BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

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EXHIBIT NO._____(SAH-2)

STEPHEN A. HARPER

REPRESENTING AVISTA CORPORATION

# 2012 Natural Gas Integrated Resource Plan

**August 31, 2012**

**www.avistautilities.com**

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Note: Appendices provided under separate cover.

# II SAFE HARBOR STATEMENT

This document contains forward-looking statements, including statements regarding our current expectations for future financial performance and cash flows, capital expenditures, financing plans, our current plans or objectives for future operations and other factors, which may affect the company in the future. Such statements are subject to a variety of risks, uncertainties and other factors, most of which are beyond our control and many of which could have significant impact on our operations, results of operations, financial condition or cash flows and could cause actual results to differ materially from those anticipated in such statements.

For a further discussion of these factors and other important factors please refer to the Company's reports filed with the Securities and Exchange Commission, which are available on our website at www.avistacorp.com. The forward-looking statements contained in this document speak only as of the date hereof. We undertake no obligation to update any forward-looking statement or statements to reflect events or circumstances that occur after the date on which such statement is made or to reflect the occurrence of unanticipated events. New factors emerge from time to time, and it is not possible for management to predict all of such factors, nor can it assess the impact of each such factor on our business or the extent to which any such factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statement.

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# 2012 IRP KEY MESSAGES

- Avista has a diversified portfolio of existing natural gas supply resources including owned and contracted storage, firm capacity rights on six pipelines and purchase contracts from several different supply basins. Our philosophy is to reliably provide natural gas to customers with an appropriate balance of price stability and prudent cost.
- Avista's 2012 Integrated Resource Plan (IRP) forecasts lower demand for all service territories than our previous plans. These reductions are driven by lower growth rates and declining use-per-customer in our service territories than originally anticipated driven primarily by the recession.
- Additional resource needs do not occur until well into the future. In Oregon, the first resource deficits occur in 2029 and in Washington and Idaho in 2030. Demand growth averages 1.3 percent per year in the respective jurisdictions. Customer accounts are expected to grow at an annual average rate of 1.6 percent and 1.7 percent, respectively. Our plan indicates incremental pipeline transportation capacity is the preferred resource to meet the identified needs.
- An important risk with the identified future resource deficits is the relatively flat slope of forecasted demand growth. Implied in this outlook is existing resources will be sufficient to meet demand for most of the 20 year planning horizon. However, should demand growth accelerate, the steepening of the demand curve could quickly accelerate resource shortages by several years.
- Other risks evaluated include long term natural gas pricing levels, potential impacts of carbon legislation and hydraulic fracturing, future availability of existing regional resources, implication of exporting LNG, alternate weather planning standard, and potential NGV/CNG demand.
- Conservation potential is an integral component of our IRP process and a starting point for the DSM business planning process, as these programs result in multiple benefits including reduced customers' bills, reduced supply-side resource needs and reduced greenhouse gas (GHG) emissions. Lower avoided costs have challenged the cost-effectiveness of natural gas DSM programs, resulting in filings to suspend programs in Washington and Idaho. The Oregon DSM portfolio is currently under evaluation.
- The IRP identifies and establishes an Action Plan that continues to guide us toward the risk-adjusted, least-cost method of providing service to our natural gas customers. Included in this Action Plan are efforts to closely monitor avoided costs and the cost effectiveness of natural gas DSM, evaluate current price elasticity adjustment, watch LNG export trends, and perform gate station analysis.

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# Chapter 1 ‖ Executive Summary

Avista's 2012 Natural Gas Integrated Resource Plan (IRP) identifies a strategic natural gas resource portfolio that meets future customer demand requirements over the next 20 years. While the primary focus of the IRP is ensuring our ability to meet customer's needs under peak weather conditions, this process also provides a methodology for evaluating customer needs under normal or average conditions. The formal exercise of bringing together customer demand forecasts with comprehensive analyses of resource options, including supply-side resources and demand-side measures, is valuable to Avista, its customers, Regulatory Commissions and other stakeholders for long-range planning.

## IRP Process and Stakeholder Involvement

The IRP is a coordinated effort by several Avista departments along with input from our Technical Advisory Committee (TAC), which includes Commission Staff, peer utilities, customers and other stakeholders. This group is a vital component of our IRP process, as it provides a forum for the exchange of ideas from multiple perspectives, identifies issues and risks and improves analytical methods. Topics discussed with the TAC include natural gas demand forecasts, demand-side management (DSM), supply-side resources, computer modeling tools and distribution planning. The end result is an integrated resource portfolio designed to serve our customers' natural gas needs well into the future while balancing cost and risk.

## Planning Environment

Uncertainty is a factor in any forecast, and while there are many uncertainties to consider in this IRP there is one element that has become clear. Shale gas has changed the landscape for North American supply and turned the price of natural gas on its head. While shale is not new, the technological improvements for extraction, the value of natural gas liquids and the amount of gas associated with oil extraction have significantly impacted the volume and cost of the supply mix. Couple this with declining use-per-customer and stagnant customer growth due to the prolonged effect of the recession and you have a supply glut driving prices to lows not seen in the last decade. Even though we are hopeful that low-cost natural gas will be available for many years to come, there are no guarantees, so we continue to challenge key assumptions and perform our "what if" analysis in order to cover a broad range of possibilities.

## Demand Forecasts

In this IRP, we define eight distinct demand areas, which are structured around the pipeline transportation and storage resources that serve them. Our demand areas are aggregated into four large service territories (Washington/Idaho; Medford/Roseburg, Oregon; Klamath Falls, Oregon and La Grande, Oregon) and then disaggregated by the pipelines that serve them. The Washington/Idaho service territory is disaggregated into areas that can be served only by Northwest Pipeline (NWP), only by Gas Transmission Northwest (GTN) and by both pipelines. The Medford service territory is also disaggregated into an area that can only be served by NWP and GTN.

Avista's approach to demand forecasting focuses on customer growth and use-per-customer as the base components of demand. We recognize and have accounted for weather as the most significant direct demand-influencing factor. We also study other factors that influence demand, including population, employment trends, age and income demographics, construction trends, conservation technology, new uses development (e.g. natural gas vehicles) and use-per-customer trends.

Recognizing that customers adjust consumption in response to price, we also analyzed factors that could influence natural gas prices and demand through price elasticity. These included:

- Supply Trends – Shale gas, Canadian supply availability, and export LNG
- Infrastructure Trends – regional pipeline projects, national pipeline projects, and storage
- Regulatory Trends – subsidies, market transparency/speculation, and carbon legislation
- Other Trends – thermal generation, and energy correlations (i.e. oil/gas, coal/gas, liquids/gas)

We developed a historical-based reference case and conducted sensitivity analysis on key demand drivers by varying assumptions to understand how demand changes. Using this information and incorporating input from the TAC, we formed several alternate demand scenarios for detailed analysis. Table 1.1 summarizes these scenarios, which do not represent the maximum bounds of possible cases, but frame a range of potential outcomes. Within this range, we define an Average Case, which represents our demand forecast for normal planning purposes. Then we define an Expected Case, which we view as the most likely scenario for peak day planning purposes.

| Table 1.1<br>Demand Scenarios |
|---|
| **Average Case** |
| **Expected Case** |
| **High Growth, Low Price** |
| **Low Growth, High Price** |
| **Alternate Weather Standard** |

The IRP process defines the methodology and is the basis for the development of two primary types of demand forecasts – annual average daily and peak day. First is an evaluation of annual average daily demand forecasts which are useful for preparing revenue budgets, developing natural gas procurement plans and preparing purchased gas adjustment filings. Peak day demand forecasts are critical for determining the adequacy of existing resources or the timing for new resource acquisitions to meet our customers' natural gas needs in extreme weather conditions. The demand forecasts from the Average and Expected Cases revealed the following:

**ANNUAL AVERAGE DAILY DEMAND** – Average day, system-wide core demand is projected to increase from an average of 96,160 dekatherms per day (Dth/day) in 2012 to 117,660 Dth/day in 2031. This is an annual average growth rate of 1.1 percent and is net of projected conservation savings from DSM programs.[1]

**PEAK DAY DEMAND** – Coincidental peak day, system-wide core demand is projected to increase from a peak of 365,720 Dth/day in 2013 to 474,670 Dth/day in 2031. Forecasted non-coincidental peak day demand peaks at 341,850 Dth/day in 2012 and increases to

[1] Appendix 3.9 shows gross demand, DSM savings and net demand.

440,630 Dth/day in 2031, a 1.3 percent compounded growth rate in peak day requirements. This is also net of projected conservation savings from DSM programs.

Figure 1.1 shows forecasted **average daily demand** for the five main demand scenarios modeled over the planning horizon.

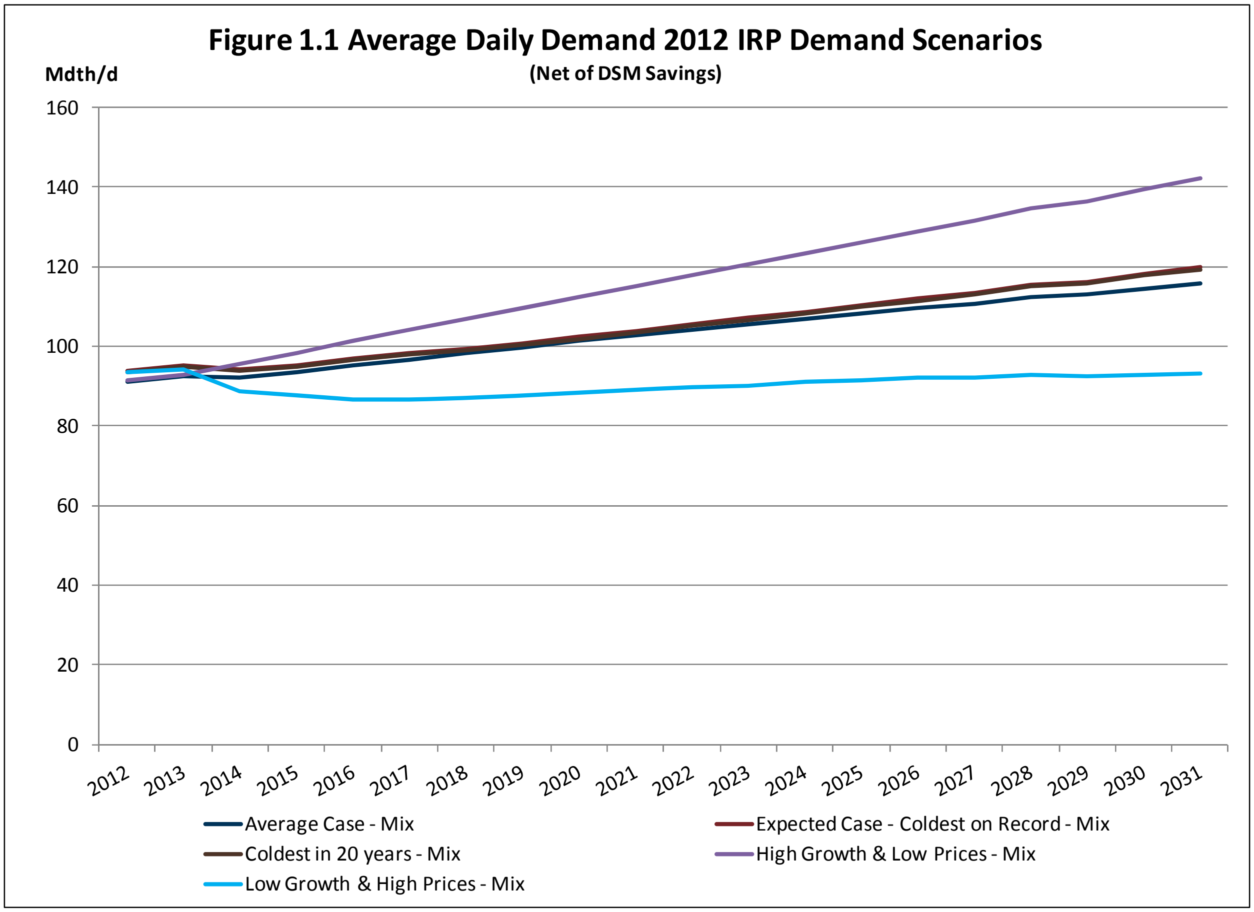
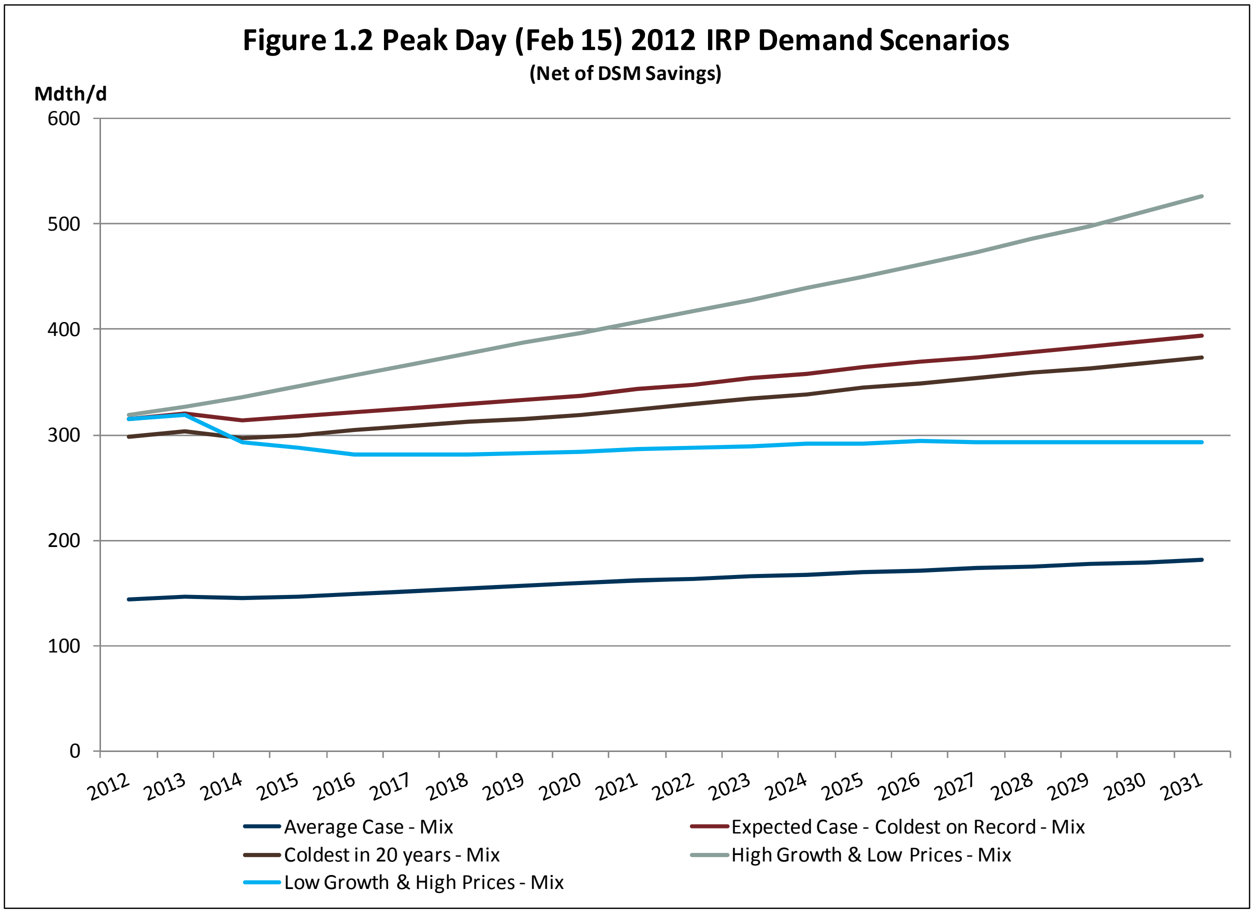



Figure 1.2 shows forecasted system-wide **peak day demand** for the five main demand scenarios modeled over the planning horizon.




## NATURAL GAS PRICE FORECASTS

Natural gas prices are a fundamental component of integrated resource planning because the commodity price is a significant component of the total cost of a resource option. This affects the avoided cost threshold for determining cost-effectiveness of conservation measures. The price of natural gas also influences the consumption of natural gas by customers.  A price elasticity adjustment to use per customer is modeled to reflect customer response to changing natural gas prices.

At the end of our last planning cycle the impacts of shale gas on market prices were just beginning to be realized. Forecasters anticipated that this resource could have a significant impact on lowering prices over the long term. However, a faster recovery of customer growth, aggressive carbon legislation in the near term, and sizeable coal switching creating significant gas-fired demand were also anticipated. These factors produced price forecasts, while lower than previous forecasts, higher than current trends. Now more information is known about the costs and volumes produced by shale gas and there appears to be consensus that production costs will continue to stay low for quite some time.

Although we do not believe we can accurately predict future prices for the 20-year horizon of this IRP, we have reviewed several price forecasts from credible sources and have selected high, medium and low price forecasts to represent a reasonable range of pricing possibilities for our analysis. The range of prices provides necessary variation for addressing uncertainty of future prices. Figure 1.3 depicts the price forecasts used in our IRP.

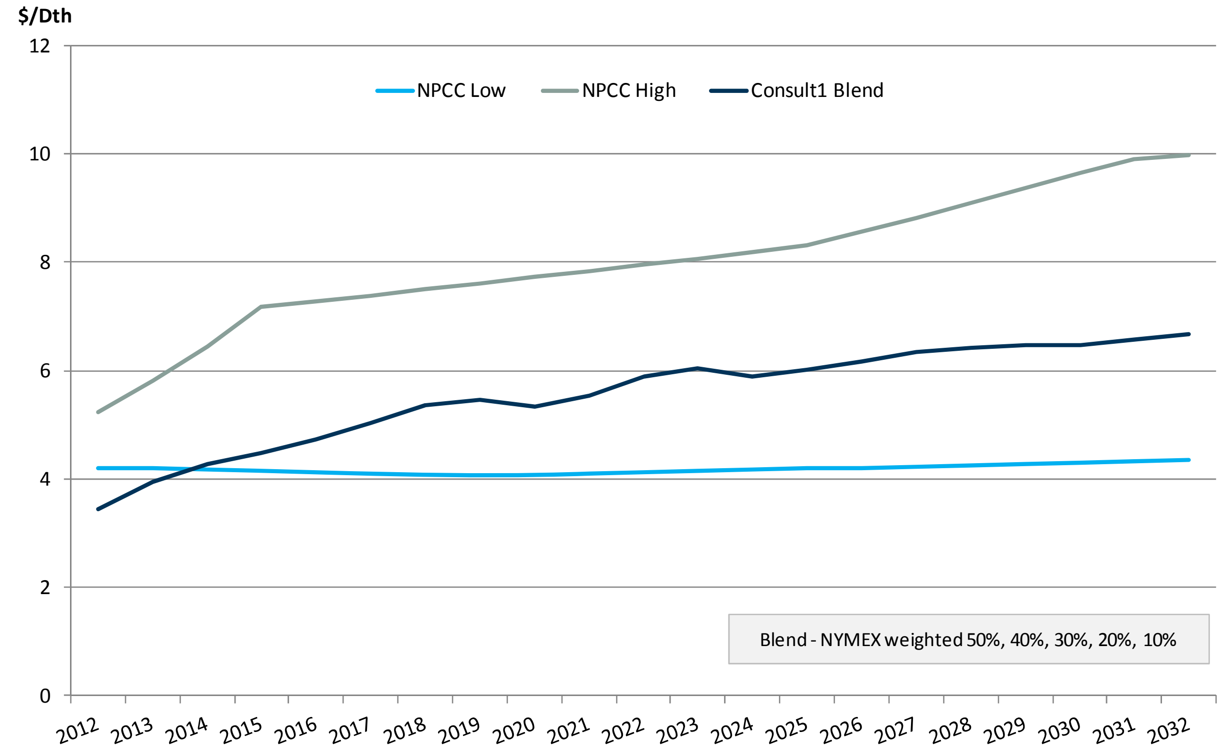



**Figure 1.3 – Henry Hub Price Forecasts for IRP Low/Medium/High Forecasted Price**
**(Real $ per Dth)**

Long run statistical analysis shows a consumption response to changes in price. In order to model a consumption response to these price curves, we utilized an expected elasticity response factor, which was applied under various scenarios. We will monitor this assumption over the IRP cycle and make any necessary adjustments.

