payment therefore. The risk of loss and damage with respect to project equipment and supplies will remain with CBI until mechanical completion.

Insurance. As referenced under "Pricing" above, PSE will obtain "Builder's All Risk" insurance and will name CBI as an additional insured on such policy. CBI will obtain standard coverages for workers' compensation, commercial general liability, automobile, umbrella, and construction equipment, as well as professional design and engineering coverage and, where applicable, certain marine liability coverage. In addition to Builder's All Risk, PSE will obtain ocean marine cargo and certain pollution liability coverage.

Indemnification. The EPC contract provides that CBI will indemnify PSE with respect to any liabilities, losses, penalties, claims, actions or suits and expenses arising out of or relating to claims of third parties, imposed or asserted against PSE to the extent such liabilities are caused by CBI or its subcontractors and arise out of or relate to the Work.

Dispute Resolution. The contract requires the parties to submit to non-binding mediation in the event any disputed claim is not otherwise resolved, prior to any initiating any litigation. Venue shall be in Seattle, and the contract shall be construed in accordance with the laws of the state of Washington.

Representations and Warranties. Each of PSE and CBI represents and warrants to the other with respect to its organization and the due authorization of the transactions, that the EPC contract does not violate or breach any agreement by which either party is bound and that each party is in material compliance with all applicable laws.

Exhibits. Attached as exhibits to the EPC contract are the forms of all necessary certificates and notices, all requisite technical specifications, project schedules, construction plans, permit and contractor lists, and other materials.

PUGET SOUND ENERGY

Exhibit L.

Gas Distribution System Improvements

Contents

Gas Distribution System Improvements

The gas distribution system expansion discussed in this exhibit facilitates delivery of up to 19,000 Dth/day of natural gas to the Tacoma LNG Facility and receipt of up to 66,000 Dth/day from the Tacoma LNG Facility. The expansion necessary to serve the Facility will be augmented by upgrades to improve existing low pressure issues in the South Tacoma system, which are necessary with or without the Tacoma LNG Project and would eventually be implemented independent of the Facility.

Gas Distribution System Expansion and Modifications

PSE will expand portions of its distribution system to provide natural gas service to and from the Tacoma LNG Facility. The distribution system expansion includes the three components listed below. To support commissioning of the Tacoma LNG Facility, all of the component projects must be completed before 2018. PSE will implement the projects in phases over a two-year period (2016-2017) to minimize risk and optimize resources. A discussion of Tacoma LNG Project risks, including risks associated with the gas distribution system expansion can be found in ***Exhibit F***.

Distribution System Expansion Components

1. Install approximately four miles of new 16-inch high pressure ("HP") pipeline in the cities of Fife and Tacoma between Interstate 5 and the Facility site at the Port of Tacoma;

2. Install approximately one mile of new 12-inch HP pipeline in Golden Given Road and install the new Golden Given Limit Station; and

3. Rebuild the Fredrickson Gate Station

A more detailed discussion is provided as ***Attachment L-1*** to this exhibit.

Tacoma LNG Facility Service

The distribution expansion will support firm delivery of up to 19,000 Dth/day (792,000 scfh[1]) of natural gas to the Tacoma LNG Facility for liquefaction and the ability to receive up to 66,000 Dth/day (2,750,000 scfh) of gas supply into PSE's distribution system during colder weather events. The receipt capacity will be implemented in two phases:

- The initial receipt capacity of 50,000 Dth/day (2,083,000 scfh) will allow PSE to deliver natural gas to its retail customers from the Tacoma LNG Facility during peak, cold weather periods. This phase will be completed by year-end 2017.

- Expansion to the full receipt capacity is not expected to be needed until at least 2022.[2] Expanding to 66,000 Dth/day (2,750,000 scfh), or anything greater than 50,000 Dth/day, will require the installation of approximately 2.1 miles of 12-inch HP pipeline parallel to the Bonney Lake lateral to expand that system. The cost to complete the reinforcement is estimated to be $12.3 million and is not included in the cost of system upgrades to be installed in 2017. However, the $12.3 million has been included as a future expenditure in the project pro forma and is considered in the least cost analysis found in ***Exhibit N***.

Benefits of the Distribution System Expansion

In addition to supporting the Tacoma LNG Facility, the improvements made to the distribution system outside of the Port of Tacoma will improve existing low pressure issues in the Dupont, Steilacoom, University Place and Fircrest areas. Collectively, they are referred to as the "South Tacoma Distribution Upgrades." With or without the Tacoma LNG Project, the South Tacoma Distribution Upgrades would eventually be required to provide reliable service in Tacoma and surrounding areas (within PSE's 10-year planning horizon). However, these projects must be accelerated to meet the commissioning schedule for the Facility. PSE is including the entire cost of these upgrades when considering the prudency of the Project.

Permits

A variety of permits from multiple jurisdictions are required to complete the gas distribution system expansion project. The following table lists the necessary permits by location.

[1] Standard cubic feet per hour ("scfh")
[2] The Bonney Lake lateral is currently at capacity. Upgrades to accommodate customer growth in the area are likely prior to 2022 or 2023. While it is possible that the 2.1 miles will be added before this timeframe, a Bonney Lake reinforcement to some portion of the seven-mile, six-inch diameter HP lateral would still likely be required by 2023, when the 66,000 Dth/day will be needed to meet system-wide peak-day resource need.

Location	Permit List
Four miles of 16" HP line in the Port of Tacoma	City of Fife ROW Use City of Tacoma ROW Use WSDOT SR 99, SR 509, and I-5 Tacoma Rail (permit) National Pollutant Discharge Elimination System permitting Hydrolic Project Approval Federal Highway Access Break Approval F
One mile of 12" South Tacoma HP line	Pierce County ROW Use National Pollutant Discharge Elimination System permitting Washington Department of Transportation
Golden Given Limit Station (GGLS)	Conditional Use Permit Pierce County ROW Use Driveway access permit Landscape plans National Pollutant Discharge Elimination System permitting
Fredrickson Gate Station	Building Permit Clear and Grade
Facility Meter Station	National Pollutant Discharge Elimination System permitting

WUTC Authorizations

PSE will seek approval in fall 2016 to operate the one mile of new 12-inch HP pipeline along Golden Given Road East and the Golden Given Limit Station at an MAOP of 500 psi. (PSE received WUTC approval to operate approximately 5.2 miles of existing HP pipeline on the existing South Tacoma Supply #2 system at an MAOP of 490 psi on July 30, 2015.)

Expansion Execution

Distribution system expansions are routine projects for PSE; PSE's standard policies, procedures and strategies will be used to support project execution. Project management, pipeline design, engineering, construction management, procurement and quality assurance activities will generally be performed by PSE staff. Consideration will be given to the use of engineering and other consulting services to supplement PSE staff and support project delivery.

PSE will use its standard contracting methodologies to ensure delivery of a safe, reliable, timely and reasonably valued project. A competitive bidding process will be used to select the construction contractor, with consideration given to schedule and efficiencies.

PSE completed all major property purchases for the Golden Given Limit Station in 2014. An easement to extend and modify the Fredrickson Gate Station was secured in August 2015. PSE will secure staging sites and temporary construction easements as needed to support construction activities.

A pipeline communications and outreach plan has been developed that includes standard PSE communication tools and activities, such as project status updates, construction notifications, social media outreach, direct communications, and frequent updates for community groups and key stakeholders.

Status and Timeline

Expansion Component	Status
Four miles of 16" HP line in the Port of Tacoma	• Route survey complete • Geotechnical evaluation for I-5 and SR-509 complete • Geotechnical and environmental assessment for the rest of the line is in progress. Phase I review will be completed by November 1, 2015.
One mile of 12" South Tacoma HP line and new Golden Given Limit Station	• Route review and survey complete • Golden Given Limit Station: o Purchased property in 2014 o Property survey complete o Conditional Use Permit approved by public hearing and pending FEIS
Frederickson Gate Station	• Property survey complete • Environmental assessment complete • Evaluated preliminary layouts • Acquired expanded easements • Design in progress

Timeline	Task Description
2015	Complete designs for Phase 1 pipelines Complete engineering for Frederickson Gate Station Order long lead materials (heaters) Continue permitting
2016	Complete design for Phase 2 pipeline Construct horizontal directional drills (Phase 1 pipeline) Construct I-5 Limit Station Continue permitting
2017	Obtain final permits Construct Phase 2 pipeline Construct Golden Given Limit Station Construct one-mile South Tacoma pipeline Install Facility meter set Complete construction of all facilities by year end 2017

PUGET SOUND ENERGY

Attachment L-1.

Detailed Project Descriptions

Detailed Project Descriptions

PSE studied many potential distribution system expansion combinations involving a variety of pipeline, gate station and pressure regulating station configurations, and ultimately selected a plan that includes the following components:

Four miles of 16-inch HP line in the Port of Tacoma – PSE will install a new 16-inch HP line from the existing North Tacoma HP system beginning near the intersection of 20th Street East and 62nd Avenue East in Fife, Washington, to the Tacoma LNG Facility at Taylor Way and East 11th Street in the Port of Tacoma. The route will generally follow 62nd Avenue East, East 12th Street, 54th Avenue East and Taylor Way in Fife and Tacoma. This segment will be engineered and constructed in two phases to minimize risk and optimize resources.

The new 16-inch line will be used to (i) supply natural gas to the Tacoma LNG Facility for liquefaction and (ii) transport vaporized natural gas from the Tacoma LNG Facility to the distribution system when required to provide peak-day supplies to the distribution system. The same pipe will be used for both functions.

One mile of 12" South Tacoma HP line and the new Golden Given Limit Station – PSE will install one mile of 12-inch HP line north along Golden Given Road East from the existing 12-inch HP line at the intersection of Golden Given Road East and 112th Street South in Tacoma to the existing 8-inch HP line just north of 96th Street South in Tacoma. PSE will also install a new Golden Given Limit Station on PSE property near the intersection of 99th Street East and 10th Avenue East in Tacoma. The new limit station will reduce line pressure from an inlet MAOP of 490 psig to an outlet MAOP of 250 psig.

Currently, the Tacoma natural gas distribution system is served from the North Tacoma HP line and the South Tacoma HP line. These two lines operate independently, both serving limit stations that feed the remainder of the North and South Tacoma distribution systems. The addition of the Tacoma LNG Facility natural gas load would exceed the capacity of the North Tacoma HP line unless reinforcement actions are taken to increase system capacity. The Installation of the 12-inch HP line along Golden Given Road East and the new limit station connect the North Tacoma HP line and the South Tacoma HP line, allowing the South Tacoma HP line to support more of the load and increase overall system capacity.

Fredrickson Gate Station – The Fredrickson Gate Station has a delivery capacity of 2,690,000 scfh. The current peak design day requires 92 percent of this capacity, and the addition of the volumes for the Tacoma LNG Facility would exceed the capacity of the Fredrickson Gate Station. PSE will rebuild the Fredrickson Gate Station to serve 6,000,000 scfh, which is sufficient to meet anticipated loads, including the Tacoma LNG Facility, for the next 20 years. Northwest Pipeline will retire the existing heater and install new metering facilities, and PSE will install a new heater and pressure regulation equipment. The additional facilities will require a larger footprint, so an easement for additional property has been obtained.

PUGET SOUND ENERGY

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PUGET SOUND ENERGY

Exhibit M.

Resource Need and Alternatives Analysis

Contents

Gas Peak Day Resource Need and Alternatives Analysis

This exhibit considers PSE's gas peak-day resource needs and the options available to meet such needs. PSE's resource requirements are guided by the biennial Integrated Resource Plan ("IRP").

PSE conducted two separate analyses to compare the cost of resource alternatives. One analysis uses the Resource Planning department's planning software to simulate total portfolio costs by optimally selecting resources to serve demand. The second analysis uses discounted cash flows ("DCF") to evaluate the present value of the costs and revenues associated with owning and operating the Tacoma LNG Project. The DCF analysis also evaluates the cost of serving growing demand with a smaller peak shaving facility and long-haul interstate pipeline capacity.

A summary of the analyses and their results are discussed in detail below.

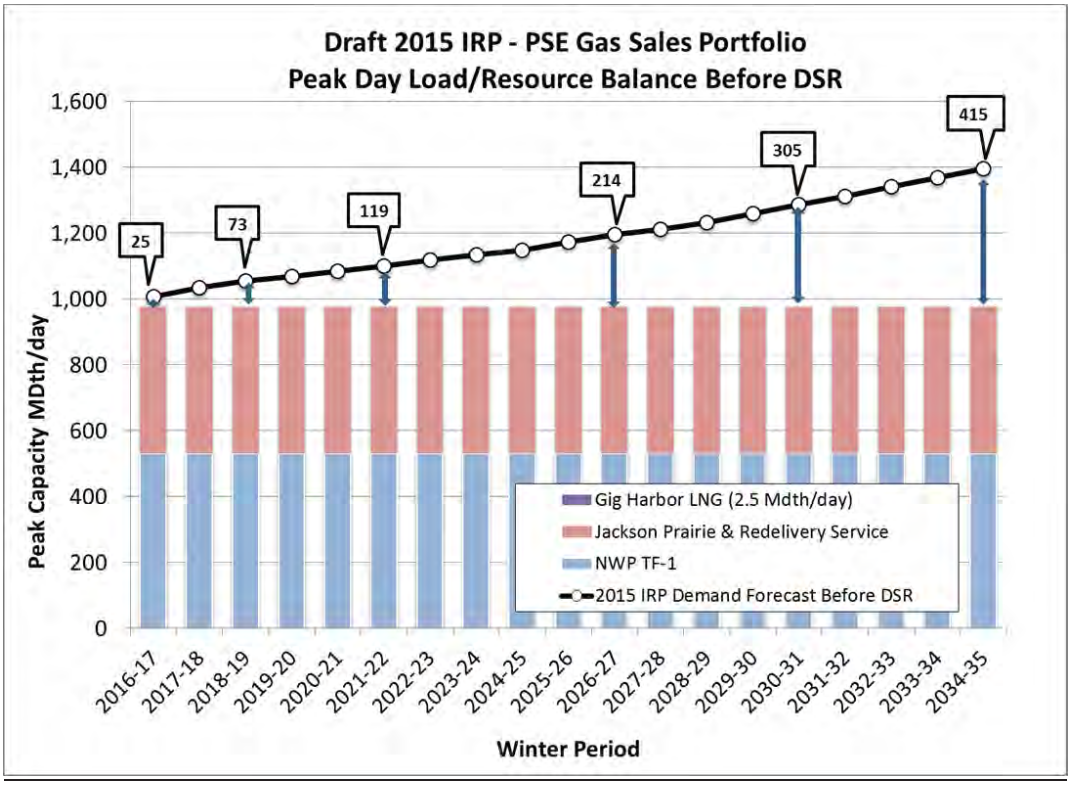
Resource Need

PSE's gas customer resource need is defined as the design peak demand of its retail sales customers less the existing portfolio resources available to meet such demand. Each IRP includes an updated long-term forecast of customer demand, based on existing and expected customer count, use per customer trends, temperature response and economic conditions affecting growth in the service area. Resource need is determined by comparing this forecast to existing resources, including firm pipeline capacity contracts, gas storage and other peaking resources that PSE controls and expects to maintain. Potential new resources, both demand- and supply-side, are then compared to determine the least-cost (adjusted for risk) resources to serve the future needs of customers. New supply-side resources may be hypothetical or conceptual, and lack specific site-driven or detailed cost estimates, but inclusion of such resources is intended to guide the company toward further evaluation of promising alternatives.

Further analysis of specific resources with known contractual terms or more detailed cost estimates are also performed to confirm the cost-effectiveness of a resource prior to an acquisition decision.

Below is the draft 2015 IRP[1] gas sales portfolio load-resource balance with current resources. The difference between total projected customer demand and the resources is the projected resource need.

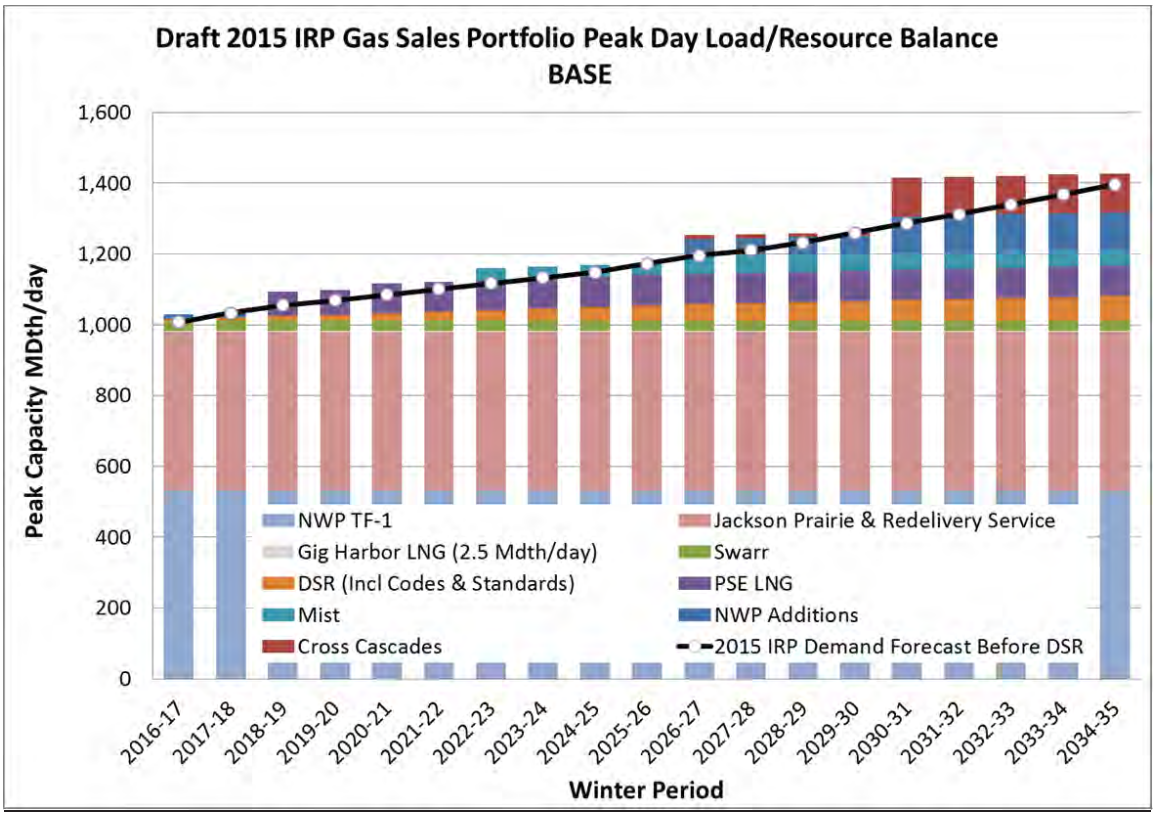
Figure 1. PSE's draft 2015 IRP current gas sales portfolio load-resource balance



[1] The final 2015 Integrated Resource Plan will be filed with the WUTC on November 30, 2015.

Below is the Base Scenario resource portfolio from the draft 2015 IRP, which shows the resources selected to balance the gas sales portfolio peak-day load forecast. Note that the LNG facility was selected as one of the cost-effective resources to meet the projected resource need.

Figure 2. PSE's draft 2015 IRP gas sales portfolio load/resource balance



Gas Sales Portfolio Load/Resource Balance

The firm peak-day supply resources and forecast peak-day loads for the winter peak periods 2016-2017 through 2034-2035 and used in ***Figure 1*** above are shown in ***Figure 3*** below. The F2014 peak-load forecast, net of Demand Side Resources (DSR), is compared with available supply resources. During the 2016 to 2017 winter period, PSE will have 982 MDth/day of supply resources compared to a forecast peak-load, before DSR, of 1,008 MDth/day, resulting in a load/resources deficit of 25 MDth/day. As shown, with the existing resources and F2014 load forecast, the gas sales portfolio is expected to be short resources to supply loads as early as the winter of 2016- 2017.

Figure 3. Gas sales portfolio peak load/resource balance (MDth/day)

Winter Period	NWP TF-1	Jackson Prairie & Redelivery Service	Gig Harbor LNG (2.5 Mdth/day)	Existing Supply Side Resources	2015 IRP Demand Forecast Before DSR	IRP Resource Surplus/ (Need)
2016-17	532.9	447.1	2.5	982	1,008	(25)
2017-18	532.9	447.1	2.5	982	1,034	(52)
2018-19	532.9	447.1	2.5	982	1,056	(73)
2019-20	532.9	447.1	2.5	982	1,070	(87)
2020-21	532.9	447.1	2.5	982	1,085	(103)
2021-22	532.9	447.1	2.5	982	1,101	(119)
2022-23	532.9	447.1	2.5	982	1,118	(135)
2023-24	532.9	447.1	2.5	982	1,134	(151)
2024-25	532.9	447.1	2.5	982	1,149	(166)
2025-26	532.9	447.1	2.5	982	1,173	(191)
2026-27	532.9	447.1	2.5	982	1,196	(214)
2027-28	532.9	447.1	2.5	982	1,211	(229)
2028-29	532.9	447.1	2.5	982	1,232	(250)
2029-30	532.9	447.1	2.5	982	1,260	(278)
2030-31	532.9	447.1	2.5	982	1,287	(305)
2031-32	532.9	447.1	2.5	982	1,313	(330)
2032-33	532.9	447.1	2.5	982	1,341	(358)
2033-34	532.9	447.1	2.5	982	1,369	(386)
2034-35	532.9	447.1	2.5	982	1,397	(415)

The largest natural gas supply resource is firm pipeline capacity on Williams-Northwest Pipeline ("NWP") with a total of 532.9 MDth/day of capacity to PSE's service territory. This consists of capacity from British Columbia originating at Sumas (269.2 MDth/day) and a similar amount of capacity from Alberta and the Rockies (263.7 MDth/day).

PSE also owns and contracts for Jackson Prairie natural gas storage service, which is delivered to PSE's service territory via firm NWP redelivery pipeline capacity. Jackson Prairie provides peak-supply resources of 447.1 MDth/day.

PSE controls a small, on-system supply resource: an LNG satellite peaking facility located near Gig Harbor with vaporization capacity of 2.5 MDth/day. This resource serves peak loads in the Gig Harbor area.

Description of Resource Alternatives Considered

Past IRPs have found that a generic, regional LNG peaking resource may be a cost-effective addition to the company's portfolio. In fact, a 50 MDth/day regional LNG peaking plant was selected as part of the least-cost solution in PSE's 2013 IRP. PSE's draft 2015 IRP evaluated the Tacoma LNG Project, along with other potentially available resources and selected it as a preferred resource in several cases.

As part of the ongoing 2015 IRP (now in draft form) PSE has considered a range of DSR and the following supply-side resource options:

Swarr Propane-Air Facility Upgrade. The Swarr propane-air facility has been temporarily removed from service while awaiting upgrades to improve environmental safety and operational reliability and efficiency. When upgraded, Swarr's capacity will be 30 MDth/day. Before moving forward with the Swarr upgrade, PSE evaluated the overall risk associated with operating Swarr; the evaluation determined that Swarr could be operated in a safe and responsible manner, and enabled PSE to move into the design and economic feasibility phase of the project. While cost estimates are not yet fully developed, project costs are not expected to exceed $10 million, which would make the project economic. The upgraded facilities could be available as early as November 2016.

Tacoma LNG Project. The peaking portion of the proposed Tacoma LNG Project is designed to provide 85 MDth/day of firm delivered gas supply at the start of the 2020- 2021 winter season, and is assumed to be partially available to provide 69 MDth/day of firm delivered gas supply for the 2018 to 2019 heating season.

Mist Storage and NWP Interstate Pipeline Capacity. PSE has been exploring the possibility of participating in NW Natural Gas Company's proposed expansion of the Mist storage project in northwest Oregon. Recent discussions considered a project that was proposed to be completed and in-service as early as 2017. PSE contemplated service with withdrawal capacity of 50 MDth/day to serve PSE's retail natural gas customers, with firm delivery into NWP via the Kelso-Beaver Pipeline. After analysis of both internal estimates and external consulting studies, NW Natural provided a detailed cost-estimate of the proposed storage project, including 20-year annualized costs.

For the Mist storage service to be considered a firm resource, PSE would also need to acquire additional firm NWP capacity from the Kelso-Beaver Pipeline interconnect with NWP to PSE's distribution system (south to north). Incremental, discounted storage redelivery service is not currently available, so PSE is assuming that NWP capacity would have to be acquired through an NWP expansion project at a cost equal to or greater than existing rates.

NWP and Westcoast Energy Pipeline Capacity and Gas Supply. Another resource alternative would be to acquire additional firm NWP pipeline capacity from the Sumas, Washington interconnect with Westcoast Energy's pipeline. Since NWP is generally fully-contracted on a long-term basis, PSE is assuming that such service would require a NWP expansion of its interstate system. PSE has received order-of-magnitude estimates from NWP and has seen the results of recent expansion open seasons, which indicate that expansion pipeline capacity will cost more than existing pipeline capacity. Consistent with PSE's existing supply diversity strategy, PSE would also acquire 100 percent of firm capacity on the Westcoast Energy T-South system. Of course, pipeline capacity does not include a supply resource, so the analysis assumes that gas supply will be available at Station 2 or Sumas at an index-based price.

Cross Cascades Pipeline, Upstream pipeline and Gas Supply. PSE is considering the cost and benefits of a proposed pipeline from a central Oregon interconnect with TransCanada's Gas Transmission Northwest ("GTN") pipeline to NWP south of Portland. NWP would combine capacity on that project with an upgrade of its facilities to PSE's service territory. PSE has received order-of-magnitude estimates from NWP and TransCanada, which indicate that the project's pipeline capacity will cost more than existing pipeline capacity. Consistent with PSE's existing supply diversity strategy, PSE would also need to acquire firm capacity on GTN and other upstream pipelines. PSE assumes that gas supply will be available at the AECO hub in Alberta at an index-based price.

SENDOUT® Gas Portfolio Model Analysis of Resource Alternatives in the Draft 2015 IRP

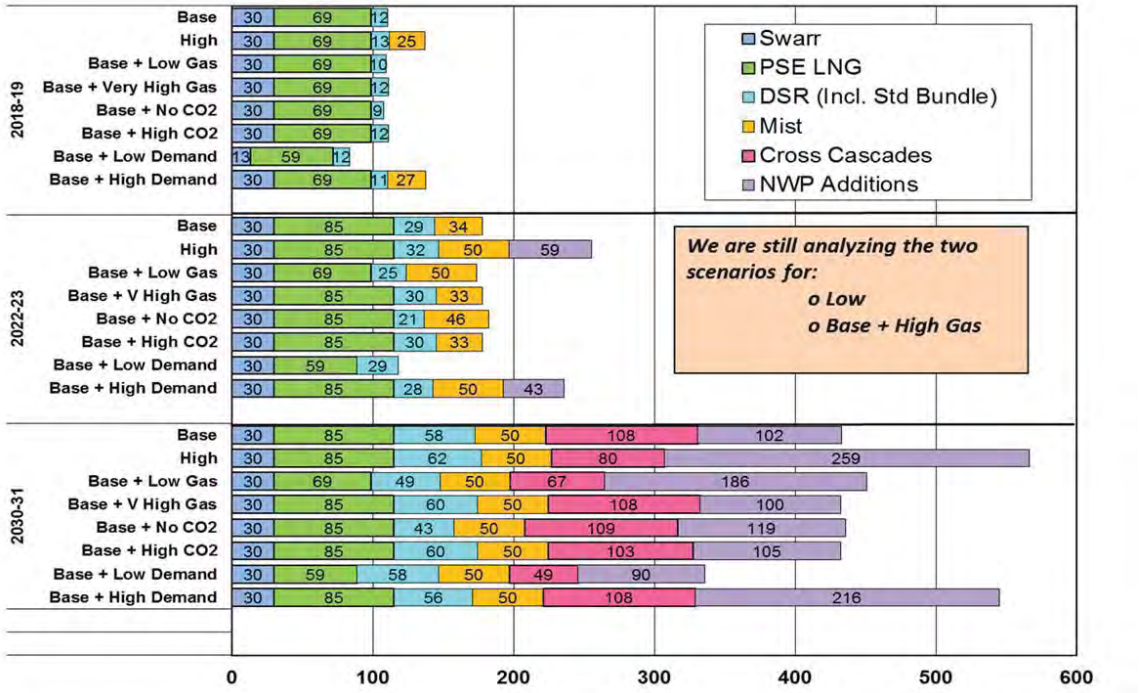
PSE's Resource Planning department has been evaluating the alternatives described above using the SENDOUT® gas portfolio model (GPM) under 10 different scenarios as a part of the 2015 IRP. The scenarios consider various levels of customer demand, long-term gas prices and a range of CO_2 emissions prices.

Figure 4. Draft 2015 IRP scenarios for analysis

	Scenario	Demand	Gas Price	CO2 Price
1	Low	Low	Low	None
2	Base	Mid	Mid	Mid
3	High	High	High	High
4	Base + Low Gas Price	Mid	Low	Mid
5	Base + High Gas Price	Mid	High	Mid
6	Base + Very High Gas Price	Mid	Very High	Mid
7	Base + No CO2	Mid	Mid	None
8	Base + High CO2	Mid	Mid	High
9	Base + Low Demand	Low	Mid	Mid
10	Base + High Demand	High	Mid	Mid

The GPM selected the upgrade to Swarr, Tacoma LNG and optimal levels of DSR under all eight of the scenarios run to date. Note that the GPM has the ability to select some or all of a particular resource and, thus, under some scenarios the model has identified a slightly smaller project. This is not an unusual result and stakeholders understand that the resource is actually a build or no-build option at 85 MDth per day. An excerpt of the "build-out" of future resources is shown below for the eight draft scenarios. PSE will continue to analyze these scenarios and will present the final results in its 2015 IRP filing on November 30, 2015.

Figure 4. Draft 2015 IRP optimal resource selections under various scenarios (excerpt)



Peak-Day Resource Financial Analysis

This section considers the costs of the Tacoma LNG Project to PSE gas customers by examining the incremental costs of the Facility and the supporting gas distribution upgrades along with the revenue contribution from TOTE and any transfer of non-utility revenues to the core gas book.

Gas Peak-Day Resource Capacity

The Tacoma LNG Project will have a peak capacity of up to 85 MDth/day. This includes 66 MDth/day of gas injection from the Facility and up to 19 MDth/day of diverted gas that can be delivered to any PSE gate station along NWP.

Plant Injection Capacity. The Tacoma LNG Facility will be equipped with vaporizers capable of gasifying and injecting natural gas into PSE's distribution system at a rate 66 MDth/day. Natural gas will be injected directly into PSE's high pressure gas system at the Facility. To supply the vaporized gas, PSE will reserve approximately 4.9 million gallons (or 416 MDth) of the onsite storage tank capacity. This storage will allow the Facility to supply 66 MDth/day for more than six days.

Diverted Gas. PSE will procure up to 19 MDth/day of year-round pipeline capacity for LNG fuel customers.[2] Since the LNG Facility will not liquefy natural gas at the same time it is vaporizing for injection into the system, PSE will utilize the pipeline capacity and natural gas supply as an additional peaking resource. To continue to serve the other LNG customers, PSE will hold 1.4 million gallons (or 122 MDth) of additional tank capacity and serve customers with this capacity during a vaporization event. This allows PSE to divert up to 19 MDth/day allocated to retail customers to peak system use. Note that the LNG fuel customers will be paying for the natural gas and related transportation capacity and will be receiving uninterrupted LNG service. ***Figure 4*** summarizes the peak-day resource capacity of the Tacoma LNG Facility.

[2] Approximately nine MDth/day of pipeline capacity will be reserved to serve TOTE. An additional 10 MDth/day will be procured to serve non-regulated customers. A tolling customer may wish to utilize its own pipeline capacity while a customer purchasing a bundled product would rely on PSE to provide pipeline capacity.

Figure 4. Peaking resource plant capacity

		MDth	LNG Gallons
	Injection Capacity		
[1]	Plant Injection Capacity (per day)	66	772,807
[2]	Tank Capacity for Plant Injection (6+ Day Period)	416	4,876,126
	Diverted Gas Capacity		
[3]	Retail LNG Customers Dailey Liquefaction	19	225,667
[4]	Tank Capacity for Diverted Gas (6+ Day Period)	122	1,423,874
[5]	**Other**		
[6]	Additional Liquefaction for Gig Harbor (per year)	23	270,000
[7]	**Total Peak Day Capacity ([1]+[3])**	85	998,473
[8]	**Total LNG Tank Storage Capacity ([2]+[4])**	561	6,300,000
[9]	**Dailey Liquefaction Capacity ([2]+[4]+[6])/ [270 Days]**	2	24,333

Optimizing Peak Resource Capacity. The tank will be filled over a 270-day period using PSE's reserved liquefaction capacity. During the winter months, PSE can sell its liquefaction capacity on a short-term basis for the benefit of its gas customers.

In years when the peaking resource is not fully called upon over the course of a given winter season, PSE can sell unutilized liquefaction capacity over the non-winter period (up to 270 days). This would likely provide an additional economic benefit for PSE's core gas customers. The value associated with selling underutilized LNG capacity is not considered in this analysis.

Incremental Costs for Tacoma LNG Facility

The incremental gross costs of the Tacoma LNG Project to core gas customers consists of Facility costs (return on and of the asset), fixed O&M costs and variable O&M costs related to the Tacoma LNG Facility and the cost of distribution system upgrades. The actual net costs to PSE's core gas customers includes the total gross costs less any incremental revenues that the project brings in from TOTE and revenues transferred from non-regulated operations to regulated operations.[3] The specific costs in these categories and the assumptions that support them are described in detail in ***Exhibit N***.

While revenues associated with non-regulated liquefaction and storage service will not be shared with core gas customers, non-regulated LNG fuel sales will generate revenues for use of

[3] A portion of non-regulated revenues will be transferred to the regulated gas book to compensate core gas customers for use of the distribution service as well as certain corporate overheads.

the distribution system and offset costs for TOTE,[4] so a robust LNG fuels market will provide some benefit to core gas customers and TOTE. Therefore, this section considers the costs under different sales scenarios for the non-regulated portion of the LNG plant which are described in the *Unregulated Cash Flows* section of ***Exhibit G***.

This analysis summarizes costs and revenues over the life of the Facility by calculating the present value of the incremental costs and revenues. The annual costs for each year are discounted using PSE's after-tax cost of capital of 6.69 percent and summed to reflect 2015 present value. Since revenue taxes will be applied to all revenues generated from PSE gas customers at the same rate, revenue taxes are not considered in this analysis. In addition, this analysis does not include gas supply costs for system peaking. The last section of this exhibit, *Portfolio Value vs. Supply Costs*, considers the impact that gas supply would have on the cost of resource alternatives.

The present value costs and revenues for the Tacoma LNG Facility are made up of the following components:

Costs to Core Gas Customers	This is the net cost to PSE's core gas customers which includes the total cost of the regulated portion of the Facility (recovery of capital and O&M) less revenue contributions from TOTE and non-regulated fuel sales. PSE assumes the Facility lease will be renewed after the initial 25 years in all but one commercial scenario which creates additional value for core gas customers by reducing their costs.
Non-Regulated Revenue Transfer	Non-regulated revenue transfers include the revenues from non-regulated sales that are transferred above the line. There are two categories of non-regulated revenue transfers: corporate OHs and distribution service. Contributions to corporate OHs are assumed to be constant across the sales scenarios. Transfers for non-regulated sales that utilize the distribution service to bring natural gas to the LNG plant will be assessed based on varying volume and tariffed rates, therefore, the higher sales scenarios for the non-regulated portion of the facility result in lower net costs for core gas customers.

[4] TOTE will receive a credit on its invoice when PSE makes non-regulated sales to other parties using the bunkering facilities that will be fully allocated to TOTE. Any revenue deficiency created by the 'bunkering facilities credit' will be offset by a transfer from non-regulated operations to regulated operations. In general, the costs to core gas customers will not be impacted by the bunkering facilities credit and transfer from non-regulated operations. However, if TOTE is over its contractual cap, the credit will benefit core gas customers since the transfer from non-regulated to regulated operations will remain the same and PSE will still receive the same revenues from TOTE (the capped price).

TOTE Renewal	The TOTE renewal scenario includes regulated revenues from years 11 through 25 assuming that either TOTE renews or another party contracts for the capacity. The renewal revenues include a contribution towards the distribution system upgrades based on pricing similar to tariffed rates. In addition, it assumes a reduced rate to TOTE in years 11 to 15 which equate to a roughly $5.5 million credit to TOTE on a 2015 present value basis.
TOTE Initial 10 Year Term	TOTE's revenues for their initial terms are based on the Fuel Supply Agreement and include a return on and of the allocated capital, a pass through on operating costs, a premium to compensate for a contract term less than the depreciable life of the facility and revenues for distribution service that are based on tariffed rates. TOTE's fixed price is subject to a contractual cap and PSE is forecasting that TOTE's price will exceed the cap in the initial years of the contract. TOTE will receive a revenue credit for use of the bunkering facilities to make non-regulated sales. This credit will count against the capped price. Therefore, TOTE's contribution increases with additional non-regulated sales. The additional benefit is approximately $7.5 million on a present value basis between the 'Very Low Case' and the 'High Case' scenarios.
Residual Value	The residual value considers the present value of the peaking resource, assuming the plant continues to operate from years 26 through 50. The Facility will be fully depreciated at the end of year 25. Therefore, PSE's core gas customers will only pay for the operating costs and any sustaining capital in years 26 to 50. The residual value is calculated by considering the cost differential between operating the Facility in years 26 to 50 and pipeline capacity in that same time period. The calculation includes a $52 million investment in the Facility in year 26, of which $16 million is allocated to the peaking service. The operating life of the Facility is expected to be 50 years (the depreciable life is limited by the primary term of the Port of Tacoma lease). Furthermore, LNG plants have a long history of reliable operations. Many have remained in service for up to 50 years with the major components of original equipment intact, therefore, $52 million of sustaining capital is considered to be a conservative estimate.

Net Costs to PSE Gas Customers. The present value incremental costs associated with the 25-year life of the Project are shown in ***Figure 5***. Each bar shows the costs to core gas customers for a given commercial scenario. The total gross incremental cost allocated to the gas book is $521 million and is the same in all scenarios. These gross costs are offset by incremental regulated revenues associated with the Project and a residual value to get the net costs to core gas customers. The net cost to PSE's core gas customers vary depending on the commercial scenario, and range between $263 million in the case where the Facility lease is not renewed to $164 million in the scenario where PSE is able to sell the entire capacity of the Facility.