# EXISTING AND POTENTIAL RESOURCES

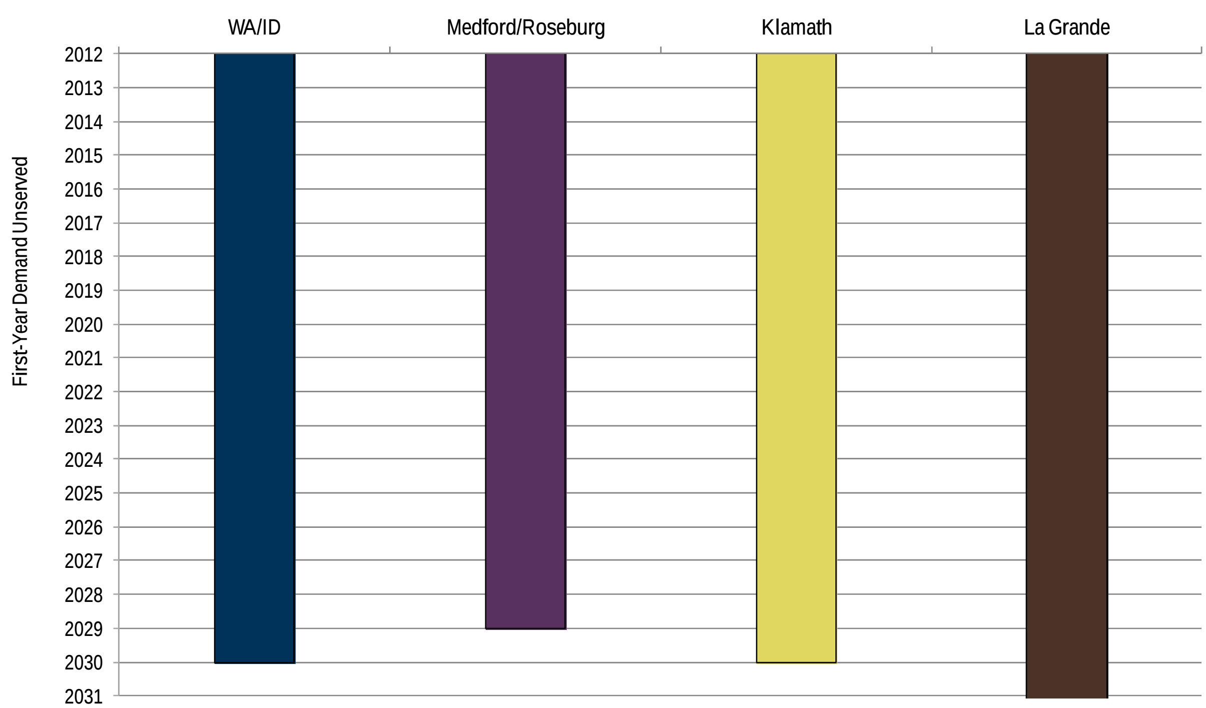
Avista has a diversified portfolio of natural gas supply resources, including contracts to purchase natural gas from several supply basins; owned and contracted storage providing flexibility of supply sources; and firm capacity rights on six pipelines diversifies delivery of supply to our service territory city gates. For potential resource additions, we also consider incremental pipeline transportation, storage options, distribution enhancements and various forms of liquefied natural gas storage or service.

In our IRP process, we model aggregated conservation potential that reduce demand if they are cost-effective over the planning horizon. Based on the projected natural gas prices and the estimated cost of alternative supply resources, our computer planning model (SENDOUT®) selects conservation savings for further review and implementation. Utilizing IRP selected savings as a starting point the operational business planning process ultimately determines the DSM programs cost-effectiveness. Given current avoided costs, programs in Washington and Idaho have proven to be cost ineffective and filings were made to suspend programs in Washington and Idaho. In Oregon we are able to offer limited programs on a cost-effective basis. We actively promote these measures to our customers as one component of a comprehensive strategy to arrive at mix of best cost/risk adjusted resources.

## RESOURCE NEEDS

In our Average Case demand scenario matched with our existing supply resources scenario, we determined we are not resource deficient in the 20 year planning horizon. Using our Expected Case demand scenario, matched with our existing resources supply scenario, we assessed when the first year peak day demand is not fully served. The results of this portfolio are summarized in Figure 1.4.

**Figure 1.4 - First-Year Peak Demand Not Met with Existing Resources Expected Case**




In Washington and Idaho, this system first becomes unserved in 2030 in the Expected Case. In Oregon, the first unserved year is in Medford/Roseburg in 2029 and 2030 in Klamath Falls. The La Grande system does not go unserved at any time during the 20-year planning horizon.

Figures 1.5 through 1.8 illustrate when our peak day demand first goes unserved by service territory for both this IRP and our prior IRP. These charts compare existing peak day resources to expected peak day demand by year and show timing and extent of resource deficiencies for the Expected Case. Given this information, it appears we have ample time to carefully monitor, plan and take action on potential resource additions.

Figure 1.5 - Expected Case - WA/ID Existing Resources vs. Peak Day Demand
(Net of DSM)
FEB 15

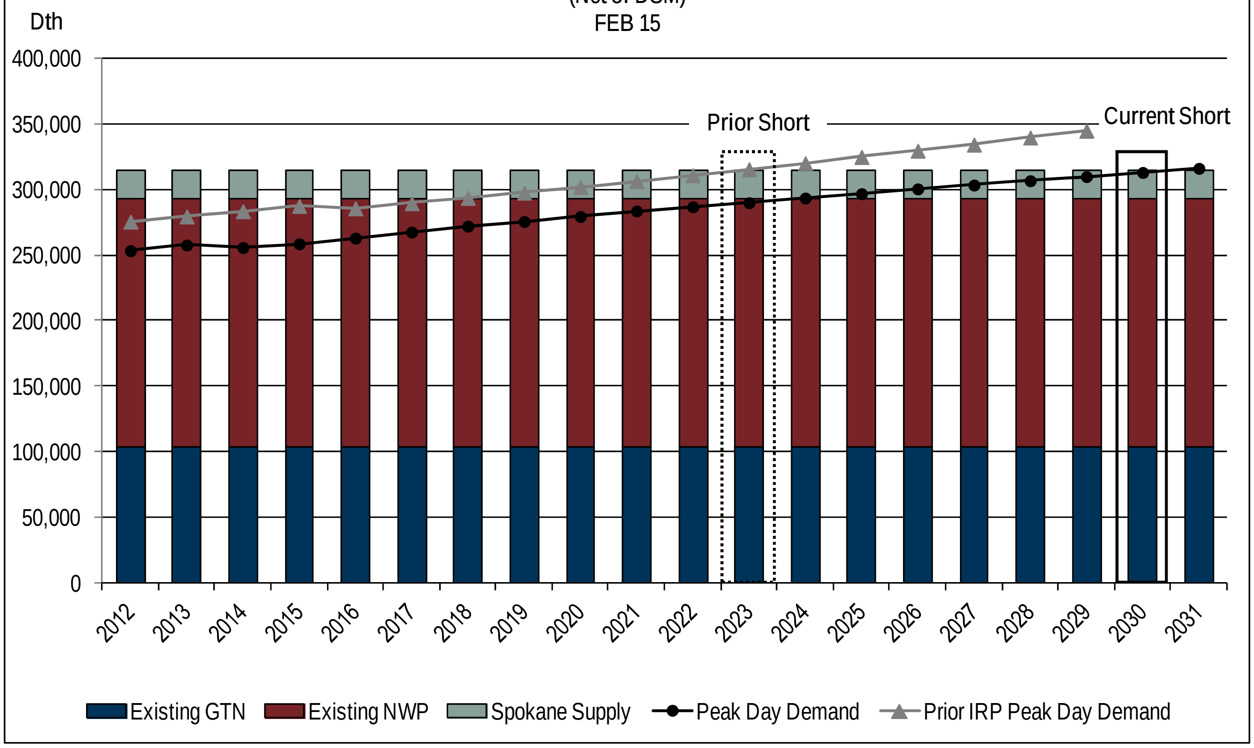



**Figure 1.6 - Expected Case - Medford/Roseburg Existing Resources vs. Peak Day Demand**
**(Net of DSM)**
**DEC 20**

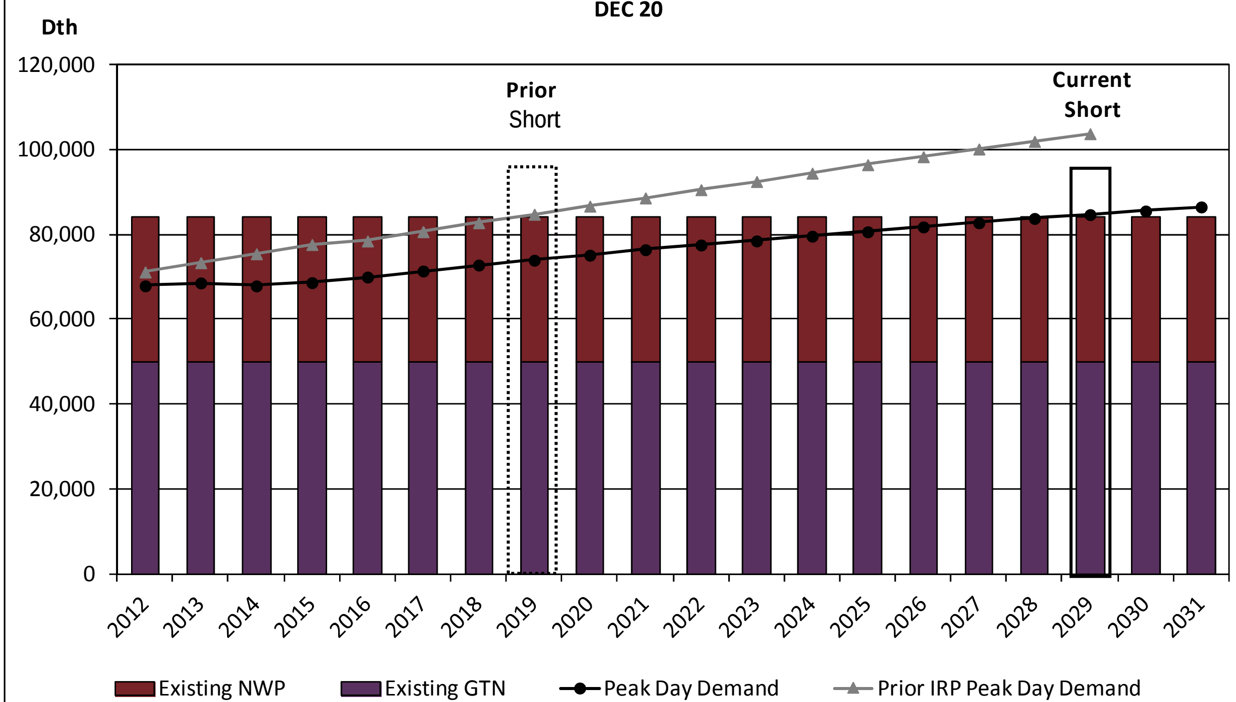


**Figure 1.7 - Expected Case - Klamath Falls Existing Resources vs. Peak Day Demand**
**(Net of DSM)**
**DEC 20**

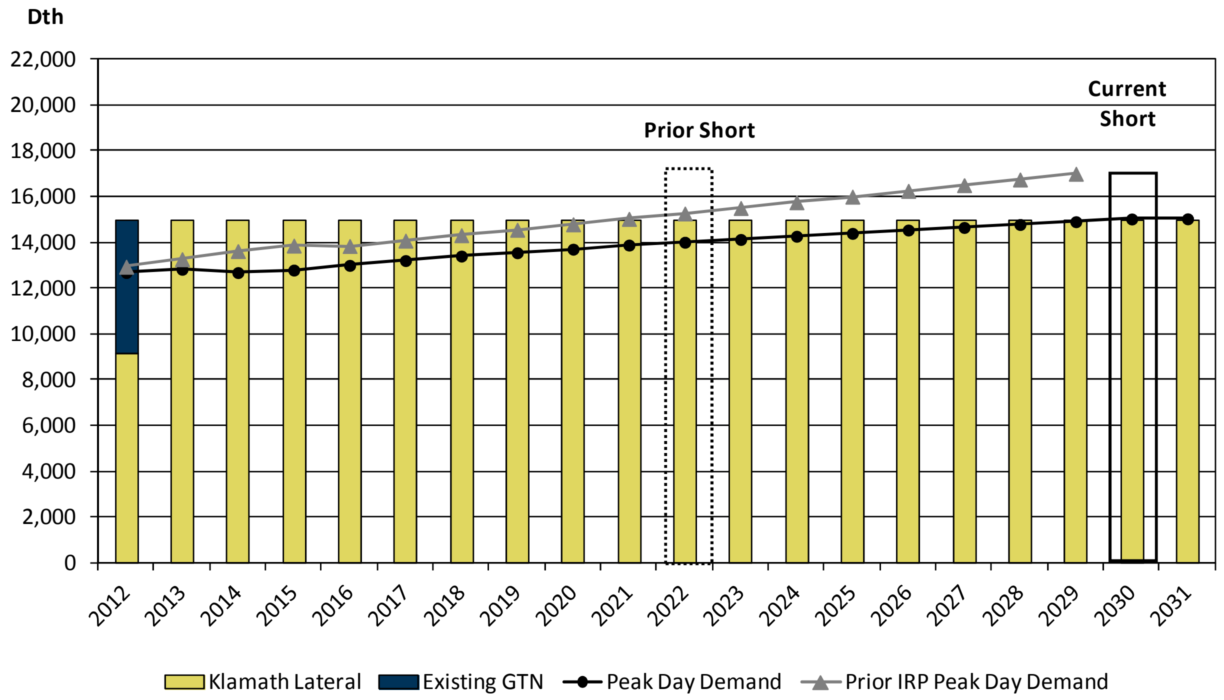
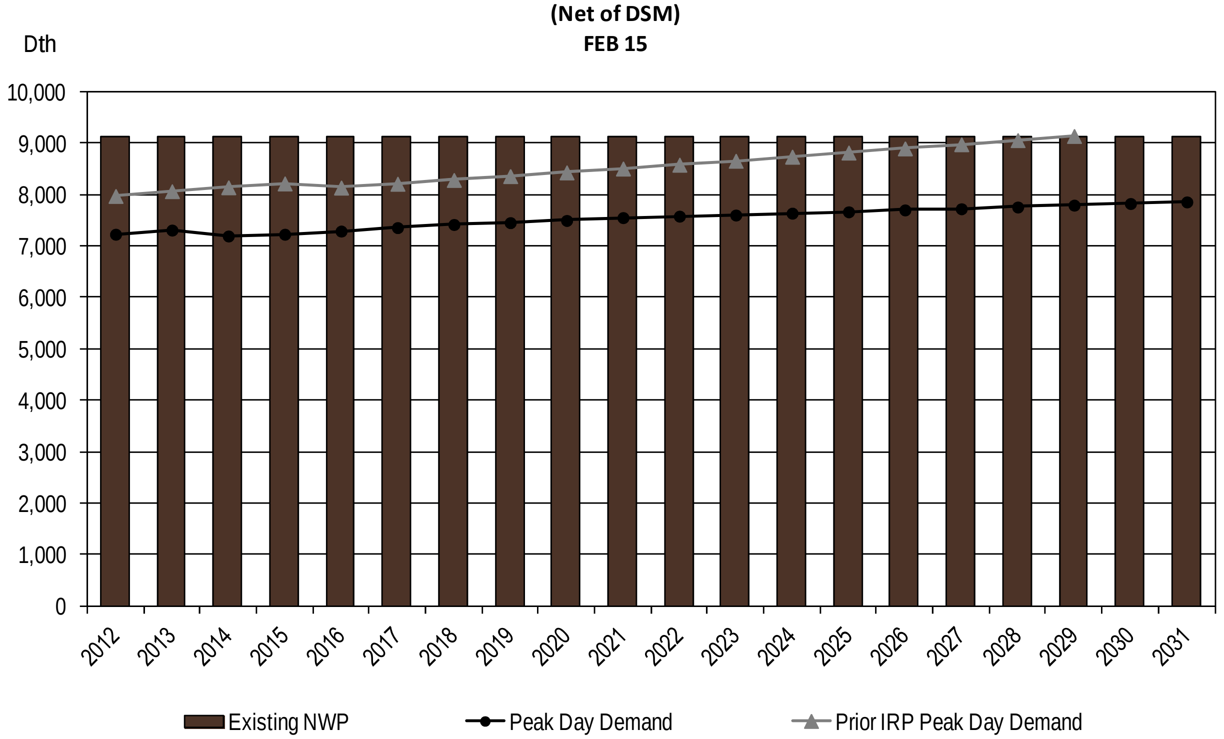
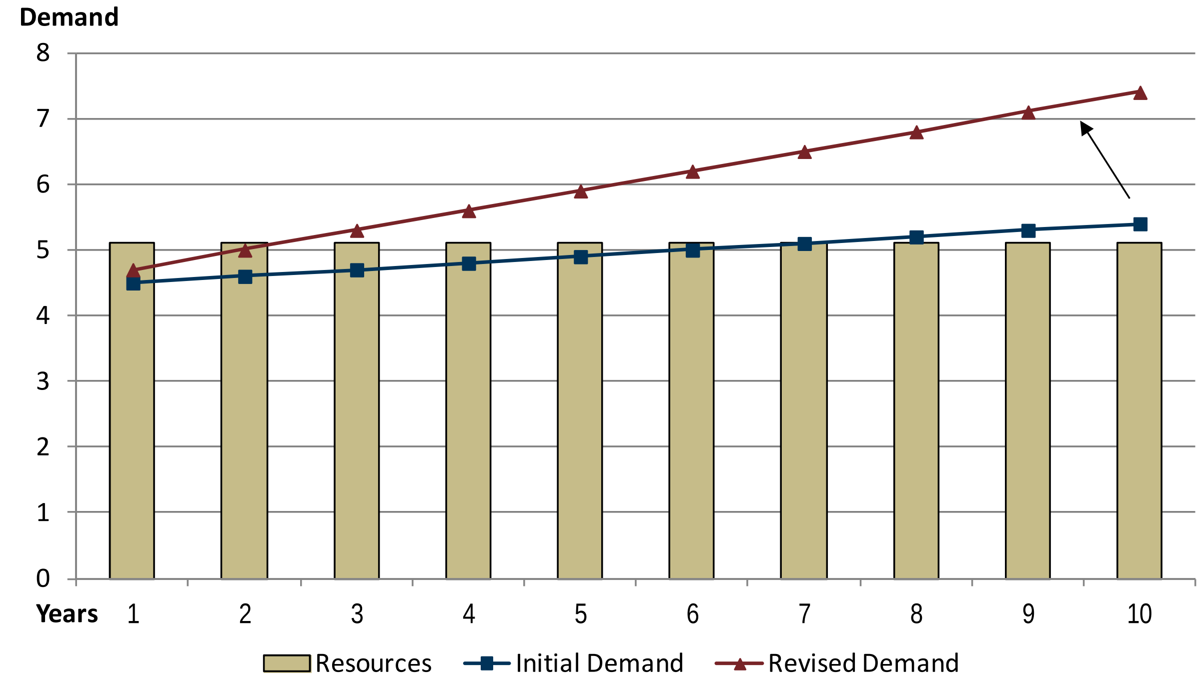



**Figure 1.8 - Expected Case - La Grande Existing Resources vs. Peak Day Demand**
**(Net of DSM)**
**FEB 15**



A critical risk with respect to our identified resource shortages is the slope of forecasted demand growth, which is almost flat. This outlook implies that existing resources will be sufficient for quite some time to meet demand. However, if demand growth accelerates, the steeper demand curve could quickly accelerate resource shortages by several years. Figure 1.9 conceptually illustrates this risk. In this hypothetical example, a resource shortage does not occur until year eight in the initial demand case. However, the shortage dramatically accelerates by five years under the revised demand case to year three. This "flat demand risk" necessitates close monitoring of accelerating demand as well as careful evaluation of lead times to acquire the preferred incremental resource.

**Figure 1.9 Flat Demand Risk Example**




## RESOURCE SELECTIONS

The next step is to determine how to resolve resource deficiencies. For this step, we identified possible resource options, placed them into the SENDOUT® model and allowed it to select the best cost/risk incremental resources over the 20-year planning horizon. Figures 1.10 through 1.12 depict the best cost/risk portfolio selected by SENDOUT® to meet the identified resource shortages. As previously mentioned, the La Grande service territory does not have resource shortages over our planning horizon in the Expected Case.

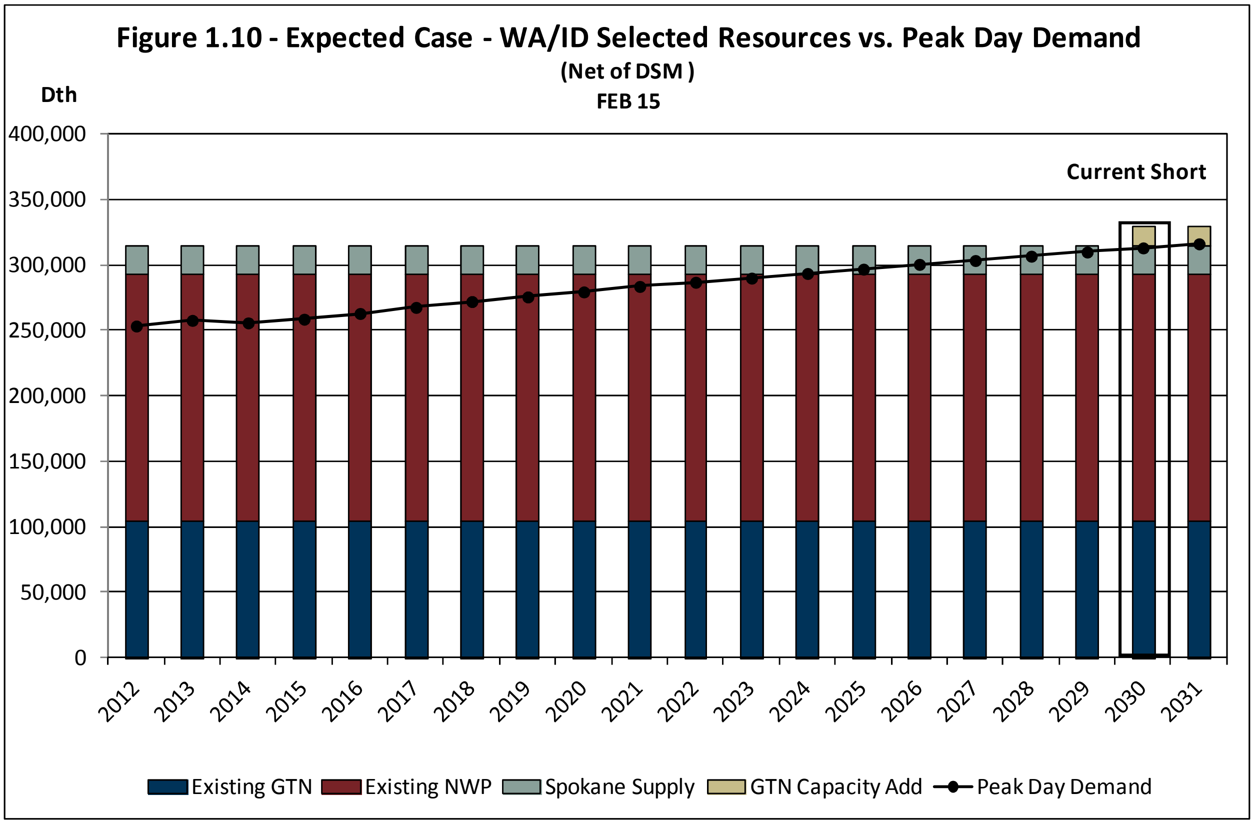


Figure 1.10 - Expected Case - WA/ID Selected Resources vs. Peak Day Demand
(Net of DSM )
FEB 15
Dth
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
Current Short
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
Existing GTN
Existing NWP
Spokane Supply
GTN Capacity Add
Peak Day Demand

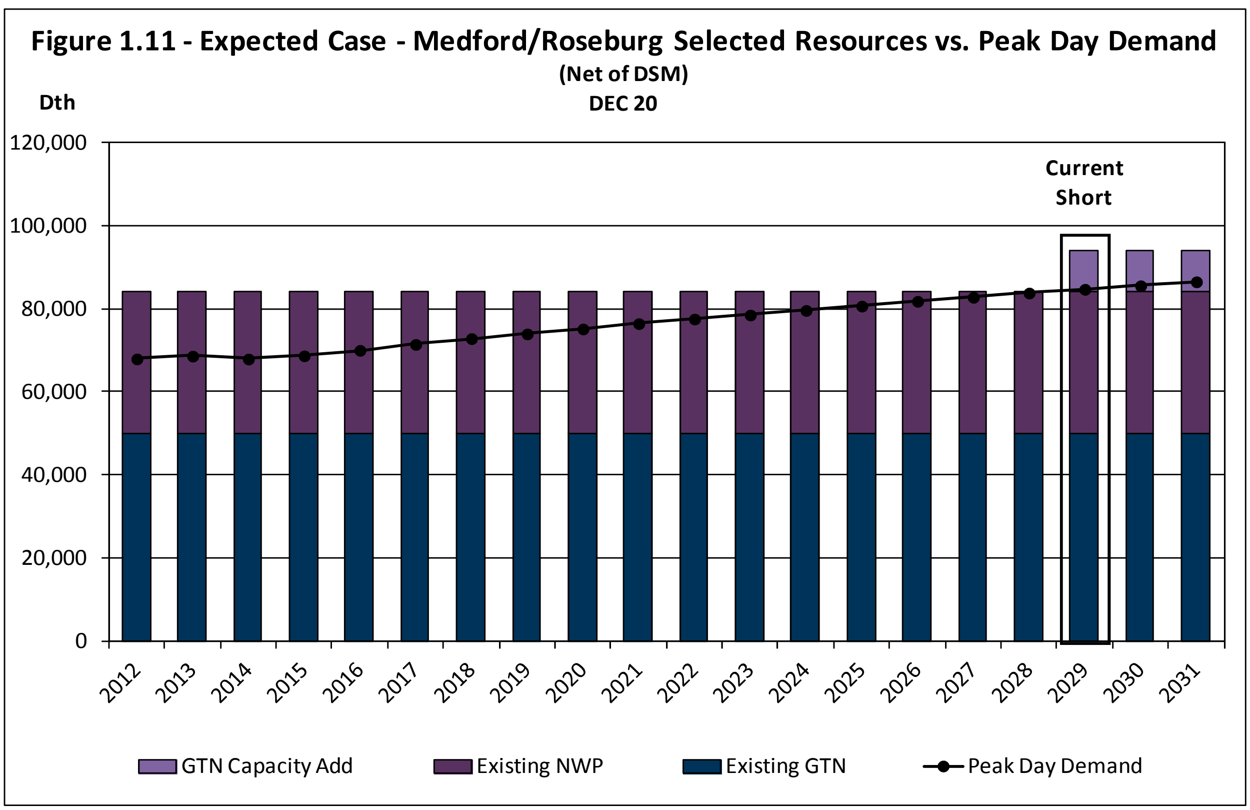


Figure 1.11 - Expected Case - Medford/Roseburg Selected Resources vs. Peak Day Demand
(Net of DSM)
DEC 20
Dth
120,000
100,000
80,000
60,000
40,000
20,000
0
Current Short
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
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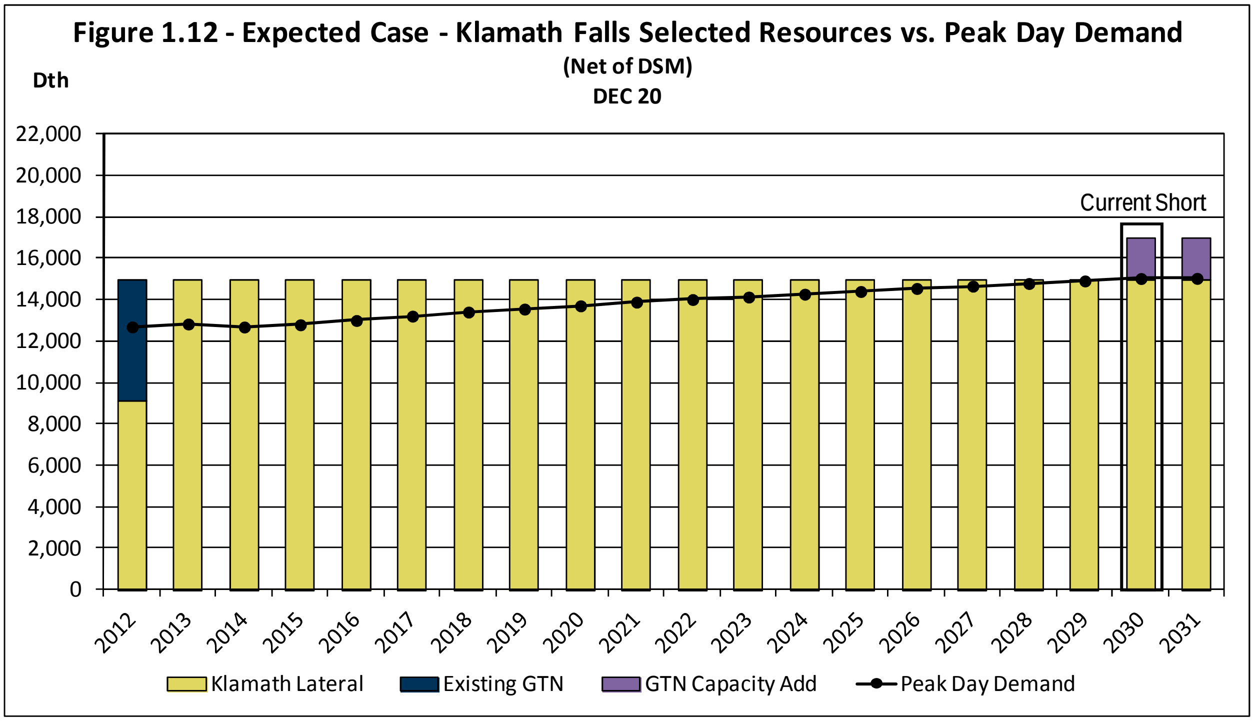
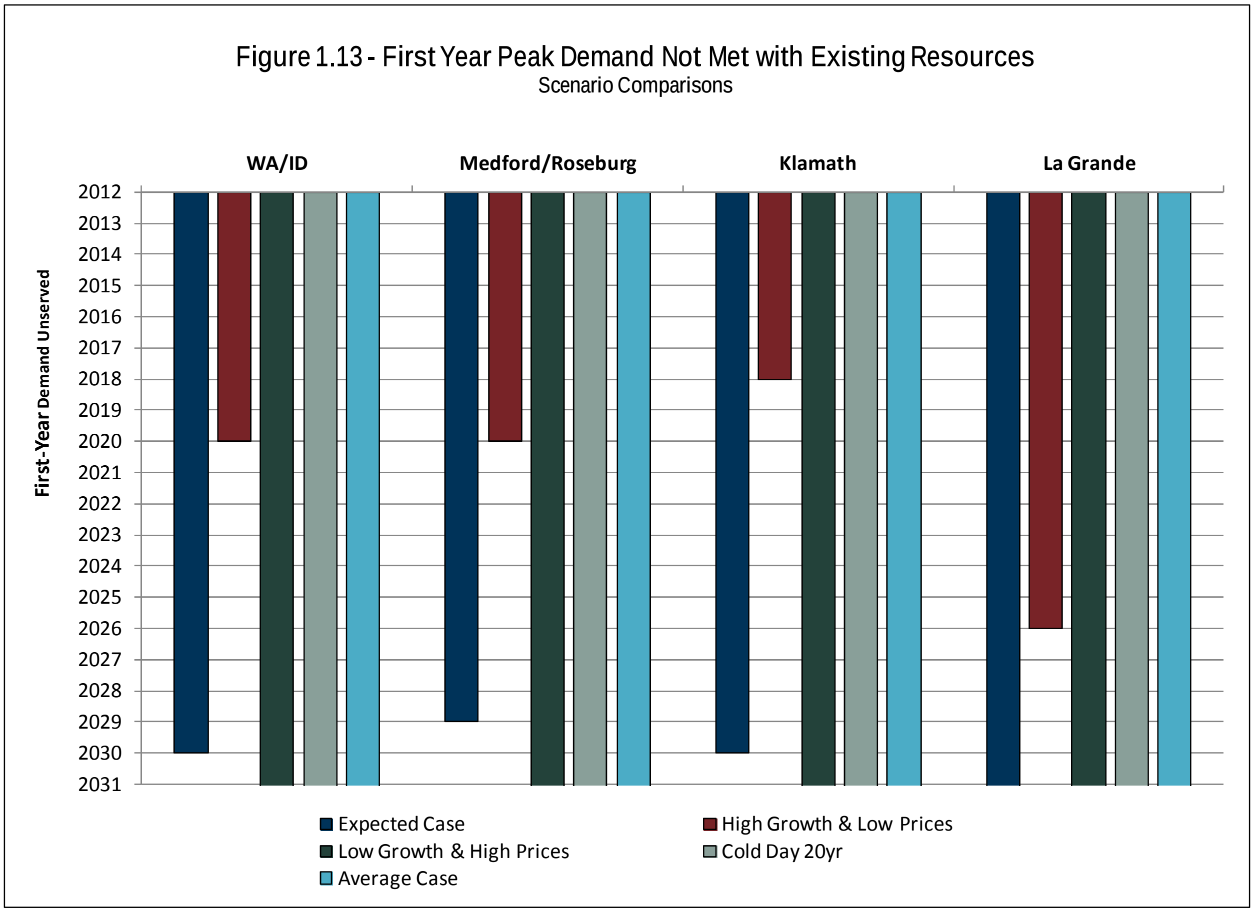
2027
2028
2029
2030
2031
GTN Capacity Add
Existing NWP
Existing GTN
Peak Day Demand




As indicated in the figures, after DSM savings, the model shows a general preference for incremental transportation resources from existing pipelines and supply basins to resolve resource shortages.

## ALTERNATE DEMAND SCENARIOS

We performed the same SENDOUT® process for three other demand scenarios, which identified first year unserved dates for each scenario by service territory (Figure 1.13). As expected, the High Growth, Low Price scenario has the most rapid growth and the earliest first year unserved dated. This “steeper” demand lessens the “flat demand risk” discussed above, but the earlier unserved dates warrant close monitoring of demand trends and resource lead times.




## II ISSUES AND CHALLENGES

Although we are satisfied with the planning, analysis and conclusions reached in this IRP, we recognize wide spread uncertainty exists requiring diligent monitoring of the following issues and challenges:

### CONTINUED ECONOMIC UNCERTAINTY

Whether it is through plummeting home prices, empty retail spaces, unemployment, or lack of consumer spending, evidence of the struggling economy was seen and felt throughout our service territory and region. Growth across our service territory has been paltry at best and use-per-customer has continued to decrease. As the country continues to work through the repercussions of the recession, low to moderate growth is anticipated in our region for many years to come.

With uncertainty about the timing and magnitude of economic recovery, it is prudent to evaluate alternative growth scenarios. We sought to capture the variability of recovery through a wide range of scenarios in our modeling and analysis. Monitoring will be required to see how events unfold and if there are outcomes we did not consider, requiring adjustment of our analysis and Action Plan.

### FIVE DOLLAR GAS FOREVER?

The reality of shale gas has changed the face of North American supply. The abundance of shale along with lagging demand has created a near term supply glut driving prices to lows not seen in the last decade. Shale production over the last few years has grown to 25% of total North American production. The unexpected amounts of gas extracted from shale wells, drilling induced by held-by-production (HBP) clauses in leases, increasing drilling efficiencies, and the tie in of previously drilled wells caused a significant increase in production. The excess production was able to be absorbed by the market due to a couple of colder than normal winters and hotter than normal summers. This year's warmer than normal winter highlighted the oversupply sending prices into a freefall. Forecasters anticipate prices to rebound from current lows; with forecasted prices averaging $5.50 per dekatherm at Henry Hub over the planning horizon.

For our customers we hope that the forecaster's expectations come to fruition, but we are mindful of past experiences and understand that markets can change quickly and dramatically. To address this uncertainty, our plan includes high and low price scenarios along with stochastic price analysis to capture a range of possible pricing outcomes.

### EXPORTING LNG

A few short years ago importing LNG was the answer to meet North America's growing gas demand needs. Enter shale gas. Now the availability of plentiful amounts of natural gas in North America has changed LNG dynamics. Import LNG facilities are now switching gears and looking to export low cost North American gas to the higher priced Asian and European markets. One export terminal has been approved on the coast of British Columbia and another in the Gulf of Mexico. Many more applications to export are sitting at FERC for review and the same is true in Canada. In the Northwest, there are two proposed terminals in Oregon. How many of these terminals actually get approval is yet to be determined. However, exporting has the potential to alter the price and flows of natural gas across all regions in North America .

### NATURAL GAS VEHICLES (NGV)

High oil prices have heightened the desire to reduce reliance on foreign oil. Aided by efforts to reduce emissions and the low cost of natural gas interest in natural gas vehicles has once again been rekindled. The transportation sector is the nation's largest consumer of foreign oil therefore changing the nation's vehicle fleet will be essential in achieving this goal.