Figure 5. Net Project Costs to PSE Core Gas Customers

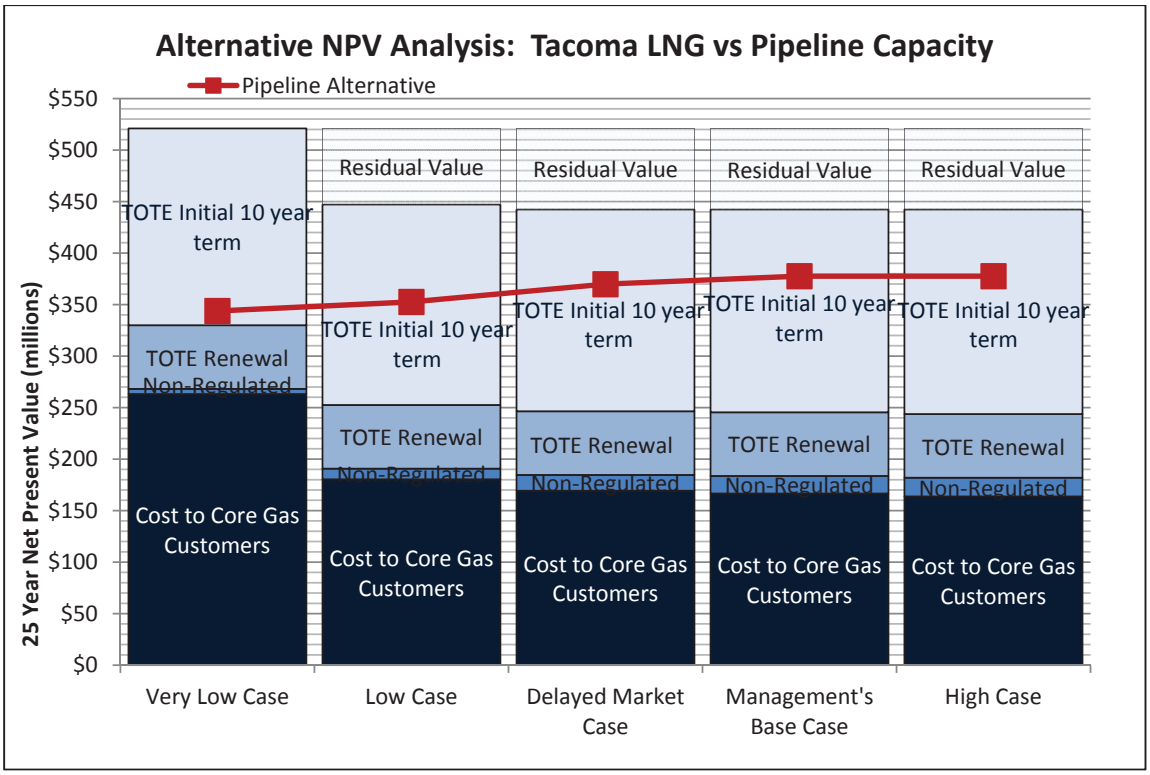


Figure 5 also overlays incremental costs of equivalent pipeline capacity (in red). Clearly, the Tacoma LNG Project is a lower cost option than the pipeline alternative to provide peak-day capacity to core gas customers. Even in the worst case scenario where the lease is not renewed (the 'Very Low Case'), the Tacoma LNG Project is a lower cost alternative than pipeline capacity. In this case, Tacoma LNG is lower cost even without the TOTE contract renewal, which assumes no additional revenues from capacity allocated to TOTE after year 10. In the 'High Case', the cost to core gas customers is a fraction of the pipeline alternative at roughly 43 percent of the

costs. In 'Management's Base Case' the cost of the Project to gas customers is estimated to be $167 million compared to $378 million for equivalent pipeline capacity, representing a $211 million savings to customers with the Tacoma LNG Project. Pipeline capacity cost assumptions are discussed in the next section.

Comparison to Alternative Resources

Incremental Pipeline Capacity

PSE currently meets approximately half of its peak-day gas need through long-haul pipeline capacity and most of the other half through storage redelivery pipeline capacity from the Jackson Prairie underground storage facility. Long-haul pipeline capacity is paid for year-round, but as a peaking resource would be utilized only a few days of the year. Furthermore, pipeline capacity, by itself, does not come with natural gas supply, so additional peak-day natural gas supply arrangements must be made. Nevertheless, due to limited alternatives, it is the fall back resource that must always be considered. Storage redelivery pipeline capacity has historically been significantly cheaper than long-haul pipeline capacity and, therefore, has made acquisition of regional underground storage attractive. However, there is no discounted redelivery service currently available, so regional underground storage acquisitions would have to be supported by an interstate pipeline expansion, which is assumed to be equal to long-haul pipeline costs.

Pipeline Assumptions. The assumptions used to create the incremental costs of additional pipeline capacity are shown in ***Figure 6***. These estimates are consistent with the assumptions in PSE's 2015 IRP.

Figure 6. Pipeline Assumptions

Northwest Pipeline Cost ($/Dth/day)	$ 0.56
Westcoast Pipeline ($/Dth/day)	$ 0.52
Westcoast Capacity %	100%
Pipeline escalator (annual)	1.25%

The assumptions are described in more detail below:

NWP Costs	Northwest Pipeline (NWP) year-round firm shipping costs are assumed to be 2015 costs escalating annually. It is assumed that the pipeline must be expanded to serve the volumes under consideration.
Westcoast Pipeline	Spectra's Westcoast pipeline delivers gas from producing fields and processing plants in northern B.C. and delivers it to NWP at the international border near Sumas, WA. The cost is a year 2015 estimate escalating annually.
Westcoast Capacity %	PSE's pipeline acquisition strategy includes purchasing 100 percent of its NWP receipt point capacity at Sumas upstream on Westcoast. For example, if PSE were to procure 85 MDth/Day of NWP capacity with a receipt point of Sumas, it would also procure 85 MDth/day of Westcoast capacity.
Pipeline Escalator	The annual increase in pipeline tariff rates (commensurate with PSE's IRP analysis)

Timing of Supply. The Tacoma LNG Facility is expected to be operational in winter 2018-2019. PSE typically buys pipeline capacity in large blocks, however this analysis conservatively assumes that capacity is purchased in smaller blocks: 65 MDth/day in 2019 and 2021 and additional capacity thereafter, such that the total pipeline capacity in each year is equal to that of the Tacoma LNG Project in each commercial scenario.

The capacity of the Project is assumed to be 75 MDth/day plus the subscribed capacity of the non-regulated portion of the Facility. For example, when the non-regulated capacity is fully subscribed (as it is in the 'High Sales' scenario), then the Project capacity is 85 MDth/day starting in 2022. If it is 50 percent subscribed, the Project capacity is 80 MDth/day and with no subscription the Project capacity is 75 MDth/day.

Portfolio Value vs. Incremental Costs

This analysis only considers the direct incremental costs of an LNG facility and pipeline capacity and does not include the impact of the supply associated with either alternative. Gas supply for the LNG facility will be procured over the summer months at lower rates. The supply will be transmitted through existing pipeline capacity that PSE holds, resulting in no new fixed pipeline costs.

In contrast, purchasing interstate pipeline capacity would require PSE to procure gas supply during the peak days of the year when commodity costs are highest. PSE would likely purchase a call option for supply with pipeline capacity, which would result in additional costs not considered in this analysis. However, interstate pipeline may also provide a system benefit by allowing PSE to acquire more gas from a specific basin with a cost advantage to other supply basins. While the LNG facility supplies lower cost gas for over six days, pipeline capacity could link PSE's system to a lower cost supply basin for many days throughout the winter (since pipeline capacity can be fully utilized every day). For example, gas purchased in northern British Columbia is forecast to be cheaper than Rockies gas for the next several years. Purchasing additional interstate pipeline capacity to British Columbia would allow PSE to pull supply from this cheaper basin year-round.

To understand the magnitude of supply basin differential necessary to outweigh the benefits of the Project, consider the following example:

> In 'Management's Base Case' scenario, the Project benefit to core gas customers is $211 million on a PV basis. To equal this benefit, the supply basin differential value would need to be $16.6 million each year from 2019 to 2043. Assuming a capacity of 85 MDth/day and that the capacity would only be of value for 90 days over the winter months,[5] the $/MMBtu differential between supply basins would have to average **$2.30/MMBtu**.

Given this high differential and the fact it would need to persist consistently for 25 years, PSE is confident that any additional portfolio benefit associated with pipeline capacity would not outweigh the Tacoma LNG Project benefits to core gas customers. This assertion is affirmed by the results of the draft 2015 IRP, which considers total portfolio costs and selects the Tacoma LNG Project as a least cost resource.

[5] It is assumed that for the other 275 days per year (the non-winter months) PSE would not rely on this last 85MDth/day. In other words, as the last resource on the stack, it is only called upon when the system is at or near peak.

PUGET SOUND ENERGY

Exhibit N.

Pro Forma Financial Statements

Pro Forma Financial Statements

Project Description

The Tacoma LNG Project ("Project") consists of the permits, land lease, other real estate rights, commercial contracts, upgrades to PSE's gas distribution system and other necessary rights, agreements, equipment and work to develop, construct, own and operate an LNG facility ("Facility") at the Port of Tacoma in Pierce County, Washington. The cost to develop and construct the Facility is approximately $311 million and the supporting upgrades to PSE's distribution system are estimated at around $54 million, before AFUDC.

A. Commercial Structure of the Tacoma LNG Facility

As discussed in the *Report to the Board of Directors*, PSE will own the entire LNG facility and allocate the capacity and associated costs and revenues to regulated and non-regulated services. Project capacity used to serve the peak day needs of core gas customers and TOTE under the Fuel Supply Agreement ("FSA") will be part of PSE's regulated operations and therefore included in gas ratebase. The remaining capacity at the facility will be allocated to non-regulated sales and will be treated as non-utility operations. All costs and revenues associated with non-regulated sales will fall outside the purview of PSE's regulated business. Therefore, PSE's regulated customers will not be responsible for the costs associated with non-regulated sales, nor will these customers benefit from non-regulated revenues.

B. Description of the Project

Siting	The Facility will be located at the Port of Tacoma, on the Hylebos waterway, on the corner of East 11th Street and Alexander Avenue East. The 33-acre site is currently a mix of warehouses, vacant offices and support buildings.
Owner	Puget Sound Energy will fully own both the distribution upgrades and the Tacoma LNG Facility. Real estate and other agreements have been structured to allow for partial assignment if PSE were to sell a portion of the LNG facility or invest in future expansions with an equity partner.

Timing of Project Development	To date, PSE has signed a long term Fuel Supply Agreement with TOTE, and entered into a lease with the Port of Tacoma. PSE is still awaiting the issuance of the Final EIS and other substantive permits. PSE is also awaiting WUTC approval of the TOTE special contract and a declaratory order affirming the methodology for allocating costs between regulated and non-regulated LNG services. Management anticipates requesting final project approval at the November 5, 2015 board meeting pending issuance of permits.
Timing of Project Construction	PSE plans to start demolition once environmental permits are received and final Board approval is obtained. The Facility will be constructed and commissioned over a three-year period with commercial operation expected in late 2018. The financial statements in this exhibit are listed as full calendar year such that if the facility is put into service on September 1 2018, the year labeled "2019" in this exhibit is runs from September 2018 through August 2019.
Full Notice to Proceed	November 5, 2015 (pending Board approval)
In Service Date	October 1, 2018 (estimated). For the purposes of this pro forma COD is assumed to be December 31, 2017 for the distribution upgrades. The distribution upgrades need to be in service to support Facility commissioning and startup. PSE's obligations under the TOTE Fuel Supply Agreement begin January 1, 2019.
Liquefaction Capacity	250,000 LNG gallons/day (21 MDth/day)
Storage Capacity	8 million LNG gallons (680 MDth)

Peaking Capacity	66 MDth/day (The total peaking resource will be 85 MDth/day, with 66 MDth/day of LNG vaporized and injected into the gas distribution system at the Tacoma LNG Facility and up to 19 MDth/day of gas intended for liquefaction diverted to other customers on PSE's distribution system).
Real Estate	PSE will lease the 33-acre parcel from the Port of Tacoma. PSE will also acquire easements and property to support the gas distribution system upgrades and for the direct LNG pipeline to TOTE.

Estimated Project Budget and Allocations

The following section outlines the estimated Project budget and allocation of capital and operating costs to Facility customers.

A. Estimated Project Budget

The breakdown of the total Project budget is shown on the following page. A calendar view of the Project budget is included in ***Exhibit D***. PSE is the sole owner and is responsible for 100% of the capital cost.

Table 1. Estimated Project Budget ($1,000s)

Development Budget	Total Budget
Construction Work Outside of Fixed Price EPC Scope:	
Engineering and Analysis	$7,429
Permitting & Legal Support	$3,368
Real Estate and Lease	$1,078
Communications/Outreach	$852
OH and Expenses	$284
Distribution Upgrades	$1,955
Commercial and Regulatory[1]	$860
Project Development Sub-Total	**$15,826**
Tacoma LNG Facility Capital Budget	
Development Budget	$13,012
CBI Milestone Payments	$191,941
Construction Work Outside of Fixed Price EPC Scope:	
Capital Spares	$1,200
Demolition	$2,473
Soil Stabilization	$20,620
Substation & Utilities	$8,365
Direct Bunkering Line to TOTE Facility	$9,884
In-water Work at the TOTE Site	$6,300
Project Management and Outside Services	
PSE Labor	$4,905
Outside Services and QA	$2,479
Port of Tacoma Lease Payments	$5,110
Permitting Support and Mitigations	$1,250
Insurance	$1,576
Sales Tax	$13,471
Contingency	$19,038
PSE Construction OH's	$9,149
Facility Sub-Total	**$310,773**
Gas System Upgrades Capital Budget	
General Development	$310
South Tacoma Upgrades	$11,061
Port of Tacoma 4 Mile 16"	$29,290
Contingency	$8,343
Permitting Mitigations	$4,500
Gas System Upgrades Sub-Total	**$53,504**
PROJECT CAPITAL COSTS	**$364,277**
AFUDC (less reserve)	$54,696
CLOSING GROSS PLANT	**$418,973**
O&M During Construction	
In Support of Regulated LNG Service	$926
In Support of Non-Regulated LNG Service	$534

[1]*Commerical and Regulatory expenses are not capitalized*

[2]*Capital development budget for the Facility excludes the work on the gas distribution upgrades and O&M work.*

The budget items are defined as follows:

Development Budget	The development budget shown in ***Table 1*** represents the costs to complete the development phase of the Project. The budget includes actuals through August 2015 and projected costs for September and October of 2015.
Engineering and Analysis	This category includes all engineering and analysis work during the development phase, as well as preliminary analyses by engineering and economic firms. It includes work done on a time and materials basis as well as fixed fee FEED studies by PSE contractors: Chicago Bridge and Iron ("CBI"), Black & Veatch, Moffat and Nichol, Sanborn Head, and Geo Engineers.
Permitting and Legal Support	Permitting support is provided by CH2MHill who was responsible for preparing the first draft of the EIS for the City of Tacoma and its consultants. Berger ABAM is also supporting permitting and Stoel Rives has been engaged as environmental and land-use attorneys.
Communications and Outreach	PSE has and will continue to engage outside firms to provide strategy and support with outreach to the local community and other key stakeholders at the Port of Tacoma and in local and state government.
Commercial and Regulatory	PSE has engaged Perkins Coie to assist in regulatory matters related to LNG such as filing the TOTE contract and accounting petition as well as negotiating the EPC contract. Baker Botts was engaged to assist with the TOTE contract and will likely assist with other commercial arrangements. Development dollars spent on legal fees associated with negotiating and executing commercial contracts and regulatory filings cannot be capitalized.
Real Estate and Lease	The ground lease with the Port of Tacoma includes up to 24 months for permitting and due diligence. During this time, the lease payments will be at a reduced rate. The lease payments will increase to 75% of the full lease payment when construction activities begin; the lease provides for a three-year construction period. Lease payments prior to commercial operations will be capitalized.
Capital Facility Budget	The construction budget includes all capital costs associated with constructing and commissioning the Facility.

CBI Milestone Payments	The EPC contract divides the lump sum fixed price into a series of payments based on construction milestones. This category, which comprises roughly two thirds of the construction budget will be fixed when the contract with CBI is executed.
Capital Spares	Major spare parts can be capitalized. The Facility will require spares of critical components to minimize downtime.
Demoliton and Civil Work	Significant geotechnical work will need to be done onsite to stabilize the soils. LNG Facilities must meet strict earthquake guidelines and the poor soil conditions at the Port of Tacoma require improvements in order to meet the guidelines.
Substation	Tacoma Public Utilities will construct a substation onsite to serve the Facility load which is estimated to be 14.8 MW at peak demand.
Direct Bunkering Line to Serve TOTE	CBI will design and construct an underground LNG fuel line that connects PSE's LNG Facility with the bunkering station on the TOTE terminal. This work will be performed outside of the fixed price CBI provides for the rest of their scope and will be billed on a T&M basis.
In-Water Work at TOTE Dock	PSE will be responsible for engineering and constructing marine structures at TOTE's facility to support bunkering operations.
PSE Labor	PSE labor for construction includes PSE project managers, continued permitting and commercial support and other supporting PSE employees as well as their expenses and overheads. PSE labor related to regulatory filings and marketing the non-regulated capacity cannot be capitalized. These costs are accounted for in the O&M budget.
Outside Service and QA	Outside services include engineering analysis and quality control, legal review, and communications and outreach after the Project enters the construction phase.
Lease Payments	Lease payments at the Port of Tacoma will increase to $146,000 per month when demolition and site improvements begin.
Permitting Support and Mitigations	This category encompasses costs associated with meeting permitting requirements in the EIS.
Insurance	During construction, PSE will purchase builders risk, pollution and marine liability insurance.

Contingency	The contingency for the EPC contractor scope is 5% of the FEED estimate provided by CBI. The contingency for other Facility items that are yet to go through detailed engineering design is determined by industry standards. Specifically, there is a 10-15% contingency on geotechnical, demolition and substation work, and a 25-40% contingency on the direct line to TOTE and in-water work.
Construction Overhead	Construction overhead for the Project is assumed to be 3% for non-PSE expenditures and 13% for PSE labor.
Sales Tax	PSE has received a manufacturing exemption from sales tax for machinery and equipment used in producing LNG for expenditures made after July 2015. PSE will pay sales tax on the machinery and equipment as expenditures are made and receive refunds beginning in 2017.
AFUDC	Allowance for funds used during development and construction for the LNG Facility will be applied at PSE's pre-tax weighted average cost of capital of 7.8%.
AFUDC Reserve	The LNG Facility will accrue full AFUDC during construction; however, PSE will also recognize an AFUDC reserve expense on capital allocated to the non-regulated sales portion of the plant. The AFUDC reserve expense will be equal to PSE's pre-tax WACC less PSE's weighted average cost of debt. When the LNG Facility is put into service, the AFUDC reserve account will net out capitalized financing costs for the non-regulated sales portion of the facility such that the capitalized financing for this portion of the project is equal to PSE's cost of debt.
Gas System Upgrades	In order to supply gas to the Facility for liquefaction and receive vaporized gas from the Facility, PSE will upgrade the existing gas distribution system. These upgrades include installing new pipe at the Port of Tacoma, installing pipe and increase operating pressure in the South Tacoma distribution system, upgrading the Frederickson gate station and installing a new limit station. Upgrades in the South Tacoma system are either planned or will be required in the near future to support system growth regardless of the added load of the Facility.
Improvements at the Port of Tacoma	PSE will construct approximately four miles of 16-inch pipeline at the Port of Tacoma. This line will connect the Tacoma LNG Facility to PSE's high pressure gas system.

Improvements in South Tacoma	In order to support the additional load at the Port, PSE will improve the distribution system near the Clover Creek limit station. This work includes increasing the operating pressure in an existing segment of pipe up to 500 psi, adding two limit stations and adding a mile of pipe to connect the north and south Tacoma systems. In addition, PSE will rebuild parts of the Frederickson gate station. The pressure increase and addition of one limit station will be undertaken independent of the Tacoma LNG Project to support customer growth in the area; but the improvements are mentioned here because the Tacoma LNG Project requires the pressure increase to be in place before service can commence.
AFUDC	Allowance for funds used during development and construction of the gas system upgrades will be applied at PSE's weighted average cost of capital of 7.8%.

B. Allocation of Facility Capital and Customer Contributions

The capital used to develop and construct the Facility will be allocated amongst services the Facility provides. The two main services at the Facility are liquefaction and storage. The other services are related to dispensing LNG from the Facility, including vaporization, truck loading and marine vessel bunkering. Facility customers will contribute revenues based on their utilization of these services. ***Table 2*** shows the capital allocated to each service and the contribution from each of the customers for each service. For example, TOTE's volumes will equal 44% of the Facility's liquefaction capacity. Therefore, TOTE's cost-of-service pricing will contribute revenues to cover 44% of the cost allocated to the liquefaction service.

Table 2. Allocation of Facility Capital ($1,000)

Facility Services	Capital Allocated to Each Service	With AFUDC associated with each service	Contributions from Customers Towards Services		
			Peaking	TOTE	Non Regulated
Liquefaction	$87,955	$14,851	10%	44%	46%
Storage	$106,117	$18,461	79%	6%	15%
Bunkering	$37,474	$6,114	0%	100%	0%
Truck Loading	$10,126	$1,730	25%	0%	75%
Vaporization	$18,984	$3,205	100%	0%	0%
Common Items	$50,117	$10,630	47%	24%	29%
Gross Allocated Capital	$310,773		$137,434	$94,976	$78,362
AFUDC		$54,992	$24,667	$16,368	$13,957
AFUDC Reserve		(3,278)	-	-	(3,278)
Closing Plant			**$162,101**	**$111,344**	**$89,041**
Capital Allocation Ratio[1]			*44%*	*31%*	*25%*

The total cost of each service (column 2 of the above table) is calculated by assigning each line item of the capital budget to each service. The full capital budget can be found in ***Exhibit D***.

The portion of the project allocated to serve the peaking resource and TOTE will be placed into ratebase when the facility is put into service. The portion of the project allocated to non-regulated fuel sales will be part of PSE's non-utility operations. These costs will not be recovered through regulated rates. Instead, PSE will recover these costs through non-regulates sales to LNG fuel customers. See ***Exhibit G*** for an analysis of the potential returns generated by non-regulated fuel sales.

The allocation of the Facility amongst the services and the Facility services are defined as follows:

Allocation of Facility Capital:	Capital is allocated to Facility services based upon the costs of those services. Customers will contribute revenues to support services based on their utilization of those services.
Facility Services	Facility services are the functions that the Tacoma LNG Facility provides PSE and its customers. The services are specifically: liquefaction, storage, bunkering, truck loading and vaporization.

Liquefaction	Costs that are allocated to liquefaction include the costs of facilities used to receive natural gas, treat the gas, cool the gas below its boiling point and deliver the gas to onsite storage.
Storage	A large portion of Facility costs are attributable to the site-erected full containment cryogenic storage tank. Costs that are allocated to storage include tank costs as well as foundations and other supporting facilities.
Bunkering	Costs allocated to bunkering include facilities used to move the LNG from the onsite storage tank to the marine loading facility, which will be located at TOTE's berthing location. PSE will be able to use these bunkering facilities to make non-regulated fuel sales to marine customers via LNG barges. These facilities will be 100% allocated to TOTE, and PSE will credit TOTE for any sales made using these facilities as provided for in Exhibit B of the TOTE Fuel Supply Agreement.
Truck Loading	Truck loading involves moving LNG from the onsite storage tank to tanker trucks or ISO containers.
Vaporization	Vaporization costs include facilities used to vaporize the gas and inject it into PSE's distribution system. This service and the facilities devoted to it are only utilized by PSE gas customers, so other LNG customers do not pay for vaporization.
Common Items	Approximately 16% of the Facility costs will be common items, which cannot be allocated to any individual service (e.g., Facility development, civil and site work, site utilities, etc.). For pricing or ownership purposes, revenue contributions or ownership of common items are based on the user's weighted average utilization of liquefaction and storage services.
Gross Allocated Capital	Gross allocated capital represents the amount of capital investment allocated to different customers and therefore how much of the facility is put into ratebase. The TOTE and Peaking allocated capital, along with associated AFUDC determine the cost-of-service revenue contribution.
Capital Ratios	The capital ratio (expressed as a percentage) is the ratio of the capital attributable to each customer's services over the total capital cost of the Tacoma LNG Facility.

C. Estimated Operating Budget

Operating expenses include all of the fixed and variables costs of operating the Tacoma LNG Facility. ***Table 3*** shows a summary of the O&M expenses for the Facility and the allocation of these expenses to customers. Under a fuel supply or tolling arrangement PSE will pass through O&M costs to the customers.

To the extent possible, PSE will direct assign operational costs to customers based on their utilization of the services of the Tacoma LNG. When it is not possible to direct assign operational costs, the costs will be allocated to facility services based on the drivers of those costs. For example, plant electricity consumption is almost entirely driven by the cost to run compressors needed to liquefy the gas. Therefore, variable electric costs will be allocated based on LNG volumes that are liquefied over a certain period. When costs cannot be directly assigned to a service, they will be assigned using the capital allocator shown in ***Table 2***.

For the purposes of modeling the allocation of operating costs for the pro forma, it is assumed that staffing costs are allocated based on the capital ratio and that maintenance costs are allocated based on a weighted average of liquefaction and storage allocations, with the higher weighting on liquefaction which is anticipated to require more maintenance. While fixed costs are assigned based on reserved customer capacity[1], variable costs are allocated based on actual utilization in a given year. For that reason, both the total variable cost and the allocation of those costs will vary based on actual utilization. ***Table 3*** shows variable costs and allocations based off of the management's base case sales forecast for the non-regulated portion of the plant (or 19% of total capacity sold).

Table 3. Estimated Operating Budget and Allocation ($1,000s)

Fixed Expenses	Total Fixed Expense (Year 1)	Allocation of Operating Costs			Escalation Factor
		PSE	TOTE	Non-Regulated	
Maintenance	$733	27%	35%	38%	2.50%
Staff	$3,066	44%	31%	25%	3%
Incremental Insurance	$844	44%	31%	25%	2.50%
Allocated General Costs*	$1,880	NA - Based on Rate Dept. Calculation			
Lease	$2,549	44%	31%	25%	2.50%
Bunkering Station	$61	0%	100%	0%	2.50%
Fixed Electric Costs	$1,104	16%	73%	11%	2.50%

[1] Fixed electric costs are based off of forecasted capacity for a given year (as opposed to reserved capacity at the plant).

Variable Expenses					
Plant Consumables	$171	13%	76%	12%	2.50%
Port Volume Charge	$108	0%	87%	13%	2.50%
Variable Electric Costs	$3,451	13%	76%	12%	NA

Operational Cost Allocators	To the extent possible, operational costs will be direct assigned to customers based on their utilization of facility services. Charges that cannot be direct assigned will be allocated based on pre-defined allocators described below.
Capital Allocator	The capital allocator is expressed as a percentage of the total Facility capital attributable to each customer (as show in ***Table 2***).
Annual Capacity Allocator	The annual capacity allocator is based on forecasted LNG capacity for a given year and is used to allocate fixed electric costs.
LNG Volumes Allocator	LNG volumes allocator is based on actual LNG volumes liquefied and is used to allocate variable electric costs and plant consumables.
Wharfage Allocator	Wharfage allocator is used to allocate Port of Tacoma volumetric charges. The Port of Tacoma volume charges only apply to LNG moved through the truck loading racks and bunkering system and will not apply to volumes liquefied for peak shaving.
Escalation of operational costs	For the purposes of the financial pro forma and cost estimates, all expenses are escalated annually at 2.5% with the exception of labor costs, which are escalated at 3% annually. Corporate OH calculations are dependent on O&M costs and allocated ratebase.
Fixed Operating Expenses	Fixed operating expenses allocated to TOTE and the peaking resource will be recovered through regulated rates. Fixed costs allocated to non-regulated sales will be 'below the line'.

Maintenance	This category encompasses all maintenance cost other than consumables and labor. These costs include replacement parts and paying for outside service providers to perform maintenance on Facility components or Facility grounds. Maintenance that is attributable to equipment that is specifically used for a particular Facility service will be allocated to customers based on their use of that service. General maintenance that cannot be directly allocated will be allocated based on the capital allocator. For the purposes of this pro forma, the maintenance allocation is calculated for each customer based on a weighted average of liquefaction and storage allocation (with a 75% weight on liquefaction and a 25% weight on storage).
Facility Staff	This category includes the salaries and overhead for Facility staff, which are expected to be fulltime PSE employees; PSE has included 16 employees in the financial pro forma. This includes 10 gas operators, and a control technician, which will most likely be union positions. It is possible that the USCG and Dept. of Homeland Security will require manned security at the Facility at all times. PSE will contract with a service provider for security services. Like maintenance expense, to the extent possible, staff hours will be allocated to customers based on the use of facility services. For staff time that cannot be directly assigned, the expense will be allocated on the capital allocator. For the purposed of this pro forma, all staff time is allocated on the capital allocator.
Incremental Insurance	Incremental insurance premiums will be allocated to customers based on the capital allocator.

Allocated General Costs	All PSE facilities and operations are allocated, on a formulaic basis determined by WUTC mandated ratemaking rules, a certain amount of overhead to recover corporate administrative and general expenses. The administrative fee will largely be charged to Facility customers based on their share of the Facility's total O&M expenses for the previous contract year, but a portion will be charged to Facility customers based on gross plant balances at the beginning of the contract year. The administrative fee will be set at the start of each contract year. The non-regulated portion of the plant will also be responsible for a portion of corporate overhead, however the allocation will be different. PSE labor allocated to non-regulated sales will assessed an overhead rate that covers corporate expenses. In addition, placing the non-regulated portion of the plant into non-utility operations will attract working capital away from the regulated part of the business. The lost regulated revenues associated with the return on that working capital are also categorized as corporate overhead for non-regulated fuel sales.
Lease	The Tacoma LNG Facility will be located on land that is under a long-term lease with the Port of Tacoma. All Facility customers will pay their allocable share of the lease payments, which are subject to an annual increase equal to the previous year's average CPI-U. For the purposes of the financial pro forma, CPI-U is assumed to be 2.5% annually. The cost of the lease will be allocated using the capital allocator.
Bunkering Costs	Costs specifically attributed to operating the bunkering facilities include the costs of an exclusive easement for the real estate rights. These costs will be fully allocated to TOTE.
Fixed Electric Costs	Fixed electric charges include fixed payments to Tacoma Power. PSE has assumed that the fixed electric costs will be at Tacoma's tariffed industrial rates. PSE should have the ability to reduce fixed electric costs with projected plant liquefaction rates. For example, if the plant is not operating at full capacity due to the non-regulated portion of the facility not being fully subscribed, then the contract demand with Tacoma Power could be reduced to below the peak electric demand at nameplate capacity (14.8 MW). Fixed electric costs will be allocated based the annual capacity allocator.
Variable Expenses	Variable operating costs will be allocated to customers based on their actual gallons liquefied.

Plant Consumables	Consumables include the nitrogen and other compounds used to treat and cool the natural gas. Consumable costs will be charged to customers each month based on their actual liquefaction volumes for that month.
Port of Tacoma Volume Charge	The Port of Tacoma charges a fee for any commodity that is sold in the Port. This fee will be assessed at $0.085/volumetric barrel (approximately $0.1573/BOE). This rate is subject to an annual increase by CPI-U. The Port of Tacoma is reserving the right to develop a Port Tariff for LNG that may be substituted in lieu of this charge. This cost will be passed directly to customers based on their actual deliveries.
Variable Electric Costs	Electricity is the largest Facility operating cost. Electricity will be provided at wholesale market prices and wheeled by Tacoma Power. For the purposes of the pro forma, the Mid-C price forecast from PSE's 2015 IRP has been used for estimating wholesale power prices.

Bunkering Credit

As mentioned in the previous sections, both capital and O&M costs associated with the bunkering facilities will be 100% allocated to TOTE. To the extent that PSE makes non regulated LNG sales to marine customers using these facilities, PSE will credit TOTE on a pro rata basis. For example, if PSE makes non-regulated sales utilizing the bunkering facilities equaling the volume of TOTE, then TOTE will be credited 50% of costs associated with bunkering facilities for that period. Any deficiency in TOTE revenues will be supplemented with a transfer from below the line to the regulated gas book. Therefore, the non-regulated pro forma considers the bunkering credit as a variable expense even though all the incremental expense associated with the project is covered in the TOTE portion of the regulated pro forma.

D. Fuel Charge

PSE will be offering a bundled service to TOTE, and other potential customers may also subscribe to a bundled service. Bundled service includes the gas commodity and transportation to the Tacoma LNG Facility.

Fuel Charge	The fuel charge includes the cost of natural gas delivered to the Tacoma LNG Facility.
Commodity Charge	The commodity charge is variable and billed each month based on the previous month's usage. The commodity charge will equal the total amount of natural gas used by Facility customers (as measured in

	MMBtu) including plant fuel multiplied by the Sumas index price plus 3 cents ($0.03) per MMBtu for the month in which the gas was liquefied.
Northwest Pipeline Charges	Northwest Pipeline LLC ("NWP") delivers gas from British Columbia to PSE's city gate via an interstate pipeline system. NWP Charges will be passed through at cost. Current Pricing includes: *Pipeline transportation charges – Pursuant to NWP's then effective FERC Gas Tariff –* • Rate Schedule TF-1 Reservation (Large Customer) System-Wide rate, currently $.41/MMBtu/day; • Rate Schedule TF-1 Volumetric (Large Customer) System-Wide rate, currently $.0318/MMBtu/day; • Rate Schedule TF-1 fuel use reimbursement charge (fuel reimbursed in-kind), currently 1.6%. The reservation and volumetric rates detailed above are expected to be in place until 2017; NWP's rates typically change every 3 to 5 years, oftentimes through settlements negotiated with its customers. The fuel reimbursement factor changes every six months (usually effective October 1 and April 1 each year), and are adjusted to reflect actual activity.
PSE Distribution Charge	PSE distribution charges reflect the cost of moving gas on PSE's distribution system from the interstate pipeline to the Tacoma LNG Facility. These costs will be charged pursuant to PSE's LNG tariff and/or a negotiated special contract. The charges will include a fixed monthly payment and a variable component that will be assessed on a $/MMBtu basis.

The Projection

The following write-up and associated pro forma financials (the "Projection") describes the incremental financial impact the Project will have over the approximately three-year construction timeline and the first 10 years of operations.

This section includes a projection for the project income statement and balance sheet. For both statements, the projection is shown for the regulated and non-regulated operations

separately, then combined. The income statements assume management's base case for non-regulated LNG fuel sales.

A. Income Statement

The income statements on the following pages consider the incremental revenues and costs associated with the operation of the Tacoma LNG Facility and associated distribution system upgrades. The projection assumes perfect ratemaking.

Revenues	Revenues include the incremental revenues attributable to the project. Total revenues for the regulated gas book include the full revenues collected from TOTE (including contract premiums above the cost of service) as well as transfers from the non-regulated book to compensate PSE's core gas customers for use of the gas distribution system. Revenue from core gas customers are the incremental revenues needed to cover the costs of the facility and distribution upgrades less any benefit from TOTE and non-regulated fuel sales. For the non-regulated income statement, revenues include the total project revenues from management's base case assumptions less transfers to the regulated book for use of the distribution service and the bunkering facilities that are fully allocated to the regulated gas book.
Expenses	Operating expenses include the incremental costs to operate the LNG Facility and associated distribution upgrades. The gas feedstock and electric costs to power the Facility are the largest operating expenses. These expenses are categorized as 'Energy Costs' on the income statement.
Ratebase	The LNG Facility is depreciated on a 25-year schedule that is determined by the initial term of the Port of Tacoma lease. Only portion of the facility allocated to regulated fuel sales is included in ratebase. Distribution plant is depreciated on a 50-year schedule.

INCOME STATEMENT - Regulated Gas Book ***($1,000's)***

	Operating Year:	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
	Revenues										
[1]	Core Gas	35,739	34,298	32,529	32,180	31,173	30,248	29,486	29,214	28,333	27,383
[2]	TOTE	46,543	47,256	48,535	48,793	49,035	49,465	50,633	54,628	54,833	54,773
[3]	Non Regulated Sales Transfers	678	695	1,385	1,396	1,408	1,420	1,433	1,446	1,460	1,475
[4]	Revenues	82,960	82,249	82,449	82,370	81,616	81,133	81,551	85,288	84,627	83,631
	Expenses										
[5]	Plant Operational Expenses	5,865	6,016	6,172	6,332	6,496	6,665	6,838	7,016	7,199	7,388
[6]	Energy Costs	23,375	24,250	25,225	26,138	26,988	28,013	29,844	34,857	35,585	36,007
[7]	Depreciation and Amortization	12,981	12,981	13,241	13,241	13,241	13,241	13,241	13,241	13,241	13,241
[8]	Property Tax	4,585	4,585	4,586	4,587	4,588	4,588	4,589	4,590	4,591	4,591
[9]	Sales Tax	2,678	2,656	2,687	2,683	2,649	2,623	2,621	2,704	2,675	2,637
[10]	Income Tax	8,222	7,800	7,500	7,218	6,792	6,386	5,997	5,619	5,240	4,855
[11]	Operating Expenses	57,705	58,289	59,411	60,198	60,754	61,517	63,130	68,028	68,531	68,719
	Income										
[12]	Operating Income	25,255	23,960	23,038	22,172	20,862	19,616	18,421	17,260	16,096	14,912
[13]	Interest Expense	(9,986)	(9,473)	(9,109)	(8,766)	(8,249)	(7,756)	(7,283)	(6,824)	(6,364)	(5,896)
[14]	Net Income	15,269	14,486	13,929	13,405	12,614	11,860	11,137	10,436	9,732	9,016
[15]	EBITDA	46,458	44,741	43,779	42,631	40,895	39,243	37,659	36,120	34,577	33,008
	Ratebase										
[16]	LNG Plant Ratebase	271,321	256,750	240,550	225,213	210,655	196,809	183,511	170,601	157,622	144,376
[17]	Distribution System Ratebase	53,940	51,832	56,162	60,338	58,032	55,831	53,732	51,695	49,676	47,677
[18]	Total Ratebase	325,262	308,582	296,712	285,551	268,687	252,640	237,243	222,295	207,299	192,053
[19]	Equity Capitalization of Ratebase	156,126	148,119	142,422	137,064	128,970	121,267	113,876	106,702	99,503	92,185
[20]	Return on Equity	9.78%	9.78%	9.78%	9.78%	9.78%	9.78%	9.78%	9.78%	9.78%	9.78%

INCOME STATEMENT - Non-Regulated Sales *($1,000's)*

	Operating Year:	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
	Revenues										
[1]	Non Regulated Revenues	5,868	6,696	31,166	31,246	31,306	31,382	31,493	31,995	32,060	32,146
[2]	Transfer to Regulated Book	(678)	(695)	(1,385)	(1,396)	(1,408)	(1,420)	(1,433)	(1,446)	(1,460)	(1,475)
[3]	Transfer for Bunkering Facilities	(738)	(834)	(3,875)	(3,779)	(3,684)	(3,592)	(3,503)	(3,416)	(3,329)	(3,319)
[4]	Revenues	4,453	5,168	25,906	26,070	26,215	26,369	26,557	27,133	27,271	27,352
	Expenses										
[5]	Plant Operational Expenses	1,951	1,981	2,114	2,171	2,230	2,290	2,351	2,415	2,480	2,547
[6]	Energy Costs	693	780	3,905	4,076	4,228	4,390	4,586	5,169	5,317	5,409
[7]	Depreciation and Amortization	4,287	4,287	4,287	4,287	4,287	4,287	4,287	4,287	4,287	4,287
[8]	Property Tax	1,240	1,240	1,240	1,240	1,241	1,241	1,241	1,241	1,242	1,242
[9]	Sales Tax	35	40	185	186	186	186	187	190	190	191
[10]	Income Tax	(2,249)	(1,988)	4,138	4,171	4,202	4,230	4,255	4,279	4,303	4,325
[11]	Operating Expenses	5,957	6,339	15,869	16,131	16,373	16,624	16,908	17,582	17,819	18,000
	Income										
[12]	Operating Income	(1,505)	(1,172)	10,037	9,940	9,842	9,745	9,649	9,551	9,452	9,352
[13]	Interest Expense	(2,672)	(2,521)	(2,353)	(2,194)	(2,039)	(1,890)	(1,746)	(1,604)	(1,462)	(1,320)
[14]	Net Income	(4,176)	(3,693)	7,684	7,746	7,803	7,855	7,902	7,947	7,990	8,032
[15]	EBITDA	534	1,127	18,462	18,397	18,331	18,262	18,191	18,118	18,042	17,964
	Capitalization (Mid Year Average)										
[16]	Debt	45,256	42,701	39,863	37,167	34,531	32,014	29,579	27,170	24,762	22,355
[17]	Equity	41,775	39,416	36,797	34,308	31,874	29,551	27,304	25,080	22,857	20,636
[18]	Total Assets	87,031	82,117	76,660	71,474	66,405	61,565	56,883	52,251	47,619	42,991
[19]	Return on Equity	-10.0%	-9.4%	20.9%	22.6%	24.5%	26.6%	28.9%	31.7%	35.0%	38.9%

INCOME STATEMENT - TOTAL *($1,000's)*

	Operating Year:	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
	Revenues										
[1]	Core Gas	35,739	34,298	32,529	32,180	31,173	30,248	29,486	29,214	28,333	27,383
[2]	TOTE	46,543	47,256	48,535	48,793	49,035	49,465	50,633	54,628	54,833	54,773
[3]	Non Regulated Sales	5,868	5,863	27,292	27,467	27,622	27,789	27,989	28,579	28,731	28,827
[4]	Revenues	88,150	87,417	108,356	108,440	107,831	107,503	108,107	112,421	111,898	110,983
	Expenses										
[5]	Plant Operational Expenses	7,816	7,997	8,286	8,503	8,726	8,955	9,190	9,431	9,679	9,934
[6]	Energy Costs	24,068	25,031	29,130	30,214	31,216	32,404	34,430	40,027	40,902	41,416
[7]	Depreciation and Amortization	17,268	17,268	17,528	17,528	17,528	17,528	17,528	17,528	17,528	17,528
[8]	Property Tax	5,824	5,825	5,826	5,827	5,828	5,829	5,830	5,831	5,832	5,833
[9]	Sales Tax	2,713	2,696	2,872	2,868	2,835	2,810	2,808	2,894	2,866	2,828
[10]	Income Tax	5,973	5,812	11,638	11,389	10,994	10,616	10,252	9,898	9,543	9,180
[11]	Operating Expenses	63,662	64,628	75,280	76,329	77,126	78,141	80,038	85,610	86,350	86,719
	Income										
[12]	Operating Income	24,488	22,788	33,076	32,111	30,704	29,361	28,069	26,811	25,548	24,264
[13]	Interest Expense	(12,657)	(11,994)	(11,462)	(10,961)	(10,287)	(9,646)	(9,030)	(8,429)	(7,826)	(7,216)
[14]	Net Income	11,831	10,794	21,613	21,151	20,417	19,715	19,040	18,383	17,722	17,048
[15]	EBITDA	46,991	45,868	62,241	61,028	59,226	57,505	55,850	54,238	52,619	50,971
	Equity (Mid Year Average)										
[16]	Equity Component of Ratebase	156,126	148,119	142,422	137,064	128,970	121,267	113,876	106,702	99,503	92,185
[17]	Equity Component of Non-Regula	41,775	39,416	36,797	34,308	31,874	29,551	27,304	25,080	22,857	20,636
[18]	Total Equity	197,900	187,536	179,218	171,372	160,844	150,819	141,180	131,782	122,361	112,821
[19]	Return on Equity	6.0%	5.8%	12.1%	12.3%	12.7%	13.1%	13.5%	13.9%	14.5%	15.1%

B. Balance Sheet

The balance sheet for the regulated gas book includes the assets of the Tacoma LNG Project that will be allocated to regulated sales and operations. These regulated assets include the portion of the LNG Facility allocated to serve TOTE and the peaking resource as well as the upgrades to the distribution system that are required to serve the Facility. The non-regulated balance sheet includes the portion of the facility allocated to non-regulated fuel sales. The entire facility will be listed as part of a CWIP account in the gas book during construction. When the facility is put into service, the portion of the plant allocated to non-regulated fuel sales will be transferred to non-utility plant.

The distribution system upgrades are required to be in place prior to Facility operations in order to support Facility commissioning, start up and testing. In the following table, the distribution system upgrades go into service in year 2018 and the LNG Facility begins service in year 2019.

BALANCE SHEET - Regulated Gas Book *($1,000's)*

	Year:	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*	*2022*	*2023*	*2024*	*2025*
	Assets										
[1]	Gross Plant	-	-	(50,523)	222,923	222,923	235,932	235,932	235,932	235,932	235,932
[2]	Accumulated Depreciation	-	-	(1,130)	(14,110)	(27,091)	(40,332)	(53,573)	(66,814)	(80,055)	(93,295)
[3]	CWIP	176,663	256,245	362,522	-	3,133	13,009	-	-	-	-
[4]	Transfer to Non-Utility Plant			(89,076)	-	-	-	-	-	-	-
[5]	Net Plant	176,663	256,245	221,793	208,813	198,965	208,609	182,359	169,118	155,878	142,637
[6]	Gas Inventory	-	-	-	2,303	2,349	2,440	2,531	2,620	2,717	2,876
[7]	Working Capital	-	-	11	1,828	1,853	1,903	1,954	2,006	2,060	2,115
[8]	**Total Assets**	**176,663**	**256,245**	**221,804**	**212,944**	**203,166**	**212,952**	**186,845**	**173,745**	**160,655**	**147,628**
	Liabilities										
[9]	Deferred Tax	-	-	346	2,015	7,885	12,826	17,019	20,355	22,932	25,097
	Capitalization										
[10]	Debt	91,865	133,247	115,158	109,683	99,917	97,301	88,309	79,763	71,616	63,716
[11]	Equity	84,798	122,998	106,300	101,245	92,231	89,816	81,516	73,627	66,107	58,815
[12]	**Total Capitalization**	176,663	256,245	221,458	210,928	192,148	187,117	169,826	153,390	137,723	122,531
[13]	**Total Liabilities and Equity**	**176,663**	**256,245**	**221,804**	**212,944**	**200,033**	**199,943**	**186,845**	**173,745**	**160,655**	**147,628**

BALANCE SHEET - Non Regulated ***($1,000's)***

	Year:	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*	*2022*	*2023*	*2024*	*2025*
	Assets										
[1]	Gross Plant	-	-	-	89,076	89,076	89,076	89,076	89,076	89,076	89,076
[2]	Accumulated Depreciation	-	-	-	(4,287)	(8,574)	(12,861)	(17,148)	(21,435)	(25,722)	(30,009)
[3]	CWIP	-	-	89,076	-	-	-	-	-	-	-
[4]	Transfer from Gas Book CWIP	-	-	89,076							
[5]	Net Plant	-	-	89,076	84,789	80,502	76,215	71,928	67,641	63,354	59,067
[6]	Gas Inventory	-	-	-	-	-	-	-	-	-	-
[7]	Working Capital	-	-	-	255	267	540	536	532	529	526
[8]	**Total Assets**	**-**	**-**	**89,076**	**85,044**	**80,769**	**76,755**	**72,464**	**68,173**	**63,883**	**59,593**
	Liabilities										
[9]	Deferred Tax	-	-	-	58	1,520	2,685	3,585	4,242	4,684	5,026
	Capitalization										
[10]	Debt	-	-	46,320	44,193	41,210	38,516	35,817	33,244	30,783	28,375
[11]	Equity	-	-	42,757	40,793	38,040	35,554	33,062	30,687	28,415	26,192
[12]	**Total Capitalization**	-	-	89,076	84,986	79,249	74,070	68,879	63,931	59,199	54,567
[13]	**Total Liabilities and Equity**	**-**	**-**	**89,076**	**85,044**	**80,769**	**76,755**	**72,464**	**68,173**	**63,883**	**59,593**

BALANCE SHEET - TOTAL ***($1,000's)***

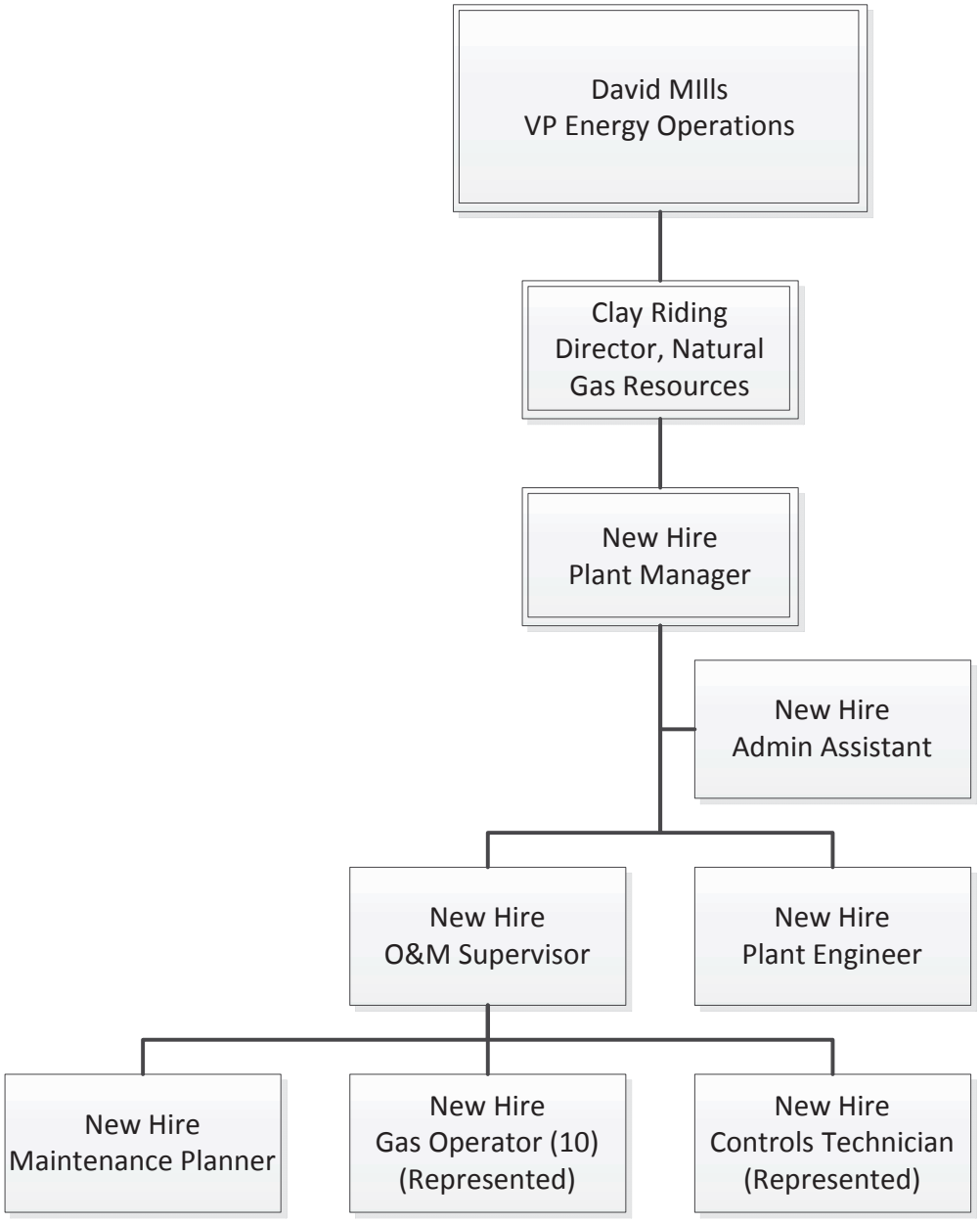
	Year:	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*	*2022*	*2023*	*2024*	*2025*
	Assets										
[1]	Gross Plant	-	-	(50,523)	311,999	311,999	325,008	325,008	325,008	325,008	325,008
[2]	Accumulated Depreciation	-	-	(1,130)	(18,397)	(35,665)	(53,193)	(70,721)	(88,249)	(105,777)	(123,305)
[3]	CWIP	176,663	256,245	451,598	-	3,133	13,009	-	-	-	-
[4]	Transfer from Gas Book CWIP	-	-	-	-	-	-	-	-	-	-
[5]	Net Plant	176,663	256,245	310,869	293,602	279,467	284,824	254,287	236,759	219,232	201,704
[6]	Gas Inventory	-	-	-	2,303	2,349	2,440	2,531	2,620	2,717	2,876
[7]	Working Capital	-	-	11	2,083	2,120	2,442	2,489	2,538	2,589	2,641
[8]	**Total Assets**	**176,663**	**256,245**	**310,880**	**297,988**	**283,935**	**289,707**	**259,308**	**241,918**	**224,537**	**207,221**
	Liabilities										
[9]	Deferred Tax	-	-	346	2,074	9,405	15,511	20,604	24,597	27,615	30,123
	Capitalization										
[10]	Debt	91,865	133,247	161,478	153,875	141,127	135,817	124,126	113,007	102,399	92,091
[11]	Equity	84,798	122,998	149,056	142,039	130,271	125,370	114,578	104,314	94,523	85,007
[12]	**Total Capitalization**	176,663	256,245	310,534	295,914	271,398	261,187	238,705	217,321	196,922	177,098
[13]	**Total Liabilities and Equity**	**176,663**	**256,245**	**310,880**	**297,988**	**280,802**	**276,698**	**259,308**	**241,918**	**224,537**	**207,221**

PUGET SOUND ENERGY

Exhibit O.

Operations Organization

Operations Organization



PUGET SOUND ENERGY

Exhibit P.

Market Assessment of LNG as a Distributed Fuel in WA State

Prepared by Concentric Energy Advisors

CONFIDENTIAL per Protective Order in
WUTC Docket No. UG-151663

MARKET ASSESSMENT OF LIQUEFIED NATURAL GAS AS A DISTRIBUTED FUEL IN WASHINGTON STATE

DRAFT

Prepared for

Puget Sound Energy

September 19, 2012

I. EXECUTIVE SUMMARY

Puget Sound Energy ("PSE") is evaluating liquefied natural gas ("LNG") as a fuel option for certain markets in the Pacific Northwest, specifically the state of Washington and the western Columbia River Port ("market area"). PSE retained Concentric Energy Advisors, Inc. ("Concentric") to provide a market assessment for several potential LNG markets including heavy duty on-road transportation, marine, rail, and industrial conversion markets.[1] In addition, PSE requested that Concentric assess the market for LNG to compressed natural gas ("CNG") in on-road and off-road fleet applications. Last, Concentric considered PSE's strategic advantages and the roles of potential competitors and/or partners to PSE in serving these markets.

Concentric provides this report to supplement PSE's decision criteria regarding LNG market demand and strategic positioning. Major price and supply assumptions and certain of Concentric's findings are summarized as follows:

- Basing oil prices on the Energy Information Administration ("EIA") Long Term Energy Outlook ("AEO") dated June 2012, Reference Case oil prices, the resulting Ultra Low Sulfur Diesel ("ULSD") prices in the market area will remain significantly above the expected cost of LNG from PSE's proposed greenfield LNG facility to allow customers to payback investments for conversion of engines and related equipment. The EIA's Reference Case Long Term Energy Outlook, August 2012 forecasts crude oil prices to rise to 170 USD per barrel by 2025. ULSD, which sells at a premium to crude prices, is currently used in the heavy duty trucking market, and its price will drive economic considerations for future industry conversions. Beginning in 2015, marine vessels operating in the North American Emission Control Area or ECA [2] must use marine oil that contains only 0.1% sulfur. For purposes of this report, the forecast assumes on-road ULSD and 0.1% sulfur marine fuel are equal in price.

- While there is LNG production in Washington and northern Oregon, this LNG supply is generally part of the integrated resource portfolio of the local distribution companies serving the region, including PSE. These LNG facilities could be used to provide bridging supply for the new, distributed LNG markets that develop until a new LNG facility is built. PSE has collaborated with potential bridge suppliers of LNG, notably Fortis BC in Vancouver, BC, as sources of LNG supply in the event demand for LNG from new markets precedes the availability of LNG from a new liquefaction facility in the market area.

- Only two markets, marine and heavy duty trucking, will contribute measurably to distributed LNG demand in PSE's market area:

[1] Initially, Concentric was retained to consider electric and gas peak shaving markets, microgrid markets and LNG supply context and alternatives associated with serving potential markets. Through mutual agreement with PSE, in early July 2012, PSE and Concentric reduced the work scope to consider only the stated markets.

[2] The ECA is any area within 200 nautical miles of the North American coastline.

- Marine customers in the market area that must comply with ECA regulations are numerous. Excluding ocean traffic (vessels that operate internationally and largely outside the ECA), Concentric estimates that the ECA-compliant shipping market could consume as much as 1,000,000 LNG gallons per day[3] of fuel if 100% of the vessels operating in the market area converted to LNG. PSE is advantaged to possibly serve marine LNG markets that are significantly more active than elsewhere in the United States. Specifically, LNG as a marine fuel has been publically endorsed by two major marine customers in PSE's market area, Washington State Ferries ("WSF") and Totem Ocean Trailers Express ("TOTE"). Both potential customers have implementation plans and, to a large degree, have regulatory support to convert a portion of all of their marine-based fleets to LNG over the next few years. In addition, several other large marine customers could convert to LNG based on LNG's availability in the Puget Sound area, emulating conversion activities of WSF and TOTE. By 2020, Concentric forecasts demand in the marine market to exceed 170,000 LNG gallons per day or a market penetration level of about 20%.[4]

- Based on Concentric's analysis, demand for LNG in the heavy duty truck (Class 7&8) transportation market could to grow over the next several years from its current level to over 100,000 LNG gallons per day by 2020. The majority of demand comes from national and interstate long-haul fleets and assumes an adaption rate of between 5-8% in these two segments. Overall, Concentric forecasts a 2020 market area adoption rate in the Class 7&8 segment of approximately 7%.

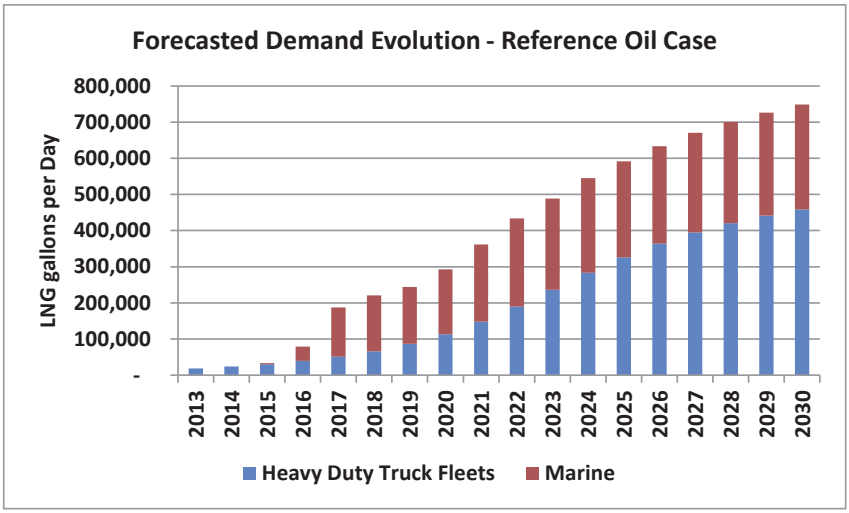
	LNG gallons per day	
EIA on-highway diesel use - 2010	2,838,873	
Est. diesel use in western Washington	2,129,155	
Class 7&8 use in western Washington	1,596,866	
Concentric forecasted market penetration by 2020	113,399	7.1%

- The trucking market demand, when combined with marine demand, could total 300,000 LNG gallons per day by 2020 and provide PSE with enough market demand to construct and operate a LNG production facility with a capacity of up to 300,000 LNG gallons per day.

[3] This includes the summer-only cruise ship market of approximately 500,000 LNG gallons per day.

[4] Since cruise ships provide summer-only demand, average daily demand on a 365-day basis is about 750,000 LNG gallons per day.

Figure 1



- Demand for LNG in the thermal conversion market is extremely limited. Most industrial customers in the market area currently use gas or, if not gas, then self-provided biomass. Only 1-2 larger industrial customers in the market area could be targets for on-site LNG as a fuel option.

- Demand for LNG in the rail segment could be viable in later years (2025+) but will not be developed in the short or medium term due to slower developing dual fuel (gas and diesel) locomotive engine technology. The rail industry needs high horsepower engines and LNG fueling along major rail routes in order to become a significant market for PSE's LNG.

- There is demand for CNG in the market area consisting of lighter duty vehicle applications and return to base/slow fill heavier duty applications (transit buses, garbage trucks). LNG to CNG does not appear to compete favorably against pipeline CNG and therefore does not contribute significantly to LNG demand unless CNG is produced at an existing LNG fueling stations (the LNG is already on-site; CNG is produced from the on-site LNG). In addition, if fleets commit to CNG under medium to long term contracts prior to the in-service date of PSE's LNG facility, it will be difficult for PSE to capture market share. Concentric has not included CNG demand from LNG in its LNG demand evolution.

- Regulatory oversight and permitting of LNG are critical factors in the success of LNG as a distributed fuel. Regulations for LNG use as a vehicle fuel are developed and known; National Fire Protection Association ("NFPA") 57 and 59A are currently used by the industry and its regulators. Rules and procedures for LNG as a marine fuel are still being developed. It is in PSE's interest to understand existing regulations for LNG as well as participate in the development of any new requirements.

- Federal, state and local tax and other incentives that encourage the use of LNG as a distributed fuel are currently very limited with the majority of federal tax incentives for fueling infrastructure and fuel tax having expired at the end of 2011. Of note, LNG as a transportation fuel currently suffers from two tax *penalties* – a) a penalty associated with the lower energy content of an LNG gallon versus a diesel gallon yet both are taxed equally on a volumetric basis ("gallon tax penalty") and b) a second penalty associated with the excise taxes on the higher gross cost of LNG engines versus diesel engines ("excise tax penalty"). While Concentric believes that the gallon tax penalty will be resolved in early 2013, it believes the excise tax penalty will remain. In summary, tax and funding incentives could materialize but currently do not play a significant role in expected LNG demand evolution.

II. RESEARCH AND ANALYSIS

Purpose of the Report

PSE retained Concentric to assist PSE with the evaluation of certain distributed LNG and LNG to CNG markets. The report contains the following five sections:

1. **Market Context –** This section identifies the relative competitiveness of LNG and LNG to CNG as a competing fuel against diesel and ULSD in the market area.

2. **Evolution of demand –** This section will quantify the demand forecast and certain scenarios for each of the following markets:

    a. **LNG as a transportation fuel in the marine segment**

    b. **LNG as a transportation fuel in the heavy duty truck segment**

    c. **LNG in the rail segment**

    d. **LNG industrial thermal conversion segment**

    e. **LNG to CNG for use as a transportation fuel primarily in lighter duty fleets**

    Each market analysis will contain methodology for establishing the fleet inventories, expected annual fuel use of vessels/vehicles in the fleet, and projected evolution for LNG to capture market share under three price scenarios. In addition, factors that PSE can successfully influence in this demand evolution will be discussed.

3. **Competition and partners –** This section provides a high level summary of major competitors or partners for PSE to consider to profitably capture market share for LNG in the market area.

4. **Conclusion** – This section provides a summary of conclusions and findings based upon the research and market analysis conducted for this assignment.

5. **Appendix A-E** – This section provides price scenarios and information regarding the data and models that underlie the analysis. All data and models will be provided to PSE.

III. MARKET CONTEXT

There are two major factors driving expected demand for LNG as an alternative to oil-based fuels such as on-highway diesel oil, marine diesel and residual oil, and propane.

Economic

Demand for LNG as a distributed fuel in the market area is largely being driven by the price spread between natural gas products including LNG and CNG and refined oil products including marine fuels and on-road diesel.

Concentric and PSE collaborated in determining the long range price forecast for ULSD, the expected primary fuel used in the heavy duty transportation market and a proxy for marine fuel after 2015. The process was as follows:

- To forecast crude oil prices, for the period from 2012 and 2013, Concentric used the July 2012 EIA Short Term Energy Outlook oil price forecast; for 2014, Concentric extrapolated the oil price between EIA's short and long term outlooks. For 2015 and beyond, Concentric relied on the AEO 2012 Reference forecast for Low Sulfur Light Crude Oil ("LSLCO").

    - In order to approximate a forecast for the Washington state wholesale price for ULSD, Concentric reviewed historical spreads between EIA-reported historical LSLCO prices and North Slope Crude Oil prices. North Slope Crude is the feedstock for refiners in the market area that produce ULSD. Historical data shows little spread between LSLCO and North Slope Crude. As such, Concentric adopted the EIA short and long term forecasts for LSLCO as a proxy for North Slope Crude.

    - Based on market intelligence provided by PSE, given existing refining capacity in the Seattle-Tacoma area combined with higher demand from marine markets beginning in 2012 and tightening again in 2015, ULSD prices were set at 25% above North Slope Crude prices (red line in Figure 2 below). This price is at, or close to, the forecast for US transportation diesel fuel published by the EIA[5] (green line in Figure 2 below). Concentric and PSE also considered i) ULSD price forecasts produced by WSF in their late 2011 analysis of fleet conversion to LNG,[6] ii) TOTE's assumed ULSD price forecasts (not explicitly provided to PSE) which are much higher than the WSF forecast and iii) the potential for increased ULSD refining capacity in the Puget Sound area[7] which could decrease the relative ULSD price premium versus LSLCO. After considering several alternatives, Concentric and PSE agreed to use LSLCO AEO 2012 Reference prices at the 25% premium as the basis for the market

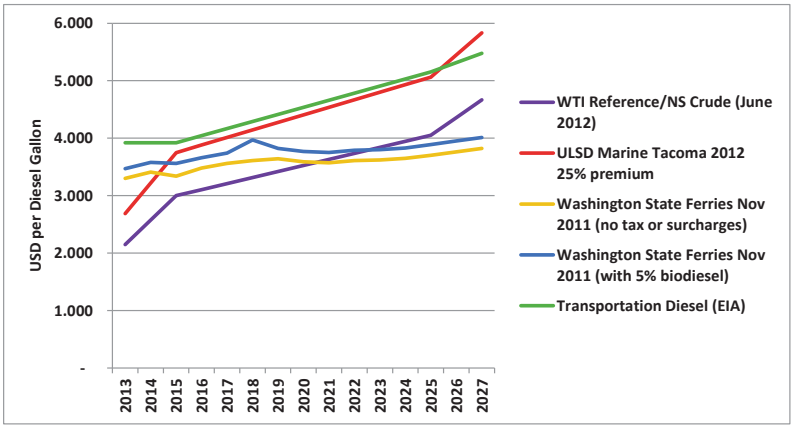
5 AEO 2012

6 Evaluating the Use of Liquefied Natural Gas in Washington State Ferries, Washington Joint Transportation Committee, January 2012, Exhibit 7

7 Incremental ULSD refining capacity is very expensive to build and very complex to operate. This adds significant risk to refiners who may be considering increasing ULSD capacity in the Puget Sound area. Refiners will try to recover these large investments through increased margins but there is no guarantee of investment recovery.

area ULSD price forecast ("ULSD Reference"). This forecast is shown in red in Figure 2 below.

Figure 2

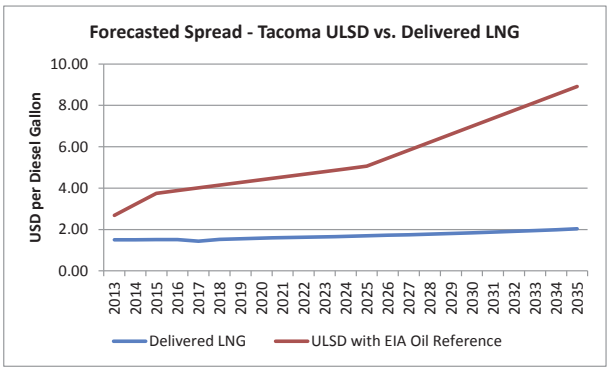


- Natural gas and LNG price forecasts were provided by PSE.

- The forecast used by Concentric also assumes that distributed LNG customer will be able to purchase LNG from existing LNG sources at a price of 10.00 USD per MMBtu for the period 2013 through Q3 2016, prior to the expected start date for new proposed liquefaction facility.

Figure 3

The forecasted spread between ULSD Reference and PSE LNG ("Reference Case Spread"), as expressed in USD per diesel gallon equivalent ("DGE"), is significant and can support investment in engine conversion and LNG fueling infrastructure in the heavy duty trucking, and as explained below, the marine markets.



- The marine market currently uses slightly heavier and therefore slightly less expensive grades of marine fuel oil than ULSD. This is expected to change in 2015 when local and coastal marine fleets must use fuels that emit <0.1% sulfur content when burned. Beginning in 2015, the forecast assumes that the price of 0.1% marine fuel equals the price of ULSD Reference. The spread between marine fuel and LNG and ULSD Reference and LNG will be significant enough to support conversion of vessels to LNG.[8]

- Forecasted price spreads between LNG and ULSD under the AEO2012 EIA "High Oil" and "Low Oil" cases are shown in Appendix A.

Environmental

- In the marine and heavy duty trucking markets, in addition to economic advantages of natural gas as a fuel, environmental regulations are also driving the move towards cleaner fuels such as natural gas.

- For the marine market, the US Environmental Protection Agency ("EPA") sets air emission standards under MARPOL Annex VI rules. These rules provide for limits for emissions of sulfur oxides ("SOx"), nitrogen oxides ("NOx") and particulate matter ("PM") applicable to US-flagged ships and foreign-flagged ships operating in US waters.[9]

- For the trucking market, as of December 2010, all heavy duty tractors are required by the EPA to use ULSD in order to comply with EPA standards. Some states further restrict air emissions, requiring national and interstate fleets to comply with the most restrictive standards in their operating area.[10]

- The reliance on higher grade fuels in these two markets puts upward pressure on cleaner diesel, such as ULSD. While crude oil and natural gas have strong price spreads, refined oil products, particularly ULSD command an additional premium above the crude price as refining costs are factored into the price and demand for ultra-light diesel grows. As such, stricter environmental regulations further expand the price spread between oil and natural gas-based transportation fuels.

- Both the marine and trucking market must rely on cleaner fuels such as natural gas to meet future sulfur and nitrogen oxide emission standards or they must rely on add-on technology, such as exhaust gas scrubbers, along with lighter grades of diesel fuel, to comply with the standards. These clean air standards, combined with the price spread between oil based fuels and natural gas based fuels, make conversion to LNG and CNG (for lighter transportation vehicles such as cars and light duty trucks) very attractive to reduce emissions and costs as compared to other alternatives to meet emissions requirements.

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8 See Figure 4 and Figure 6 below

9 As of August 1, 2012, the maximum sulfur content of fuel oil used within the Emissions Control Area ("ECA") around North America (generally 200 miles from the coast) will be limited to 1%. As of January 1, 2015, this falls to 0.1%. NOx emissions will be further restricted as of January 1, 2016.

10 For example, trucks operating in California must comply with California standards for reduction in particulate matter that are slightly more restrictive than in other states. Given that the major transportation corridor leaving the market area is interstate highway I-5, heavy duty long-haul trucks leaving the market area will likely have to comply with California air emissions standards.

IV. EVOLUTION OF DEMAND

a. Marine market

Factors influencing evolution

The evolution of demand for LNG in the marine sector is driven by several factors including:

- The forecasted sustainable price spread between oil-based clean marine fuel and LNG.
    - This includes a pricing structure between buyer (fleet owner) and seller (PSE) that allows, under multiple oil and gas price scenarios, recovery of invested capital costs of both parties over a reasonable payback period.
- PSE's willingness and ability to produce LNG for use in the market area.
    - The partnership and risk balance that is evolving between PSE, in contemplating the construction of LNG production capacity, and the potential marine customer base is a key driver in this sector's market evolution. The marine market is relatively concentrated, with few major players dominating the potential LNG conversion market (as compared to trucking fleet markets which are disaggregated). Both parties (PSE and the marine customer) must invest significant capital in infrastructure – PSE in liquefaction and storage, the customer in delivery methods, on-board engine retrofit and storage – for LNG to be considered a reliable, available alternative to oil-based marine fuel.
- The implementation of more restrictive EPA emissions requirements
    - Fleets will have several choices to make regarding compliance including the cost of installing emissions reducing equipment on-board the vessel. Maritime Executive recently reported that emission reduction equipment has technological and other challenges (deck space, increased fuel consumption) that may make LNG a better compliance alternative.
    - PSE's LNG plan is important to marine vessel owners to provide evidence to EPA and United States Coast Guard ("USCG") that implementation of LNG fueling is a viable option for compliance. In TOTE's case, an LNG implementation plan was an important factor for TOTE to gain approval from the EPA and USCG for a small but important delay in ECA compliance. This delay could give vessel owners the necessary permitting, engineering, design and construction window to convert to LNG versus install emissions reduction equipment.

- PSE's support of vessel owners in any EPA or USCG regulatory review of LNG conversion plans will help PSE gain market share in this sector.

- The ability for the converted fleet to find sources of LNG in expected trade routes and in the aftermarket.

    - Similar to truck fleets that travel outside the market area, marine fleets must have refueling options in the expected trade where fleet is or may be deployed. If LNG is not widely available in North America and around the world, vessels reliant on LNG fueling may have lower portfolio value[11] and resale value than vessels relying on traditional oil-based marine fuels. The development or lack of development of LNG fueling in other global markets will also affect the re-sale value of LNG ships.

- Marine fleet owners must account for the incremental cost of conversion including the capital cost of LNG engine and on-board fueling system and/or the incremental cost of new builds

Fleet owners must take into account all expected capital and expense-related costs associated with conversion to LNG and weigh those against fuel and technology costs associated with burning an oil-based fuel. Costs for LNG conversion include i) capital costs for LNG storage and fuel systems, ii) expense costs associated with any reduction in ship commercial space resulting from on board storage, fuel and environmental compliance systems, iii) the commercial time lost during the conversion process (either loss of incremental sailing time during conversion or time spent in a shipyard), iv) training time for mariners and fuel handlers, and v) incremental costs associated with regulatory oversight of new fueling or compliance systems. In looking at fleet conversion costs, Concentric has not estimated costs for items (ii) through (v) as there is little or no publically available information associated with such costs and each fleet and vessel will consider these costs differently[12] and review them against similar costs they will alternatively incur to install and operate exhaust gas scrubbers and Selective Catalytic Reduction ("SCR") on-board the vessels. As such, Concentric does not believe these other factors will substantially diminish forecasted LNG demand in this sector.

11 Fleet owners rely on the flexibility within their fleet to meet financial goals. If parts of the fleet cannot be used in multiple locations due to fuel availability restrictions, the overall value of the fleet is reduced.

12 This will be information that PSE will likely gather in conversations with its customers.

PSE's Role

- The demand for LNG as a marine fuel resides in a very concentrated set of customers. It is therefore important for PSE to understand the unique needs and wants of each potential customer.

- Capital investment by the customer and by PSE must be tightly coordinated. Given the demand from individual vessels once converted to LNG and the impact this demand can have on PSE's expected return from the proposed LNG facility, PSE and its potential marine customer must work in tandem to ensure LNG supply and LNG demand are as closely coordinated as possible.

- PSE should take an active role in the operational requirements associated with fueling marine vessels. Rules and regulations regarding marine fueling using LNG are under review with formal and informal stakeholders such as USCG, classification societies such as DNV and ABS, the International Maritime Organization ("IMO"), ship owners, fuel providers, LNG suppliers, equipment manufacturers, and consultants. Although PSE may ultimately play the role of LNG supplier and leave others technically, operationally and legally responsible for the custody transfer of LNG onto vessels, during this stage of LNG adoption, PSE must understand the requirements of LNG fueling and on-board storage of LNG. This is important in the timing of a customer's requirements for LNG; such timing will affect the demand growth served and economics of PSE's proposed LNG production facility.

- PSE can also work with other regional and national LNG suppliers that may provide LNG outside PSE's market area. Certain fleets need assurance that LNG will be available to vessels at multiple locations in their forecasted trade. For example, Horizon operates its fleet out of multiple locations along the Pacific coastline including Tacoma, Oakland, and Los Angeles as well as in Alaska and Hawaii. PSE can work with other utilities and LNG marine fuel providers to promote the development of marine fuel infrastructure in major ports within the ECA of the western US, Alaska and Hawaii. In addition, cruise ships operating within the ECA on the US west coast are also interested in converting to LNG but cannot do so unless LNG as a port fuel is developed in both the PSE market area (for Seattle/Vancouver to Alaska voyages in the winter) and the Southern California and Mexico markets (for winter voyages).

Determining inventory and expected fuel use of potential conversion fleets

Concentric relied on multiple sources to determine an inventory of marine fleets and vessels in the market area[13] including:

[13] Detailed marine fleet inventories, characteristics, owners, annual mileage estimates and evolution calculations will be provided to PSE in an Excel workbook. Data is summarized in Appendix C.

- Puget Sound Maritime Emissions Survey, 2007
- Washington Legislature Joint Transportation Committee report, 2012
- Washington State Ferries – Glosten Associates reports and presentations dated 2010, 2011 and 2012
- US Army Corps of Engineers Waterborne Statistics
- American Association of Port Authorities – Port Industry Statistics
- Northwest Ports Association
- Company websites

Vessels were then cross-referenced via United States Coast Guard (USCG) Vessel Documentation Database and Marine Traffic Database

Concentric then determined annual fuel requirement of certain vessels operating in the market area using multiple forecast methodologies and references including:

- Horsepower and annual mileage of vessel[14]
- Estimates from various industry reports including American Clean Skies Natural Gas for Marine Vessels, April 2012
- Route and schedule of vessel
- Multiple industry websites and presentations

Concentric then assumed that that any net incremental investments[15] in on-board LNG engine and fuel systems equipment would be recovered over a ten year period at a discount rate of 15% based on the annual estimated mileage for the vessel. Based on forecasted Reference Case Spread, [16]annual diesel use should be at or above the breakeven annual DGE threshold in order for the investment to make economic sense.