Historically, NGV market penetration of a meaningful size has been challenging due to the lack of infrastructure and prices higher than competing alternatives. Now, lower anticipated long term natural gas prices have improved the economics and investments are being made to build out the infrastructure. Most forecasters believe the largest market will be long haul trucking followed by repetitive route fleets (e.g. public transportation, school busses, and refuse trucks) and that widespread adoption/conversion will not be immediate.

Analysis and evaluation of Avista's role in the NGV initiative is underway. Future IRP's will contain the results of this analysis and include our assessment of the potential demand and our level of participation in this market segment. For this IRP we have included in our High Growth scenario additional demand from the NGV market.

## ACTION PLAN

Our 2013-2014 Action Plan outlines activities identified by our IRP team, with advice from management and TAC members, for development and inclusion in this IRP. The purpose of these action items is to position Avista to provide the best cost/risk resource portfolio and to support and improve IRP planning. The Action Plan identifies needed supply and demand side resources and also highlights key analysis that needs to be completed in the near term. It also highlights essential ongoing planning initiatives and gas industry trends Avista will be monitoring as a part of its routine planning processes.

The analysis indicates there is no near term needs to acquire additional supply side resources to meet customer demand. However, Avista will perform its gate station analysis to assess if individual gate station deficiencies exist and discuss findings and potential solutions with Commission Staff. We will continue to coordinate the analytic efforts between Gas Supply, Gas Engineering and the interstate pipelines to conduct this analysis and if deficiencies are identified seek least-cost solutions.

Avista also believes in the pursuit of cost-effective demand-side solutions, but recognizes the challenges of the current low cost environment. IRP modeling versus operational business planning are different. Within the IRP, Washington and Idaho conservation measures are targeted to reduce demand by approximately 120,000 dekatherms in the first year (2013). In Oregon, conservation measures are targeted to reduce demand by approximately 24,600 dekatherms in the first year. When these aggregated savings and resultant avoided costs were incorporated into the business planning process, natural gas programmatic DSM was cost-ineffective. This resulted in Avista filing to suspend natural gas DSM programs in Washington and Idaho. An evaluation of Oregon program offerings is currently under evaluation.

We will monitor natural gas prices a signpost for increasing avoided costs. Should avoided costs increase we will evaluate our demand side programs for cost-effectiveness and be proactive in submitting to resume our natural gas demand side management options.

Key ongoing components of the Action Plan include:

- Monitor actual demand for indications of growth exceeding our forecast to respond aggressively to address potential accelerated resource deficiencies arising from exposure to “flat demand” risk. This will include providing Commission Staff with IRP demand forecast-to-actual variance analysis on customer growth and use per customer. This information will be provided in Avista’s updates to each Commission Staff at least bi-annually.
- Pursue the possibility of a regional elasticity study through the Northwest Gas Association or possibly the American Gas Association.
- Assess potential demand impact from NGV/CNG vehicles and other new uses of natural gas to Avista.
- Continue to monitor supply resource trends including the availability and price of natural gas to the region, exporting LNG, Canadian natural gas supply availability and interprovincial consumption, as well as pipeline and storage infrastructure availability.
- Monitor availability of current resource options and assess new resource lead time requirements relative to when resources are needed to preserve flexibility.
- Regularly meet with Commission Staff members to provide information on market activities and significant changes in assumptions and/or status of Avista activities related to the IRP or natural gas procurement practices.

## ǁ CONCLUSION

Continued slow growth and the declining use- per- customer resulted in lower demand when compared to our last IRP. Current IRP analysis indicates no near-term need for the acquisition of additional supply-side resources. While Avista believes adoption of conservation is the best strategy for minimizing costs to our customers and promoting a cleaner environment, current and forecasted low prices challenge the cost-effectiveness of demand side measures at the program level. The IRP process has many objectives, but foremost, is to ensure that proper planning will enable us to continue delivering safe, reliable and economic natural gas service to our customers well into the future. We are confident this plan delivers on that objective.

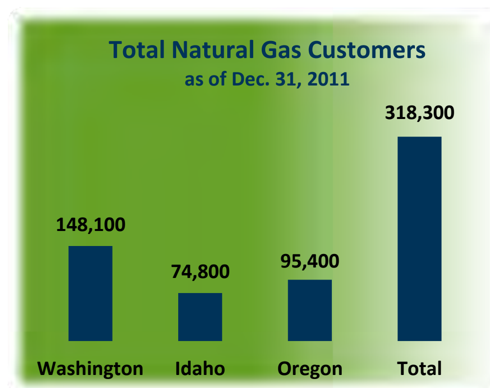
# Chapter 2 || Introduction

## Our Company

Avista is involved in the production, transmission and distribution of energy as well as other energy-related businesses. Avista was founded in 1889 as Washington Water Power and has been providing reliable, efficient and competitively priced energy to customers for over 120 years.

Avista entered the natural gas business with the purchase of Spokane Natural Gas Company in 1958. In 1970 it expanded into natural gas storage with Washington Natural Gas (now Puget Sound Energy) and El Paso Natural Gas (its interest subsequently purchased by Williams-Northwest Pipeline (NWP)) to develop the Jackson Prairie natural gas underground storage facility in Chehalis, Wash. In 1991 we added 63,000 customers with the acquisition of CP National Corporation's Oregon and California properties. Avista subsequently sold the California properties and its 18,000 South Lake Tahoe customers to Southwest Gas in 2005. Avista currently provides natural gas service to approximately 318,000 customers in eastern Washington, northern Idaho and several communities in northeast and southwest Oregon.

## Service Territories and Number of Customers


Avista manages its natural gas operation through two operating divisions – North and South:

- The North Division covers about 26,000 square miles, primarily in eastern Washington and northern Idaho. Over 840,000 people live in Avista's Washington/Idaho service area. It includes urban areas, farms, timberlands and the Coeur d'Alene mining district. Spokane is the largest metropolitan area with a regional population of approximately 450,000 followed by the Lewiston, Idaho/Clarkston, Wash. and Coeur d'Alene, Idaho. The North Division has about 74 miles of natural gas distribution mains and 5,000 miles of distribution lines. Natural gas is received at more than 40 points along interstate pipelines and distributed to over 222,000 customers.
- The South Division serves four counties in southwest Oregon and one county in northeast Oregon. The combined population of these two areas is over 480,000 residents. The South

Division includes urban areas, farms and timberlands. The Medford, Ashland and Grants Pass areas, located in Jackson and Josephine Counties, is the largest single area served by Avista in this division, with a regional population of approximately 280,000 residents. The South Division consists of about 67 miles of natural gas distribution mains and 2,000 miles of distribution lines. Natural gas is received at more than 20 points along interstate pipelines and distributed to almost 96,000 residential, commercial and industrial customers.

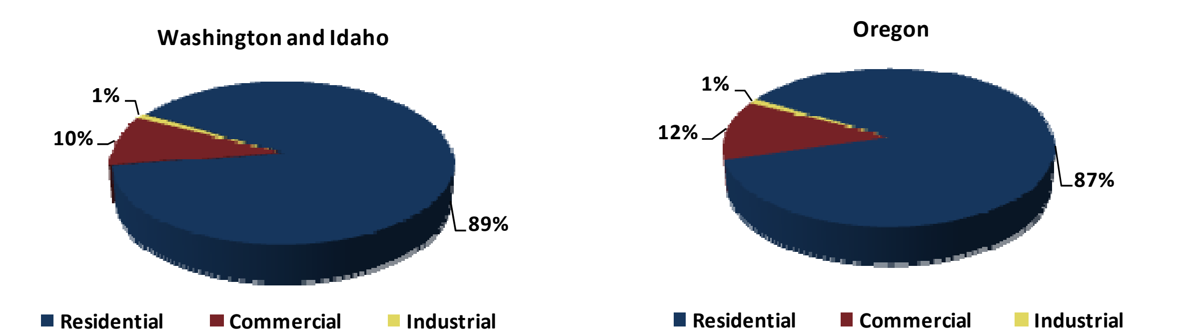
## OUR CUSTOMERS

We provide natural gas services to two customer classifications – "core" and "transportation only." Core or retail customers purchase natural gas directly from us with delivery to their home or business under a bundled rate. Those core customers on firm rate schedules are entitled to receive whatever volume of gas is needed. There are some core customers who are on interruptible rate schedules. These customers pay a lesser rate than firm customers since their service can be interrupted. These interruptible customers are not considered in our peak day IRP planning.

Transportation-only customers purchase natural gas from third parties who deliver their gas to our distribution system. We then deliver this gas to their business charging a distribution rate only. This delivery service can be interrupted by Avista following our priority of service tariff. Since our transportation-only customers purchase their own gas and utilize their own interstate pipeline transportation contracts they are excluded from this long-term resource planning exercise.

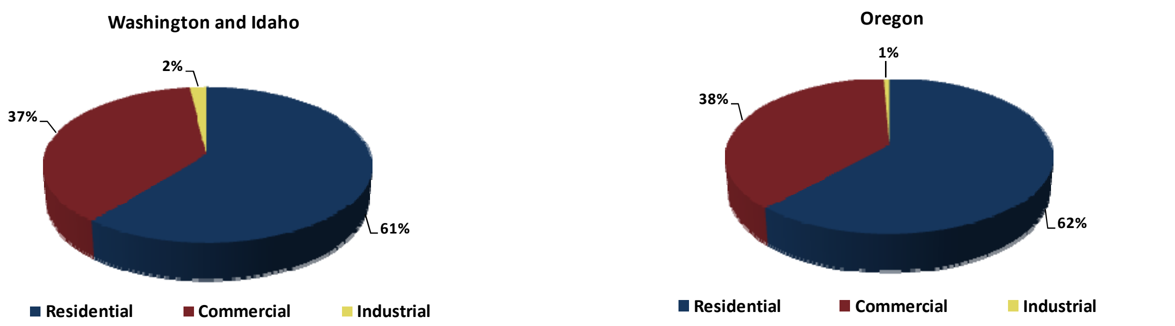
Our core or retail customers are further divided into three categories – residential, commercial and industrial. Most of our customers are residential, followed by commercial. Relatively few are industrial accounts (Figure 2.1).

**Figure 2.1 Firm Customer Mix**



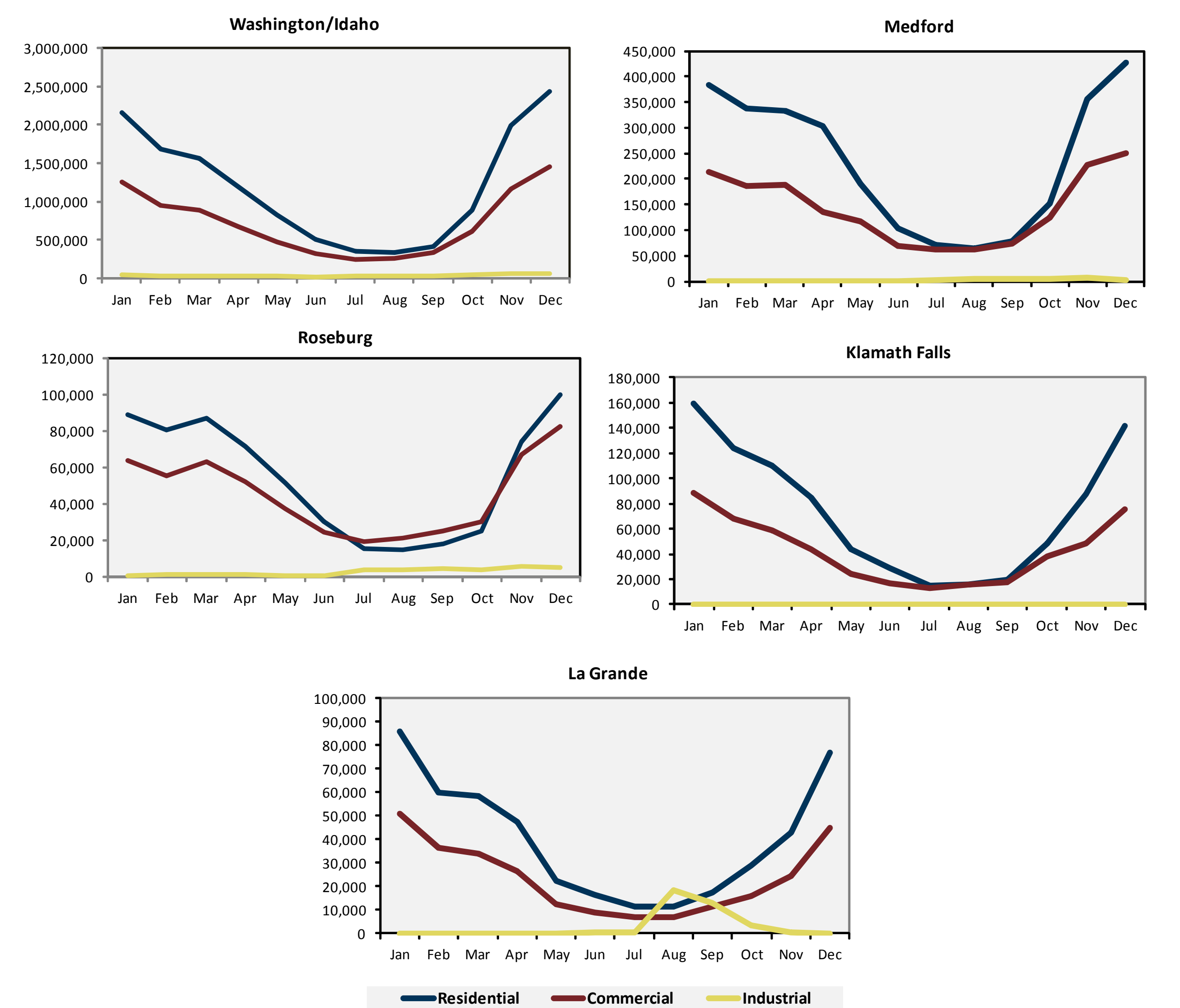

The mix is more balanced between residential and commercial accounts on an annual volume basis (Figure 2.2). Volume consumed by core industrial customers is not significant to the total, partly because most industrial customers in our service territories are transportation only customers.

**Figure 2.2 Therms by Class**




Core customer demand is seasonal, especially by our residential accounts in our service territories with colder winters (Figure 2.3). Industrial demand, which is typically not weather sensitive, has very little seasonality. However, our La Grande service territory has several agricultural processing facilities, classified as industrial, that produce a late summer season al demand spike.

**Figure 2.3 Customer Demand by Service Territory**
**(Dekatherms)**



## INTEGRATED RESOURCE PLANNING

In order to ensure that our core firm customers are provided with long-term reliable natural gas service at a competitive price, we undertake a comprehensive analytical process through the IRP. We evaluate, identify and plan for the acquisition of the best-risk, least-cost portfolio of existing and future resources to meet average daily and peak-day demand delivery requirements over a 20-year planning horizon.

### PURPOSE OF THE IRP

This document has several objectives:

- Provides a comprehensive long-range planning tool
- Fully integrates forecasted requirements with existing and potential resources
- Determines the most cost-effective, risk-adjusted means for meeting demand requirements
- Responds to Washington, Idaho and Oregon rules and orders

### AVISTA'S IRP PROCESS

The IRP process considers:

- Customer growth and usage
- Weather planning standard
- DSM opportunities
- Existing and potential supply-side resource options
- Current and potential legislation/regulation
- Risk

### PUBLIC PARTICIPATION

Members of Avista's TAC play a key role and have a significant impact in development of the IRP. TAC members include Commission Staff, peer utilities, public interest groups, customers, academics, government agencies and other interested parties. A list of TAC members is in Appendix 1.1 TAC members provide important input on modeling, planning assumptions and the general direction of the process.

Avista sponsored four TAC meetings to facilitate stakeholder involvement in the 2012 IRP. The first meeting convened on Jan. 17, 2012 and the last meeting was held on April 17, 2012. A broad spectrum of stakeholders was represented at each meeting. The meetings focused on specific planning topics, reviewed the status and progress of planning activities and solicited input on the IRP development. A draft of this IRP was provided to TAC members on May 25, 2012. We gained valuable input from the interaction and communication with TAC members and express our sincere thanks and appreciation for their contributions and participation.

Preparation of the IRP is a coordinated endeavor by several departments within Avista with involvement and guidance from management. We are grateful for these efforts and contributions.

### REGULATORY REQUIREMENTS

Avista submits an IRP to the public utility commissions in Washington, Idaho and Oregon every two years as required by state regulation.[1] We will file our IRP with all three Commissions on or before Aug. 31, 2012. We have a statutory obligation to provide reliable natural gas service to customers at rates, terms and conditions that are fair, just, reasonable and sufficient. We regard the IRP as a means for identifying and evaluating potential resource options and as a process to establish an Action Plan for resource decisions. Ongoing investigation, analysis and research may cause us to determine that alternative resources are more cost effective than resources selected in this IRP. We will continue to review and refine our understanding of resource options and will act to secure these risk-adjusted, least-cost options when appropriate.

## PLANNING MODEL

Consistent with prior IRPs is the use of SENDOUT®, the computer planning model we use to perform comprehensive and effective natural gas supply planning and analysis. SENDOUT® is a linear programming-based model that is widely used in the industry to solve natural gas supply, storage and transportation optimization problems. This model uses present value revenue requirement (PVRR) methodology to perform least-cost optimization based on daily, monthly, seasonal and annual assumptions related to:

- Customer growth and customer natural gas usage to form demand forecasts
- Existing and potential transportation and storage options
- Existing and potential natural gas supply availability and pricing
- Revenue requirements on all new asset additions
- Weather assumptions
- Demand-side management

We have also incorporated the Monte Carlo simulation module within SENDOUT® to simulate weather and price uncertainty. The module uses Monte Carlo functionality to generate simulations of weather and price to provide a probability distribution of results from which decisions can be made. Some examples of the types of analysis Monte Carlo simulation provides include:

- Price and weather probability distributions
- Probability distributions of costs (i.e. system costs, storage costs, commodity costs)
- Resource mix (optimally sizing a contract or asset level of various and competing resources)

These computer-based planning tools were used to develop our 20-year best cost/risk resource portfolio plan to serve customers.

1 In Washington the IRP requirements are outlined in WAC 480-90-238 entitled "Integrated Resource Planning." In Idaho the IRP requirements are outlined in Case No. GNR-G-93-2, Order No. 25342. In Oregon the IRP requirements are outlined in Order Nos. 07-002, 07-047 and 08-339. Appendix 2.2 provides details of these requirements and how they are met.

## PLANNING ENVIRONMENT

Although we prepare and publish an IRP biannually, the process is ongoing, taking into account new information and developments. In "normal" circumstances, the process can become complex as underlying assumptions evolve and impact previously completed analyses. Every planning cycle has challenges and uncertainties; this cycle was no different. The demand for natural gas has undergone extraordinary changes due to recessionary impacts. Residential, commercial and industrial demand has flattened. Renewable portfolio standards and the announcement of coal plant retirements have increased the need for future gas-fired generation and natural gas vehicles are once again in vogue. The supply picture has also undergone a makeover. The "Shale Gale" – in its infancy during the last planning cycle – has since grown up. While there continues to be questions about how vast the resource base is, its environmental impacts and how much can continue to be produced at these pricing levels, it has proved to be a "game changer."