Figure 4 shows the approximate annual diesel gallon equivalent ("DGE") consumption that is necessary to break even on the conversion investment. Investment period is assumed to be ten years with IRR of 15%. This assumed IRR represents a relatively conservative assumption with regard to the break-even analysis.

Figure 4

		Reference Oil Case	
	Investment	Breakeven Annual DGEs	Breakeven Annual LNG Gallons
Tugs	$7.2M	239,679	402,660
Ferries	$12M	399,464	671,100
Ships	$20M	665,774	1,118,500
	$30M	998,661	1,677,751
	$40M	1,331,548	2,237,001

14 Information provided in the Puget Sound Maritimes Inventory report is based on 2005 reported figures. An updated report and inventory should be available in late 2012 but was not yet available for this assessment.

15 Investment estimates based on industry sources including American Clean Skies Foundation, Natural Gas for Marine Vessels, April 2012

16 Since marine vessels in North America must comply with a 0.1% sulfur cap starting in January 2015, the analysis assumes that 0.1% marine fuel and ULSD have the same commodity price in the market area for the period 2015 forward.

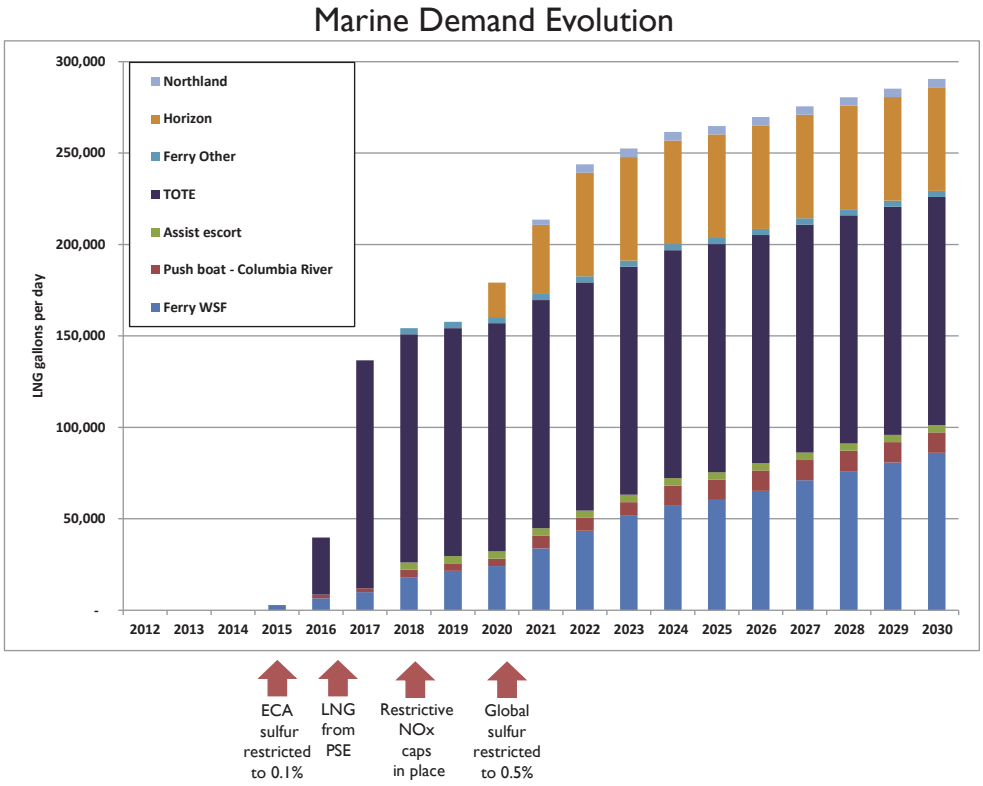
Of the vessels meeting annual estimated mileage needed to cover conversion investment costs, conversion dates for fleets and vessels are then estimated based on:

- Public information regarding intent to convert (WSF and TOTE)
- Environmental regulation drivers
- Regulatory or technical considerations associated with the use of LNG
- Availability of LNG from PSE or other market sources in vessel's anticipated trade route

Reference Case Evolution - Marine

- As shown in Figure 5 below, the LNG marine fuel market could exceed 170,000 LNG gallons per day by 2020.
- Cruise, ocean going, and other vessel conversions (designated "not active" below) may take place after 2020, but the location of LNG fueling alternatives in North America and around the world is currently the limiting factor.

Figure 5



b. Heavy duty trucking market

Factors influencing evolution

The evolution of demand for LNG in the heavy duty trucking sector is driven by the following primary factors:

- The forecasted sustainable price spread between ULSD and LNG
    - This includes a pricing structure between buyer (fleet or fueling station owner) and seller that allows, under multiple oil and gas price scenarios, recovery of invested capital costs of both parties over a reasonable payback period.
- In addition to the availability of LNG for use as a distributed fuel in the market area, the development of LNG fueling infrastructure outside the market area to support conversion of national and interstate fleets.
    - There is a certain amount of risk sharing that must take place among the LNG producer, the LNG distributor, and the LNG customer for the LNG truck transportation market to develop in the market area. The availability of LNG along major transportation routes outside the market area will have strong influence on demand evolution.
    - As shown later in this document, national fleets show the highest initial and overall potential for conversion to LNG. This is largely because of their ability to absorb financial and operating risks associated with LNG conversion, technology and training synergies among national operating fleets, and cost benefits of large scale conversion to a more economic fuel supply. In order to serve the needs of the national fleets, PSE should consider becoming part of a larger network of LNG suppliers to the market. Cooperation among LNG suppliers and distributors is necessary to build up the regional infrastructure that will support demand for LNG. This may result in PSE's role in the LNG fueling supply chain to be either more or less than originally expected.[17]
- The incremental cost of LNG engines/vehicles and LNG fueling station
    - LNG tractors currently cost approximately 30% more, or approximately $75,000 (including excise tax), than diesel tractors.
        - The analysis assumes that the incremental cost (and excise tax) of the LNG tractors is borne entirely by the customer

[17] PSE could simply play the role of LNG supplier or, in order to stimulate market adoption, PSE may have to work with partners or the customers themselves to develop fueling infrastructure to serve potential marine and transportation customers.

- The analysis also assumes that the tax "penalty" (LNG engines/fuel systems cost more than diesel; excise tax is paid on the total cost of the LNG system) continues throughout the forecast period.

- The analysis projects that there is no "salvage penalty" for the LNG tractor aftermarket. Given the LNG tractor market is in the early stages of development, there is the risk that the aftermarket for LNG tractors (primarily resale to overseas trucking companies) does not develop. Concentric believes that this aftermarket issue is offset by the industry expectation that LNG tractors will have a longer useful fleet life in North America.[18]

- As shown in Figure 6 below, using ULSD Reference prices, fleet owners could recoup their incremental investment (IRR would be greater than 0%) if the tractor averaged between 20,000 and 40,000 miles annually over a five-year period.

Figure 6

IRR	Annual Mileage					
	20,000	40,000	60,000	80,000	100,000	120,000
Low Case	(49.27%)	(36.43%)	(26.62%)	(18.13%)	(10.35%)	(2.98%)
Reference Case	(1.41%)	46.74%	113.38%	241.55%	679.17%	NA
High Case	40.73%	215.18%	NA	NA	NA	NA

- Assumes public fueling station charges minimum of $0.10 per LNG gallon[19] to recover the investment of the public fueling facility
- Low Case Breakeven at 170,000 miles

- A private, single fleet LNG fueling station can cost as much as 1-2 MUSD.
  - A fleet customer absorbing this cost must have significant centralized diesel requirements (either multiple trucks or multiples of miles per truck (as shown above in Figure 6) or combinations of the two as shown in Figure 7) in order to pay off the cost of the fueling station.
  - Figure 7 below provides indicative IRR on investment to gauge whether fleets can support the cost of private, centralized fueling

[18] In August 2011, Chuck Gordon, President and Chief Operating Officer of Heckmann Resources, stated that their expectation is that an LNG tractor purchased by Heckmann Resources in 2011 will have a useful life of over seven years versus a diesel tractor that has a useful life of only five years.

[19] The 2012 NACS Retail Fuels Report stated that retail fuel distributors have a 5-year average mark-up of 15.8 cents per gallon. This equates to approximately 10 cents per LNG gallon.

Figure 7

IRR	Annual Mileage					
Number of Trucks in Fleet	30,000	55,000	80,000	105,000	130,000	155,000
5	(42.64%)	(29.30%)	(18.42%)	(8.56%)	0.86%	10.15%
10	(30.80%)	(12.41%)	3.91%	20.07%	37.07%	55.73%
15	(23.27%)	(0.83%)	20.48%	43.28%	69.53%	101.73%
20	(17.81%)	8.06%	34.09%	63.92%	101.43%	153.12%
25	(13.60%)	15.27%	45.77%	83.00%	133.98%	213.57%
30	(10.22%)	21.28%	56.05%	100.98%	167.88%	287.41%
35	(7.43%)	26.42%	65.22%	118.12%	203.61%	380.82%
40	(5.09%)	30.87%	73.51%	134.57%	241.60%	503.65%
45	(3.09%)	34.78%	81.06%	150.45%	282.24%	673.16%
50	(1.35%)	38.24%	87.98%	165.82%	325.96%	922.86%

Based on fueling station cost of $1.5 M, payback period of 5 years, Reference Case Oil

- Availability of public LNG fueling stations

  - Availability of LNG along high-traffic trucking routes is essential to the development of the heavy-duty trucking market. LNG tractors can currently travel approximately 200-600 miles per LNG fill-up using currently available LNG tractor equipment. Most national and long haul fleets will want a network of LNG refueling stations every 100-200 miles in order to ensure adequate refueling capability.

- Availability of Original Equipment Manufacturer ("OEM") heavy duty LNG truck engines

  - The analysis assumes that demand in the LNG trucking market will be stimulated by the availability of high performance, mass-produced LNG OEM engines beginning in late 2013 and early 2014 from Westport, Cummins, Navistar and Volvo.

  - Mass production of LNG engines and tractors should serve to drive down incremental costs of LNG tractors. Concentric has not assumed such a benefit in this analysis.

- Cost and availability of compliance options regarding EPA clean fuel requirements

  - Concentric does not explicitly quantify the implementation of tighter clean air standards as they relate to the demand evolution for heavy duty trucking. However, the impact of the clean air standards is accounted for in the ULSD Reference price premium expectation and therefore, a larger spread between ULSD and LNG.

- DGE tax penalty for LNG

  - Since an LNG gallon has energy density 40% lower than diesel yet is taxed on a per volumetric gallon basis, LNG currently has an effective federal tax penalty as compared to diesel.

- The analysis assumes this will be resolved in 2013 making the tax applicable to both diesel and LNG on an energy (versus volumetric gallon) equivalent basis. This serves to slightly increase the spread between ULSD and LNG.

While a sustained price advantage of LNG over ULSD is the most important determining factor in the evolution of demand in the trucking sector, Concentric also identified other key events that will influence the timing and magnitude of demand growth. PSE requested Concentric estimate the evolution of demand over the ten year period starting in 2015 (beginning with demand prior to the in-service date of a proposed liquefaction facility in late 2016 and including demand during the first 8-10 years of the investment cycle), Concentric focused on short and medium term key events that will influence market growth.

2012:	National fleets (UPS, Ryder, FedEx) start adopting LNG technology creating more public and fleet awareness of price benefits, technology advancements and LNG availability
2013:	The elimination of the LNG gallon tax penalty creates more economic incentive for fleets to convert
2014:	New widely mass-produced engines and technology improvements in performance could make the switch to LNG more realistic for longer haul trucking fleets
2015:	New emission regulations will increase the demand and consequently the cost of ULSD in the Puget Sound area, making LNG more economical for many fleets
2017:	Supply from a proposed new LNG facility could be available (the analysis assumes LNG is available from existing sources of supply prior to 2017). This stimulates growth in all segments but, in particular, local fleets
2018:	The dispersion and spacing of on-highway LNG refueling stations will encourage more fleets to consider LNG (dissipating fear of running out of fuel while on a run). This can also eliminate fueling facility capital costs for smaller customers interested in converting.

PSE's Role

By developing local LNG production capacity, PSE could facilitate the market development of fleet use of LNG. Since fleet owners identified "lack of LNG infrastructure" as the most critical factor they consider in conversion to LNG, providing LNG to the market and/or supplying LNG to fuel distributors sends a critical positive signal.

Effort put forth by PSE to support LNG as a vehicle and marine fuel infrastructure in the market area as well as on a regional and national basis is a key factor in helping develop LNG as a transportation fuel. This support can take the form of:

1) coordination among utilities in Washington, Oregon, Northern California and southern British Columbia to supply LNG and/or build LNG fueling infrastructure,

2) providing LNG supply to developers of LNG fueling infrastructure such as Shell, Clean Energy, Linde and others.[20]

Supporting federal, state and local economic and environmental incentives for fleet owners and infrastructure providers is also an important role for PSE.

1) On a national level, PSE can establish and maintain contacts with industry organizations that promote the use of natural gas as a transportation fuel such as NGVAmerica, American Clean Skies Foundation, and the National Petroleum Council.

2) On a state and local level, PSE can work with governmental and environmental organizations such as Washington's Joint Transportation Committee and other industry organizations to promote market adoption of LNG.

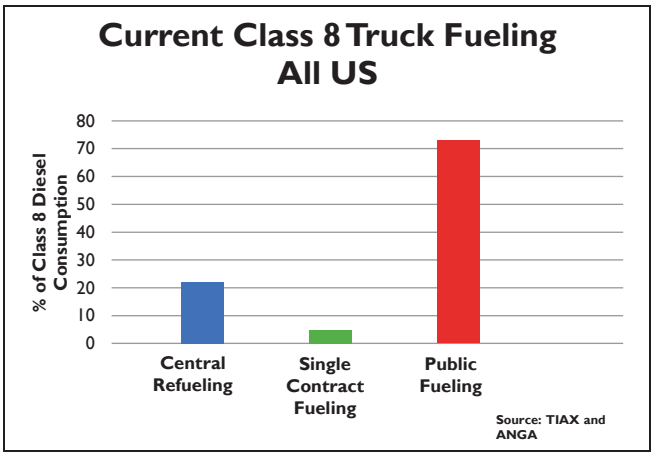
PSE can also work to ensure LNG safety and security is a perceived benefit, not a deterrent, to large scale adoption of the fuel. LNG has low market penetration and is widely perceived by the general public as a dangerous fuel. Large scale LNG import and export facilities proposed in the Pacific Northwest have received significant negative publicity, with safety and security driving local opposition to these facilities. PSE and its customers and partners must work jointly to ensure the public is well informed about LNG safety and security.

Last, the existing diesel fuel supply distribution chain is important in understanding customer behavior and preferences. The majority of heavy duty fleets refuel at public diesel fueling stations. While private fueling may be PSE's preferred distribution method – return to based fleets with on-site private LNG fueling infrastructure – the market's existing preferences for public fueling will likely drive demand.

[20] Clean Energy is developing "America's Natural Gas Highway" and plans to install up to 150 LNG fueling stations in the United States by the end of 2013. Shell has developed a partnership to provide LNG fueling at Pilot Flying J facilities across Canada.

Figure 8

PSE must consider existing fleet refueling habits in order to understand potential demand. As shown in Figure 8, most fleets refuel at public stations. As such, PSE may consider partnerships with current fuel distributors, national gasoline companies, and natural gas and diesel distributors like Shell and Clean Energy.



Determining inventory and expected fuel use of potential conversion fleets

Concentric relied on various local and national fleet databases, government references and industry sources to compile an inventory of fleets in PSE's market area. Included in this information is source data from.

- U.S. Department of Transportation, Federal Motor Carrier Safety Administration
- Department of Transportation, Washington State
- Washington Trucking Association
- EIA
- TIAX report for America's Natural Gas Alliance, "Liquefied Natural Gas Infrastructure"
- Clean Energy Fuels 2011 Annual Report; Clean Energy website information on America's Natural Gas Highway ("ANGH")
- CenterPoint Energy, "Building a Business Case for NGV's"
- National Petroleum Council, "Advancing Technology for America's Transportation Future." August 2012
- PLS Logistic Service, "Use of LNG-Powered Vehicles for Industrial Freight"
- National Energy Policy Institute, "What set of Conditions Would Make the Business Case to Convert Heavy Trucks to Natural Gas? – A Case Study", November 2010
- University of Chicago, "Natural Gas and the Transformation of the U.S. Class 8 Trucking Fleet." May 2012

The summary data provides fleet name, location and estimated or actual size of fleets doing business in the market area based. Size of national fleets doing business in the market area is based on per capita income of Washington versus other US states. In addition, interstate and intrastate fleet data

is used to estimate market growth based on location, number of tractors per company,[21] estimated annual miles driven per tractor,[22] percentage of fleet owned versus leased, the type of cargo carried,[23]

Concentric divided the fleet data into the five categories below and assessed the evolution of demand in each of the categories separately.

Figure 9

Fleet	Characteristics	Impact on Demand Evolution
National	Overall size determined for national fleets, fleet size per state estimated/researched	More total tractors, could rely on internal network of fueling stations for long range trips/not necessarily reliant on NGHW, converting to LNG has marketing appeal
Interstate long range	Interstate fleets with majority of trips greater than 100 miles, DOT	Needs NGHW to convert, but will convert quickly once it is established because of economics/ # of tractors
Interstate short range	Interstate fleets with majority of trips less than 100 miles, DOT	Needs NGHW to convert, not as economical as long range fleets due to lower mileage, slower adoption rate
Intrastate long range	Intrastate fleets with majority of trips greater than 100 miles, DOT	Hesitant without NGHW, but higher mileage makes converting more economical
Intrastate short range	Intrastate fleets with majority of trips less than 100 miles, DOT	No broad scale LNG infrastructure required, but less mileage and generally smaller fleets make adoption less economical and therefore much slower

Reference Case Evolution – Heavy Duty Trucking

Based on the economics of conversion (total cost, miles driven) combined with the key milestones shown in Figure 9 Concentric estimated market demand for LNG from the heavy duty transportation market to reach over 100,000 LNG gallons per day by 2020 and over 520,000 LNG

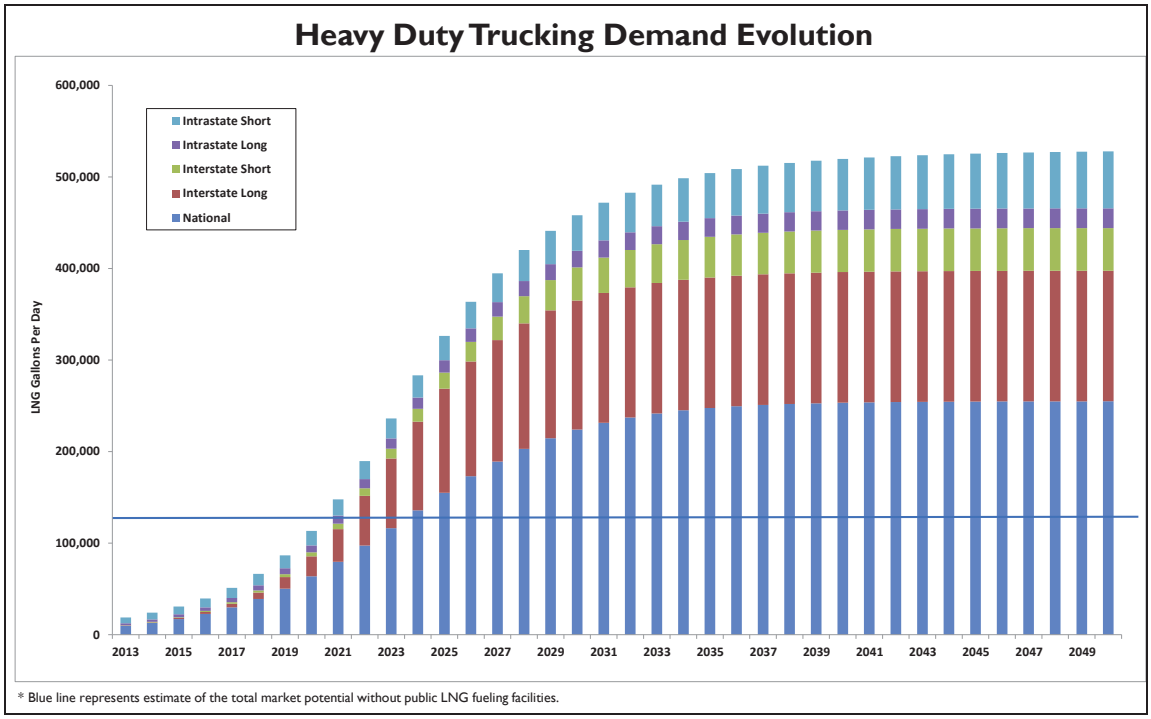
21 Tractors per company location is an important metric to determine the financial viability of on-site LNG fueling. Since the cost of an LNG fueling station is between 1-2 MUSD, there must be sufficient fleet size (and miles per tractor) to pay for the cost of the fueling station. The analysis assumes the fueling station capital investment must be paid back over 5 years to coincide with the life of the LNG tractor(s).

22 Miles driven per tractor is also an important metric to determine the financial viability of the higher cost of LNG tractor.

23 Type of cargo carried can help PSE determine whether the fleet is return-to-base and/or has fueling characteristics that may allow for overnight refill such as CNG slow fill.

gallons per day by 2050. The majority of this demand occurs in the national and interstate long haul fleet categories.

Figure 10

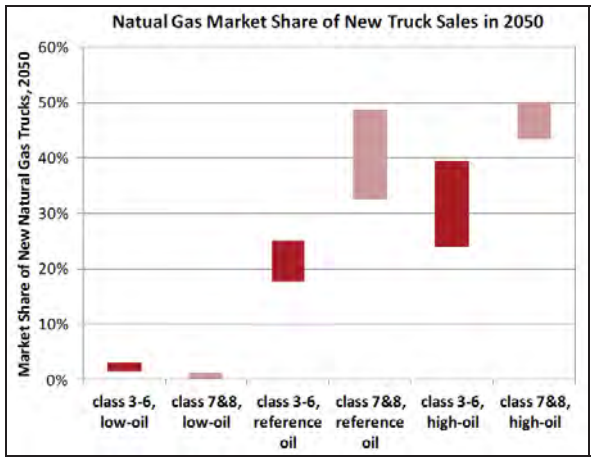


Concentric believes that the establishment of regional and national fueling infrastructure is a key element for successful adoption of LNG by the trucking industry. If demand were limited to fleets dependent **only** on on-site fueling, demand growth is probably limited to approximately 120,000 LNG gallons per day as shown by the blue line in Figure 10 above.

In its recent study,[24] the National Petroleum Council ("NPC") estimates that natural gas (mostly in the form of LNG) will capture between 32 and 49% of the heavy duty truck transportation new truck sales by 2050.[25]

24 Advancing Technology for America's Transportation Future dated August 1, 2012
25 Using EIA Reference Price Scenario oil prices

Figure 11



Source: National Petroleum Council

Based on current diesel use for on-road transportation in Washington State of 1.7 million diesel gallons per day[26] or 2.8 million LNG gallons per day, and assuming 65% of this consumption occurs in PSE's market area, Concentric's projection for 2050 of approximately 520,000 LNG gallons per day of demand (approximately 28% of the 2010 consumption) falls under the low end of the NPC Reference Case forecast.[27]

26 EIA Independent Statistics and Analysis, On-Highway Diesel Use 2010

27 The analysis assumes that increases in heavy duty truck miles driven in the market area through 2050 are offset by fuel efficiency improvements

c. Rail market

Factors influencing evolution

The evolution of demand for LNG in the rail sector is driven by several factors including:

- The forecasted sustainable price spread between ULSD and LNG (see above)
- Available LNG in the market area but also along major rail routes serving the Pacific Northwest and to the east and south
- Stricter EPA rules regulating air emissions for rail locomotives
- Development of rail engine technology
    - Advancements in LNG locomotive engine technology remain in the pilot stage. A good example of this is in eastern Canada where GazMetro and Canadian National Railroad will develop a prototype hybrid locomotive (diesel and LNG) that *could* begin operation in 2013. The project proponents believe pilot testing is far in advance of commercial use of LNG as a locomotive fuel.
    - GE and Shell have also formed a research project to develop dual-fuel rail locomotives but no commercial development timelines have been publically announced
    - No commercially available dedicated LNG or dual fuel engines are at commercial stages of development at this time

Determining inventory and expected fuel use of potential conversion fleets

Concentric assessed the railroad demand for diesel use in Washington. BNSF is the primary rail service provider in western Washington; Union Pacific operates mostly in the eastern half of the state.

Concentric estimates demand for LNG in the market area could be as high as 50,000 LNG gallons per day[28] if LNG replaced diesel fuel on major rail routes.[29]

Figure 12

Rail service provider	Route	Miles	Freight train frequency	Passenger train frequency	Total Miles	High Level Estimate LNG Gallons per Day	Per Train
BNSF	Seattle-Everett	30	40	8	1,440	4,608	96
BNSF	Everett-Spokane	300	25		7,500	24,000	960
BNSF	Seattle-Portland	177	50		8,850	28,320	566

Rail demand has not been included as part of the demand evolution for PSE. Current technology limitations cannot be overcome in the short term. Demand could start to develop after 2020 but in limited form.

Last, rail transportation of goods competes directly with over-the-road trucking. To the extent LNG is widely adopted as a transportation fuel in the heavy duty trucking market, any development of LNG use in rail could indirectly reduce demand for LNG as a trucking fuel.

[28] Based on an average mile per gallon of diesel at 0.5.

[29] Major rail routes in western Washington are Seattle to Everett, Everett to Spokane and Seattle to Portland. BNSF is the operator of all conversion routes studied.

d. Industrial thermal conversion market

Factors influencing evolution

The evolution of demand for LNG in the industrial thermal conversion sector is driven by several factors including:

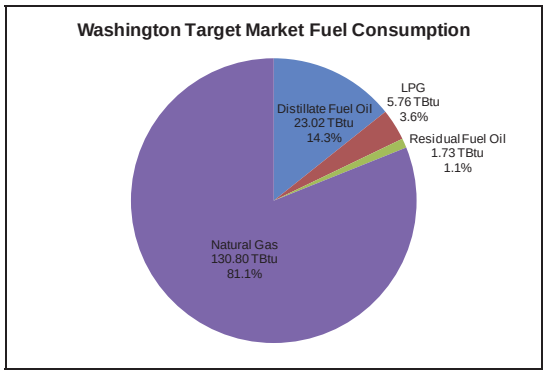
- The forecasted sustainable price spread between oil based stationary fuels such as distillate oil and propane, and natural gas. Natural gas can take the form of pipeline gas, distributed LNG or distributed CNG depending on the customers distance from the natural gas source and the annual load of the customer.
- Ability of customer or fuel supplier to change out on site equipment and provide site space for LNG or CNG equipment.

Determining inventory and expected fuel use of industrial conversion customers

Concentric assessed the industrial thermal conversion demand by reviewing PSE's market area. In that effort, Concentric:

Figure 13

- Assessed natural gas market share relative to other fuels consumed in Washington. Natural gas consumption is relatively high as a total percentage compared to other US states.



Source: EIA

- Gathered a comprehensive list of fuel burning facilities in the PSE market area based on air emissions

- Eliminated certain facilities based on pre-determined filters:
  - Companies located in an existing LDC service territory
  - Companies located within 10 miles of the LDC territory or a natural gas pipeline
  - Low energy intensive industries such as financial services, retail
  - Companies using self-provided biomass to generate energy (paper, lumber)

- Inventory remaining consisted of only two potential customers - Nippon Paper Industries in Port Angeles and TransAlta Centralia Mining in Centralia (currently not operating)

- Industrial conversion does not present a viable LNG demand source for PSE at this time

e. LNG to CNG

Factors influencing evolution

In the light duty vehicle market, there is demand for CNG in the PSE market area. Lighter duty trucks (Class 3-6), car fleets, and small vehicles such as forklifts and other operating equipment do not need the range or density of LNG in order to use natural gas as a fuel

CNG made from LNG saves power costs associated with compression. However, producing LNG at a central location, trucking it to an off-site fueling facility, then converting the LNG back to CNG is not economical as compared to producing CNG from pipeline gas.

Determining inventory and expected fuel use of potential conversion fleets

Concentric considered potential CNG demand for trucking. Certain short range truck and bus fleets could find CNG to be an acceptable transportation fuel as compared to LNG if the vehicles make short trips, return to base each day, and spend off-hours at slow-fill CNG fueling stations. As stated above, CNG from LNG may not initially compete with CNG from pipeline gas. Concentric has not included demand from this segment in forecasted LNG demand growth.

Concentric also surveyed yard vehicles in ports – forklifts, yard tractors, and cranes – as potential CNG conversion targets. Currently, there is only one commercially available CNG forklift available in the market. However, to the extent LNG and CNG become more readily available in ports, manufacturers may look at this market for potential development. Most port vehicles have long lives (over 10 years); as such, Concentric does not believe this market provides for growth opportunity for at least 10-15 years.

Other considerations

Clean Energy operates five public CNG fueling facilities in the Seattle-Tacoma area, with current delivered prices between 1.80 and 2.25 per CNG gallon

Although the CNG produced on-site at an LNG fueling facility could be competitive as compared to CNG produced from pipeline gas, Clean Energy and other CNG providers have already established contractual and locational relationships with existing and potential CNG fleet customers

There is opportunity to provide LNG to CNG as an additional on-site fuel to the extent PSE or its downstream partners are successful in capturing fleet markets served via on-site LNG fueling infrastructure; however, this on-site market is very limited.

While there may be some LNG to CNG demand that evolves over time, Concentric conservatively assumes that LNG to CNG is not a source of incremental LNG demand in the demand evolution projections.

V. COMPETITION AND PARTNERS

PSE is working to provide a source of LNG for use in the market area. Given the potential demand for LNG and the public announcements of both TOTE and Washington State Ferries regarding their intention to convert to LNG, PSE should expect significant competitive and cooperative interests from LNG and other fuel suppliers both regionally and nationally. Below is a summary of potential parties:

Shell
Shell is very active in distributed LNG applications, forming partnerships with potential LNG supply chain participants to develop and market the necessary equipment and infrastructure that supports LNG market growth. Shell recently acquired Gasnor, a provider of LNG and related services to the marine and trucking markets in Europe. Additionally, Shell announced a partnership with Pilot Flying J to develop LNG fueling infrastructure in Canada. Additionally, Shell has formed infrastructure partnerships with Westport Cummins for LNG truck engines, Wartsila for LNG marine applications and GE for LNG locomotive applications.

Shell owns and operates the Puget Sound Refinery in Anacortes, Washington and supplies refined oil products, including ULSD, to the region.

Shell could be a major competitor to PSE in the event Shell develops LNG production infrastructure in the market area. In the alternative, Shell could be a customer of PSE in the development of public LNG fueling stations in southern British Columbia and/or Western Washington.

BP
Although BP has not yet publically announced plans for distributed LNG demand and infrastructure development, BP is internally studying distributed LNG markets. BP owns the Cherry Point refinery located in Whatcom County. BP provides the majority of marine fuel to customers in the Puget Sound area.

BP has a long history in large scale LNG projects. Given the potential for BP to give up marine and trucking diesel market share to PSE's LNG, BP might attempt to develop LNG capabilities themselves. BP may also contract for PSE's plant capacity and distribute the LNG to end users in the area.

Both BP and Shell have large international energy portfolios and are both actively pursuing LNG export opportunities in Canada and Alaska. In order for PSE and its customers to ensure the spread between LNG and ULSD/low sulfur marine oil is sufficient, companies like BP and Shell may be able to take the risk of spread maintenance into these large financial portfolios. Smaller companies like PSE, Clean Energy, LNG customers and motor fuel distributors may not have the creditworthiness or risk tolerance to take such positions.

Clean Energy
Clean Energy is the US's largest developer of LNG and CNG infrastructure. Clean Energy owns multiple public CNG fueling stations in the market area and is considering developing at least two LNG fueling stations as part of the ANGH effort.

Clean Energy should be considered both a competitor (Clean Energy owns and operates LNG liquefaction capacity in Boron, California) and a partner/customer. It is likely that Clean Energy will not develop LNG production capacity in the PSE market area. Instead, it is likely that Clean Energy could develop on-highway LNG fueling infrastructure and rely on PSE for LNG supply.

As of 2011, Clean Energy received and continues to receive significant funding from Chesapeake Energy to develop natural gas demand. As such, most of Clean Energy's recent LNG fueling station investments have been in gas producing regions in the Marcellus, Utica, Eagle Ford and Haynesville.

Motor fuels providers in the market area

There are multiple diesel providers operating the market area including Love's Truck Stops, Union 76, Chevron, and Texaco, as well as petroleum distributors such as Associated Petroleum and SC Fuels. It is possible that any of these current motor fuels providers could finance LNG fuelling infrastructure and distribute LNG to fleets.

Given the reliance by heavy duty truck fleets on the availability of fuel from public fueling stations (see Figure 8 above), PSE's ability to reach the on-highway trucking market via distributors is important to consider. Developing relationships with current motor fuels distributors could be important to PSE in accelerating the rate of market evolution in the heavy duty trucking markets.

Marine fuel distributors

Although marine fueling infrastructure could remain between PSE and the handful of potential LNG customers in the market area, marine fuel distributors such as ChemOil could be interested in playing a role in the marine LNG distribution chain.

VI. CONCLUSIONS

As stated above, projected costs of LNG versus oil-based fuels like ULSD and low-sulfur marine fuel, environmental initiatives, and LNG engine and storage technology advancements, all contribute to the potential for significant market growth of distributed LNG in PSE's market area.

Since availability of LNG infrastructure is viewed by the market as the largest factor preventing wide scale adoption of LNG as a distributed fuel, especially as it relates to the marine and heavy duty trucking market, PSE's proposed LNG production facility could provide the market with the promise of future regional LNG supply.

The timing of the in-service date of PSE's proposed LNG facility is critical since

1) the spread between oil and gas-based fuels is currently at a high level; interest in natural gas as a transportation fuel is building rapidly,

2) large marine customers interested in converting to comply with ECA emission requirements must begin permitting, capital allocation, engineering, design and fleet planning to begin using LNG three to five years from now, and

3) distributors interested in investing in LNG fueling infrastructure for the on-road transportation market can be assured of a local source of LNG supply in a little over four years.

PSE's coordination efforts with other regional LNG suppliers can provide a network of LNG supply, adding to the reliability of the fuel and reducing risks for both customers and suppliers.

The demand for LNG in PSE's market area should be sufficient by 2020 to absorb the LNG production capacity contemplated by PSE.

Although not part of Concentric's scope of work, Concentric makes additional observations as follows:

- Regulatory jurisdiction of the LNG facility is an important consideration for PSE given the accelerated market expectations for development and commercial operations. This must be weighed against the future flexibility PSE may want in supplying LNG to markets that may require the proposed LNG facility to fall under FERC jurisdiction.

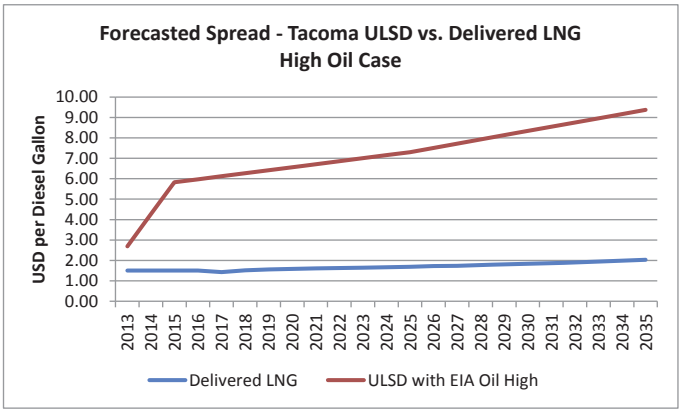
- Community outreach on a local and state level is important with regard to the siting of any energy facility. Given the history of LNG siting and past perception of the fuel as a safety and security threat, PSE may consider a comprehensive strategy to inform the public and government stakeholders that could support or oppose construction of the LNG production facility.

Appendix A – Alternative Price Scenarios

EIA High Oil

The high oil scenario shows a rapidly increasing the spread between gas and oil, especially during the period 2013 to 2015. In EIA high oil scenario, domestic natural gas prices remain decoupled from global oil prices. This is primarily due to North American supply dynamics - associated gas is abundantly available due to high levels of domestic oil drilling activity.

Figure 14

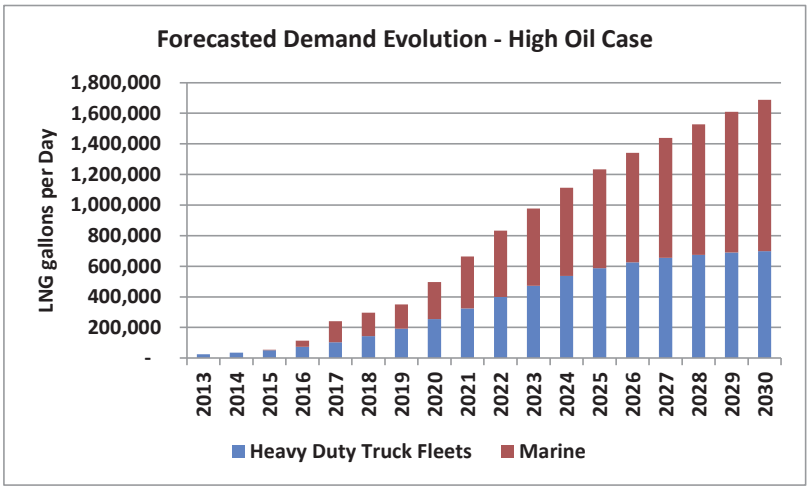


The increased spread leads to accelerated marine and heavy duty trucking adoption rates.

The forecast assumes the cruise sector begins conversion of fleets in 2020 as LNG as a marine fuel becomes available across North America. Global fleet conversion to LNG still lags as *global oil*, not *US natural gas*, drives LNG prices abroad.

The forecast also assumes trucking demand accelerates and increases as LNG becomes more available nationally and the spread widens.

Figure 15



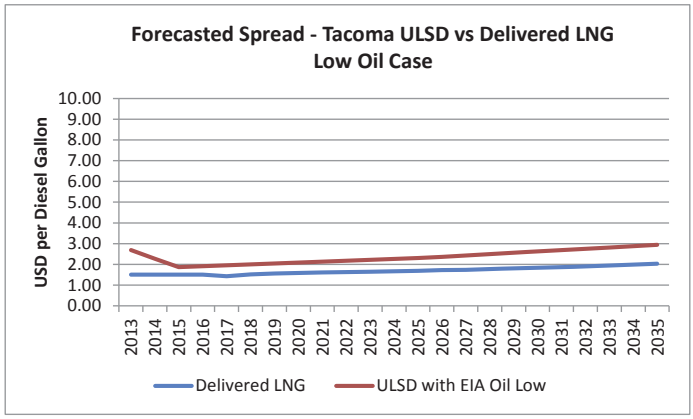
Appendix A – Alternative Price Scenarios (continued)

EIA Low Oil

The low oil scenario assumes the price of oil stabilizes at or below current levels and the spread between oil and gas remains at only an 8 USD per MMBtu level.

This spread slows significantly the wide adoption of LNG as a fuel as, in the trucking sector, the payback periods for incremental tractor costs are extended beyond the useful life of the tractor (5-7 years).

Figure 16



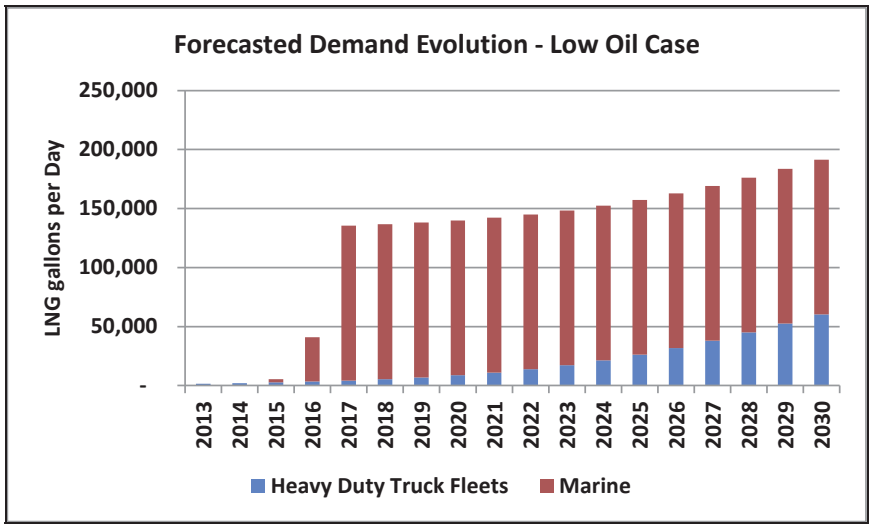
The decreased spread leads to very low marine and heavy duty trucking adoption rates.

The forecast assumes conversion of certain national fleets will continue but it is limited to 3-4 fleets in PSE's market area.

The forecast assumes TOTE completes its conversion to LNG and WSF converts two ferries. No additional marine demand transpires as options to meet clean air requirements can more economically be met by scrubbers and other technologies.

In this scenario, PSE's proposed LNG facility could be significantly underutilized.

Figure 17



Appendix B – Summary of Trucking Fleet Database

This database has multiple uses for PSE. First, the model includes all potential local and national fleets expected to do business in the market area. Expected demand from customers along with assumptions about market penetration of LNG, creates a market evolution forecasts for PSE. The evolution model can easily be adjusted if specific segments (national, interstate long haul etc) grow more rapidly or more slowly based on market information PSE is able to gather or scenarios PSE wishes to consider.

The tool also provides a comprehensive list of potential conversion customers including:

- Fleet size
- Location of fleet including relative to existing CNG infrastructure
- Cargo carried (trash, lumber etc)
- Estimated annual miles per tractor in the fleet
- Interstate or intrastate use of the fleet
- Number of tractors, buses/vans and other power units on site
- Lease or ownership of the equipment

The fleet model allows for sorting of the data - size, location, and type of goods, determination of IRR metrics for fleets, payback periods, and the impact of ULSD-LNG spread on conversion economics.

The fleet model provides the PSE sales team with specific information on each potential customer and can allow for scenario testing on each market segment or each fleet.

Inventory example

Legal Name	IRR	Tractors	Trucks, Vans, Buses	Total Power Units	Owned	Leased	% Leased	Miles/Tract	Miles/Van	Diesel Gallons	LNG Per Day	Miles/Vehicle
PACCAR INC		66	23	89	89	0	0.0%	50,000	50,000	733,333	3,375	10,494
RALPH'S CONCRETE PUMPING INC		64	11	75	75	0	0.0%	50,000	50,000	711,111	3,273	10,667
WASHINGTON TRUCKING INC		57	0	57	57	0	0.0%	130,000	50,000	1,140,000	5,247	58,683
TRIPLE B CORPORATION		56	88	144	144	0	0.0%	50,000	50,000	622,222	2,864	28,115
KING COUNTY SOLID WASTE DIVISION		55	10	67	65	0	0.0%	50,000	40,000	611,111	2,813	55,522
GARY MERLINO CONSTRUCTION CO INC		52	92	144	144	0	0.0%	50,000	50,000	577,778	2,659	10,861
M & M TRANSPORT INC		50	0	59	50	9	15.3%	80,000	50,000	727,273	3,347	76,446

Cargo	D&B #	Country	Street	City	County	State	Service Area?	ZIP	Shipper Type
General Freight	48341267	US	777 106TH AVE NE	BELLEVUE	33	WA	YES	98004	Carrier Interstate
Machinery, Large Objects	9504499	US	1529 RAINIER AVE SOUTH	SEATTLE	33	WA	YES	98144	Carrier Interstate
General Freight		US	2810 34TH ST	EVERETT	61	WA	YES	98201	Carrier Interstate
General Freight	173823147	US	4103 2ND AVE S	SEATTLE	33	WA	YES	98134	Carrier Interstate
Building Material	47848122	US	201 SOUTH JACKSON STREET SUITE 701	SEATTLE	33	WA	YES	98104	Carrier Intra/HazMat
General Freight	27452689	US	9125 10TH AVE SOUTH	SEATTLE	33	WA	YES	98108	Carrier Interstate
Logs, Poles, Beams		US	170 STATE HIGHWAY 508	CHEHALIS	41	WA	YES	98532	Carrier Interstate

Appendix B – Summary of Trucking Fleet Database (continued)

Scenario testing example

	Min # of Tractors	*Probability of Converison* 2013	2015	2016	2018	2020
Intrastate SR	11	10%	15%	20%	25%	30%
Interstate SR	8	0%	0%	0%	10%	15%
Intrastate LR	6	0%	10%	15%	20%	25%
Interstate LR	5	0%	0%	0%	0%	15%

Out of Top 200 National Fleets (# of Fleets Converting)					
Top Percentile (#)	0	0	0	0	1
Avg National (#)	5	10	15	50	75

Tax Penalty Ends ISR Begin to Convert | Tech Improves ILR Convert | New Regs | Rough NGHW XSR Convert | Better NGHW XLR Convert

Appendix C – Summary of Marine Fleet Database

The information provided can be useful to PSE in determining overall market demand for marine LNG. In addition, when talking to companies who are considering conversion to marine LNG, PSE has a good understanding of fleet size, characteristics, and requirements for fuel.

Types and Companies

- Assist and Escort Vessels
- Harbor Tugs
- Pilot Boats
- Ocean Tugs
- Columbia River Ports – Tidewater Pushboats
- Columbia River Ports – Sause Brothers Shipping
- Washington State Ferries, other Puget Sound area ferries
- Cruise Vessels calling on Seattle
- Horizon Shipping
- TOTEM Shipping
- Northland Shipping

Information

- Name, vessel type, and USCG Vessel ID
- Owner
- Horsepower
- Hours in service per year
- Estimated diesel and LNG gallons per year
- Equipment age

Example

Vessel ID	Type	Hours	Age	HP	EPA Category	Propulsion Engines	Pounds of fuel per year	Diesel gallons of fuel per year	LNG gallons of fuel per year	With Engine Load Factor of 68%	Conversion Liklihood	Owner	
559404	Ocean Tug	1500	1976	3500	1	2	2,625,000	330,189	554,717	377,208		Crowley	
PSOTS	Ocean Tug	1423	1981	3070	1	2	2,184,305	274,755	461,589	313,881	*working on identifying owner*		
256829	Ocean Tug	5000	1974	850	1	2	2,125,000	267,296	449,057	305,358		Dunlap	
567630	Ocean Tug	1620	1975	2150	1	2	1,741,500	219,057	368,015	250,250		Kirby	
500126	Ocean Tug	3325	1980	900	1	2	1,496,250	188,208	316,189	215,008		Kirby	
569517	Ocean Tug	1041	1986	1710	1	2	890,055	111,957	188,087	127,899		Dunlap	
566082	Ocean Tug	1331	1975	1125	1	2	748,688	94,175	158,213	107,585		Dunlap	

Appendix D – Summary of Rail and Industrial Database

The rail database summarizes the owner, routes traveled, and frequency of trips in order to estimate potential market demand for LNG. Although this market is not likely to generate measurable LNG demand in the market area in the immediate future, if engine technology advances and LNG fueling is more readily available along rail routes, there is potential for rail use of LNG in the next decade.

Example

Rail service provider	Route	Miles	Freight train frequency	Passenger train frequency	Total Miles	High Level Estimate LNG Gallons per Day	Per Train
BNSF	Seattle-Everett	30	40	8	1,440	4,608	96
BNSF	Everett-Spokane	300	25		7,500	24,000	960
BNSF	Seattle-Portland	177	50		8,850	28,320	566
BNSF	Portland-Pasco	233	31		7,223	23,114	
BNSF	Auburn-Pasco	227	6		1,362	4,358	
BNSF	Pasco-Spokane	147	33		4,851	15,523	
BNSF	Spokane-Sandpoint	69	46		3,174	10,157	
BNSF	Everett-Vancouver	155	24	4	4,340	13,888	
UP	Hinkle-Spokane	171	11		1,881	6,019	
UP	Spokane-Sandpoint	74	7		518	1,658	
					41,139		
			Diesel Gallons of Fuel per Day		82,278		
			LNG Gallons of Fuel per Day		131,645		

The industrial database provides customer listings, primary fuels and estimated load. Although this market is not likely to generate measurable LNG demand in the market area, the data is available for PSE's other research efforts.

Example

							EU1		
Facility Name	**Location**	**Industry**	**SIC**	**NAICS**	**Issuing Body**	**Permit**	**Primary Fuel**	**Secondary Fuels**	**MMBtu/HR**
Nippon Paper Industries	Port Angeles	Paper Products	2621		ORCAA	http://www.orcaa.org/	#6		236
TransAlta Centralia Mining, LLC	Centralia	Coal Mining Operations	1221	212111	SWCAA	http://www.swcleanai	Fuel Oil		NA
City of Spokane - Northside Landfill	Spokane	Landfill	4953		SRCAA	http://www.spokanecl	Landfill Gas	Propane	NA
City of Spokane - Spokane Regional Solid Wa	Spokane	Solid Waste Combustion	4953		SRCAA	http://www.spokanecl	Solid Waste	Natural Gas	183.33
KC Natl Resources Wastewater Treatment	Seattle	Municipal Wastewater Treatment	4952		PSCAA	http://www.pscleanair	Digester Gas	Propane	25.7

Appendix E – Summary of Port Vehicles Database

The port vehicle database provides information related to the potential for CNG to be used in various lighter duty equipment and vehicles that are part of port operations. Concentric relied on the Puget Sound Maritimes Emissions Survey 2007 to compile the data. Currently, CNG port vehicles are very limited in availability; only Toyota manufacturers an OEM natural gas forklift. Concentric does not yet consider the port vehicle market as immediately impacting the demand for LNG in the market area.

Example

Port	Terminal Number	High Use Vehicle	High Use Number in Port	Gallons per hour	Average annual hours	Average Annual Diesel Consumption per Vehicle (in gallons)	Annual CNG Consumption (in therms)	Annual CNG Consumption per Vehicle (in therms)	Annual CNG Consumption per Day in Port (in therms)
Everett	PSE020	Wheelloader	6			5,083	41,172	6,862	
	PSE020	Log Shovel	2			3,750	10,125	5,063	
									140.54
Tacoma									
	PST010	Forklift	2			1,900	5,130	2,565	
	PST010	Straddle carrier	4			2,130	11,502	2,876	
	PST010	Straddle carrier	13			10,749	188,645	14,511	
	PST020	Forklift	8	2.2	880	1,936	20,909	2,614	
	PST020	SidePick	5	2.8	1,850	5,180	34,965	6,993	
	PST020	Straddle Carrier	59	6.0	1,850	11,100	884,115	14,985	
	PST020	Yard Tractor	3	2.4	1,500	3,600	14,580	4,860	

PUGET SOUND ENERGY

Exhibit Q.

Natural Gas, ULSD and Fuel Oil Dynamics Study

Prepared by WoodMackenzie

Wood Mackenzie

March 2014

Natural Gas, ULSD and Fuel Oil Dynamics Study

Background

Puget Sound Energy (PSE) is requesting a discussion on the price spreads of ULSD and IFO-380 to Sumas natural gas. The intent is to support the appropriate oil pricing outlook for considering future price spreads in the Puget Sound region to be used for contracting purposes. In particular, PSE has asked for an analysis detailing the probable ceiling price on Sumas natural gas and probable floor price on ULSD and IFO-380, drivers behind the current spread, and what factors could lead to a degradation of the spread in the study period (2013-2030) and the likelihood of such circumstances occurring.

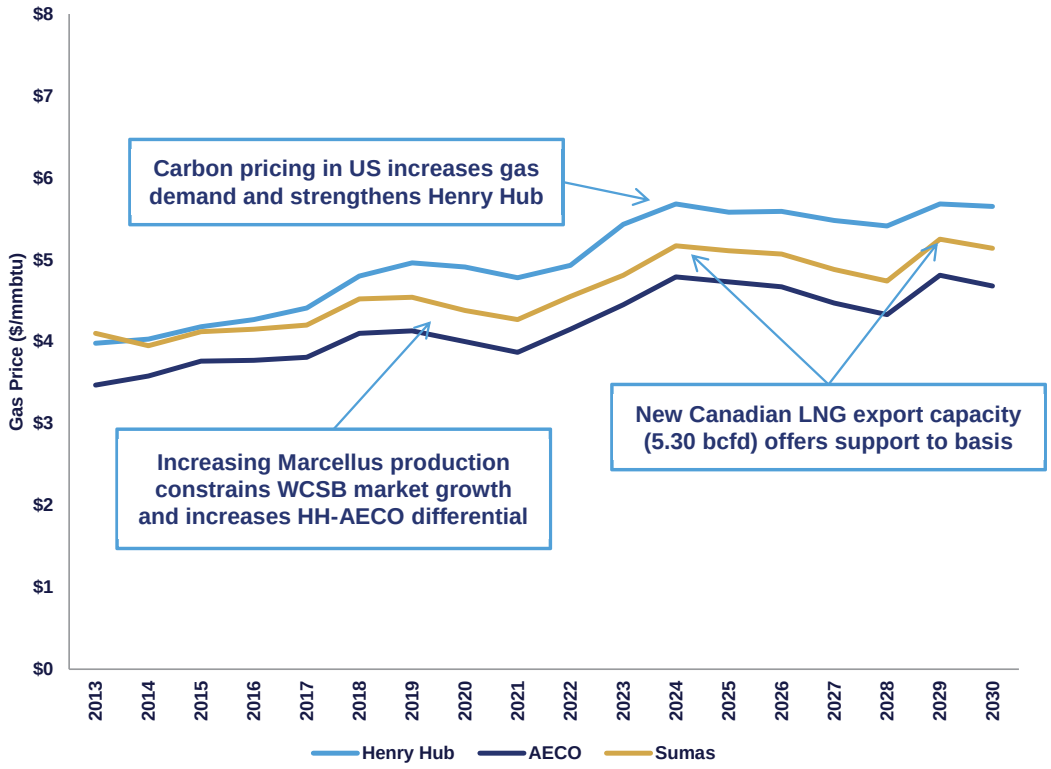
The ULSD and IFO-380 price spread to Sumas natural gas will be driven by regional supply/demand dynamics in US PADD V and Western Canada (Figure 1). PADD V covers the US West Coast and consists of Alaska, Arizona, California, Hawaii, Nevada, Oregon, and Washington. Western Canada is defined as the provinces of British Columbia and Alberta for the purposes of this study.

Figure 1: Map of US PADD V and Western Canada

Sumas Gas Price Dynamics

Natural Gas Hub Prices

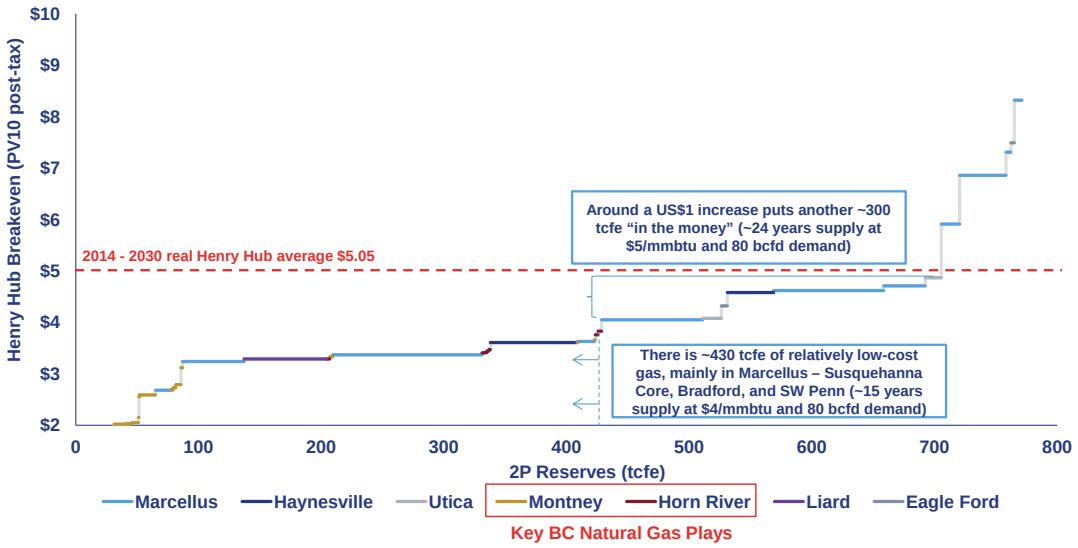
Figure 2: North American Natural Gas Prices



Wood Mackenzie does not forecast a significant recovery of gas prices and expects Sumas gas price to remain in the $4.00-$5.25/mmbtu range throughout the study period (Figure 2). Despite price support to Henry Hub due to LNG exports coming online in the Gulf Coast as well as robust industrial demand growth, Sumas sources the majority of its natural gas from British Columbia, which prices its volumes off of AECO. At the AECO hub, price increases are constrained due to limited demand access as well as increasing competition from sources of supply in North America flowing into current end markets (i.e. Marcellus). Consequently, upside to Sumas gas price is limited, and Sumas gas price is not expected to cause the price spread to ULSD/fuel oil to collapse.

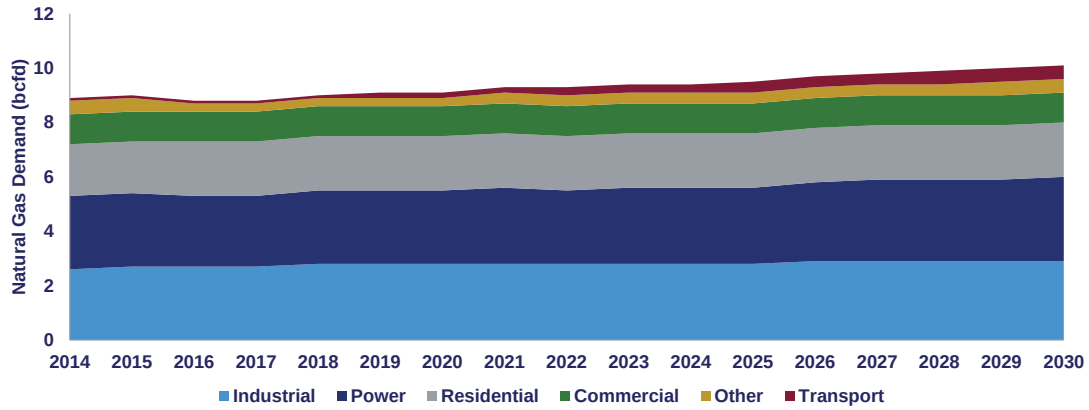
Natural Gas Supply/Demand Dynamics

Figure 3: PV10 Breakeven Gas Price by Sub-Play



Natural gas price dynamics are driven by the rise of North American unconventionals and the associated increase in volumes of relatively low-cost gas. At prices of $4/mmbtu, there is ~430 tcf of economic reserves in unconventional plays alone with another ~300 tcf of gas available with just a $1/mmbtu increase, enough to supply North America for another 24 years at current demand levels (Figure 3).

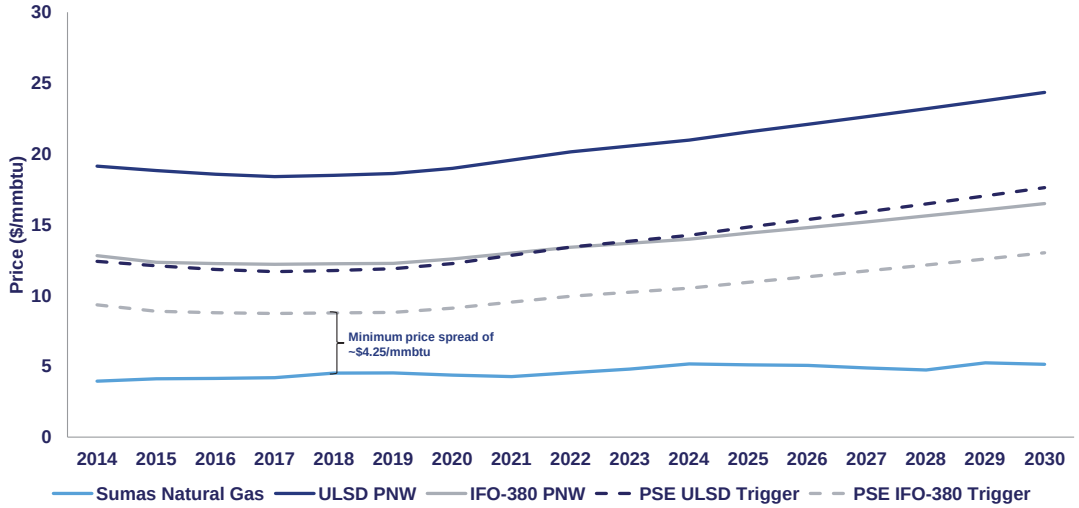
Figure 4: North American Pacific Coast Natural Gas Demand



North American gas demand is expected to grow through the study period, driven by increases in the power generation sector and LNG export facilities coming online. However, the North American Pacific Coast is expected to contribute very little of this growth, with only an increase of ~1 bcfd of demand by 2030 (Figure 4). Industrial growth demand is forecast to be negligible due to a dearth of established industrial projects in the pipeline. NGV penetration is also expected to have little effect as the lack of re-fuelling infrastructure has constrained NGV uptake and competition with hybrid / electric vehicles has further eroded their market share. Opportunity for long-term upside in British Columbia LNG (BCLNG) exists, but high deliverability risk makes the timing and cost of these projects very uncertain. A number of issues must be resolved on technical, political, and fiscal aspects for these projects to move forward. Most tellingly, a large number of these concerns are dependent on regulation and thus are high-risk projects.

ULSD and IFO-380 Price Dynamics

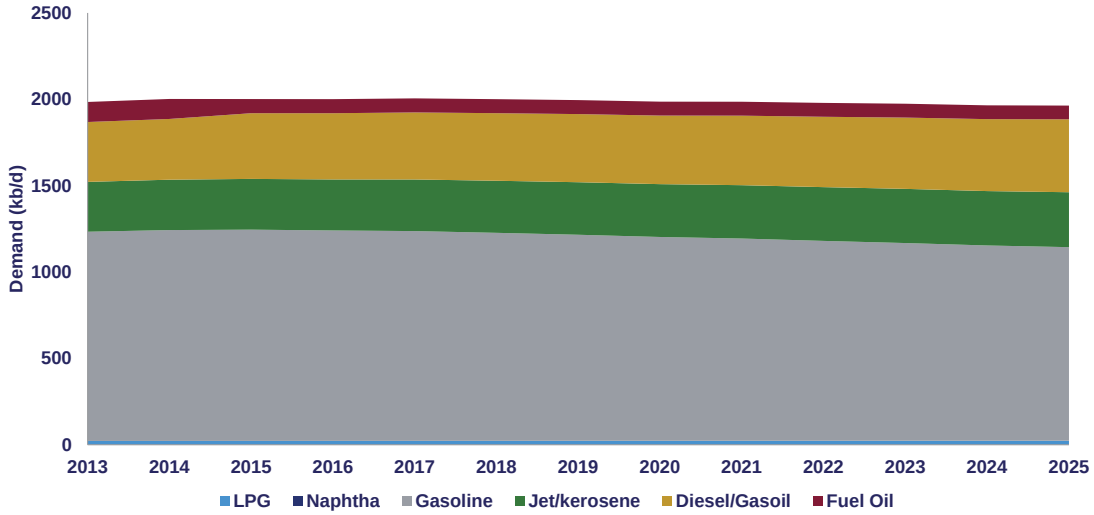
Figure 5: PNW Price Forecast for Sumas Natural Gas, ULSD and IFO-380



Wood Mackenzie expects the basis spreads between natural gas to ULSD and IFO-380 to be sustained throughout the study period due to crude price support and decreased ULSD and IFO-380 price in PNW. Even taking into account the PSE Price Triggers as defined by the PSE contracts, Wood Mackenzie expects a minimum price spread of $4.25/mmbtu occurring in 2018 before the differential reverses trend and widens through the end of the study period (Figure 5).

ULSD and IFO-380 Supply/Demand Dynamics

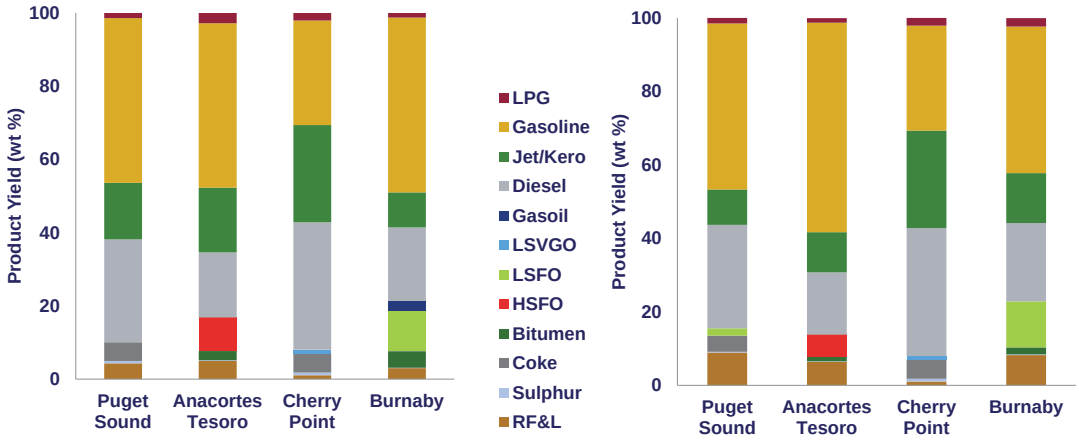
Figure 6: PNW Petroleum Product Demand Forecast



Petroleum product dynamics are not expected to change significantly through 2030 (Figure 6). Demand is forecast to

decrease slightly from ~2000 kb/d in 2014 to ~1960 kb/d in 2030, with diesel demand increasing and fuel oil demand decreasing to small extents over the same timeframe.

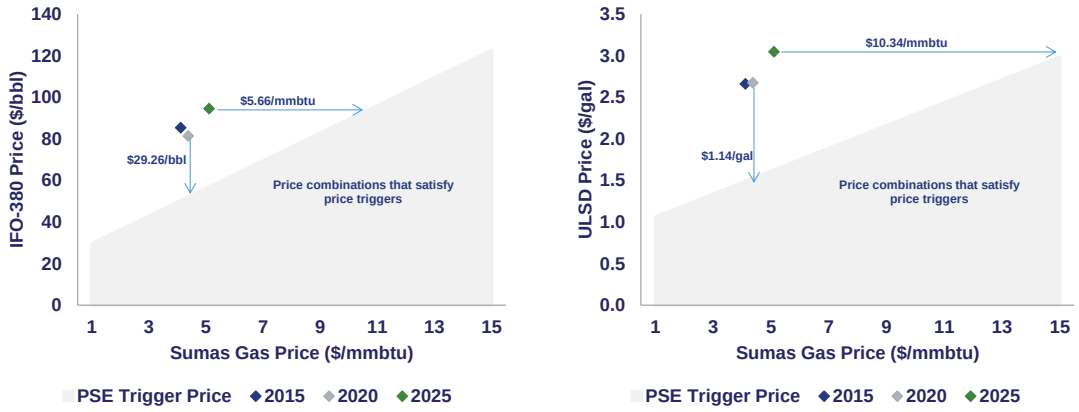
Figure 7: 2012 and 2020 Snapshots of PNW Refinery Yields



Refinery yields in the region are expected to remain relatively consistent with minor changes resulting from increased light, tight oil (LTO) production from the Bakken. However, these changes provide favourable price increases as refining of LTO shifts yields towards the lighter end of the product barrel and decreases supply of ULSD and IFO-380. Further price upside exists as current rail offloading capacity in California and PNW is currently underutilized; should rail buildout occur there is available capability to handle increased volumes of Bakken crude.

Conclusions and Risk Factors

Figure 8: IFO-380 and ULSD Trigger Prices



Wood Mackenzie expects ULSD and IFO-380 price spreads to Sumas gas to be sustained throughout the study period. Production of ULSD and IFO-380 will decrease due to lightening of the crude slate, while product demand in PNW will remain relatively constant through 2030. Natural gas price growth is expected to remain muted due to the ability to access significant volumes of economic reserves; Sumas will grow even less due to AECO-priced volumes struggling to find end markets.

Wood Mackenzie has identified a number of risk factors to the study, but even in the event of a "perfect storm" scenario, a substantial price spread will still be sustained. Wood Mackenzie's forecast currently includes four BCLNG facilities coming online; even if all projects proposed in the queue were to be constructed, price upside to Sumas natural gas is limited. Therefore, NGV demand would need to increase by an extreme amount (greater than current North American diesel demand) before prices begin to approach trigger prices due to substitution for long-haul trucks and potentially rail. However, the narrowing of the ULSD-Sumas gas spread would impair substitution economics, since increased gas price increased cost of NGV use, making it unlikely a large enough volume swap will occur to drive prices towards each other. On the product side, price support from oil project breakevens keep product prices at a premium to gas. In addition, market forces are able to adjust to worst case scenarios in a span of months to push them back towards the base case.

Wood Mackenzie

Natural Gas, ULSD and Fuel Oil Dynamics Study

Full Report

April 2014

Strategy with substance

www.woodmac.com

PSE PUGET SOUND ENERGY

Background and Objectives

Background

Puget Sound Energy is requesting a discussion on the price spread between Sumas natural gas and ULSD as well as Sumas natural gas and IFO-380. The intent is to support the appropriate oil pricing outlook for considering future price spreads in the Puget Sound region to be used for contracting purposes.

Key objectives of this study

- Understand the minimum spread by examining a probable ceiling price on Sumas natural gas and a probable floor price on ULSD and IFO-380
- Understand what factors and drivers have led to the current spread as well as the sustainability of such factors
- Understand any factors that could lead to a degradation of the spread in the study period (2013-2030) and the likelihood of such circumstances occurring

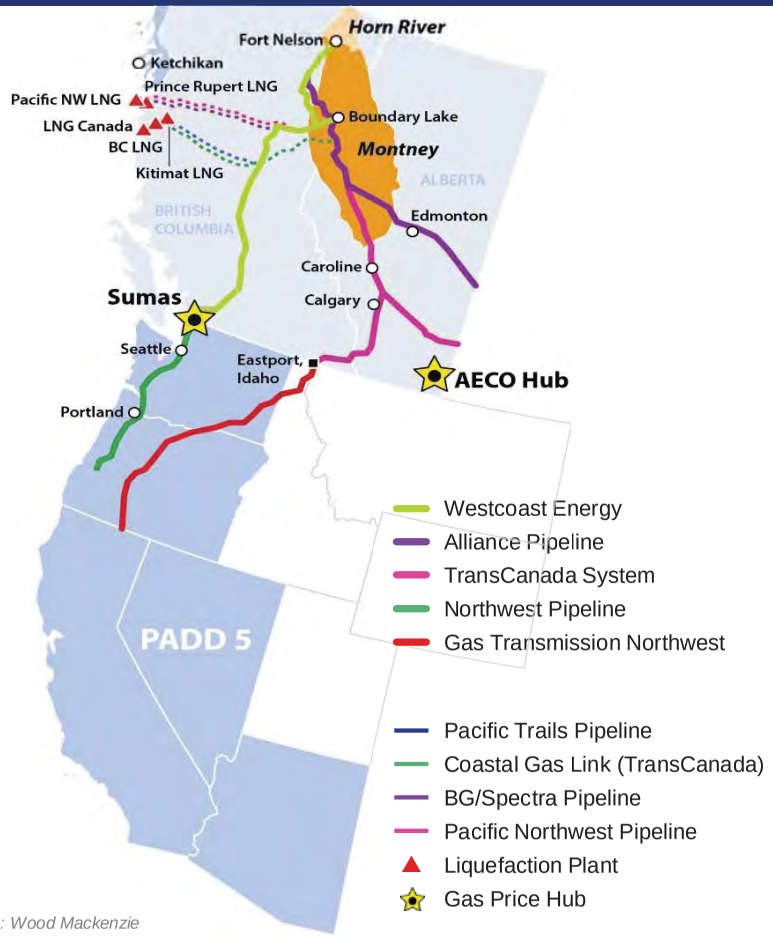
Agenda

1. **Executive Summary**
2. Sumas Gas Price Dynamics and Risks
3. ULSD and IFO-380 Price Dynamics and Risks
4. Conclusions
5. Appendix

EXECUTIVE SUMMARY

The ULSD and IFO-380 price spread to Sumas natural gas will be driven by regional dynamics in US PADD V and Western Canada

US PADD V and Western Canada



Source: Wood Mackenzie

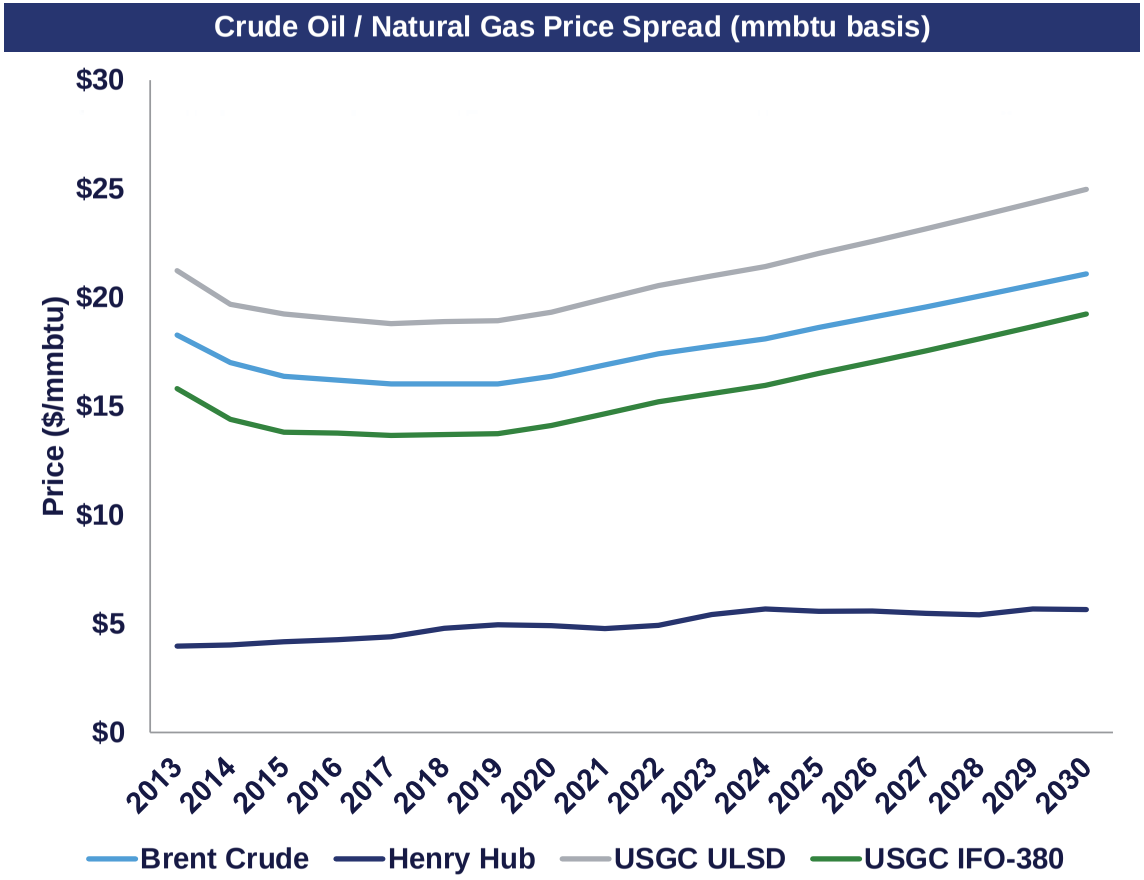
- PADD V covers the US West coast and consists of Alaska, Arizona, California, Hawaii, Nevada, Oregon, and Washington
- Western Canada is commonly defined as the four provinces west of Ontario, but for the purposes of this study refer to British Columbia and Alberta
- Supply/demand dynamics in these two regions are key to the ULSD and IFO-380 forecast price spread to Sumas natural gas

Executive Summary

- **Wood Mackenzie forecasts Sumas to remain in the $4.00-$5.25/mmbtu range and does not expect significant sustained price increases**
  - » There is already ample recoverable gas supply with ~430 tcfe economic under current prices
    - » Additional ~300 tcfe of reserves with just a $1/mmbtu increase in price
  - » Demand is forecast to grow at a slower pace from ~80 bcfd (~29 tcf/yr) to ~125 bcfd (~46 tcf/yr), with growth driven by increases in the power sector and LNG exports
- **ULSD and IFO-380 prices are expected to be sustained at a considerable premium to Sumas gas prices**
  - » Overall product demand on the North American Pacific Coast is forecast to remain relatively constant, with ULSD demand increasing ~76 kb/d and IFO-380 demand decreasing ~37 kb/d
  - » Supply is skewed towards the lighter end of the barrel due to PNW refineries running higher volumes of Bakken crude (LTO)
- **Wood Mackenzie has identified potential risk factors to our forecast but expects the price spread to persist even in a "perfect storm" worst case scenario**
  - » Sumas gas price has potential upside from LNG exports, NGV demand, and US carbon policy regulations, but these factors are all dependent upon regulatory policy
  - » ULSD and IFO-380 demand will be affected by regulations such as LCFS and MARPOL as well as refinery crude slates but prices are supported by breakevens for new oil projects needed to meet projected demand
  - » ***Circumstances approaching PSE's "price triggers" would be extreme market imbalances and would resolve as the market reacts – this would occur in months, not years***