## ‖ IRP PLANNING STRATEGY

Planning for an uncertain future requires robust analysis that encompasses a wide range of possibilities. We have determined our approach needs to:

- Recognize historical trends may be fundamentally altered
- Critically review all assumptions
- Stress test assumptions via sensitivity analysis
- Pursue a spectrum of possible scenarios
- Develop a flexible analytical framework to accommodate changes
- Maintain a long-term perspective

With these objectives in mind we believe we have developed a strong strategy encompassing all required planning criteria that allowed us to produce a complete IRP that effectively analyzes risks and resource options, which sufficiently ensure our customers will receive safe and reliable energy delivery services well into the future with the best-risk, lease-cost, long-term solutions.

# CHAPTER 3 || DEMAND FORECASTS

## OVERVIEW

The integrated resource planning process begins with the development of forecasted demand. Understanding and analyzing key demand drivers and their potential impact on our forecasts is vital to the planning process. Utilization of historical data provides a reliable baseline, however it is important to remember that past trends may not be indicative of future trends. The permanent long term effects of the recession will not be fully realized for many years.  This uncertainty leads us to consider a range of scenarios to evaluate and prepare for a broad spectrum of outcomes.

### DEMAND AREAS

Eight demand areas, structured around the pipeline transportation resources that serve them, were defined with the SENDOUT® computer model (Table 3.1). These demand areas are aggregated into four service territories and further summarized into two divisions for presentation throughout this IRP.

**Table 3.1  Geographic Demand Classifications**

| Demand Area | Service Territory | Division |
|---|---|---|
| Spokane NWP | Washington/Idaho | North |
| Spokane GTN | Washington/Idaho | North |
| Spokane Both | Washington/Idaho | North |
| Medford NWP | Medford/Roseburg | South |
| Medford GTN | Medford/Roseburg | South |
| Roseburg | Medford/Roseburg | South |
| Klamath Falls | Klamath Falls | South |
| La Grande | La Grande | South |

## DEMAND FORECAST METHODOLOGY

Avista uses the IRP process to develop two types of demand forecasts – “annual” and “peak day.” Annual average demand forecasts are useful for several purposes, including preparing revenue budgets, developing natural gas procurement plans and preparing purchased gas adjustment filings. Peak day demand forecasts are critical for determining the adequacy of existing resources or the timing for acquiring new resources to meet our customers’ natural gas needs in extreme weather conditions throughout the planning period.

In general, if existing resources are sufficient to meet peak day demand, they will be sufficient to meet annual average day demand.  Developing annual average demand first and evaluating it against existing resources is an important step in understanding the performance of the portfolio under normal circumstances. It also facilitates synchronization of modeling processes and assumptions for all planning purposes.

Peak weather analysis aids in assessing not only resource adequacy but differences, if any, in resource utilization. For example, storage may be dispatched differently under peak weather scenarios.

## DEMAND MODELING EQUATION

Because natural gas demand can vary widely from day to day, especially in winter months when heating demand is at its highest, developing daily demand forecasts is essential. In its most basic form, demand is a function of customer base usage (non-weather sensitive usage) plus customer weather sensitive usage. This can be expressed by the following general formula:

**Table 3.2 Basic Demand Formula**

| |
|---|
| # of customers **x** Daily **base usage** / customer |
| **Plus** |
| # of customers **x** Daily **weather sensitive** usage / customer |

More specifically, SENDOUT® requires inputs as expressed in the below format to compute daily demand in dekatherms (Dth):

**Table 3.3 SENDOUT® Demand Formula**

| |
|---|
| # of customers **x** Daily **Dth base usage** / customer |
| **Plus** |
| # of customers **x** Daily Dth **weather sensitive** usage / customer **x** # of daiy degree days |

This calculation is performed by SENDOUT® for each day for each customer class and each demand area. The base and weather sensitive usage (heating degree day usage) factors are customer demand coefficients developed outside the SENDOUT® model and capture a variety of demand usage assumptions. This is discussed in more detail in the Use-per-Customer Forecast section below. The number of daily degree days is simply heating degree days (HDDs), which are further discussed in the Weather Forecast section later in this chapter.

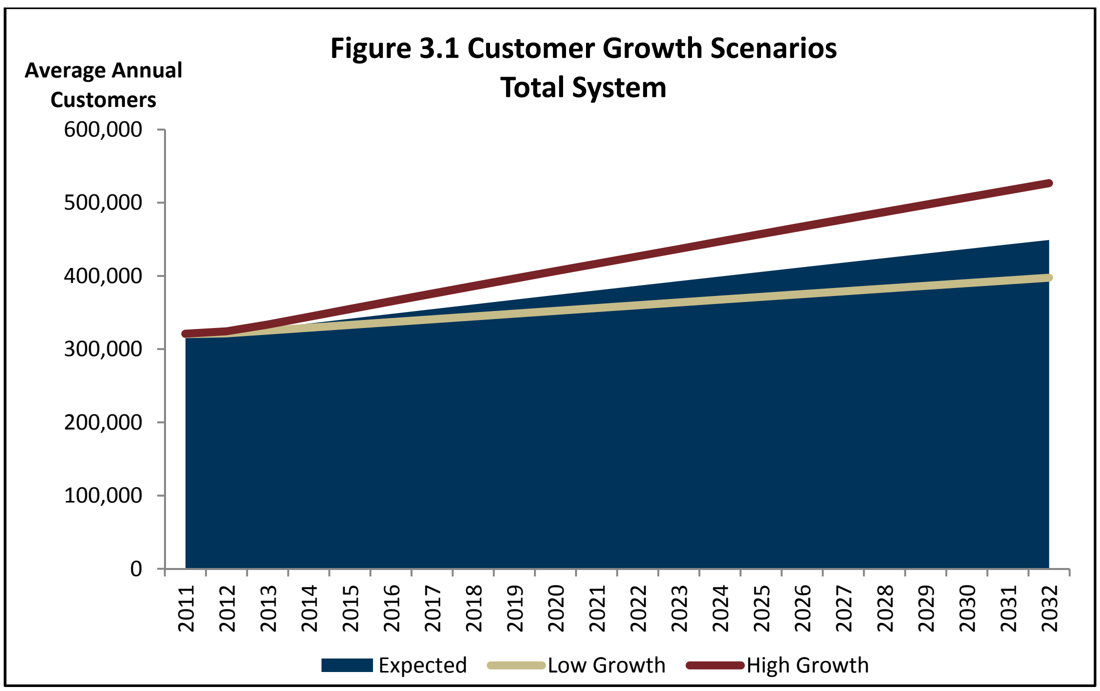
### CUSTOMER FORECASTS

Avista's customer base is segregated into three categories: residential, commercial and industrial. For each of the customer categories we develop our customer forecasts by starting with national economic forecasts and then drilling down into regional economies. Population growth expectations and employment are key drivers in regional economic forecasts and are useful in estimating natural gas customers. We contract with Global Insight, Inc. for long-term regional economic forecasts. A description of the Global Insight forecasts is found in our customer forecasts detail in Appendix 3.1. We combine this data with local knowledge about sub-regional construction activity, age and other demographic trends and historical data to develop our 20-year customer forecasts.

The annual growth for each state is allocated so that the total equals the sum of the parts. These forecasts are used by the distribution engineering group for optimizing decisions within these geographic sub-areas and facilitating integrated forecasting and planning within Avista (see further discussion in Chapter 8 – Distribution Planning).

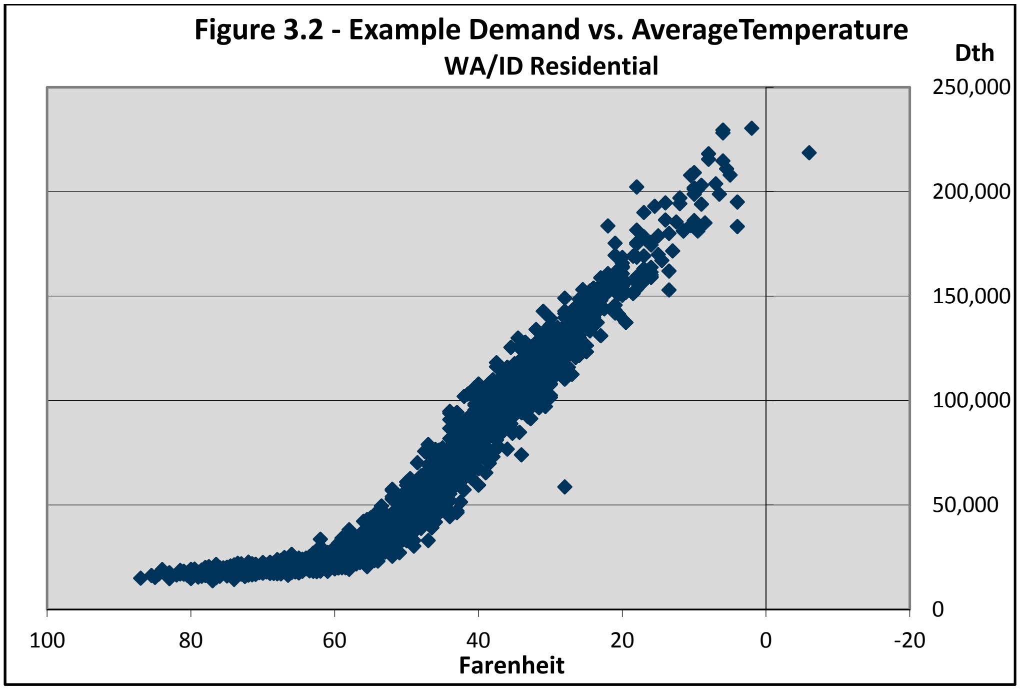
Forecasting customer growth is an inexact science so it is important to consider alternative forecasts. Two alternative growth forecasts were developed for consideration in this IRP. In past IRPs we have used 25 years of historical growth rates to derive our low and high growth sensitivities. This historical look back gave us growth assumptions of 50% greater than expected and 50% lower than expected for our high and low growth sensitivities. Utilizing historical data provided some comfort with the reasonableness of these growth forecasts.

However, recent events have impacted our economy and there is much uncertainty about when and how much recovery will occur. The past may not be indicative of future behaviors. Growth experienced in the last couple of years is low. In examining recent trends and comparing to history the range of growth seems asymmetric. To this end we utilized forecasted information from the Washington State Office of Financial Management (OFM) to prepare the high and low growth sensitivities. The OFM forecasts the potential for growth rates 40% below and 60% above current growth rates. These three customer growth forecasts are shown in Figure 3.1. Detailed customer count data by region and class for all three scenarios is in Appendix. 3.2.




#### Use-per-Customer Forecast

The goal for a use-per-customer forecast is to develop base and weather sensitive demand coefficients that can be combined and applied to HDD weather parameters to reflect average use per customer. This produces a very reliable forecast because of the high correlation between usage and temperature as depicted in the example scatter plot in Figure 3.2.




The first step in developing demand coefficients was gathering daily historical gas flow data for all of our city gates. Our preference to use city gate data over revenue data is due to the tight correlation between weather and demand. Our revenue system does not capture data on a daily basis and therefore, makes a statistical analysis with tight correlations virtually impossible. We do reconcile city gate flow data to revenue data to ensure that we are properly capturing total demand.

The historical city gate data was gathered, segregated by service territory/temperature zone and then by month. In our last IRP we used three years of historical data to derive our use per customer coefficients. Continuing with our theme of challenging each assumption we looked at varying the number of years of historical data. We analyzed five years, three years and two years of use per customer. We decided that two years was not necessarily indicative of future use per customer behavior nor does it incorporate enough data points to make a comprehensive long term analysis. Five years incorporated some years of higher use per customer, which may overstate use due to current recessionary impacts and conservation savings. Three years seemed to strike the right balance between historical and contemporaneous customer usage patterns. Figure 3.3 illustrates the annual demand differences between the three year and five year use per customer with normal and peak weather conditions.

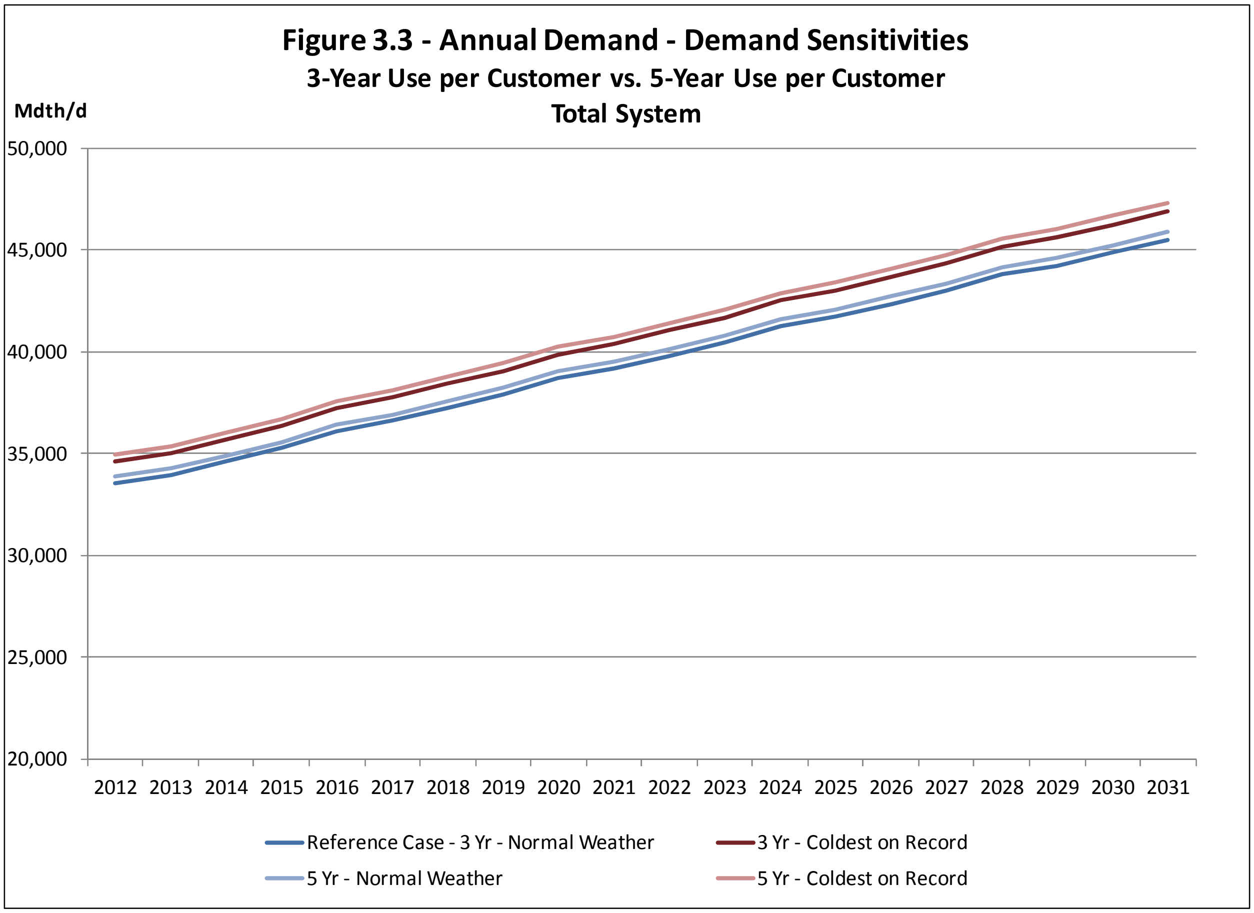



**Figure 3.3 - Annual Demand - Demand Sensitivities**
**3-Year Use per Customer vs. 5-Year Use per Customer**
**Total System**

To calculate base usage, three years of July and August data was used to derive coefficients. Average usage in these months divided by average number of customers provides the base usage coefficient input into SENDOUT®.This calculation is done for each area and customer class based on customer billing data demand ratios.

To derive weather sensitive demand coefficients, for each monthly data subset, we removed base demand from the total and plotted usage by HDD in a scatter plot chart to visually verify correlation. We then applied linear regression to the data by month to capture the linear relationship of usage to HDD. The slopes of the resulting lines are the monthly weather sensitive demand coefficients input into SENDOUT®. Again, this calculation is done by area and by customer class using allocations based on customer billing data demand ratios.

In extreme weather conditions, demand can sometimes begin to flatten out relative to the linear relationships at less extreme temperatures. This occurs, for example, when appliances such as furnaces reach maximum output and do not consume any more natural gas regardless of how much colder temperatures get. We sought to capture this phenomenon through development of super peak coefficients.

The methodology for deriving super peak coefficients was exactly the same as deriving weather sensitive demand coefficients except, instead of forming data subsets by month, a dataset was created using temperature (specifically HDD's greater than 65). The line slope from the regression on this data was typically flatter relative to the other monthly weather sensitive demand coefficients. One inherent drawback to this methodology is the lack of sufficient data points to develop a strong linear relationship.

More years of data can help, but the older data becomes less and less relevant to current demand relationships. We will continue to test this theory and monitor trends.

As a final step, to check coefficient reasonableness, we applied the coefficients to actual customer count and weather data to backcast demand. This was compared to actual demand with satisfactory results. The regression calculations and coefficients can be found in Appendix 3.3.

#### WEATHER FORECAST

The last input in the demand modeling equation is weather (specifically HDDs). We obtain the most current 30 years of daily weather data from the National Oceanic Atmospheric Administration (NOAA), convert it to HDDs and compute an average for each day to develop our weather forecast. For Oregon we use four weather stations, corresponding to the areas where natural gas services are provided. HDD weather patterns between these areas are uncorrelated. For the eastern Washington and northern Idaho portions of our service area weather data for the Spokane Airport is used, as HDD weather patterns within that region are correlated.

The NOAA 30-year average weather (adjusted for global warming – see below) serves as the base weather forecast that is used to prepare the annual average demand forecast. In preparing the peak day demand forecast we adjust average weather to reflect a five-day cold weather event. This consists of adjusting the middle day of the five-day cold weather event to the coldest temperature on record for a service territory, as well as adjusting the two days either side of the coldest day to temperatures slightly warmer than the coldest day. For our Washington/Idaho and La Grande service territories, we model this event on and around February 15 each year. For our southwestern Oregon service territories (Medford, Roseburg, Klamath Falls) we model this event on and around December 20 each year.

The following describes specific details on the coldest days on record for each service territory:

- On Dec. 30, 1968, the Washington/Idaho service area experienced the coldest day on record, an 82 HDD for Spokane. This is equal to an average daily temperature of -17 degrees Fahrenheit. Only one 82 HDD has been experienced in the last 40 years for this area; however, within that same time period, 80, 79 and 74 HDD events occurred on Dec. 29, 1968, Dec. 31,1978, and January 5, 2004, respectively.
- On Dec. 9, 1972, Medford experienced the coldest day on record, a 61 HDD. This is equal to an average daily temperature of 4 degrees Fahrenheit. Medford has experienced only one 61 HDD in the last 40 years; however, it has also experienced 59 and 58 HDD events on Dec. 8, 1972, and Dec. 21, 1990, respectively.
- The other three areas in Oregon have similar weather data. For Klamath Falls, a 72 HDD occurred on Dec. 21, 1990, in La Grande a 74 HDD occurred on Dec. 23, 1983, and a 55 HDD occurred in Roseburg on Dec. 22, 1990. As with Washington/Idaho and Medford, these days are used as the peak day weather standard for modeling purposes.