EXECUTIVE SUMMARY

Supply increases driven by shale production in North America will drive further expansions of the crude products/gas price spread



- Henry Hub price remains significantly lower than crude prices as accessibility to reserves is more than sufficient to meet forecast demand growth
- Crude pricing is forecast to soften in the short to medium term due to demand risks in OECD markets
  - » In the long-term, crude pricing is strengthened by increasing demand and breakeven economics for marginal projects
- Increased LTO production skews refinery output towards the lighter end of the barrel, limiting supply of ULSD and IFO-380

Source: Wood Mackenzie

Agenda

1. Executive Summary
2. **Sumas Gas Price Dynamics and Risks**
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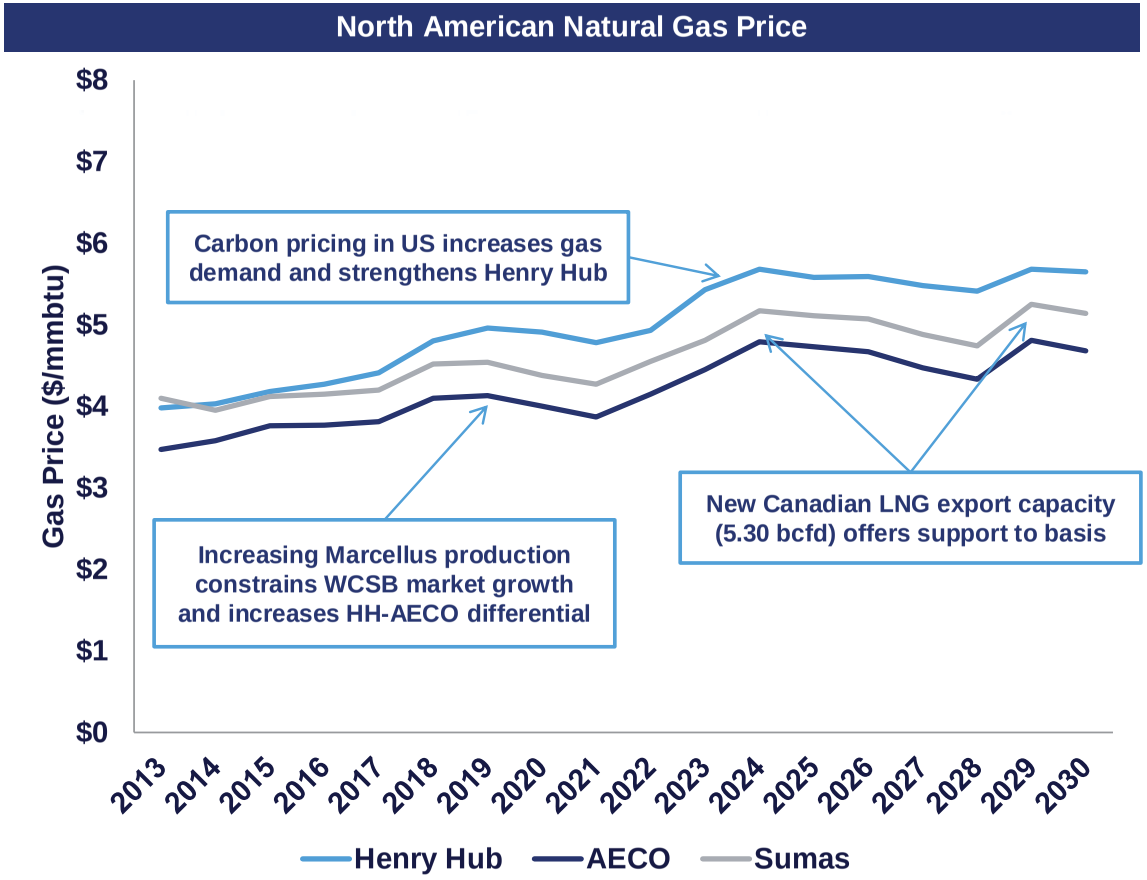
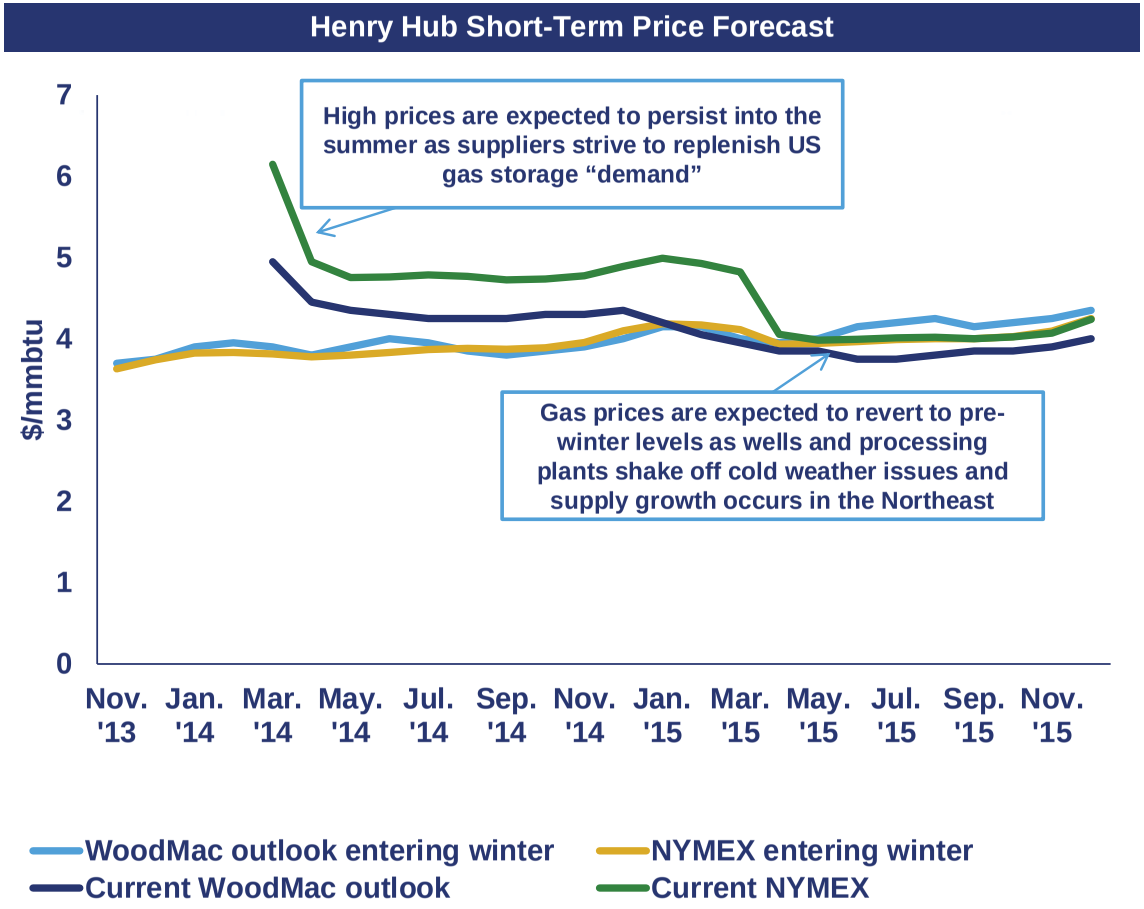
Wood Mackenzie does not forecast a significant recovery of gas prices, despite increased demand driven by regulatory policies and LNG exports



- Henry Hub is largely strengthened by LNG exports and industrial demand growth along the Gulf Coast region
- Price increases at AECO are constrained by limited demand access as well as increasing production from competing sources of supply in North America
- Sumas sources the majority of its natural gas from British Columbia which is priced off AECO, causing it to remain at a premium due to transport cost

Source: Wood Mackenzie

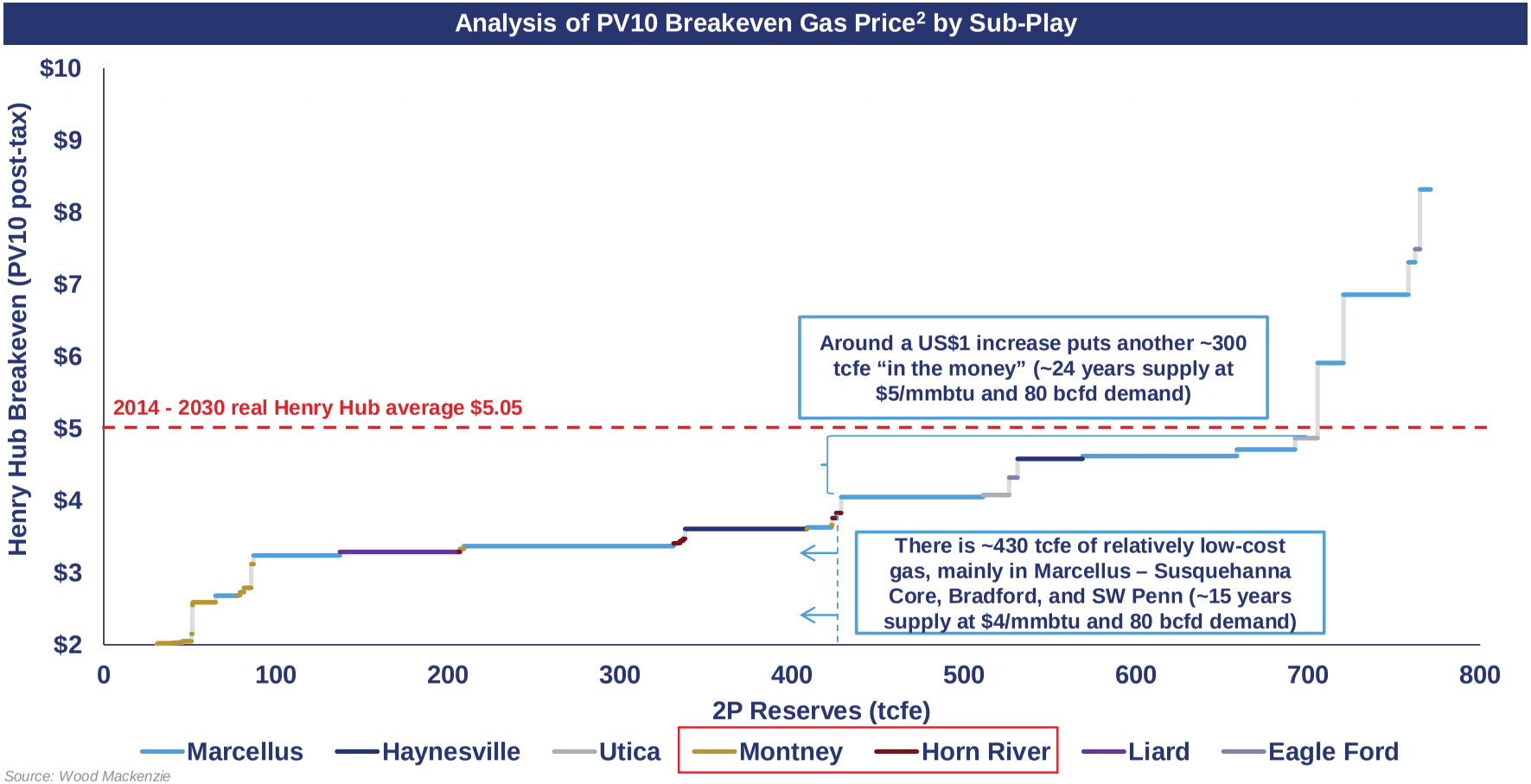
Recent gas prices have been driven by colder than normal weather in several regions, but fundamentals return to the norm in the long-term



- **This winter has been the coldest since 2000-2001, causing increased gas-fired generation, and withdrawals from US storage have been well above average levels drawn historically**
  - » Prices will be sustained in the short-term as suppliers strive to refill US storage "demand"
- **However, Wood Mackenzie expects this to be a short-lived phenomenon as temperatures revert to the norm**
  - As demand falls back to normal levels, supply will increase driven by relief of cold-weather issues (plant shutdowns, well freeze-offs) and increased production from the Northeast

Source: Wood Mackenzie

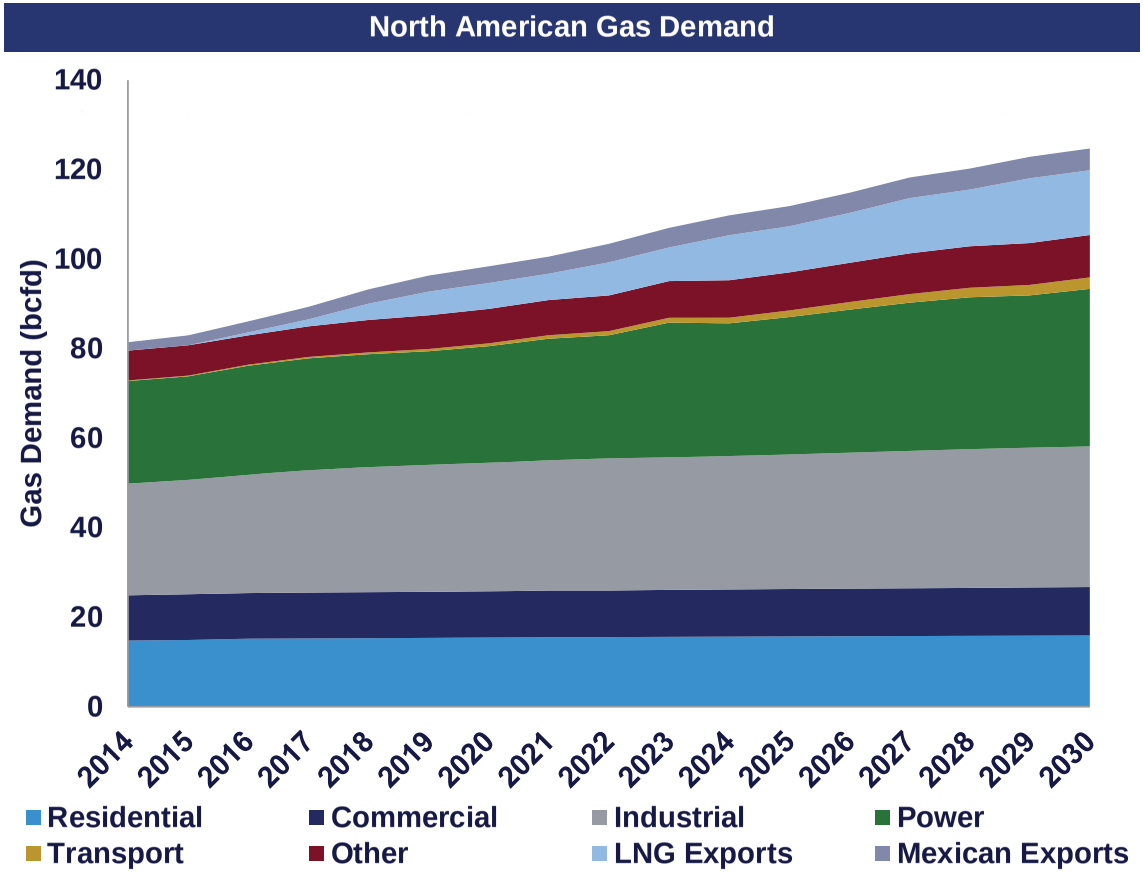
North American unconventionals have provided access to significant volumes[1] of relatively low cost gas



Source: Wood Mackenzie

Notes:
1. **2P Reserves are defined as Proven + Probable** reserves, which analysis of geologic and engineering data suggest are likely to be recoverable under reasonable economic, technical and operating conditions
2. Breakeven analysis includes current views of typical drilling & completion costs, per-well infrastructure Capex, operating expenses and fiscal take; excludes lease acquisition and E&A

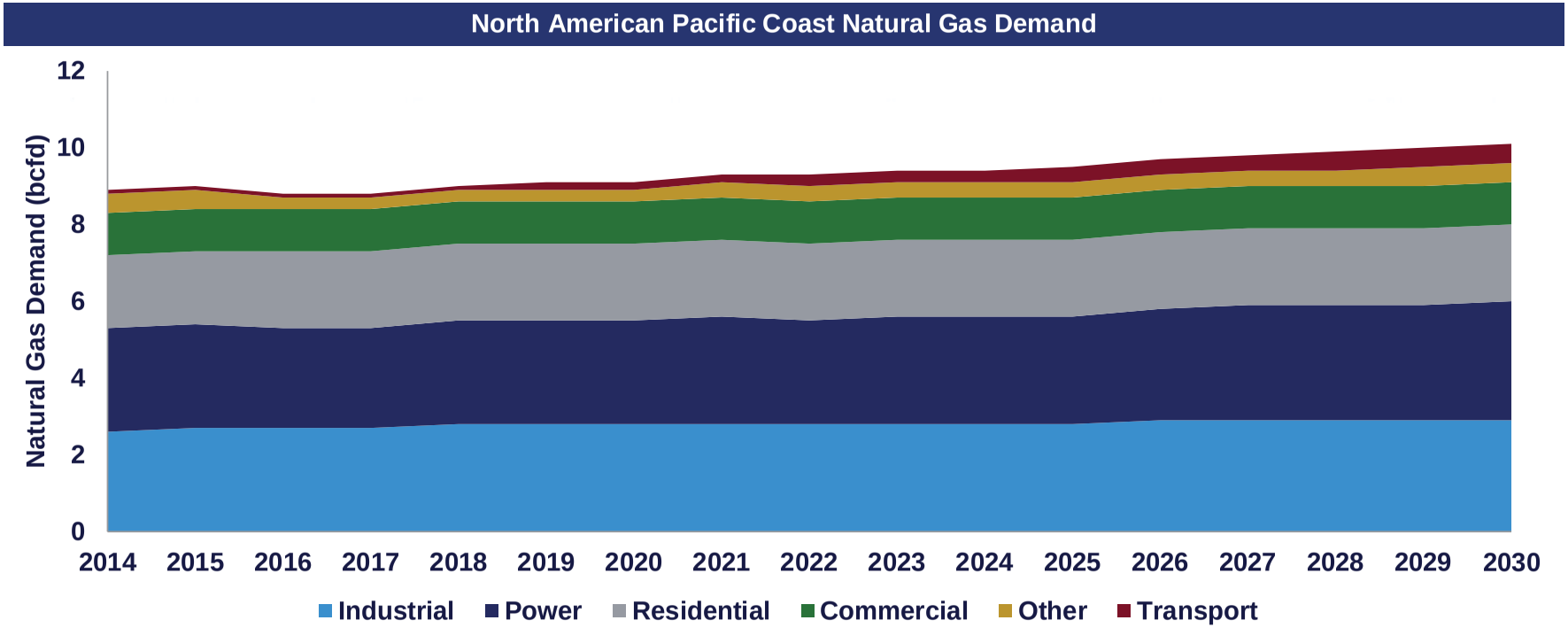
North American gas demand is expected to grow through the study period, driven mainly by the power sector and LNG exports



- The power sector is forecast to grow from 23 bcfd in 2014 to 35 bcfd in 2030 due to additional gas-fired generation addressing mandated retirements of coal-fired power plants in the US
- LNG exports are expected to add another 15 bcfd (5 bcfd from BCLNG) to demand by 2030 and compete strongly with other global sources into the Asian markets
- Economic growth supports an additional 7 bcfd of industrial demand by 2030 as low gas prices lead to increasing competiveness and investment in additional industrial capacity

Source: Wood Mackenzie

Gas demand on the North American Pacific Coast contributes very little of this growth, with only an increase of ~1 bcfd of demand by 2030

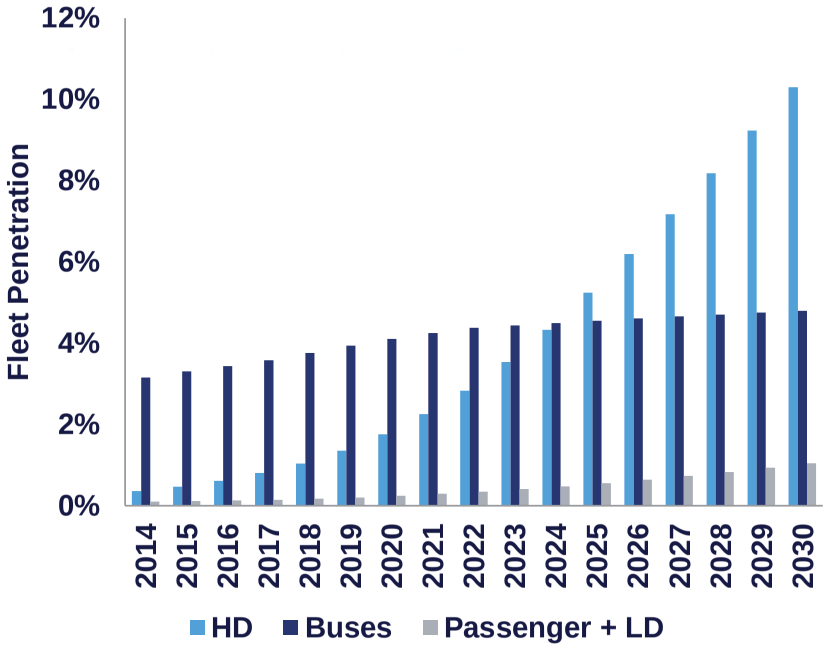


- The power sector provides the majority of growth in the region as natural gas displaces other sources due to environmental regulations coming into effect
- Industrial demand is not forecast to increase significantly due to a lack of industrial projects; Canada Methanol Corporation's plant in British Columbia is still early in the planning stage and must resolve offloading issues

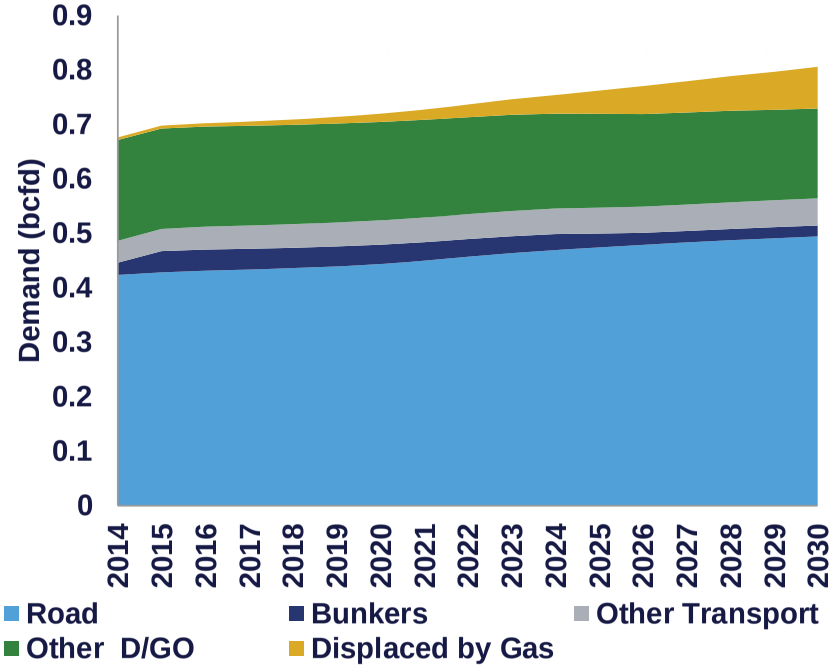
Source: Wood Mackenzie

Despite clean air initiatives and incentives, Wood Mackenzie does not forecast significant demand growth for NGVs in the US

NGV Vehicle Fleet Penetration



US Diesel / Gasoil Demand



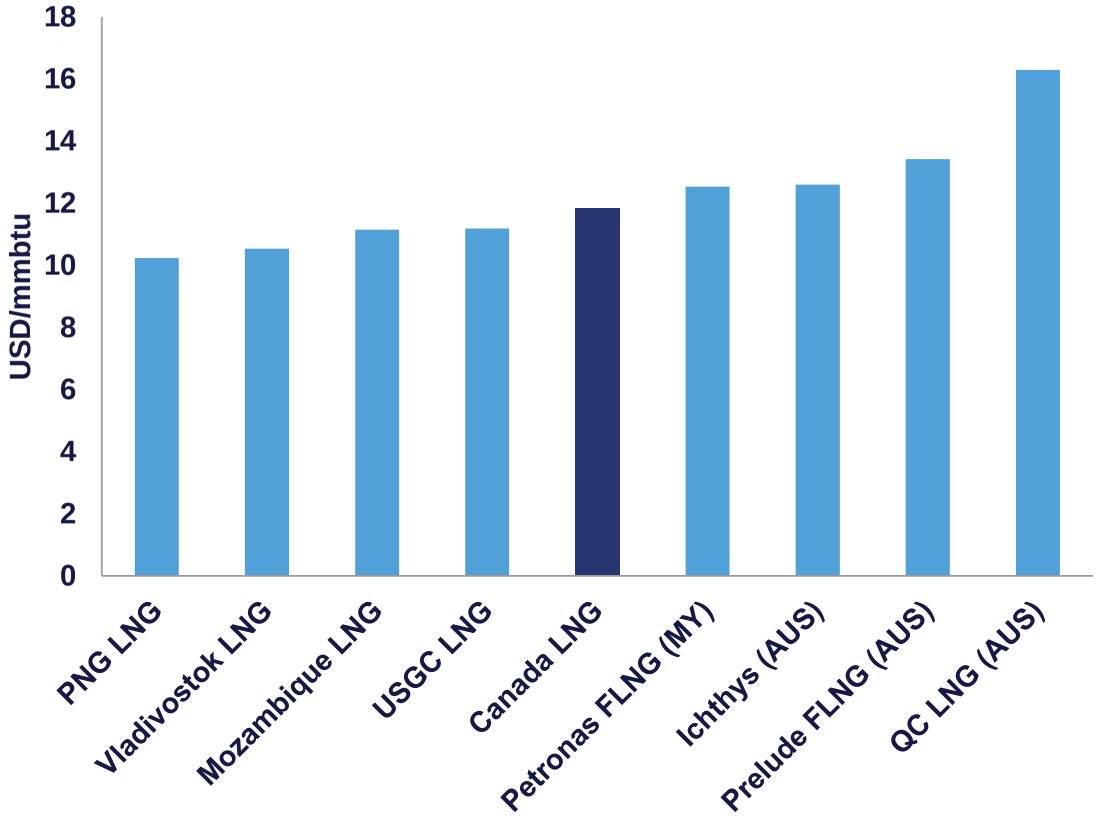
- The lack of re-fuelling infrastructure has constrained NGV uptake, with only ~1,300 CNG stations (~50% open to public) and 70 LNG stations (c.f. 5,000 diesel stops)
- In addition, NGVs face stiff competition in the market from alternative vehicle technologies, notably hybrid / electric vehicles

Source: Wood Mackenzie

Notes:
1. HD = heavy duty truck, LD = light duty truck. Based on gross vehicle weight rating (GVWR)

North American LNG export projects are expected to be competitive into Asian markets, but a race is on to build capacity and secure commitments

2020 Est. Delivered Cost[1] Comparison with Competing Projects into Asia



- **The potential LNG projects in North America, East Africa and Australia are competing to supply a "limited re-gas market"**
  - » Proposed liquefaction capacity greatly exceeds forecast LNG appetite
- **LNG exports from Western Canada are intriguing due to proximity to Asian markets, but face a number of challenges:**
  - » Remote location of source gas plays (Montney and Horn River)
  - » Regulatory hurdles to secure right-of-ways and approvals (including First Nations)
  - » High costs due largely to labor force competition with oil sands

Source: Wood Mackenzie

Notes:
1. Includes gas feedstock, liquefaction costs, and shipping costs to Japan
2. PNG = Papua New Guinea

There is opportunity for long-term upside in Canadian LNG but high deliverability risk makes timing and costs very uncertain

Project (Partners)	NEB export license status	Proposed Capacity (1st phase, mmtpa/bcfd)	Location
Kitimat LNG (Apache, Chevron)	Received	10.0 / 1.3	Kitimat
BC LNG Export Co-op (LNG Partners, Haisla First Nation, Golar)	Received	0.9 / 0.1	Kitimat
LNG Canada (Shell, PetroChina, KOGAS, Mitsubishi)	Received	12.0 / 1.6	Kitimat
Pacific Northwest LNG (PETRONAS, JAPEX)	Approved	12.0 / 1.6	Prince Rupert
WCC LNG (Exxon Mobil, Imperial)	Approved	30.0 / 3.9 (NEB Application Total)	Not finalized
Prince Rupert LNG (BG Group)	Approved	14.0 / 1.8	Prince Rupert
Woodfibre LNG (Pacific Oil & Gas)	Approved	2.1 / 0.3	Squamish
Jordan Cove[1] (Veresen)	Approved	6.0 / 0.8	Coos Bay, Oregon
Triton LNG (AltaGas, Idemitsu)	Applied	2.3 / 0.3	Not finalized (Kitimat or Prince Rupert proposed)
Aurora LNG (Nexen, INPEX, JGC)	Applied	24.0 / 3.1	Prince Rupert
Kitsault LNG (Kitsault Energy)	Applied	20.0 / 2.6	Kitsault
Oregon LNG[2] (Leucadia)	Applied	9.6 / 1.3	Warrenton, Oregon

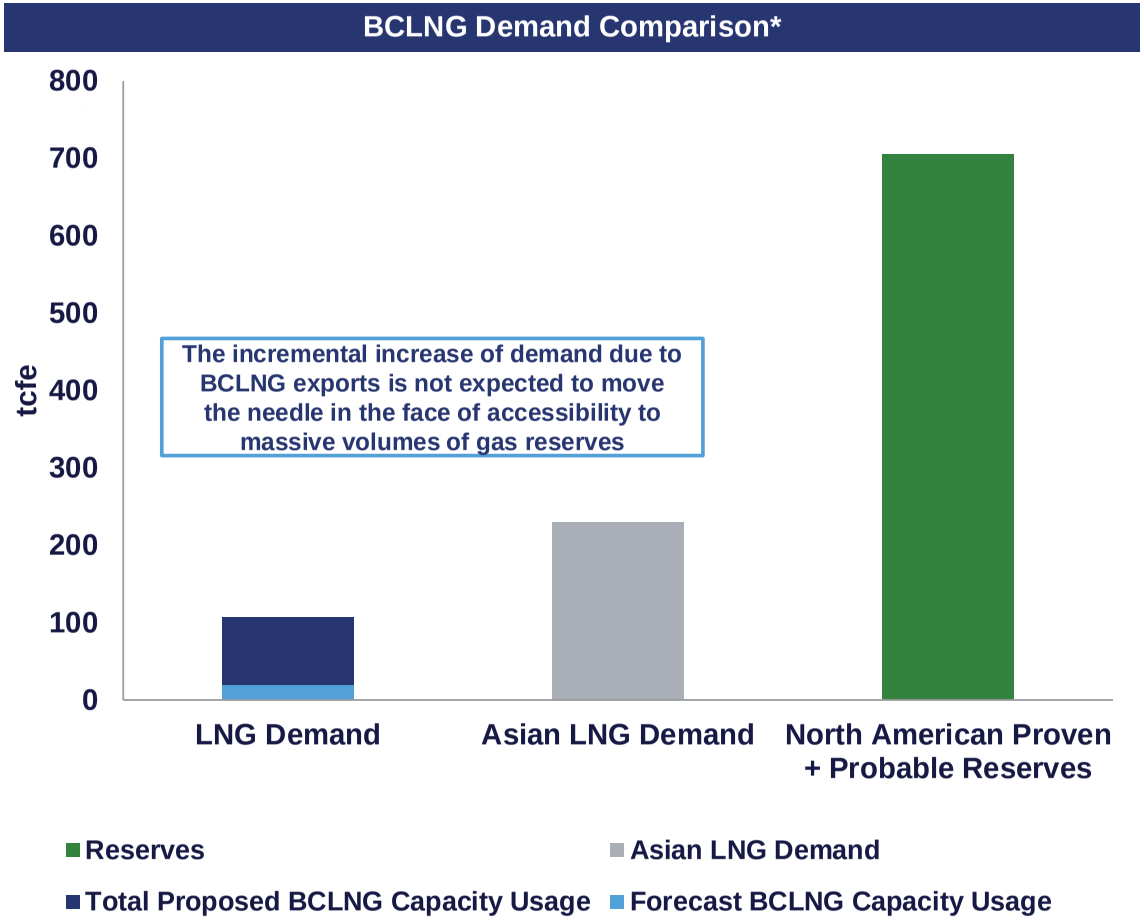
Included in WM Forecast

- **Technical challenges:**
  - » Greenfield construction with limited labor and resources
  - » Aggressive drilling campaigns necessary to achieve sufficient feed gas
  - » Infrastructure buildout is necessary to support proposed LNG volumes
- **Political/fiscal challenges:**
  - » Local stakeholder support must be secured; First Nations have protested use of their land in the past
  - » Concerns that LNG fiscal policy might burden competitiveness (i.e. proposed LNG tax)
  - » Possibility of NEB scrutinizing future approvals
- **Corporate appetite:**
  - » Major developers seeking to lower exposure (PETRONAS, KOGAS farm-downs) may indicate a "wait-and-watch" approach

Source: Wood Mackenzie

Notes:
1. Jordan Cove is proposed in the US but plans to source feedgas from Canada
2. Oregon LNG is proposed in the US but plans to source feedgas from Canada

Even if additional LNG projects come online, British Columbia LNG is expected to have a negligible effect on Sumas gas price



- Wood Mackenzie's current forecast assumes four Canadian projects come online within the study period: BC LNG, LNG Canada, Pacific NW LNG, and Prince Rupert LNG
- As LNG capacity comes online and flows increase, Sumas gas price receives support and strengthens ~2021
- However, this effect is limited as the increased price along with LNG stakeholder interests encourage access to stranded Horn River gas

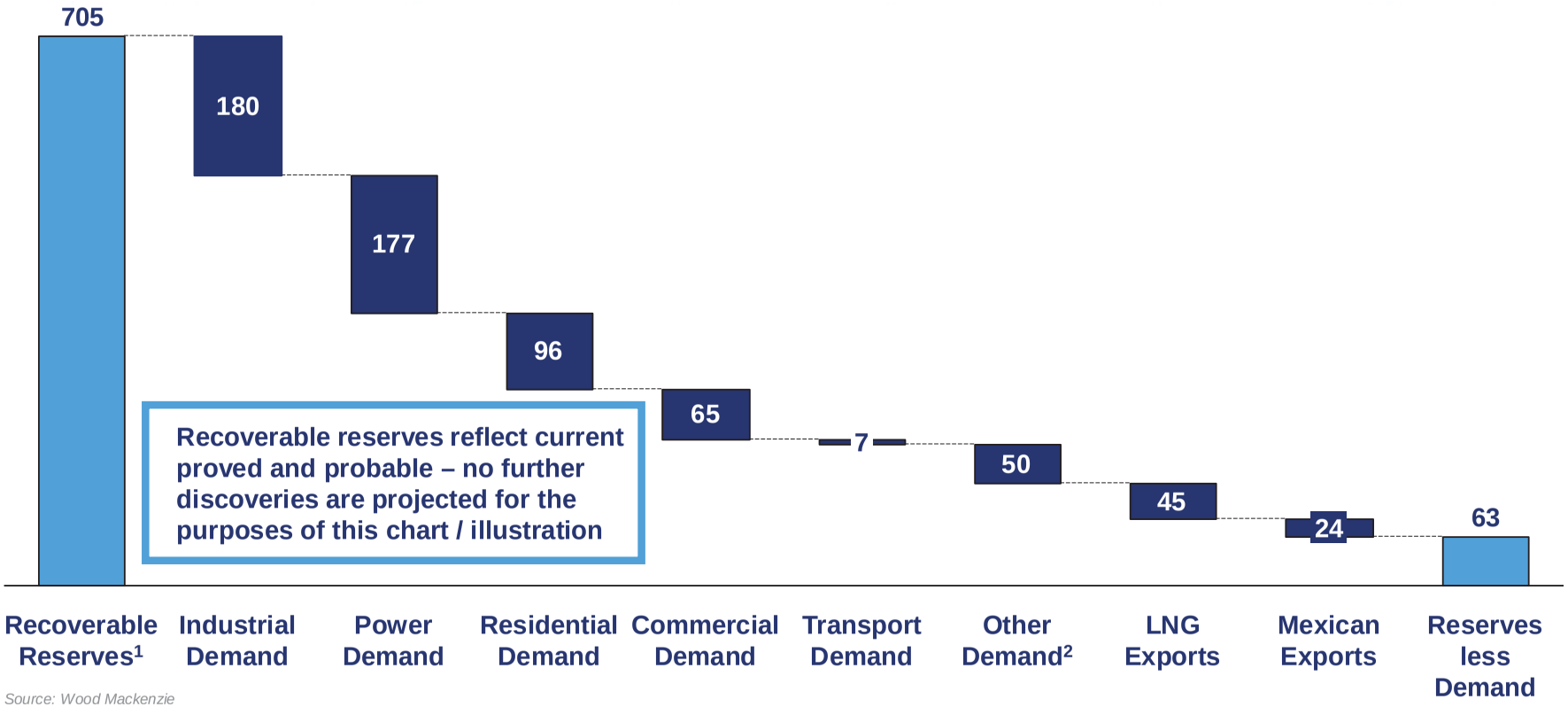
Source: Wood Mackenzie

**Forecast and Total Proposed BCLNG Capacity Usage assumes 100% capacity utilization. 2P reserves based on $5/mmbtu Henry Hub price. Demand and LNG usage estimated out to 2030.*

Current recoverable reserves are more than sufficient to supply projected demand and exports for the next 15 years, keeping gas prices low

North American Supply / Demand Breakdown (2014-2030, Gas Price $5/mmbtu)

Units: tcfe



Source: Wood Mackenzie

Notes:
1. Recoverable Reserves does not include conventional or offshore fields
2. Other Demand includes pipeline and fuel usage

SUMAS GAS PRICE DYNAMICS AND RISKS

There is more downside than upside price risk to the Sumas price forecast as many strengthening factors are dependent on regulatory policy

Risk Factor	Consequences	Effect on Sumas Gas Price	Impact
LNG Exports	• Several LNG projects are in various stages of the approval process for LNG exports into Asian markets • Canadian and US West Coast LNG exports will use source gas from British Columbia	Price Increase: Increase in demand and linking to Asian gas prices	Low
NGV Usage Growth	• The US DoE Clean Cities Coalition is incentivizing the use of alternative and renewable fuels to reduce petroleum consumption • Ongoing initiatives to increase NGV re-fuelling infrastructure improves accessibility to CNG and increases natural gas demand	Price Increase: Increased gas demand from higher NGV penetration into the vehicle fleet	Low
US Carbon Policy Regulations	• Previous proposals for carbon regulations (Bingman-Specter, Kerry-Lieberman) have garnered political backing in the past, and rising emissions levels are expected to produce increased political pressure • A tightening of carbon emissions causes the power sector to switch from coal to natural gas for its energy source, increasing gas demand	Price Increase: Increased gas demand for the power sector	Medium
Shale Gas Supply / Production Growth	• Continued delineation and improvements in operational efficiencies increases natural gas reserves and production, providing additional supply	Price Decrease: Increased gas supply from available economic reserves	High

Price Decrease Price Increase No Price Effect

Source: Wood Mackenzie

Sumas Gas Price Dynamics Overview

- **Wood Mackenzie forecasts Sumas gas price to remain in the $4.00-$5.25/mmbtu range throughout the study period and does not expect price to increase significantly**
  - » Recent temperature patterns have resulted in price spikes for natural gas, but Wood Mackenzie does not expect these trends to sustain gas prices in the long-term
- **North American unconventionals have provided access to considerable volumes of low-cost shale gas, far outpacing forecasted demand growth**
- **Demand growth resulting from NGVs is not expected to be significant due to re-fuelling infrastructure constraints and competition from alternative vehicle technology**
- **Despite long-term opportunity for exports from BCLNG, these projects face a number of technical, political, and fiscal challenges that must be overcome**

Agenda

1. Executive Summary
2. Sumas Gas Price Dynamics and Risks
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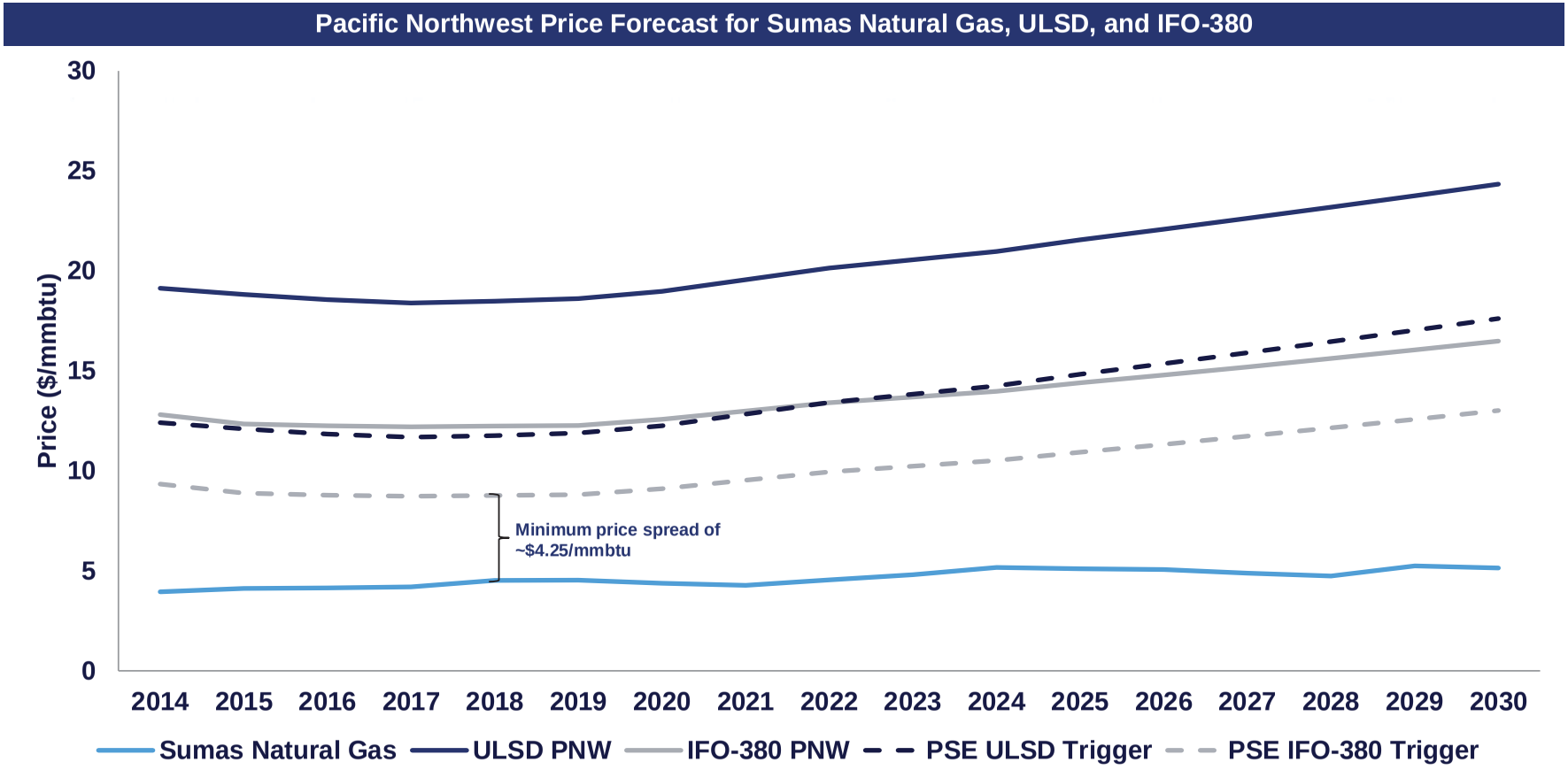
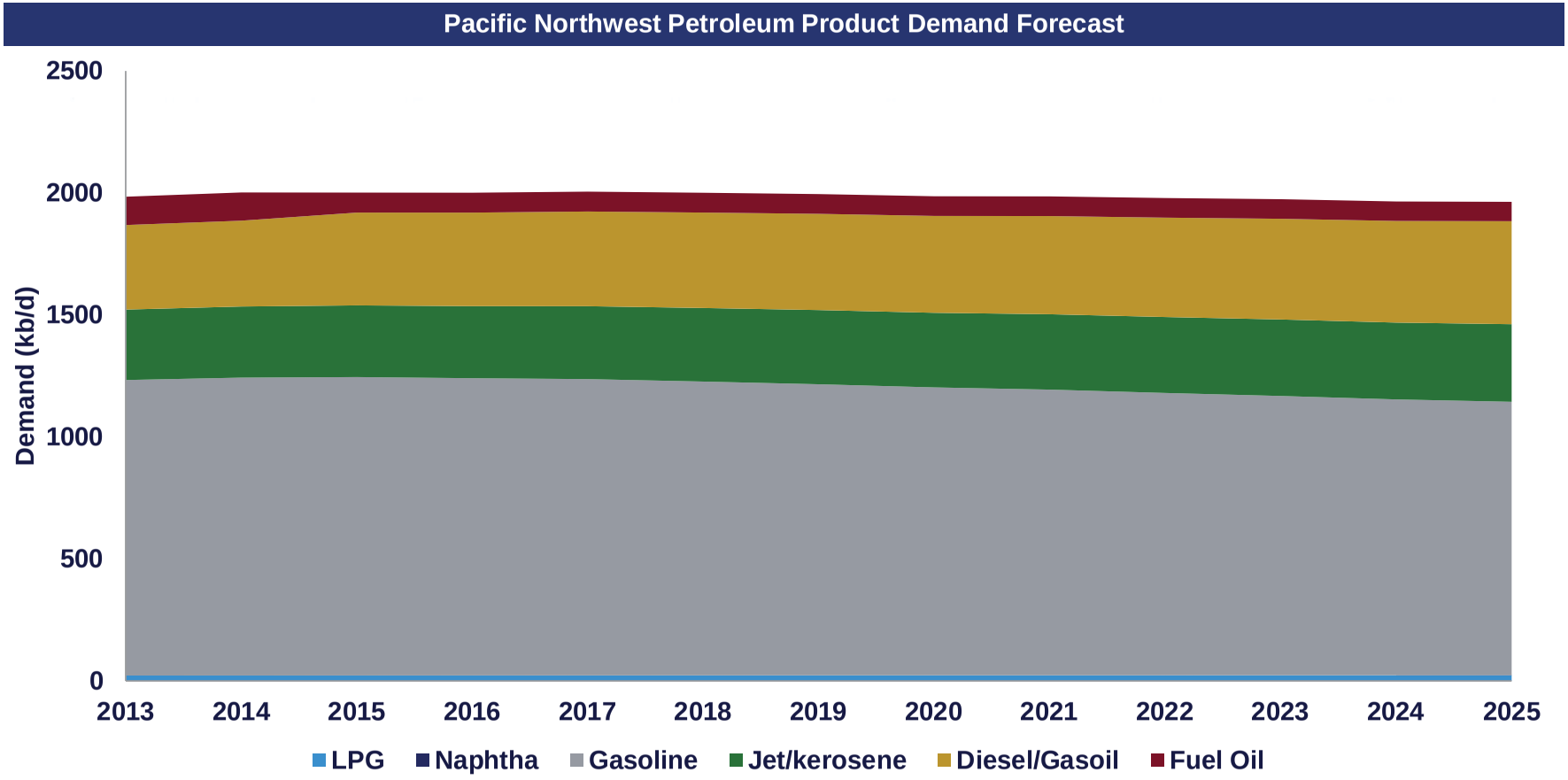
Wood Mackenzie expects the basis spread between natural gas to ULSD and IFO-380 to be sustained throughout the study period



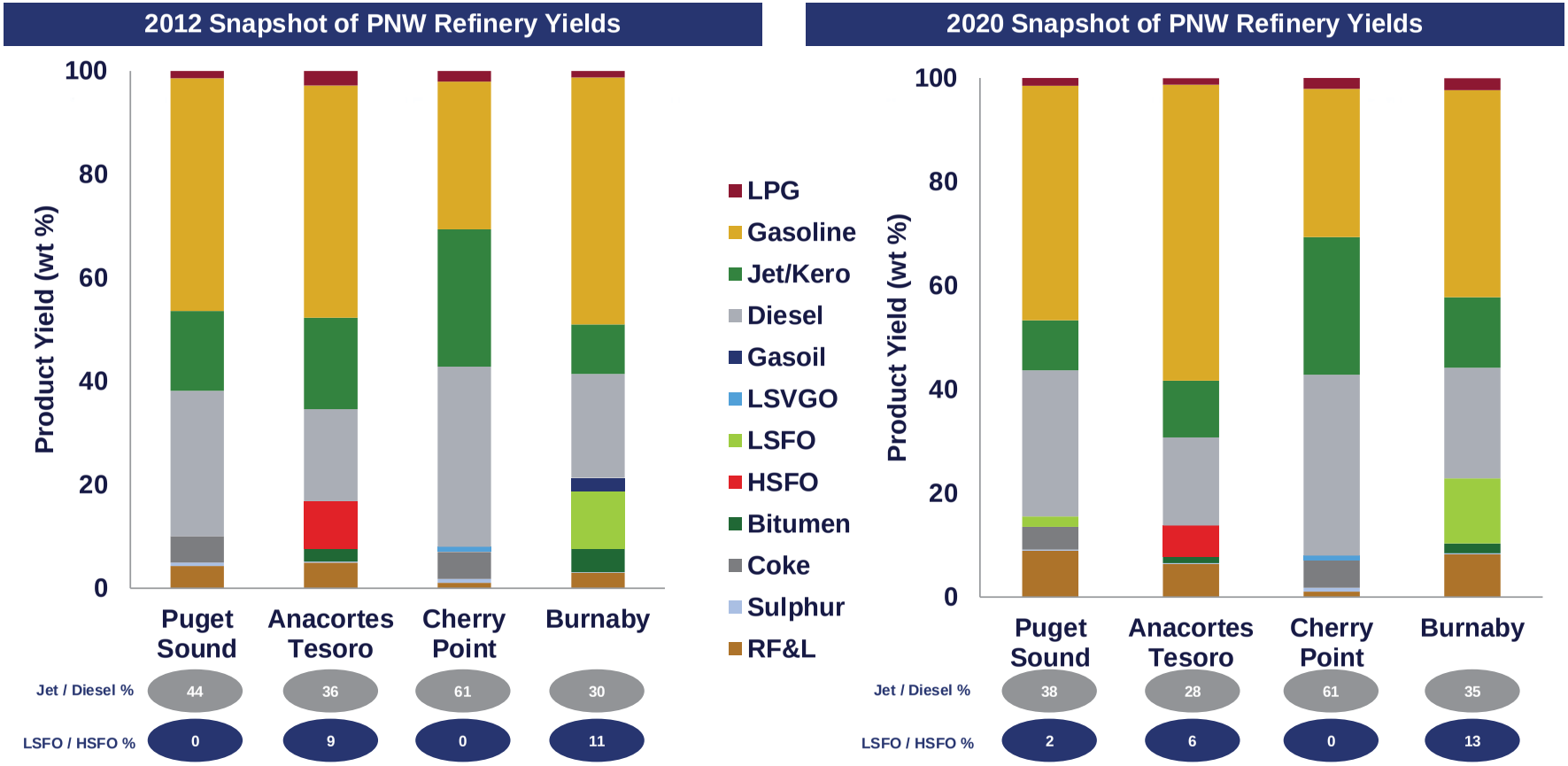
Source: Wood Mackenzie

Petroleum product dynamics in the Pacific Northwest are not expected to change significantly through the study period



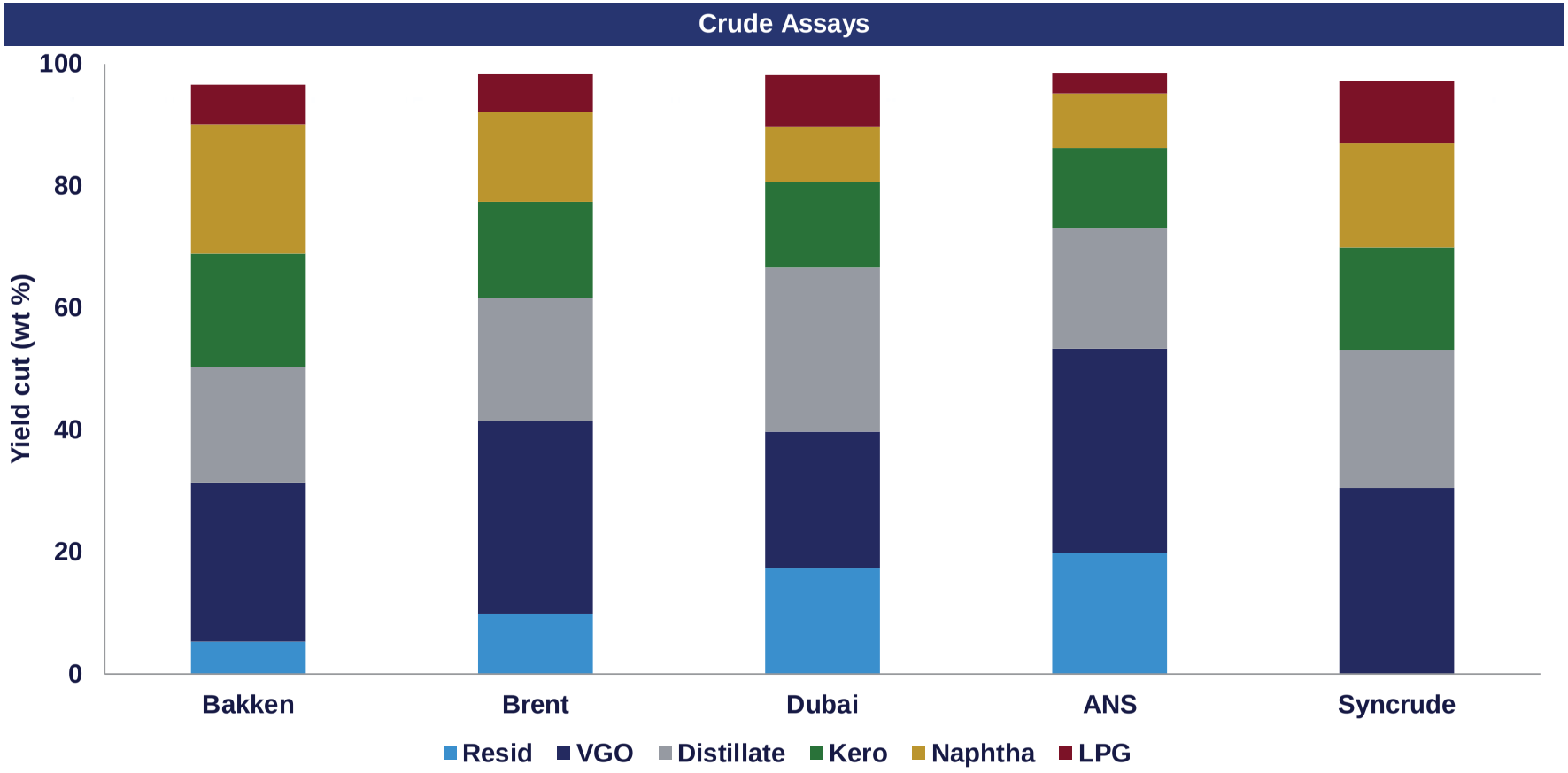
Source: Wood Mackenzie

Consequently, refinery yields remain relatively consistent, with minor changes resulting from increased LTO production



Source: Wood Mackenzie

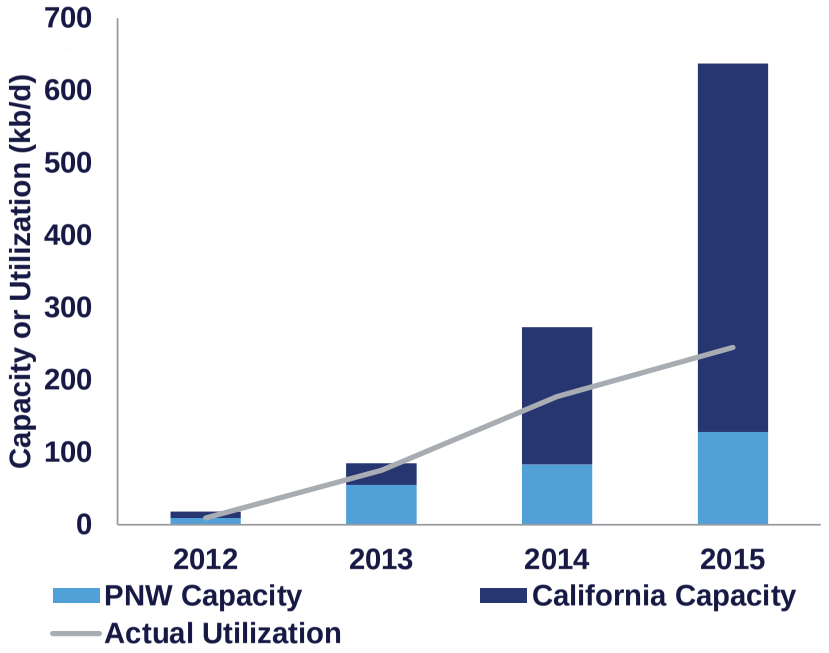
Relative to conventional grades, LTO produces less residue and more LPG and naphtha, shifting yields toward the lighter end of the product barrel



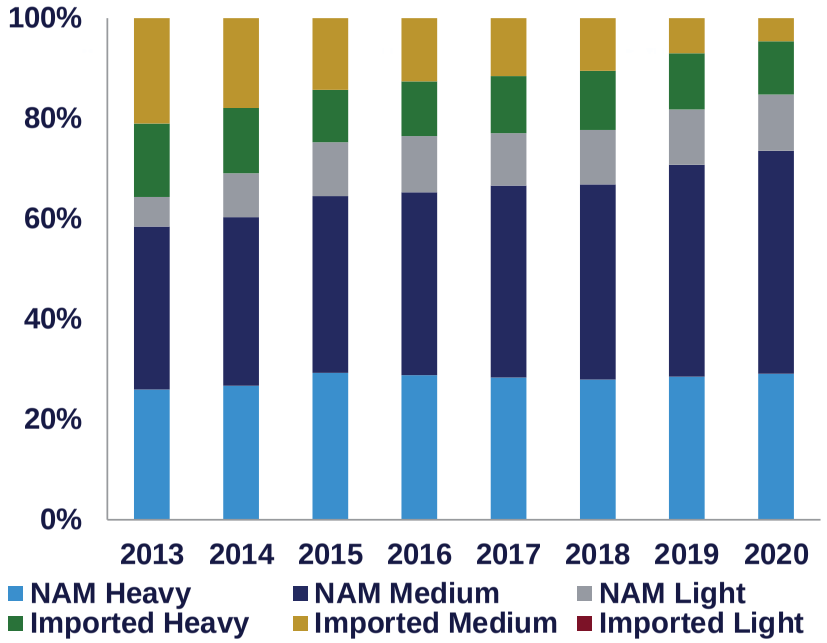
Source: Wood Mackenzie

Upward product (ULSD, IFO) price pressure as North American supply (including LTO) enters PADD V, with negative yield impact on heavier cuts

Light/Medium Rail Offloading Capacity[1]



PADD V Crude Slate



- LTO penetration will largely be confined to PNW as there is limited crude by rail into California; the PNW is expected to continue running as many Bakken volumes as possible

Source: Wood Mackenzie

Notes:
1. Assumes rail offloading capacity is 75% of maximum daily rate

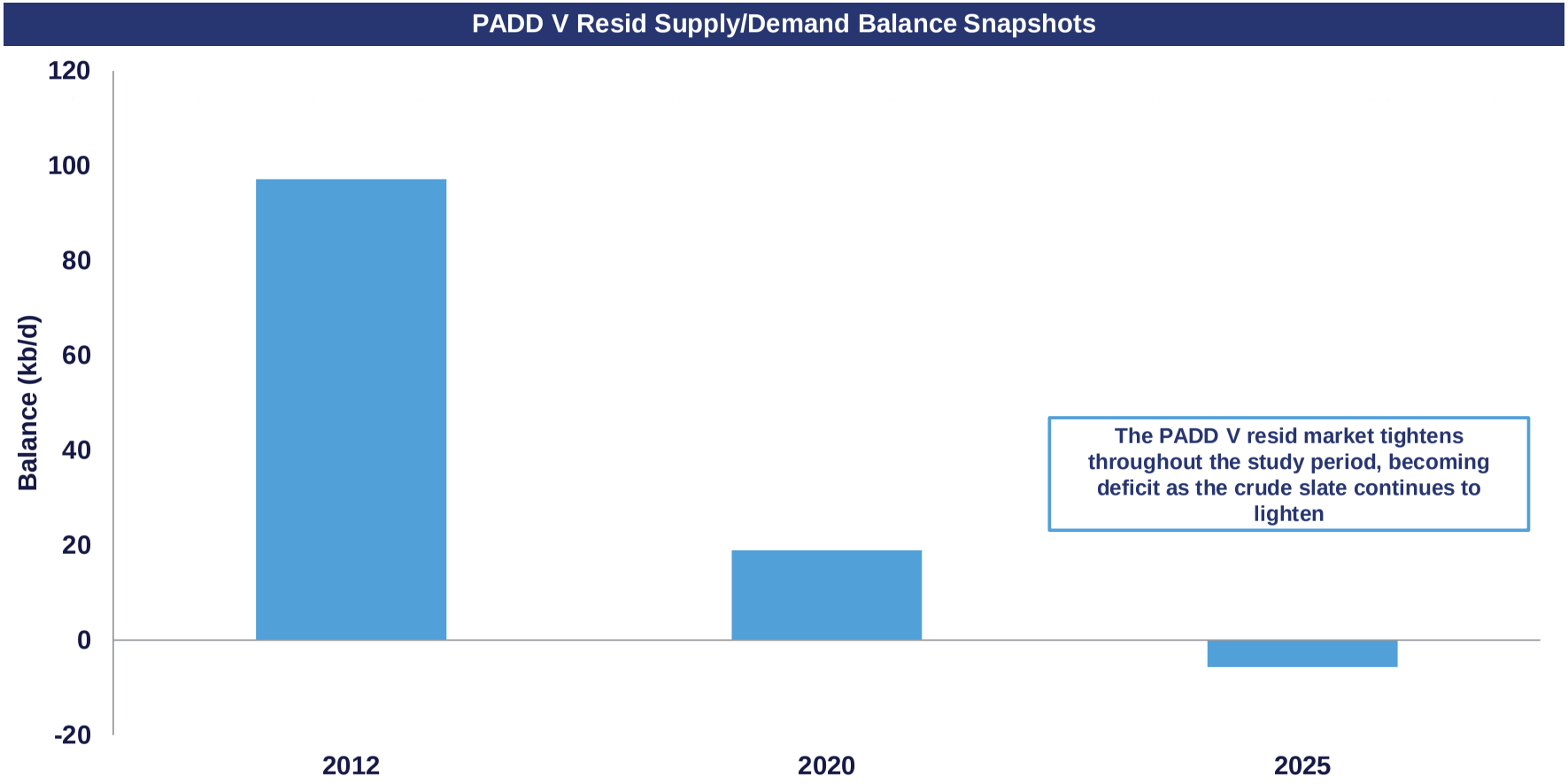
Wood Mackenzie has identified a number of possible risk factors to our ULSD and IFO-380 price forecast

Risk Factor	Consequences	Effect on ULSD Price	Effect on IFO-380 Price
California LCFS Regulations	• Due to inability of PNW refineries to make LCFS diesel, PNW diesel surplus is exported to Japan • California exports of non-LCFS diesel find a new market in Asia (Singapore) • Due to the more stringent diesel specifications, hydrotreating finishing becomes more valuable	Price Decrease: decreased demand and exports to Asian markets	No Price Effect: the price spread increases due to hydrotreating becoming more valuable in the face of more stringent diesel specifications
MARPOL Regulations	• MARPOL regulations cause gasoil to be substituted for fuel oil, increasing diesel demand • Fuel oil is pushed out of the bunker market, increasing gasoil price and decreasing resid price	Price Increase: increased diesel demand	Price Decrease: decreased IFO-380 demand, though tempered by the corresponding increase in gasoil price
Heavy Crude Supply/Demand Balance	• A short balance of heavy crude increases the value of heavy crude, which in turn increases the value of resid	No Price Effect	Price Increase: increased value of resid causes processing cost of IFO-380 to increase
Tight Oil (LTO) Production	• Reduced distillate yield reduces the supply of ULSD • Reduced resid yield increases the price of residuals which are used to blend fuel oil	Price Increase: reduction in ULSD supply	Price Increase: decreased supply of resid increases their price, causing cost of IFO-380 processing to increase as well

Notes:
1. LCFS = Low Carbon Fuel Standard. Compliant fuels are a separate commodity from standard ULSD.

Price Increase Price Decrease No Price Effect

Price downside is limited as IFO-380 becomes deficit, implying import price parity as the price-setting mechanism and providing upward price pressure



Source: Wood Mackenzie

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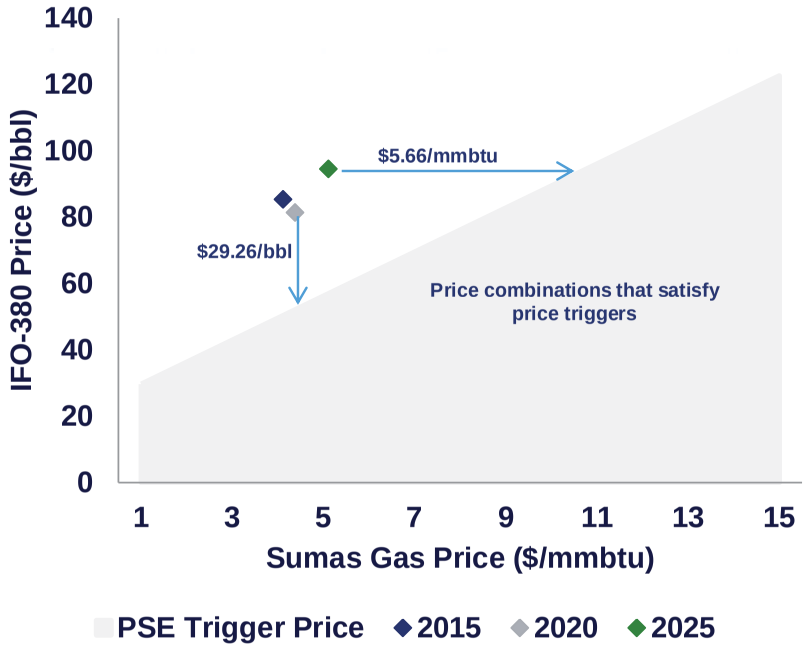
CONCLUSIONS

Key Conclusions

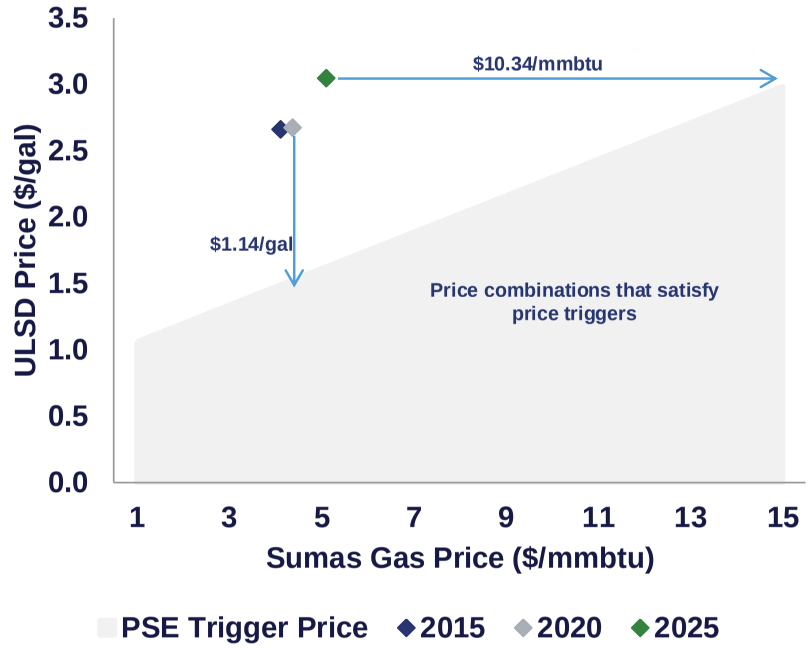
- **Even in the event of a "perfect storm", a substantial price spread will emerge and be sustained**
  - » Gas demand (e.g. LNG, NGV) needs to increase by an extreme amount before prices begin to approach trigger prices
  - » Decreasing supply from increased LTO and price support from oil project breakevens keep product prices at a premium versus gas
  - » Market forces are able to adjust to worst case scenarios in a span of months to push them back towards the base case
- **ULSD and IFO-380 price spreads to Sumas gas are sustained throughout the study period as crude supply shifts towards lighter products**
  - » Production of ULSD and IFO-380 will decrease due to lightening of the crude slate, while overall product demand in PNW is forecast to remain relatively constant through 2030
  - » PNW is a net importer of ULSD and net exporter of IFO-380 so price-setting mechanisms do not change
  - » IFO-380 price has the potential to strengthen due to local resid market deficit with lighter USWC crude slate
- **Wood Mackenzie does not expect Sumas gas price to increase significantly, remaining in the $4.00-$5.25/mmbtu range**
  - » Currently existing 2P reserves are sufficient to supply forecast demand through at least 2030
  - » Even a doubling of LNG demand and NGV penetration does not materially change production cost

Price risk factors would need to manifest in the extreme in order to collapse the price spread

IFO-380 Trigger Prices (Base Case)



ULSD Trigger Prices (Base Case)

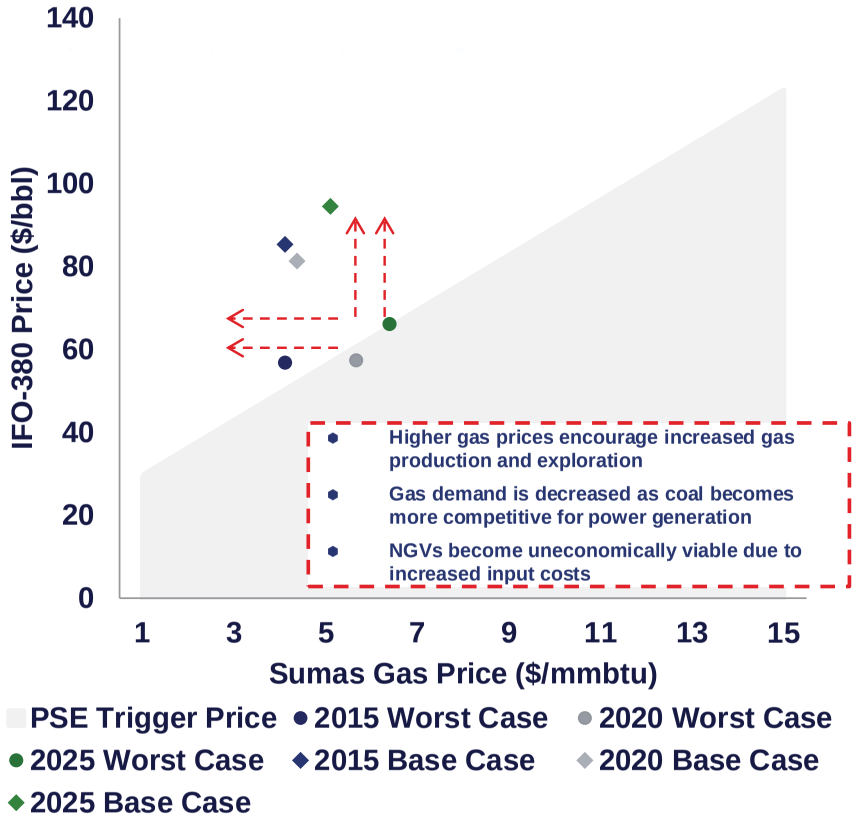


- Not only would all proposed BCLNG capacity need to be fully utilized, but NGV demand would also have to grow by an enormous amount (*more than all forecast North American diesel demand*)
- For IFO-380 and ULSD prices to drop below the trigger line, LTO production would need to drop by a significant amount and be replaced by heavy crudes from Canadian oil sands in the North American crude slate

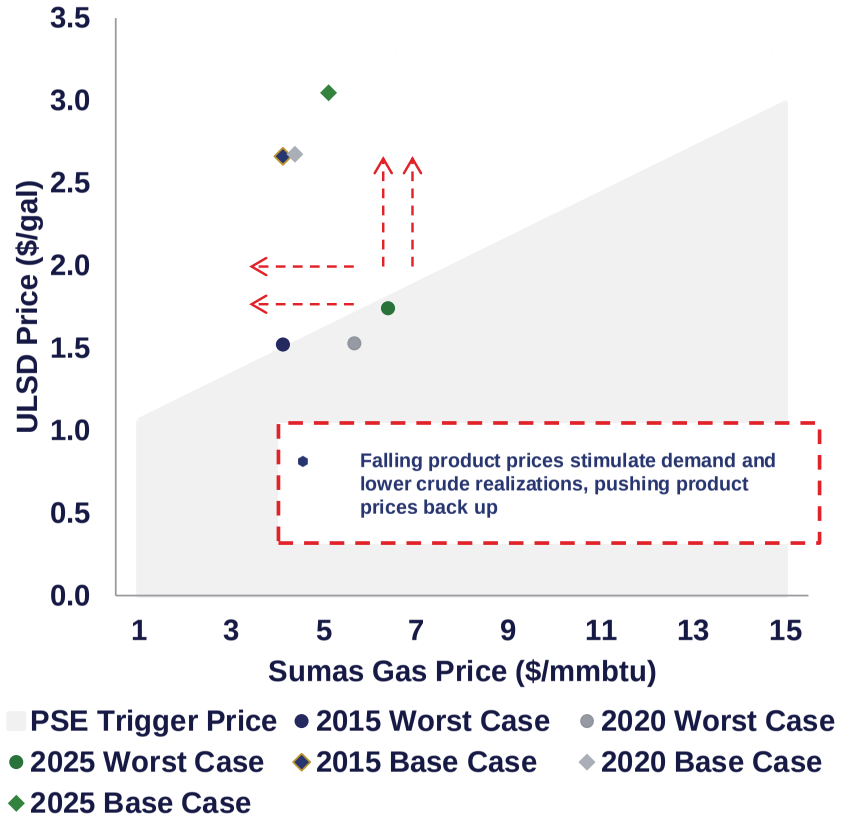
Source: Wood Mackenzie

Even if the spread does collapse for a short time, market forces will push prices back towards the base case and away from the trigger line

IFO-380 Trigger Prices (Worst Case)



ULSD Trigger Prices (Worst Case)



Source: Wood Mackenzie

Agenda

1 Executive Summary

2 Sumas Gas Price Dynamics and Risks

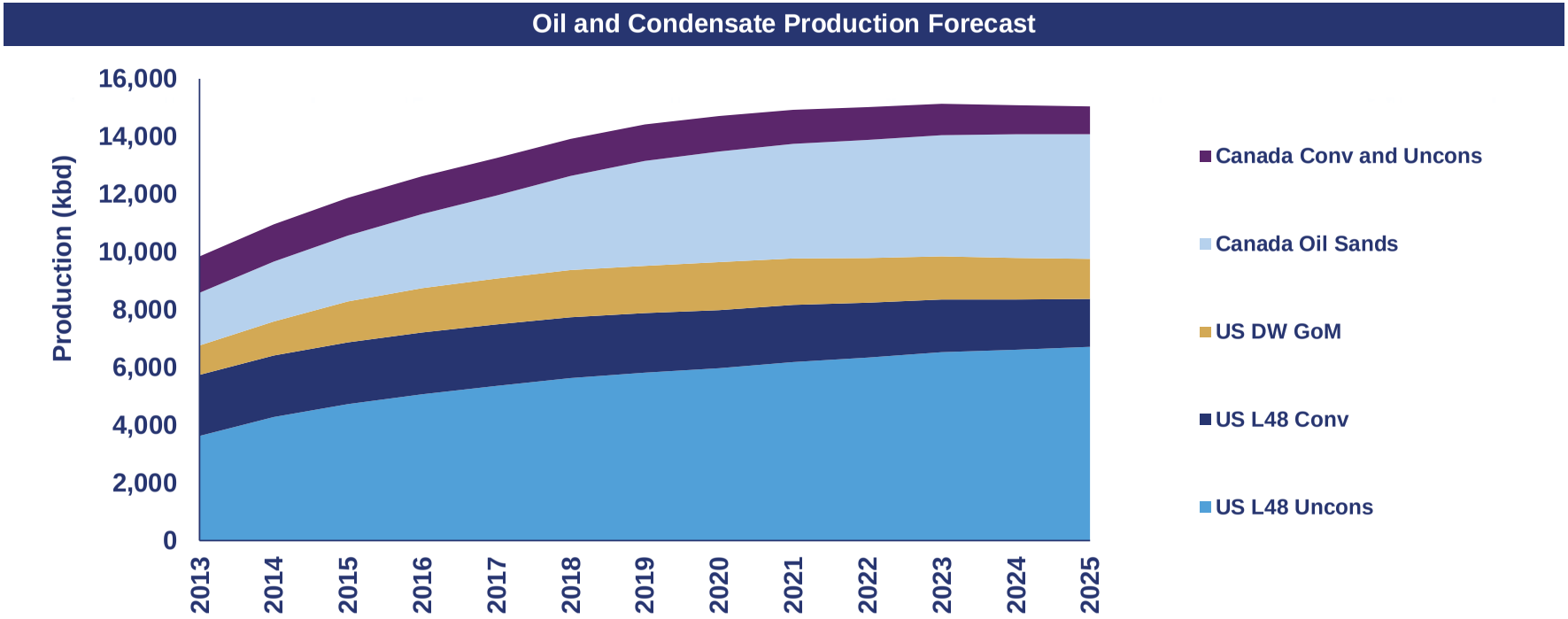
3 ULSD and IFO-380 Price Dynamics and Risks