Utilizing a peak planning standard of the coldest temperature on record may seem aggressive given we are using, in some cases, a temperature experienced only once. Given the potential impacts of an extreme weather event on our customers' personal safety and property damage to customer appliances and company infrastructure, we believe it is a prudent planning standard.

We do analyze an alternate planning standard using the coldest temperature in the last twenty years For our Washington/Idaho service area we use a 74 HDD, which is equal to an average daily temperature of -9 degrees Fahrenheit. In Medford the coldest in twenty year is a 54 HDD, equivalent to a temperature of 11 degrees Fahrenheit. In Roseburg the coldest in twenty year is a 48 HDD, equivalent to a temperature of 17 degrees Fahrenheit. In Klamath Falls the coldest in twenty is a 64 HDD, equivalent to a temperature of 1 degree Fahrenheit. In La Grande the coldest in twenty years is a 68 HDD, equivalent to a temperature of -3 degrees Fahrenheit.

These HDDs by area, class and by day entered into SENDOUT® can be found in Appendix 3.4.

### GLOBAL WARMING

Consistent with past IRPs, we adjusted the NOAA weather data to incorporate estimates for global warming in developing our HDD forecasts. This was based on extensive analysis of historical weather data in each of the areas we serve. Adjustments were applied to daily NOAA normal weather data and include a phase-in over the first ten years of our planning horizon. The effect of the adjustments, all else equal, results in declining annual demand over time. Appendix 3.5 summarizes our historical analysis and adjustment factors.

The analysis identified a gradual warming trend in the historical data; however we were unable to discern any definitive evidence to support a peak day warming trend. We continue to search but have be unsuccessful in finding supporting studies or analysis on the topic and, after discussion with our TAC, determined we would not make warming trend adjustments to our peak day weather events in our HDD forecast. Therefore, our modeling and analysis with respect to peak day planning is unaffected by global warming. Additional information on this topic is in Appendix 3.5.

## DEVELOPING A REFERENCE CASE

To adjust for uncertainty, we developed a dynamic demand forecasting methodology that is flexible to changing assumptions. To understand how various alternative assumptions influence forecasted demand we needed a reference point for comparative analysis. For this we define a reference case demand forecast (Figure 3.4). We stress that this case is not intended to reflect anything other than a simple assumption start point.

**Figure 3.4 - Reference Case Assumptions**

**1. Customer Annual Average Growth Rates**

| State | Residential | Commerical | Industrial |
|---|---|---|---|
| Washington | 1.50% | 1.60% | 1.00% |
| Idaho | 2.00% | 1.70% | 0.40% |
| Oregon | 1.70% | 1.30% | 0.74% |

**2. Use Per Customer Coefficients**

Flat Across All Classes

3-year Average Use per Customer per HDD by Area/Class

**3. Weather**

30-year Normal - NOAA (1981-2010)

Global Warming Adjustment

**4. Elasticity**

None

**5. Demand Side Management**

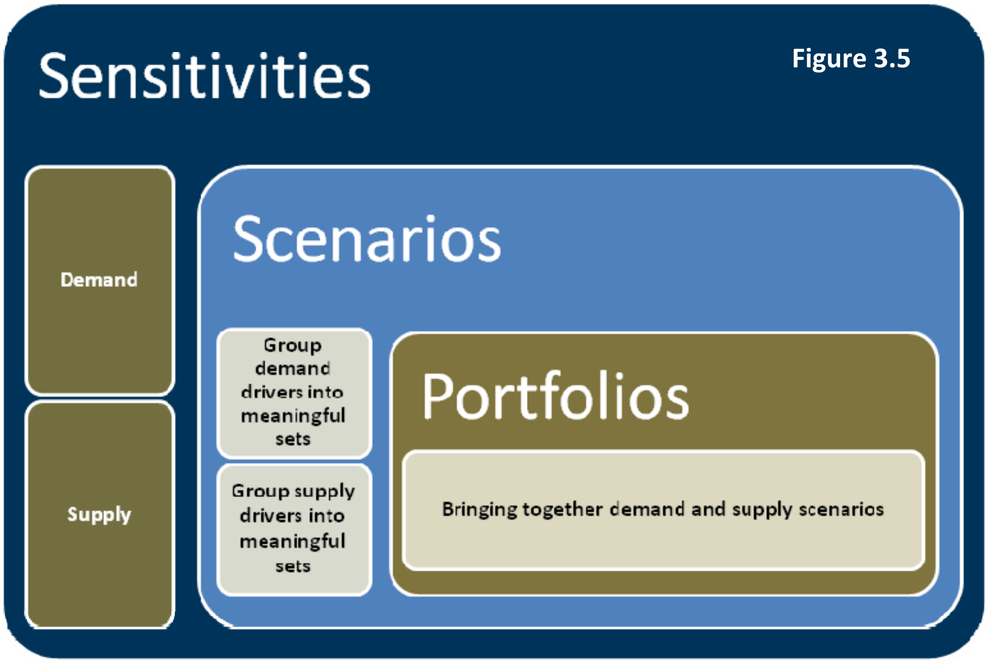
None

## DYNAMIC DEMAND METHODOLOGY

The dynamic demand planning strategy critically examines a wide range of potential outcomes. The approach developed consists of:

- Identifying key demand drivers behind natural gas consumption
- Performing sensitivity analysis on each demand driver
- Combining demand drivers under various scenarios to develop alternative potential outcomes for forecasted demand
- Matching demand scenarios with supply scenarios to identify unserved demand

Figure 3.5 represents our methodology of starting with sensitivities, progressing to scenarios, and ultimately creating portfolios.




## SENSITIVITY ANALYSIS

In analyzing demand drivers, we grouped them into two categories based on:

- **Demand Influencing Factors** – Factors that directly influence the volume of natural gas consumed by our core customers
- **Price Influencing Factors** – Factors that, through price elasticity response, indirectly influence the volume of natural gas consumed by our core customers

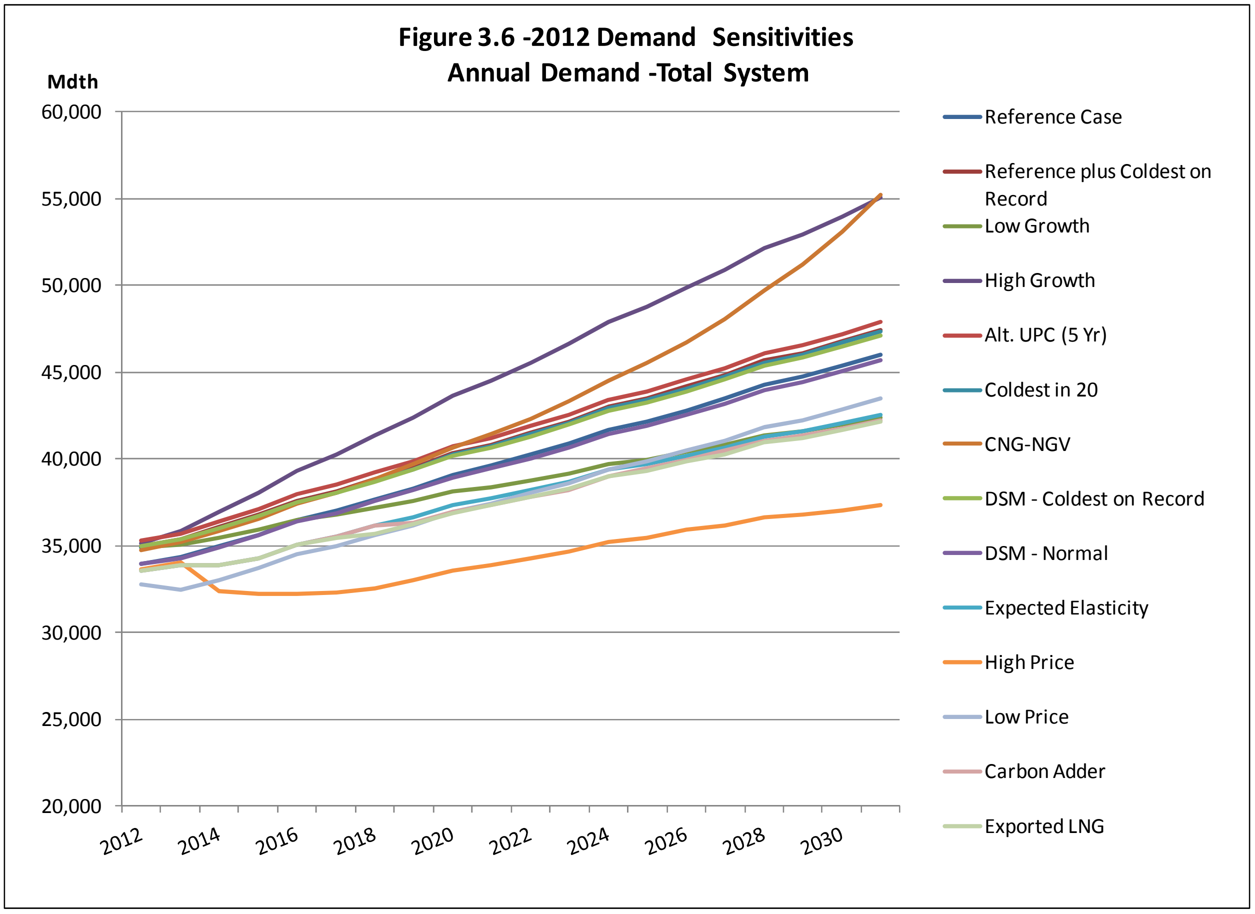
Once factors were identified, we developed sensitivities which we define as focused analysis of a specific natural gas demand driver and its impact on forecasted demand relative to our Reference Case when the underlying input assumptions are modified

Sensitivity assumptions reflect incremental adjustments we estimate are not captured in the underlying Reference Case forecast. We analyzed 14 demand sensitivities to determine the resultant effect relative to the reference case. Table 3.4 lists these sensitivities. More detailed information about these sensitivities can be found in Appendix 3.6.

**Table 3.4 - Demand Sensitivities**

| Scenario | Influence | Weather | Growth | Use per Customer | Price Curve | Carbon Adder | LNG Adder | DSM | CNG/NGV | Elasticity |
|---|---|---|---|---|---|---|---|---|---|---|
| Reference Case | Direct | Normal | Expected | 3 year | Expected | No | No | No | No | No |
| Reference Case plus Peak Weather | Direct | Peak | Expected | 3 year | Expected | No | No | No | No | No |
| High Growth Case | Direct | Peak | High | 3 year | Expected | No | No | No | No | No |
| Low Growth Case | Direct | Peak | Low | 3 year | Expected | No | No | No | No | No |
| Alternate Use per Customer | Direct | Peak | Expected | 5 year | Expected | No | No | No | No | No |
| CNG/NGV Case | Direct | Peak | Expected | 3 year | Expected | No | No | No | Yes | No |
| DSM | Direct | Normal | Expected | 3 year | Expected | No | No | No | No | No |
| Peak plus DSM | Direct | Peak | Expected | 3 year | Expected | No | No | Yes | No | No |
| Alternate Weather Planning Standard | Direct | Coldest in 20 | Expected | 3 year | Expected | No | No | Yes | No | No |
| Expected Elasticity | Indirect | Peak | Expected | 3 year | Expected | No | No | No | No | Yes |
| Low Price | Indirect | Peak | Expected | 3 year | Low | No | No | No | No | No |
| High Price | Indirect | Peak | Expected | 3 year | High | No | No | No | No | No |
| Carbon Legislation | Indirect | Peak | Expected | 3 year | Expected | Yes | No | No | No | No |
| Exported LNG | Indirect | Peak | Expected | 3 year | Expected | No | Yes | No | No | No |

Figure 3.6 shows the annual demand from each of the sensitivities we modeled.




## SCENARIO ANALYSIS

Following our testing of the various sensitivities we grouped them into meaningful combinations of demand drivers to develop demand forecasts representing scenarios. Table 3.5 identifies the scenarios we developed. Our Average Demand Case is representative of what we would consider for normal planning purposes, such as corporate budgeting, procurement planning, and PGA/General Rate Cases. The

Expected Case reflects the demand forecast we believe is most likely given peak weather conditions. The High Growth/Low Price and Low Growth/High Price represent a forecasted range of possibilities for customer growth and future prices. The Alternate Weather Standard utilizes the coldest day in the last twenty years. Each of these scenarios helps provide us with sufficient “what if” analysis given the volatile nature of many key assumptions including weather and price. Appendix 3.6 lists the specific assumptions within the scenarios while Appendix 3.7 contains a detailed description of each scenario.

**Table 3.5**

| Demand Scenarios |
|---|
| **Average Demand** |
| **Expected Demand - Peak** |
| **High Growth/Low Price** |
| **Low Growth/High Price** |
| **Alternate Weather Standard** |

## PRICE ELASTICITY

Historic natural gas price volatility has created challenges in projecting future natural gas prices. Now that shale gas has fundamentally altered the market for natural gas historic analysis may not be indicative of future behavior. Some believe price volatility will decrease due to the widespread availability of natural gas while others feel volatility could become greater as shale production profiles are much less predictable than conventional gas production. We acknowledge changing price levels influence usage so we incorporate a price elasticity of demand factor into our modeling assumptions to allow use per customer to vary into the future as our natural gas price forecast changes.

Price elasticity is usually expressed as a numerical factor that defines the relationship of a consumer’s consumption change in response to price change. Typically, the factor is a negative number as consumers normally reduce their consumption in response to higher prices or will increase their consumption in response to lower prices. For example, a price elasticity factor of negative 0.13 means a 10% price increase will prompt a 1.3% consumption decrease and a 10% price decrease will prompt a 1.3% consumption increase.

We noted complex relationships influence price elasticity and given the new economic environment, we question whether current behavior will be considered normal or if customers will return historic usage patterns.

### AGA PRICE ELASTICITY STUDY

From our participation in the 2007 AGA long-run price elasticity study, we received regional elasticity factors which compared favorably to our past estimates. Based on this corroboration we used a factor of negative .13 as our expected case factor to adjust use per customer coefficients.

In our last IRP we modeled a high and low price elasticity assumption due to the uncertainty in how our customers would respond to their evolving economic conditions. Utilizing the high elasticity assumption resulted in significant curtailment of demand which was much greater than historical experience. Alternatively low elasticity resulted in no meaningful reduction in demand. Our recent usage data indicates that even with declines in the retail rate for natural gas, use-per-customer continues to decline.

This is likely driven by a confluence of factors including high unemployment, increased investments in energy efficiency measures, building code improvements, behavioral changes and overall heightened focus of consumers' household budgets.

Based on our analysis of data since our 2009 IRP we find that the expected elasticity factor is a reasonable assumption and have decide to forgo utilizing a high or low elastic response in this IRP.

## RESULTS

During 2012, our Average Case demand forecast indicates we will serve an average of 327,300 core natural gas customers with 33,200,000 dekatherms of natural gas. By 2031, we project 448,100 core natural gas customers with an annual demand of over 42,200,000 dekatherms. In Washington/Idaho, the number of customers is projected to increase at an average annual rate of 1.6 percent with demand growing at a compounded average annual rate of 1.3 percent. In Oregon, the number of customers is projected to increase at an average annual rate of 1.7percent, with demand growing 1.3 percent per year.

During 2012 our Expected Case demand forecast indicates we will serve an average of 327,300 core natural gas customers with 34,700,000 dekatherms of natural gas. By 2031 we project 448,100 core natural gas customers with an annual demand of over 43,744,000 dekatherms.

Figure 3.7 shows system forecasted demand for the demand scenarios on an **average daily basis** for each year[1].

[1] Appendix 3.9 shows gross demand, DSM savings, and net demand.