4 Conclusions

5 **Appendix**

APPENDIX

Total North American production is forecast to increase to ~16 million barrels by 2025, driven by growth in US uncons and Canada oil sands



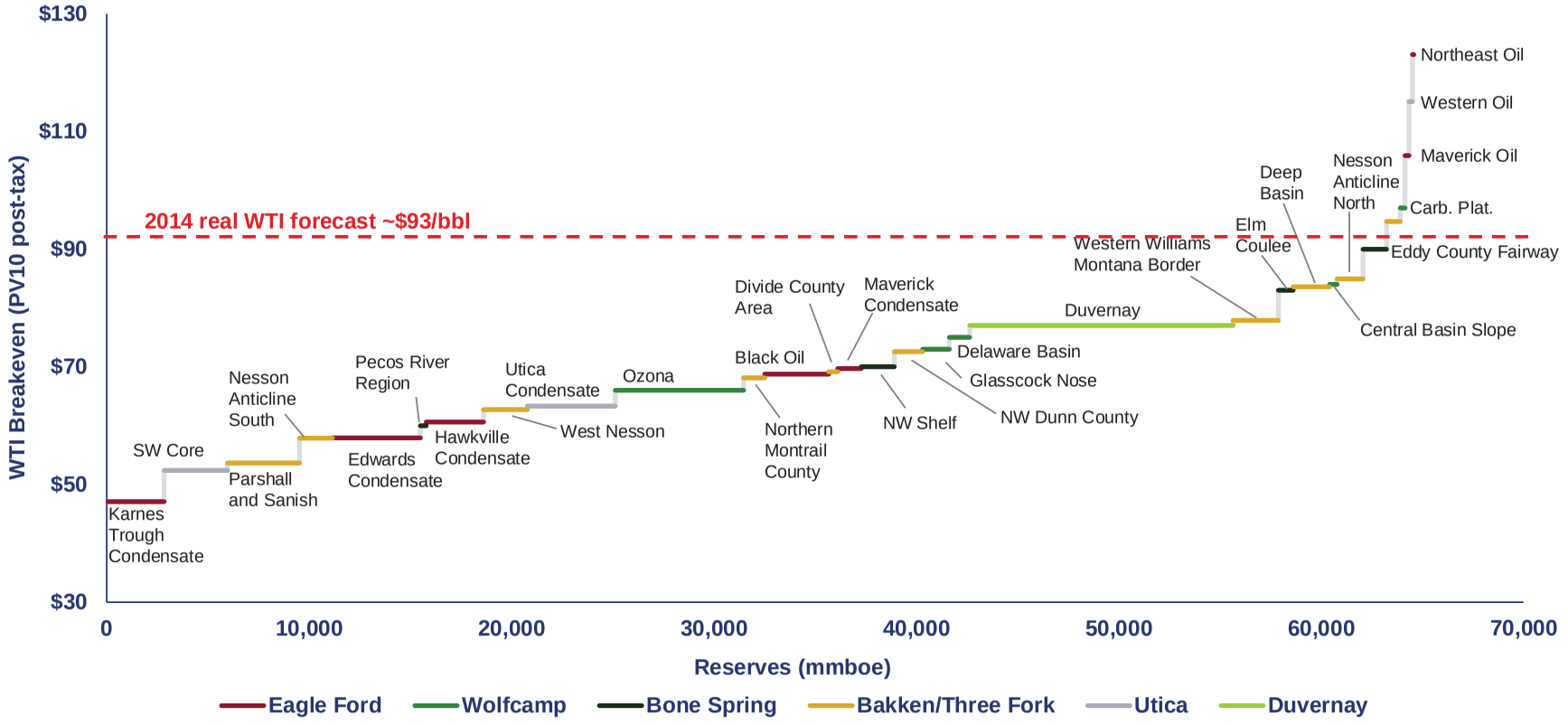
- Production growth is most aggressively forecast from US tight oil and Canadian bitumen projects, which will create a "barbell" of API quality grades skewed towards the light and heavy ends of the spectrum

Source: Wood Mackenzie

APPENDIX

Significant tight oil reserves have been identified, with much of the available supply base comfortably economic at current US oil prices

Analysis of PV10 Breakeven Oil Price[1] by Sub-Play[2]



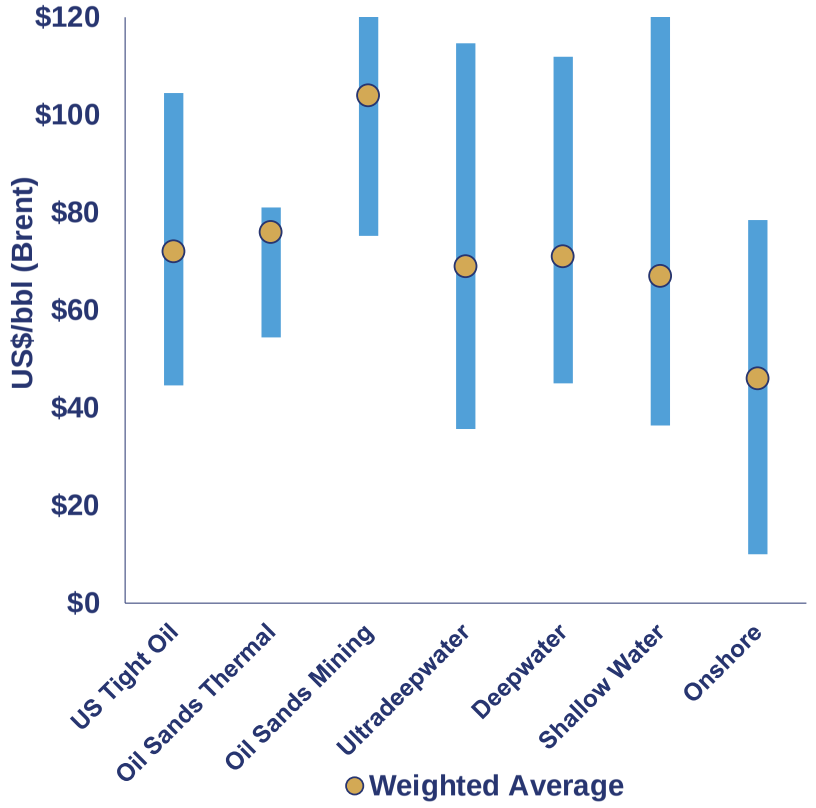
Source: Wood Mackenzie

Notes:
1. Breakeven analysis includes current views of typical drilling & completion costs, per-well infrastructure Capex, operating expenses and fiscal take; excludes lease acquisition and E&A
2. These are sub-plays recognized by Wood Mackenzie and reflect different well performances and economics

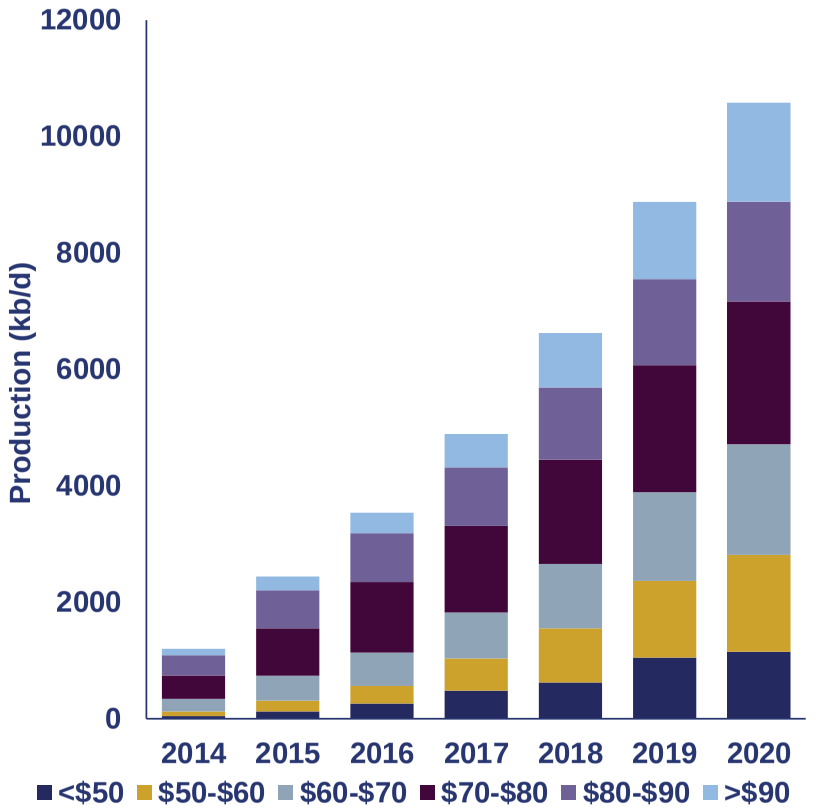
APPENDIX

Breakevens for new projects provide some support for prices, as a third of new oil developments requires more than $80 per barrel to breakeven

Breakevens for New Oil Developments



Production from New Oil Developments by Breakeven

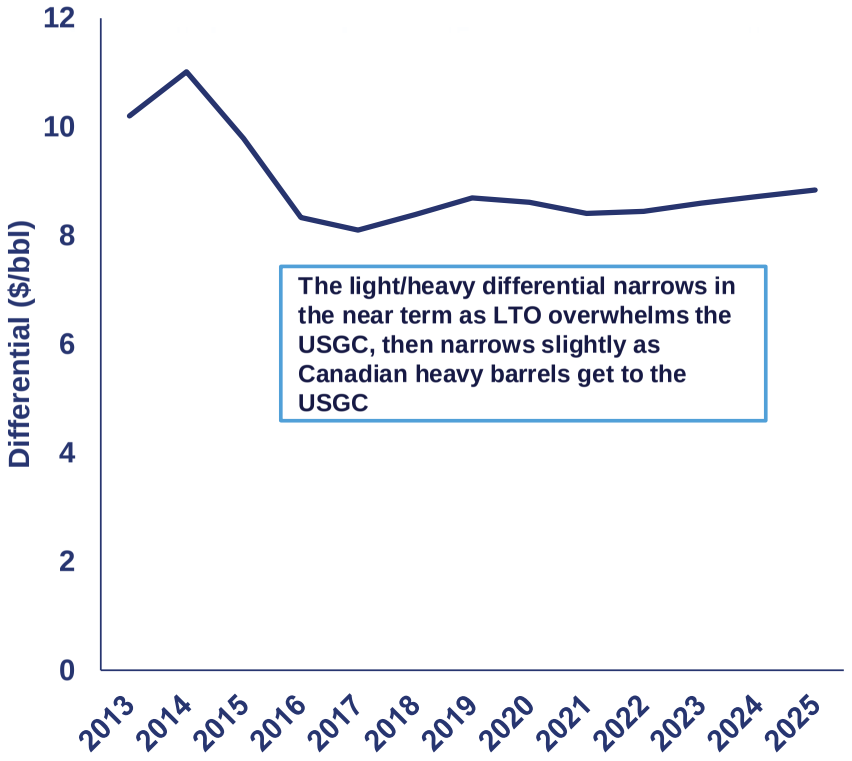


Source: Wood Mackenzie

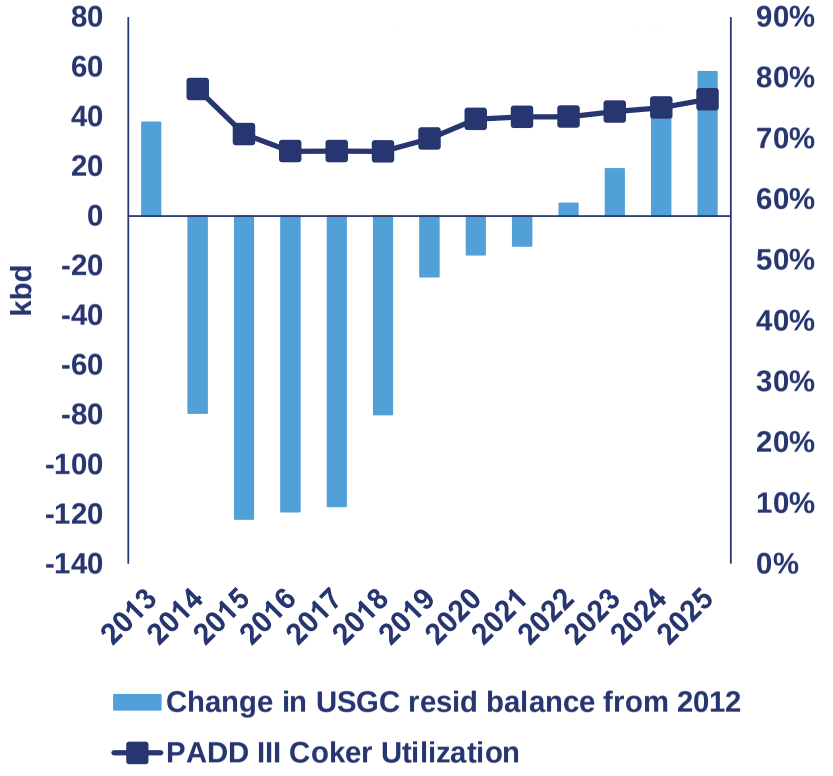
APPENDIX

Heavy crude is expected to remain in short supply with tight oil dominating much of North American supply

LLS – Maya Differential



PADD III Coker Feed Supply Change



Source: Wood Mackenzie

Contacts

Iain McAlpine
Head of Americas Downstream
T +44 (0)131 243 4509
E iain.mcalpine@woodmac.com

Harold “Skip” York, PhD
Principal Analyst - Downstream, Midstream & Chemicals
T +1 713 470 1667
E skip.york@woodmac.com

Erich Linder
Managing Consultant, Downstream
T +1 713 470 1806
E erich.linder@woodmac.com

Jason Pan
Consultant
T +1 713 470 1689
E jason.pan@woodmac.com

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Europe +44 131 243 4400
Americas +1 713 470 1600
Asia Pacific +65 6518 0800

Email contactus@woodmac.com
Website www.woodmac.com

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PSE PUGET SOUND ENERGY Wood Mackenzie

PUGET SOUND ENERGY

Exhibit R.

Current and Future Marine Emission Standards

Prepared by ABS Consulting

CONFIDENTIAL per Protective Order in
WUTC Docket No. UG-151663

ABS Consulting
RISK CONSULTING DIVISION

Current and Future Marine Emissions Standards and Related Compliance Strategies

Prepared for Puget Sound Energy

By

ABS Consulting

September 14, 2015

Current and Future Marine Emissions Standards and Related Compliance Strategies

Background

Shipping accounts for a significant portion of the world's nitrogen oxide (NOx) emissions, approximately 15% of total NOx emissions. The shipping industry is also a significant emitter of sulfur oxide (SOx), accounting for 5% and 8% of the world's total SOx emissions. Today, globally, approximately 1.8 million tons of particulate matter (PM) are emitted from marine sources, representing a 50% increase from 1997 levels. Additionally, emissions from shipping currently represent 3% of the world's total greenhouse gas (GHG) emissions, and the industry's share is increasing. A continued increase in international marine transport without any significant gains in energy efficiency may result in shipping being responsible for 6% of the world's GHG emissions by 2020 and 15% by 2050 (Jean-Florent & Pedro Andre, 2013)

The International Maritime Organization (IMO) is a specialized agency of the United Nations, IMO is the global standard-setting authority for the safety, security and environmental performance of international shipping. Its main role is to create a regulatory framework for the shipping industry that is fair and effective, universally adopted and universally implemented. The member states of the IMO are bound by convention to enforce the regulations of IMO. In the United States the U.S. Coast Guard is the primary enforcement agency charged with insuring that IMO standards are implemented for U.S. flagged vessels that trade internationally and for confirming that all foreign flag vessels entering U.S. water are in compliance with IMO standards.

In the last ten years regulatory bodies such as IMO and the national environmental protection agencies of many countries have issued regulations that seek to drastically reduce emissions emanating from marine sources. To date, these regulations have been focused on SOx and NOx. In the United States, the Environmental Protection Agency (EPA) has also mandated emission requirements for marine engines that supplement the requirements of IMO. However, EPA regulations are more focused on NOx and PM reductions. For SOx emissions, IMO has mandated the use of low sulfur content fuel or exhaust after-treatments, while the EPA has focused on requiring manufacturers to redesign marine engines to meet NOx and PM reductions standards.

Both the EPA and the IMO are phasing in implementation of emission standards based on horsepower (kW/HP) and engine displacement (L/cyl). Figure 1 provides a timeline of both the international and domestic implementation dates. It is important to note that the IMO standards designate their Tiers with a Roman numeral, while the EPA designates their Tiers with an Arabic numeral.

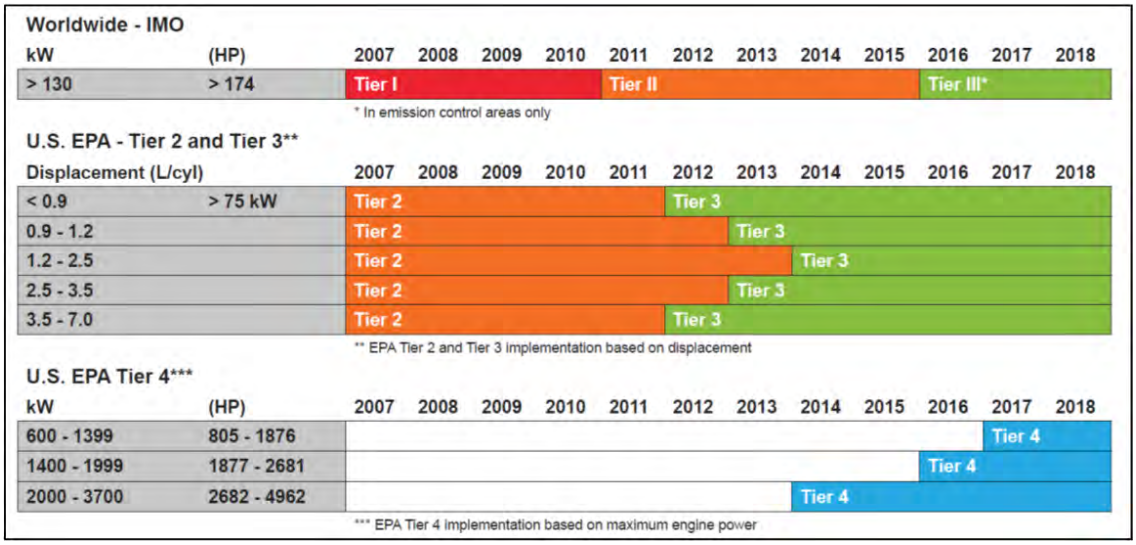

Figure 1, Source (Cummins, 2008)

To comply with these standards, vessel owners have limited options. They can install exhaust after-treatment equipment, they can switch to low sulfur fuel, or they can switch to alternative fuels, like LNG (McGill, Remley, & Winther, 2013).

In conjunction with requiring emission reductions, the IMO, EPA, and other regional regulatory bodies have established geographically based Emissions Control Areas (ECAs) to enforce SOx and NOx emission standards. The map below in Figure 2 shows the current and potential future ECAs.

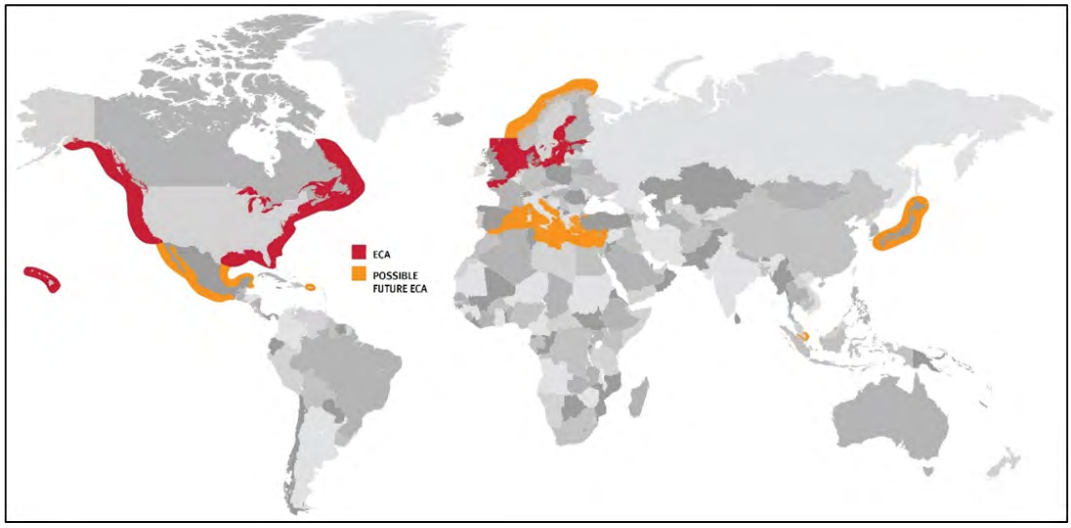

Figure 2, Source (Davidson & Billemeyer, 2014)

Vessels operating in the ECAs are required to use low sulfur fuels or add SOx exhaust after-treatment to comply. The table below in Figure 3 provides an overview of the applicable SOx standards and

implementation dates. The next significant change in SOx standards will occur in 2020 when the global standard for marine fuel drops to 0.5% sulfur content.

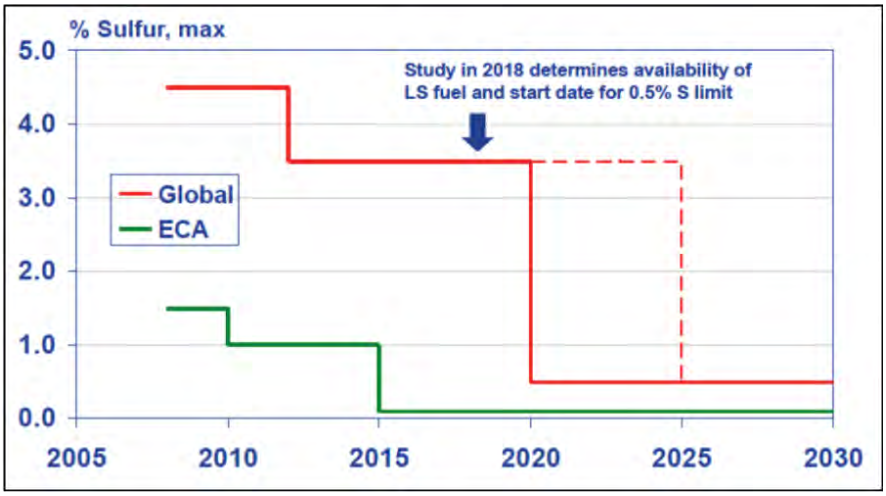

Figure 3, Source (Allen III, 2010)

U.S. Maritime Emissions Regulations

On January 1, 2004, the EPA mandated a staged reduction of NOx and PM from marine engines. The EPA's Tier 2 regulations represented a 27% reduction in NOx compared to existing standards and introduced a PM limit for the first time. The Tier 3 regulations took effect in the United States in January 2012, representing a 50% reduction in PM and a 20% reduction in NOx compared to existing Tier 2 standards. The table in Figure 4 lists the enabling Code of Federal Regulations.

40 CFR part 1042	Emission Standards and Certification Requirements—Tier 3 and Tier 4
40 CFR part 94	Emission Standards and Certification Requirements—Tier 1 and Tier 2 for engines at or above 37 kW
40 CFR part 89	Emission Standards and Certification Requirements—Tier 1 and Tier 2 for engines below 37 kW
40 CFR part 1068	General Compliance Provisions
40 CFR part 1065	Engine Exhaust Emission Test Procedures
40 CFR part 1043	Regulations implementing MARPOL Annex VI, including requirements for in-use fuels, engines above 130 kW, and vessels with those engines

Figure 4, Source (United States Environmental Protection Agency, 2015)

EPA Tier 4 regulations began phasing in January 2014 for commercial engines with a maximum power greater than 600 kW (804 HP) outline in Figure 5. The EPA Tier 4 regulations represent a 90% reduction in PM and an 80% reduction in NOx compared to existing Tier 2 standards (Cummins, 2008).

EPA Tier 4 Standards for Category 2 and Commercial Category 1 Engines above 600 kW

Maximum engine power	Displacement(L/cyl)	Model year	PM(g/kW-hr)	NO_x (g/kW-hr)	HC(g/kW-hr)
600 ≤kW <1400	all	2017	0.04	1.8	0.19
1400 ≤kW <2000	all	2016	0.04	1.8	0.19
2000 ≤kW <3700	all	2014	0.04	1.8	0.19
kW ≥3700	disp. <15.0	2014-2015	0.12	1.8	0.19
	15.0 ≤disp.<30.0	2014-2015	0.25	1.8	0.19
	all	2016	0.06	1.8	0.19

Figure 5, Source (40 CFR 1042.101)

Additionally, the EPA and IMO jointly agreed to designate the waters of the U.S. as the North American ECA, which became effective in 2012. More recently, the waters surrounding Puerto Rico and the U.S. Virgin Islands have been included as the U.S. Caribbean ECA, which became effective 2015.

The North American ECA extends 200 nautical miles (nm) from the U.S. shores and 50 nm for the U.S. Caribbean ECA. Vessels operating in an ECA must burn fuel containing a maximum of 0.1% sulfur or use scrubbers to remove the sulfur emissions (O'Malley, Steve; Walsh, Ken; Hasen, Adam; Bratvold, Delma; Ratafia-Brown, Jay, 2015).

International regulations

The International Convention for the Prevention of Pollution from Ships (MARPOL) is the foremost maritime regulatory scheme protecting the maritime environment. Annex VI (Prevention of Air Pollution from Ships) of MARPOL sets the international limits on SOx and NOx emissions and are commonly referred to as Tiers I, Tier II and Tier III standards. The Tier I standard was defined in 1997, while the Tier II/III standards were introduced by amendments adopted in 2008. Figure 6 displays the date these standards actually came (or will come) into effect. The 2008 amendments set the Tier II and Tier III NOx emission standards for new engines, and Tier I NOx requirements for existing pre-2000 engines. Tier III NOx limits will apply to all ships operating within an ECA constructed on or after 1 January 2016 with engines over 130 kW (174 HP). In conjunction with NOx standards, the 2008 amendments also set stricter fuel standards. The table in Figure 7 provides a summary of these standards and their applicability dates. In summary, a 0.1% percent low-sulfur fuel requirement applies to all ships over 400 gross tons entering any ECA after January 1, 2015, with a phase-in of stricter global standards that become effective in 2020.

Tier	Effective Date	NO_x Emission Limit (g/kWh)		
		RPM (n < 130)	RPM (130 ≤ n < 2000)	RPM (n ≥ 2000)
I	2004	17.0	$45 \cdot n^{-0.2}$	9.8
II	2011	14.4	$44 \cdot n^{-0.23}$	7.7
III	2016 *	3.4	$9 \cdot n^{-0.2}$	1.96

* In NO_x ECAs only (Tier II standards apply outside of ECAs).

Figure 6, Source (O'Malley, Steve; Walsh, Ken; Hasen, Adam; Bratvold, Delma; Ratafia-Brown, Jay, 2015)

Global		Within SO_x ECA	
Effective Date	Sulfur Fuel Limits	Effective Date	Sulfur Fuel Limits
2004	45,000 ppm	2005	15,000 ppm
2012	35,000 ppm	2010	10,000 ppm
2020*	5,000 ppm *	2015	1,000 ppm

* Subject to a feasibility review in 2018; may be delayed to 2025.

Figure 7, Source (O'Malley, Steve; Walsh, Ken; Hasen, Adam; Bratvold, Delma; Ratafia-Brown, Jay, 2015)

As an alternative to IMO allow by the Annex VI regulations may allow member country to approve alternative means of compliance with low-sulfur content if the means is at least as effective in terms of emissions reduction. This means that a ship may operate on fuel with a higher sulfur content than that allowed by the regulations, provided that SOx emissions are controlled to a level which is no higher than the levels emitted if using compliant fuel. Technologies like scrubbers would be one such means, provide that it is approved by the flag administration and IMO is notified of this approval (Llyod's Register, 2015).

Major Compliance Strategies

Low-Sulfur Fuel Oil:

From a technology standpoint the most effective way to reduce SOx emissions is to burn low-sulfur fuels. Most vessels' engines can run on both heavy fuel (currently the most used fuel in the industry) and low-sulfur fuel. Technically speaking, the use of low-sulfur fuel is a good solution, as it requires limited engine investment costs.

However, from an operational perspective it is economically advantageous to be able to burn fuel that has a higher sulfur content. Additionally, the process of refining fuel and converting it into low-sulfur fuel represents a significant cost for refiners. These costs will surely be passed on to shipping companies. Some industry resources estimate that prices for low-sulfur fuel could rise by 87%. Additionally, switching to low-sulfur only address SOx emissions (Jean-Florent & Pedro Andre, 2013).

Vessel owners still need to address vessel NOx, and in some cases PM, emissions by other means such as Selective Catalytic Reduction (SCR) or Exhaust Gas Recirculation (EGR).

Scrubbers

Operators can use exhaust gas treatment systems like scrubbers as an alternative way to comply with the SOx emissions limits. There are two main scrubber technologies. Open-loop designs use seawater as exhaust wash water and discharge the treated wash water back to the sea. In a seawater scrubber, the exhaust gasses are brought into contact with seawater, either through spraying seawater into the exhaust stream or routing the exhaust gasses through a water bath. The sulfur dioxide (SO2) in the exhaust reacts with oxygen to produce sulfur trioxide (SO3) which then reacts with water to form sulfuric acid. The sulfuric acid then reacts with carbonate and other salts in the seawater to form solid sulfates which may be removed from the exhaust. The wash water is then treated to remove solids and the pH raised prior to its discharge back to the sea. The solids are collected as sludge and held for proper disposal ashore. Closed-loop designs use fresh water as wash water, and caustic soda is injected into the wash water to neutralize the sulfur in the exhaust. A small portion of the wash water is bled off and treated to remove sludge, which is held and disposed of at port. The treated effluent is held onboard or discharged at open sea. Additional fresh water is added to the system as needed (O'Malley, Steve; Walsh, Ken; Hasen, Adam; Bratvold, Delma; Ratafia-Brown, Jay, 2015).

There are concerns regarding the sulfates being discharged into the sea by scrubbers, as they can change the acidity of water. This change in acidity could impact seawater biodiversity, especially fish species. Research on this particular aspect of scrubbers has been limited so far (Jean-Florent & Pedro Andre, 2013). Additionally, reducing sulfur by using a wet scrubber has two immediate downsides. One, there will be increased fuel cost to power pumps for the scrubbers. Two, powering pumps may increase other pollutant emissions associated with power production, especially GHGs (O'Malley, Steve; Walsh, Ken; Hasen, Adam; Bratvold, Delma; Ratafia-Brown, Jay, 2015).

Selective Catalytic Reduction (SCR)

Among presently available after-treatment technologies, the urea-based Selective Catalytic Reduction (SCR) system represents the most tested solution to meet the marine engine Tier 3/III NOx emissions standards. An SCR system uses a catalyst to chemically convert NOx to nitrogen using urea. SCR technology is compatible with higher sulfur content fuels, and SCR systems may be equipped with a soot blower to remove particulate matter.

SCR systems require expensive intermediate inspections approximately every 2.5 years and full inspections every five years. Also, SCRs can be sensitive to low engine exhaust temperature. The common practices of slow steaming could potentially contribute to SCR operational issues at low-load operations (O'Malley, Steve; Walsh, Ken; Hasen, Adam; Bratvold, Delma; Ratafia-Brown, Jay, 2015).

Exhaust Gas Recirculation (EGR)

Many of the engines modified to meet Tier 3/III NOx emission levels will use electronically or hydraulically actuated intake and exhaust valves which can allow them to use Exhaust Gas Recirculation (EGR) technology. EGR is a mature technology that has widely been used for on-road

engines. EGR systems recirculate a portion of exhaust gas back to the engine cylinders. The recirculated gasses lower the oxygen content at the engine intake resulting in lower combustion temperatures and less NOx production.

However, the net of effect of this recirculated air is a less efficient combustion process due to the lower combustion pressure. Consequently, EGR usage presents a fuel consumption penalty. Also, EGR systems require higher quality fuel with lower sulfur content for proper operation. Though not an issue in the U.S., this fuel requirement could create complications for vessels operating abroad where low sulfur fuel may not be available (O'Malley, Steve; Walsh, Ken; Hasen, Adam; Bratvold, Delma; Ratafia-Brown, Jay, 2015).

LNG-fueled vessels

LNG as a marine fuel has immediate emission reduction benefits. LNG-fueled engines burn cleaner and do not require after-treatment or specialized NOx abatement measures to meet EPA Tier 4 or IMO Tier III. LNG as a fuel results in no SOx and negligible NOx and PM emissions. LNG has a higher hydrogen-to-carbon ratio, which makes it less CO2 intensive than oil; CO2 emissions can be 25% lower with LNG (Jean-Florent & Pedro Andre, 2013). Marine vessels equipped with scrubbers and not operating in an ECA will retain the advantage of using lower-priced Heavy Fuel Oil (HFO). Ships with limited operations in ECAs will likely continue to use low-sulfur fuel to comply. However, for vessels that spend substantial time operating within ECAs the benefits of LNG may provide enough incentive for a complete shift to LNG. The potential lack of emission controls, in conjunction with its significantly lower fuel cost, makes LNG an attractive option for compliance (O'Malley, Steve; Walsh, Ken; Hasen, Adam; Bratvold, Delma; Ratafia-Brown, Jay, 2015).

For LNG to become an attractive fuel for the majority of ships, a global network of LNG bunkering terminals must be established. Additionally, LNG storage and support systems and the volumetric energy density of LNG, which can be up to three times higher than low sulfur fuels, may pose space challenges for many vessel operators (O'Malley, Steve; Walsh, Ken; Hasen, Adam; Bratvold, Delma; Ratafia-Brown, Jay, 2015).

Future U.S. and International regulations

Recent surveys of maritime experts suggest that the reduction to 0.5% sulfur content globally in 2020, should pose few challenges for ship owners. However, the imposition of 0.1% sulfur content fuel to operate in ECAs has had a significant effect, especially for vessels that operate on short routes primarily with ECAs (Clean North Sea Shipping, 2014). Additionally, new ECAs in the Mediterranean, Singapore and Japan which may enter into force in the near future will increase demand for 0.1% sulfur fuel. The long-term picture for future reductions of sulfur content beyond 2020 is unclear. There has been no open discussion at IMO about the reduction of fuel sulfur content beyond 2020. However, it would be logical to speculate that the global imposition of a 0.1% sulfur content requirement is not out of the question.

In July 2011, governments at IMO agreed a comprehensive package of technical regulations for reducing shipping's CO2 emissions which entered into force in January 2013. The IMO took the

initiative to implement two regulations to address CO2 emissions. They are the Energy Efficiency Design Index (EEDI) and the Ship Energy Efficiency Management Plan (SEEMP) regulation, which are the first ever international mandatory CO2 regulations for the shipping industry. These mechanisms, which came into effect on 1 January 2013, apply to all ships of 400 gross tons and above. While the EEDI sets a minimum energy efficiency standard for new ships, the SEEMP requires ship owners to measure the fuel efficiency of existing ships and to monitor the effects of any changes in operation. The regulation will require most new ships to be 10% more efficient beginning 2015, 20% more efficient by 2020, and 30% more efficient from 2025 (Jean-Florent & Pedro Andre, 2013). Subsequently, vessel owners are searching for options that will allow them to meet these GHG reductions standards.

Conclusion

Opportunities for LNG are emerging as a result of international and domestic maritime emissions standards. In February 2012, Lloyd's Register, a voluntary association of ship owners, ship builders, engine builders, and insurance underwriters, surveyed some of the world's leading shipping companies about their intention to implement technologies to mitigate emissions. The survey asked participants to examine four different options for meeting new emission standards: low-sulfur fuels (designated as Marine Gas Oil [MGO] in Figure 8), dual-fuel (engines capable of using compressed or liquefied natural gas and low sulfur fuel), scrubbers, and liquefied natural gas (LNG) only. The respondents were asked to declare the likelihood of adopting one of these solutions in the short, medium or long terms. The results of this survey are presented in Figure 8 below. Low sulfur fuel was considered the best short-term solution for mitigation, with scrubbers being a solution in the medium term, and dual-fuel/LNG considered the best long-term solutions (Jean-Florent & Pedro Andre, 2013).

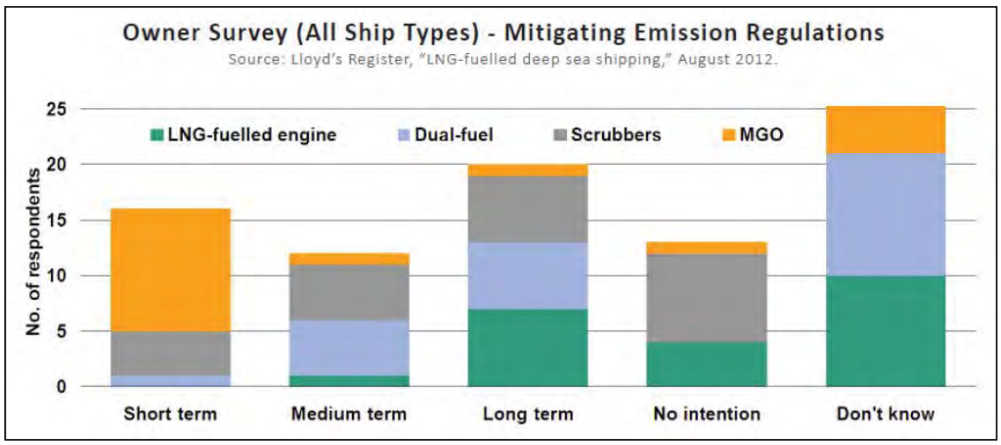

Figure 8 Source (Jean-Florent & Pedro Andre, 2013)

Operating on low-sulfur fuels is a relatively easy way to comply within ECAs. However, if the worldwide fleet of commercial ships were required to convert to 0.1% sulfur fuel beyond 2020, there is serious doubt that the current production of 0.1% fuel could meet marine fuel demand. Additionally, low sulfur fuel only tackles the SOx standards, and does not address NOx or PM. Scrubbers are effective but

it is highly likely the effluent from scrubbers will become the next target for international and domestic standards. If, for example, scrubbers were required to retain onboard effluents from scrubber operation and only discharge them ashore, this would significantly drive up the cost.

Ultimately, there is no "silver bullet" solution to address all the current or potential future emission requirements. Vessel owners will have to keep all options, or more likely combinations of options, on the table. Nonetheless, the use of LNG as fuel for ships represents a real alternative to conventional marine fuel, especially when meeting current and expected future regulated emissions of CO2, SOx, NOx, and particulate matter (Lloyd's Register, 2012).

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