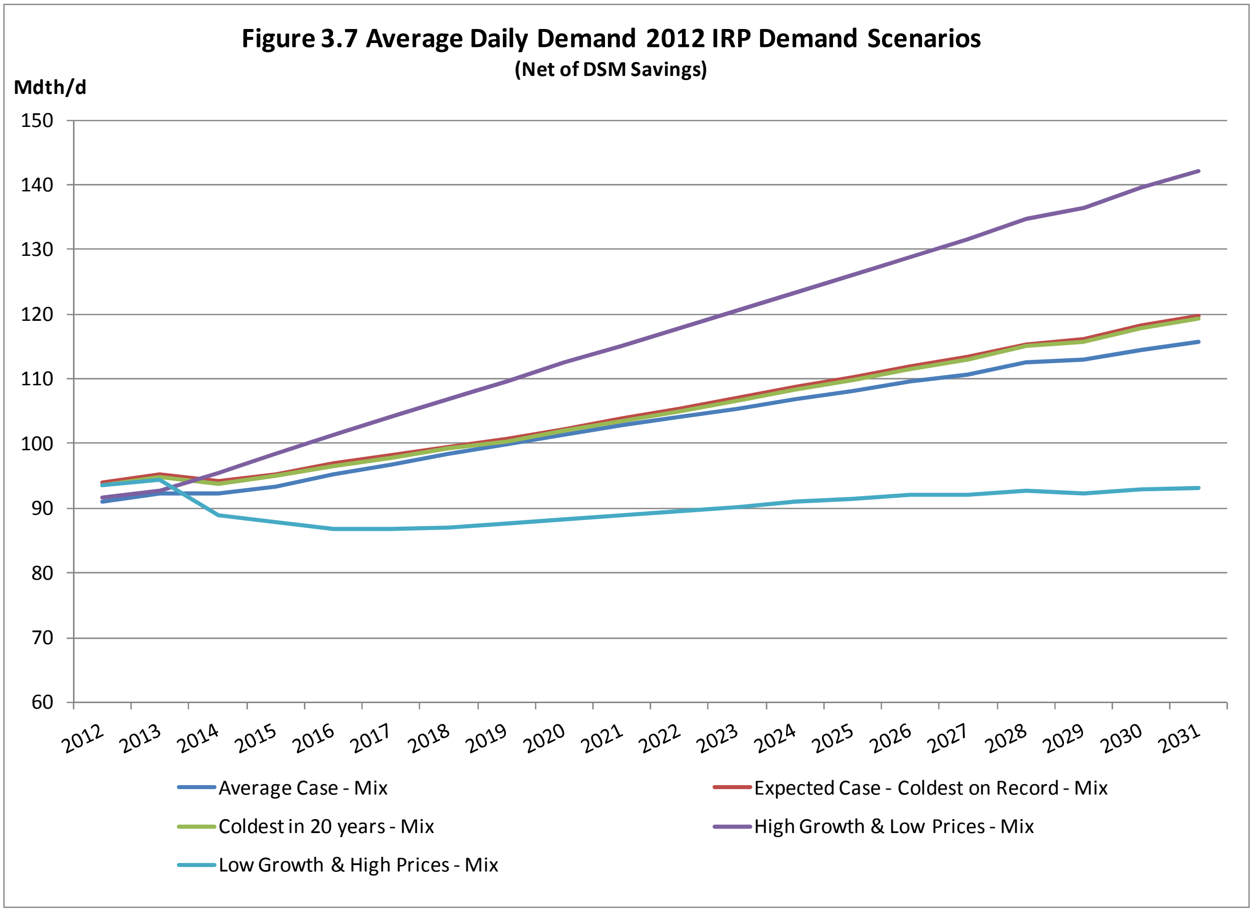
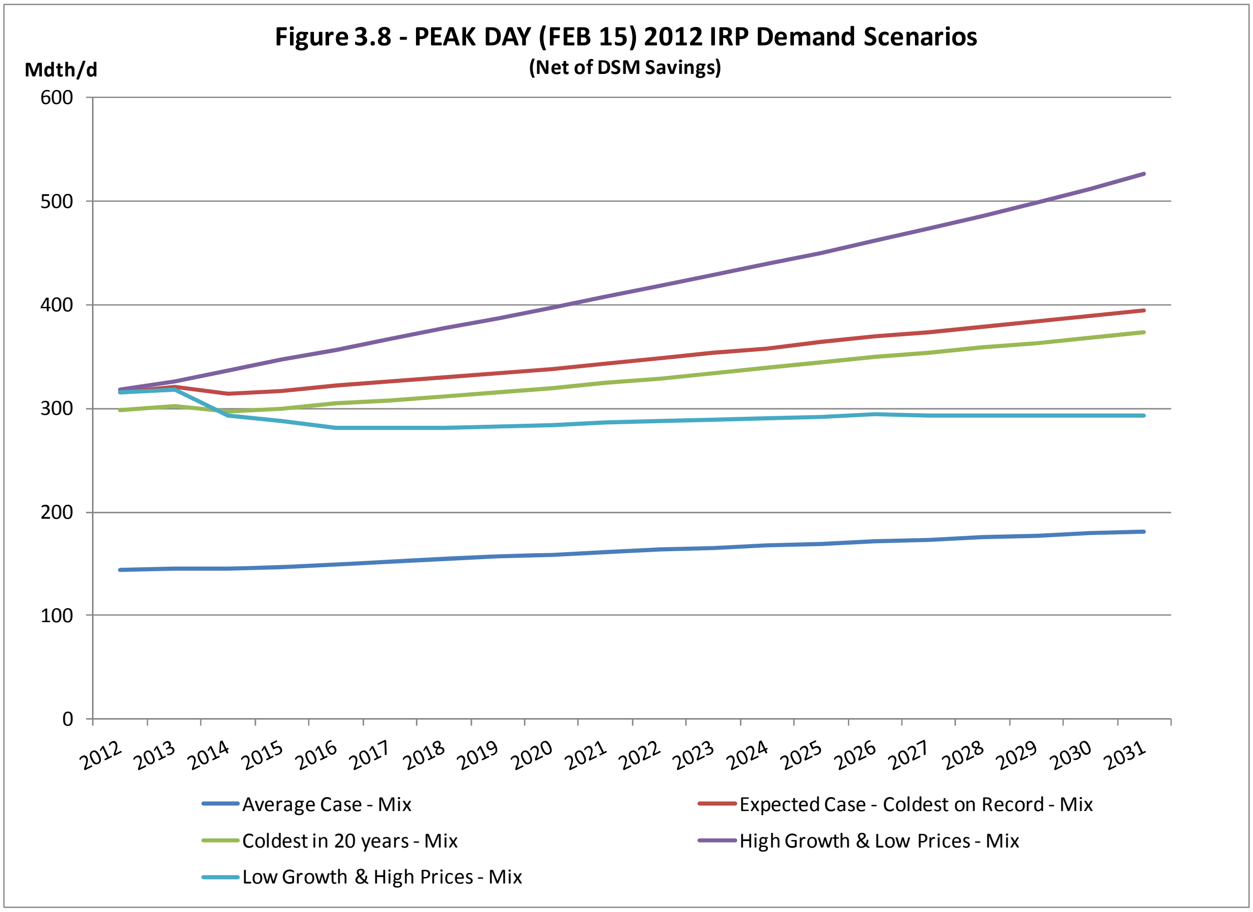



Figure 3.8 shows system forecasted demand for the Expected, High and Low Demand cases on a **peak day basis** for each year relative to the Average case average daily winter demand. Detailed data for all demand scenarios is in Appendix 3.8.




The purpose of the IRP is to balance forecasted demand with existing and new supply alternatives. Since new supply sources include conservation resources, which act as a demand reduction, the demand forecasts prepared and described in this section include existing efficiency standards and normal market acceptance levels. The methodology for modeling demand side management initiatives is described in Chapter 4 - Demand-Side Resources.

## ALTERNATIVE FORECASTING METHODOLOGIES

There are many forecasting methods available and used throughout different industries.. We strive to use methods that enhance forecast accuracy, facilitate meaningful variance analysis and allow for modeling flexibility to incorporate differing assumptions. We believe our statistical methodology to be sound and provide us with a robust range of demand considerations. Our methodology allows for us to vary the results of our statistical inputs by considering both qualitative and quantitative factors. These factors can be derived from data or surveys of market information, fundamental forecasters, and industry experts. We are always open to new methods of forecasting demand and we continually assess which, if any, alternative methodologies to include in our dynamic demand forecasting methodology.

## ‖ ACTION ITEM

Demand forecasting is a critical component, careful evaluation of the current methodology and sufficient scenario planning is essential. The change in demand over recent years has been dramatic causing a heightened focus on variance analysis and trend monitoring. Current techniques have provided sound forecasts with appropriate variance capabilities. In the near term we have identified three key issues to investigate and monitor.

## PRICE ELASTICITY

Our price elasticity analysis raised several issues. First, we noted the AGA factors were derived from annual demand data. This was satisfactory for our annual demand forecasting, but this raised a question whether the factors were applicable to peak demand analysis. We also use the same factors for residential and commercial customer classes even though the AGA factors were derived from residential customer data only.

We also noted that price signals to core customers are lagged and they are often insulated from volatile prices due to their exposure to tariff rates versus wholesale prices.

During our planning cycle we realized the effects of the recession and our demand forecast once again is lower than previous IRPs. Natural gas prices are at lows not seen in the last decade. Prices throughout this forecast are intended to increase, albeit moderately. The question still remains, how much more can/will customers curtail?

An action item from our last IRP had us make an inquiry to the AGA for an updated study. The AGA declined due to budget constraints. For the upcoming IRP cycle, we will consider working with a third-party, such as the NWGA, to conduct a price elasticity study and assess interest of other utilities in pursuing a regional study.

## FLAT DEMAND RISK

Demand once again has "flattened" when compared to previous IRPs. The flattening of demand is due to many factors including moderate forecasted customer growth over the 20-year planning horizon (especially when compared to previous IRP customer forecasts) and declining use per customer due to behavioral changes driven by challenging economic conditions, increased investments in energy efficiency measures and enhanced building codes improving the efficiency of homes. The reduced demand pushes the need for resources out further into the future which is a good thing for customers, as no new investments in resources will be necessary in the foreseeable future. However, should there be a significant rebound in demand our resource needs become more imminent. We need continued visibility into our demand trends in order to identify signposts of accelerated recovery or changing usage behavior.

## NATURAL GAS VEHICLE POTENTIAL

Robust availability of natural gas at economic prices has stimulated investments in NGV infrastructure. How much market penetration occurs nationally and regionally remains uncertain. Analysis and evaluation of our role in the NGV initiative is underway. We have included a scenario where NGV demand is served by Avista.

## II CONCLUSION

Through our dynamic demand modeling process, we have considered a wide range of potential demand impacts of both changing natural gas prices and a changing economy. The result of those considerations is a reasonable array of outcomes with respect to core consumption of natural gas. While we recognize that the actual level of demand is dependent on a variety of factors, reviewing a range of potential outcomes allows us to plan more effectively as economic or pricing conditions change.

# CHAPTER 4 || DEMAND-SIDE RESOURCES

## OVERVIEW

Avista has been offering natural gas Demand-Side Management (DSM) to its residential, commercial and industrial customers since 2001[1]. These programs result in multiple benefits including, but not limited to, reductions in customers' energy bills, reductions in natural gas supply-side resource needs and reductions in Green House Gas (GHG) emissions. These benefits make acquiring cost-effective demand-side efficiencies an appealing resource alternative which Avista believes is the best strategy for minimizing energy service costs to our customers while promoting a cleaner environment.

In response to the Washington Transportation and Utilities Commission (UTC) staff request of an independent, external Conservation Potential Assessment (CPA) pursuant to the Company's next IRP, Avista issued a Request for Proposal (RFP) for a CPA. Consequently, in preparation for this IRP, Global Energy Partners, an EnerNOC Company, was selected to conduct a CPA to forecast the 20-year DSM potential for Avista's natural gas service territory within Washington, Idaho, and Oregon. The DSM potential that was generated for Avista's service territory was then evaluated in SENDOUT® as a resource on par with other supply-side resources.

The SENDOUT® model understands that investments made in DSM are a long-term resource decision. Within SENDOUT® the aggregated potential and costs by region and class are tested against supply side resources. The model also understands that some potential may not be cost-effective in the initial forecast years; however the total cost over the life of the measure, coupled with the cumulative therms savings, is economic. Due to this modeling nuance, SENDOUT® typically selects most of the DSM potential.

The changing natural gas supply picture and lower prices have resulted in the decline of natural gas avoided costs. While this is good news for customers, these lower avoided costs add new challenges to offering a comprehensive natural gas DSM portfolio. The Company's 2012 DSM Business Plan forecasted non-cost-effective natural gas using the avoided costs from the 2009 Natural Gas IRP. A subsequent study done in February 2012 entitled "Review of Prospects and Strategies for the 2012 Avista Regular Income Natural Gas DSM Portfolio" projected that, with substantial modifications, the natural gas DSM portfolio could potentially be marginally cost-effective using a presumed 25 percent reduction in avoided cost.

Avista's originally anticipated assumption of 25 percent lower natural gas avoided costs was replaced with current IRP avoided costs which is a decrease of approximately 50 percent. Given these avoided costs, the Company's business planning projections indicate that the natural gas DSM portfolio will not be cost-effective. Evaluation of a number of scenarios to include additional adders for carbon/green house gases, distribution capacity adders, various allocations and categorizations of non-incentive utility cost, realization rates and net-to-gross ratios, as well as, evaluating the portfolio on a gross (including all program participants) rather than net (including only participants who adopted the measure as a result of the program) did not change the projected unfavorable portfolio cost-effectiveness.

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[1] The Company operated natural gas DSM programs from 1995-1997 until natural gas avoided costs declined to the point at which natural gas DSM programs became cost-ineffective. At that time, the natural gas DSM Tariff Rider, Schedule 191, was reduced to $0 until the avoided costs increased and natural gas programs could again be offered. In 2001 Schedule 191 rider amount was increased and natural gas DSM programs were again implemented. The Company has had uninterrupted natural gas DSM since 2001.

## CPA METHODOLOGY

Prior to the development of potential estimates, Global developed a baseline end-use forecast to quantify the use of natural gas by end use, in the base year, and projections of consumption in the future in the absence of utility programs and naturally occurring conservation. The end-use forecast includes the relatively certain impacts of codes and standards that will unfold over the study timeframe. All such mandates that were defined as of January 2011 are included in the baseline. The baseline forecast is the foundation for the analysis of savings from future DSM efforts, as well as, the metric against which potential savings are measured.

Inputs to the baseline forecast include current economic growth forecasts (e.g. customer growth, income growth), natural gas price forecasts, trends in fuel shares and equipment saturations developed by Global, existing and approved changes to building codes and equipment standards, and Avista's internally developed sales forecasts.

According to the natural gas CPA completed for Avista, the residential sector natural gas consumption for all end uses and technologies increases, mainly due to the projected 1.7 percent annual growth in the number of households, but also due to the slight increase in the average home size. Other heating, which includes unit wall heaters and miscellaneous loads, have a relatively high growth rate compared to other loads. However, at the end of the 20-year planning period, these loads represent only a small part of overall use.

For the commercial and industrial (C&I) sectors, natural gas use continues to grow slowly over the 20-year planning horizon as new C&I construction increases the overall square footage in the commercial sector. In addition, existing buildings are renovated to incorporate additional amenities such as full-scale kitchens. Growth in the HVAC and water heating end uses is moderate. Food preparation, though a small percentage of total usage, grows at a higher rate than other end uses. Consumption by miscellaneous equipment and process heating are also projected to increase.

Table 4.1 illustrates the system-wide baseline forecast and how natural gas use across all sectors is expected to increase by 28 percent during the 20-year planning horizon, for an average annual growth of 1.1 percent. Overall, the forecast for the next 20 years grows steadily, dominated by growth in the residential sector. Further, growth is forecasted to be highest in Idaho followed by Oregon.

**Table 4.1 Baseline Forecast Summary (1000 therms)**

| Sector | 2010 | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 | % Change (2010-2032) | Avg. Growth Rate (2010-2032) |
|---|---|---|---|---|---|---|---|---|---|
| Residential | 188,894 | 196,073 | 197,449 | 204,112 | 219,778 | 241,292 | 269,274 | 43% | **1.5%** |
| Sm. Commercial | 50,693 | 50,130 | 50,530 | 51,271 | 52,378 | 53,494 | 55,120 | 9% | **0.4%** |
| Lg. Commercial | 71,176 | 69,274 | 69,647 | 70,392 | 71,667 | 73,191 | 75,295 | 6% | **0.2%** |
| Industrial | 5,141 | 5,026 | 5,067 | 5,156 | 5,274 | 5,409 | 5,560 | 8% | **0.3%** |
| **Total** | **315,906** | **320,503** | **322,693** | **330,932** | **349,097** | **373,385** | **405,250** | **28%** | **1.1%** |

| State | 2010 | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 | % Change (2010-2032) | Avg. Growth Rate (2010-2032) |
|---|---|---|---|---|---|---|---|---|---|
| Washington | 167,021 | 168,616 | 169,523 | 173,064 | 180,908 | 191,260 | 205,302 | 23% | **0.9%** |
| Idaho | 72,017 | 73,767 | 74,426 | 76,910 | 82,427 | 89,742 | 99,277 | 38% | **1.4%** |
| Oregon | 76,867 | 78,120 | 78,744 | 80,958 | 85,762 | 92,383 | 100,671 | 31% | **1.2%** |
| **Total** | **315,906** | **320,503** | **322,693** | **330,932** | **349,097** | **373,385** | **405,250** | **28%** | **1.1%** |

The next step in the study is the development of the three types of potential: technical, economic and achievable. Technical potential is the theoretical upper limit of conservation potential. This assumes that all customers replace equipment with the most efficient option available regardless of cost, as well as, the adoption of every available non-equipment measure, where applicable. Economic potential represents the adoption of cost-effective conservation measures based on the Total Resource Cost (TRC) test and assumes that customers purchase the most cost-effective and applicable measure. Finally, achievable potential takes into account market maturity, customer preferences for energy efficiency technologies and expected program participation. Achievable potential establishes a realistic target for conservation savings that a utility can expect to achieve through its programs.

DSM measures that achieve generally uniform year round energy savings, independent of weather are considered base load measures. Examples include high efficiency water heaters, cooking equipment and front load clothes washers. Weather sensitive measures are those which are influenced by heating degree day factors and include higher efficiency furnaces, ceiling/wall/floor insulation, weather stripping, insulated windows, duct work improvements (tighter sealing to reduce leaks) and ventilation heat recovery systems (capturing chimney heat). Weather sensitive measures are desirable in resource planning, as they save the most energy during the coldest periods, thus displacing the more expensive peaking or seasonal supply resources. Weather sensitive measures are often referred to as “winter measures” and are typically valued using a higher avoided cost (due to summer to winter pricing differentials) while base load measures often called “annual measures” are valued at a lower avoided cost.

Conservation measures are offered to residential, non-residential and low-income[2] customers. Conservation measures offered to residential customers are classified as prescriptive, meaning they have a standardized therm savings which can be generalized across the customer class and all customers receive the same financial incentive for the same measures. Low income customers receive a more holistic, customized approach through

[2] For purposes of tables, figures and targets, low income is a subset of residential class.

a handful of Community Action Agency partnerships. Non-residential customers have access to prescriptive and site-specific conservation measures. Site-specific measures are customized to the facility and have cost and therm savings that are unique to the individual facility.

Finally, some conservation measures in Oregon are required by law and are therefore designated “mandatory” or “must take” measures in the modeling tool, which means they are offered to customers without regard to their current cost-effectiveness relative to the utility’s supply resources. An example of a mandated measure is a walk-through energy audit, which would not be accompanied by energy savings unless a customer chooses to participate in a program. In addition, a customer may choose to delay participating in a program for many years. In these cases, the audit would be non-cost effective since there is no savings benefit to offset the cost of the audit.

See Table 4.2 for Residential and C&I Measures evaluated in this study for all three states.

**Table 4.2 Conservation Measures**

| Residential Measures | C&I Measures |
|---|---|
| Furnace – Maintenance | Furnace – Maintenance |
| Boiler – Pipe Insulation | Boiler – Maintenance |
| Insulation – Ducting | Boiler – Hot Water Reset |
| Insulation – Infiltration Control | Boiler – High Efficiency Hot Water Circulation |
| Insulation – Ceiling | Space Heating – Heat Recovery Ventilator |
| Insulation – Wall Cavity | Insulation – Ducting |
| Insulation – Attic Hatch | Insulation – Ceiling |
| Insulation – Foundation (new only) | Insulation – Wall Cavity |
| Ducting – Repair and Sealing | Ducting – Repair and Sealing |
| Doors – Storm and Thermal | Windows – High Efficiency |
| Windows – ENERGY STAR | Energy Management System |
| Thermostat – Clock/Programmable | Thermostat – Clock/Programmable |
| Water Heating – Faucet Aerators | Water Heating – Faucet Aerators |
| Water Heating – Low Flow Showerheads | Water Heating – Pipe Insulation |
| Water Heating – Pipe Insulation | Water Heating – Tank Blanket/Insulation |
| Water Heating – Tank Blanket/Insulation | Water Heating – Hot Water Saver |
| Water Heating – Thermostat Setback | Advanced New Construction Designs (new only) |
| Water Heating – Timer | Comprehensive Commissioning |
| Water Heating – Hot Water Saver | Process – Boiler Hot Water Reset (industrial only) |
| Water Heating – Drain Water Heat Recovery (new only) | |
| Home Energy Management System | |
| Advanced new Construction Designs (new only) | |
| ENERGY STAR Homes (new only) | |

## POTENTIAL RESULTS

The technical potential reflects the adoption of all DSM measures regardless of cost effectiveness and represents the upper limit on savings. Over the 20 years considered by the CPA, technical potential reaches 38.9 percent of the baseline end-use forecast.

Economic potential applies the TRC test to measures identified within the technical potential and reflect the adoption of DSM measures that are cost-effective. By the end of the 20-year timeframe this represents 14.6 percent of the baseline energy forecast. The significant difference between the technical and economic potential reflects the lower natural gas avoided costs resulting from shale gas, as well as, the influence of

Avista's long-running history of operating DSM programs that have already achieved much of the cost-effective conservation. Consequently, the remaining conservation measures are becoming incrementally more expensive on a per-therm basis and many, therefore, do not pass the cost-effectiveness screen based on current avoided costs.

Finally, achievable potential across the residential, commercial and industrial sectors is 12.9 percent of the baseline energy forecast by the end of 2032.

For the Oregon service territory, it should be noted that both economic and achievable potential include residential weatherization measures that are mandated by Oregon legislation to be provided regardless of cost effectiveness and other factors. Many of these measures did not pass the TRC benefit-cost ratio analysis but were nevertheless included in economic and achievable potential.

Tables 4.3 and 4.4 summarize cumulative conservation for each potential type for selected years across the 20-year CPA and IRP horizon. Initially, the large commercial sector provides a relatively higher percentage of the achievable savings compared with its share of sales, but over time, this situation reverses so that the residential sector's share of savings is the greatest, due to growth in residential customer count. For more specific detail, please refer to the natural gas CPA provided in Appendix 4.1.

**Table 4.3 Summary of Cumulative Achievable, Economic and Technical Conservation Potential**

| | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 |
|---|---|---|---|---|---|---|
| **Baseline Forecast (1000 thm)** | | | | | | |
| | 320,503 | 322,693 | 330,932 | 349,097 | 373,385 | 405,250 |
| **Cumulative Natural Gas Savings (1000 thm)** | | | | | | |
| Achievable | 1,546 | 3,738 | 12,794 | 28,216 | 41,349 | 52,381 |
| Economic | 1,797 | 4,333 | 14,785 | 31,757 | 45,809 | 58,965 |
| Technical | 7,623 | 15,844 | 46,189 | 91,655 | 131,422 | 157,520 |
| **Cumulative Natural Gas Savings (% of Baseline)** | | | | | | |
| Achievable | 0.5% | 1.2% | 3.9% | 8.1% | 11.1% | 12.9% |
| Economic | 0.6% | 1.3% | 4.5% | 9.1% | 12.3% | 14.6% |
| Technical | 2.4% | 4.9% | 14.0% | 26.3% | 35.2% | 38.9% |

Furthermore, overall potential is presented first by state and then for each sector in the following table.

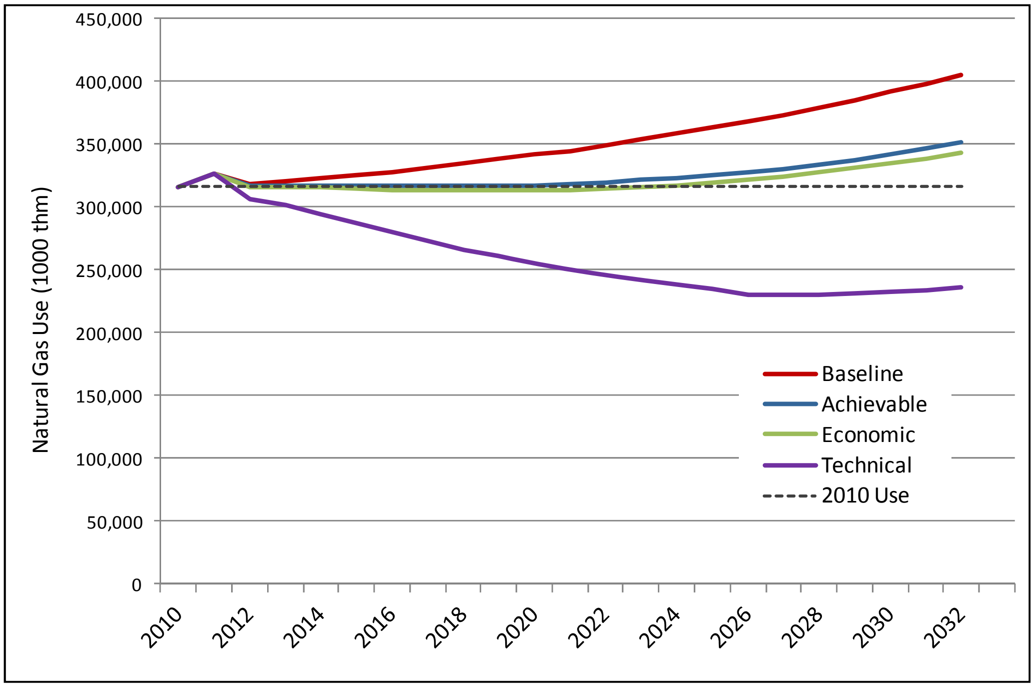
**Table 4.4 Summary of Cumulative Achievable, Economic and Technical Conservation Potential by State and Sector**

| Cumulative Savings (1000 them) | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 |
|---|---|---|---|---|---|---|
| Washington | 893 | 2,203 | 6,923 | 15,364 | 21,885 | 26,909 |
| Idaho | 364 | 821 | 2,734 | 5,601 | 8,758 | 11,914 |
| Oregon | 289 | 715 | 3,136 | 7,251 | 10,706 | 13,559 |
| **Total** | **1,546** | **3,738** | **12,794** | **28,216** | **41,349** | **52,381** |

| Cumulative Savings (1000 them) | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 |
|---|---|---|---|---|---|---|
| Residential | 515 | 1,567 | 6,507 | 14,903 | 22,278 | 29,960 |
| Small Commercial | 206 | 469 | 1,588 | 3,557 | 5,709 | 7,018 |
| Large Commercial | 801 | 1,654 | 4,548 | 9,436 | 13,007 | 15,027 |
| Industrial | 25 | 49 | 151 | 319 | 354 | 377 |
| **Total** | **1,546** | **3,738** | **12,794** | **28,216** | **41,349** | **52,381** |

Figure 4.1 below illustrates the potential forecasts compared with the end-use baseline forecast that was projected to occur in the absence of utility DSM programs. The dotted black line depicts the 2010 usage level. By the end of the 20-year period, achievable potential (indicated by the blue line) offsets 60 percent of the growth in the baseline forecast.

**Figure 4.1 - Conservation Potential Energy Forecast (1000 therm)**




## POTENTIAL RESULTS – RESIDENTIAL

Single-family homes represent 79 percent of Avista's residential natural gas customers, but accounts for 84 percent of the sector's consumption in the study base year 2010. While Oregon represents only about one-quarter of the baseline forecast, it makes up between 28 and 35 percent of the achievable potential savings. This is due to the inclusion of the legislatively mandated weatherization and insulation measures within Oregon's achievable potential.

Table 4.5 provides a distribution of achievable potential by state for the residential sector.

**Table 4.5 Residential Cumulative Achievable Potential by State, Selected Years**

| | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 |
|---|---|---|---|---|---|---|
| **Baseline Forecast (1000 thm)** | | | | | | |
| Washington | 100,894 | 101,415 | 104,274 | 110,964 | 119,962 | 132,043 |
| Idaho | 46,065 | 46,424 | 48,209 | 52,647 | 58,832 | 67,038 |
| Oregon | 49,114 | 49,609 | 51,629 | 56,167 | 62,498 | 70,193 |
| **Total** | **196,073** | **197,449** | **204,112** | **219,778** | **241,292** | **269,274** |
| **Natural Gas Savings (1000 thm)** | | | | | | |
| Washington | 237 | 838 | 3,017 | 7,268 | 10,634 | 13,894 |
| Idaho | 121 | 306 | 1,248 | 2,337 | 4,002 | 6,246 |
| Oregon | 156 | 422 | 2,242 | 5,298 | 7,642 | 9,819 |
| **Total** | **515** | **1,567** | **6,507** | **14,903** | **22,278** | **29,960** |
| **% of Total Residential Savings** | | | | | | |
| Washington | 46.2% | 53.5% | 46.4% | 48.8% | 47.7% | 46.4% |
| Idaho | 23.6% | 19.6% | 19.2% | 15.7% | 18.0% | 20.8% |
| Oregon | 30.3% | 26.9% | 34.5% | 35.5% | 34.3% | 32.8% |

The bulk of the residential potential exists primarily with space heating followed by water heating applications. Appliances and miscellaneous contribute a small percentage of potential. Based on measure-by-measure finding of the potential study, the greatest sources of residential achievable potential across all three states are:

- Shell measures and insulation
- Thermostats and home energy monitoring systems
- Water-saving devices such as low-flow showerheads and faucet aerators
- Water heater tank blankets and pipe insulation

## POTENTIAL RESULTS – COMMERCIAL AND INDUSTRIAL

The baseline forecast for the C&I sector grows steadily during the forecast period as the region begins to recover from the economic downturn. Consequently, energy efficiency opportunities are significant for this sector. However, similar to the residential sector, many conservation opportunities do not pass the TRC economic screen given the low natural gas avoided costs.

The large commercial sector provides the greatest opportunities for savings. Although potential as a percentage of baseline use varies from one sector to the next, results do not vary greatly among the three states. See Table 4.6 for achievable potential by sector for selected years.

**Table 4.6 C&I Cumulative Achievable Potential by Selected Years**

| | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 |
|---|---|---|---|---|---|---|
| **Baseline Forecast (1000 thm)** | | | | | | |
| Small Commercial | 50,130 | 50,530 | 51,271 | 52,378 | 53,494 | 55,120 |
| Large Commercial | 69,274 | 69,467 | 70,392 | 71,667 | 73,191 | 75,295 |
| Industrial | 5,026 | 5,067 | 5,156 | 5,274 | 5,409 | 5,560 |
| **Total** | **124,429** | **125,244** | **126,819** | **129,319** | **132,094** | **135,976** |
| **Natural Gas Savings (1000 thm)** | | | | | | |
| Small Commercial | 206 | 469 | 1,588 | 3,557 | 5,709 | 7,018 |
| Large Commercial | 801 | 1,654 | 4,548 | 9,436 | 13,007 | 15,027 |
| Industrial | 25 | 49 | 151 | 319 | 354 | 377 |
| **Total** | **1,031** | **2,172** | **6,287** | **13,312** | **19,071** | **22,422** |
| **% of Total C&I Savings** | | | | | | |
| Small Commercial | 20.0% | 21.6% | 25.3% | 26.7% | 29.9% | 31.3% |
| Large Commercial | 77.6% | 76.2% | 72.3% | 70.9% | 68.2% | 67.0% |
| Industrial | 2.4% | 2.2% | 2.4% | 2.4% | 1.9% | 1.7% |

Similar to Residential, the bulk of the C&I potential exists within space heating and water heating applications. Food preparation, process and miscellaneous represents a smaller proportion of potential. Primary sources of commercial achievable savings are:

- Energy management systems and programmable thermostats
- Boiler operating measures such as maintenance
- Hot water reset and efficient circulation
- Equipment upgrades for furnaces, boilers and unit heaters
- Food service equipment

## SENDOUT® MODELING METHODOLOGY

The SENDOUT® model understands that investments made in DSM are a long-term resource decision. The model also understands that some programs may not be cost-effective in the initial forecast years; however the total cost over the life of the measure, coupled with the cumulative therms savings, is economic. Due to this modeling nuance, SENDOUT® typically selects most of the DSM potential.

While the IRP process evaluates demand-side and supply-side resources for a 20-year planning horizon, the process also results in a starting point for the two year operational business plan and goal for natural gas DSM. The business plan sets targets specific to each state and sector – residential and C&I. The following three tables provide the 2013-2014 CPA identified DSM opportunity for Idaho, Oregon and Washington, respectively.

**Table 4.7 Idaho Natural Gas Target (2013-2014)**

| Incremental Annual Savings (1000 therm) | 2013 | 2014 |
|---|---|---|
| Residential | 121 | 185 |
| Commercial & Industrial | 246 | 271 |
| **Total** | **364** | **456** |

**Table 4.8 Oregon Natural Gas Target (2013-2014)**

| Incremental Annual Savings (1000 therm) | 2013 | 2014 |
|---|---|---|
| Residential | 156 | 266 |
| Commercial & Industrial | 133 | 160 |
| **Total** | **289** | **426** |

**Table 4.9 Washington Natural Gas Target (2013-2014)**

| Incremental Annual Savings (1000 therm) | 2013 | 2014 |
|---|---|---|
| Residential | 237 | 601 |
| Commercial & Industrial | 655 | 709 |
| **Total** | **893** | **1,310** |

There are substantial methodological differences between the Global Energy Partners CPA and Avista's operational business planning process. These include how measures are aggregated into programs offerings and evaluated, how non-incentive infrastructure costs are treated, and how specific the results are to Avista's service territory and program offerings. The CPA provides substantial guidance in evaluating the entire spectrum of efficiency options and illustrating trends in equipment and technologies, however the business planning process is a reflection of the likely results of actual DSM operations.

Key analytical differences between the CPA and the business planning process include the 'splintering' of measures into numerous scenarios (by building type, replace-before-burnout vs. replace-on-burnout, by jurisdiction, etc.). These splintered measures may pass and generate the expectation of the cost-effective acquisition of resources, but if the measures are not collectively cost-effective when aggregated into a program that can be operationally delivered, there are no realistic prospects for achieving these projections. Additionally there are differences in non-incentive utility cost levels driven by program design approaches and how these costs are distributed. Fundamentally these differences are driven by the use of an independent third-party packaged model intended to provide general guidance regarding resource acquisition economics versus a utility-specific business planning approach incorporating operational details, program-specific assumptions and indexed to past actual results. These differences can lead to different results under many conditions, especially under challenging cost-effectiveness scenarios.

## THE BUSINESS PLANNING PROCESS AND CONSERVATION GOALS

Each fall, Avista develops a DSM business plan where CPA-identified measure applications are re-cast into operational DSM programs and goals are developed. For example, a CPA could identify that 3-pan and 5-pan commercial cookware would be cost-effective while 4-pans may not. However, programmatically, since the 4-pan cookware is such a small slice of the market, the program would ultimately incent all of these non-residential cookware options. As explained above, the 'splintered' approach utilized in the evaluation of natural gas efficiency options within the CPA can lead to substantially different results than can be operationally achieved. Under those circumstances Avista has found that the business planning process is more indicative of what is operationally achievable.

Evaluation of the Washington/Idaho natural gas portfolio using these latest avoided costs have not resulted in any scenarios where Washington/Idaho natural gas programs are cost-effective, on either a gross or net basis. Consequently, Avista has filed in both states for an indefinite suspension of its Washington/Idaho natural gas DSM programs.

The Company has history of suspending natural gas DSM when avoided costs have decreased rendering programs cost-ineffective. Since Washington and Idaho electric DSM portfolio continues to be cost-effective and operate, it is fairly easy for the Company to ramp up the natural gas programs again should there be a change in the natural gas avoided costs. Avista's natural gas DSM programs were suspended in 1997 due to decreased avoided costs and were reinstated when avoided costs increased three years later. The Company will continue to monitor Weighted Average Cost of Gas (WACOG) as a proxy to determine changes in avoided costs.

The Oregon natural gas DSM portfolio is undergoing portfolio evaluation. This evaluation will incorporate the continuation of mandated audit services, as well as, any programs which can be redesigned to meet the required criteria. Additional review of appropriate methodologies will occur to include discussions of the appropriate discount rate and base case. This work is being expedited in recognition of the need to implement program redesigns or suspensions in a responsible manner and timeline.

While the lower natural gas avoided costs can be viewed as disappointing news for DSM, the good news for customers translates to lower retail rates. In addition, some electric efficiency programs such as fuel conversions become even more cost-effective and there may be potential for increases in customer incentives to enhance participation in these programs and encourage customers to make the appropriate fuel choice. Avista continues to support energy efficiency efforts where cost-effectiveness allows.

## ENVIRONMENTAL EXTERNALITIES

The impact of utilizing energy on the environment continues to be a subject of societal concern and debate. If there are impacts that cannot be repaired naturally within a reasonable period of time, damage cost to the environment occurs for which society will have to pay in some future undetermined form. The question of who pays, how much and when payment should be made, are complicated issues. This longstanding debate is trying to be addressed through a variety of public policy initiatives and legislation. Regulatory guidelines in Oregon[3] advocate specific analysis in the IRP process to better understand these issues. Avista included an evaluation of the impacts of environmental externalities in the context of this evolving legislative environment. Appendix 4.2 discusses the analysis.

## DEMAND RESPONSE

Demand response is a peak demand management concept where customers adjust the timing of their energy consumption away from consumption peaks in exchange for lower rates. Implementation strategies encompass a number of activities including real-time pricing, time- of-use rates, critical- peak pricing, demand buyback, interruptible rates and direct-load controls. When effectively implemented, acquisition of costly supply resources can be deferred.

Demand response works best when it is a quick solution to an immediate problem. When demand peaks, system operators need the ability to either quickly notify customers to curtail consumption or do it themselves via control systems to physically manage/restrict gas flow to increase distribution system pressures.

This mechanism exists with respect to our interruptible transportation-only customers, which make up approximately one third of Avista’s total annual throughput. However, because we do not purchase supply for these customers, they do not represent an incremental supply resource alternative. Only core customers with high winter consumption profiles would provide an incremental supply resource using demand response curtailment strategies. Unfortunately, we currently have very few core customers with a complying consumption profile. As a result, we believe that all customers who can manage their operations on interruptible service are currently served on an interruptible basis, leaving little opportunity to reduce peak loads through expanded interruptible service.

While little demand response opportunity exists on our natural gas system, we continue to monitor the progress of other natural gas utilities and their efforts of peak load shifting to offset hourly and/or daily flow constraints. Whereas electric demand response technologies have been in place for over two decades, major differences exist between electric and natural gas supply/delivery systems. The economics of the timing of natural gas usage are much more forgiving than electric due to underground storage and line packing. Furthermore, natural gas curtailment is not an option since a natural gas company cannot restart service without a technician on-site to ensure all pilots are properly lit for safety reasons.

At times natural gas providers may find implementing a demand response program helpful in offsetting or postponing a pipeline upgrade or in price balancing. However, mandatory participation in the affected areas would be vital to fund the necessary investment in enabling technologies.

## ‖ CONCLUSION

By encouraging customers to change their demand for natural gas, Avista can displace the need to purchase additional natural gas supplies, displace or delay contracting for incremental pipeline capacity and possibly displace or delay the need for upgrades to our distribution system. This IRP process provides the utility with the necessary resource analysis to evaluate demand-side resource options on par with supply-side resources,

[3] Oregon IRP regulations require that a 10% cost advantage accrues to DSM resources relative to supply resources for environmental externalities costs. Appendix 4 describes our analysis.

periodically review and update DSM operations and finally, develop and implement improved natural gas energy efficiency programs.

The completion of the IRP analysis is not the end point, but rather the midpoint of a much larger evaluation of the DSM natural gas resource portfolio. The IRP analysis presented has generally indicated a conservation potential for a future DSM program design and delivery. However, differences in modeling methodologies require further evaluation through Avista's annual business planning process in order to facilitate the development of a cost-effective program portfolio to be incorporated into overall DSM operations.

Even though applications to suspend gas DSM have been filed, Avista is committed to closely monitoring proxies for the natural gas avoided cost and returning the natural gas DSM programs to our menu of offerings if commodity costs and efficiency technologies or program delivery options change in such a manner as to make these programs cost-effective under the Total Resource Cost test. This monitoring will be performed on an ongoing basis in addition to our regularly scheduled annual DSM business plans and the biennial IRP process.

# Chapter 5 || Supply-Side Resources

## OVERVIEW

We have analyzed a range of anticipated future demand scenarios and a variety of possible conservation measures to reduce demand. This chapter discusses possible supply options to meet net demand. Our objective is to reliably provide natural gas to customers with an appropriate balance of price stability and prudent cost while navigating continuously changing market conditions. To achieve this, we evaluate a variety of supply-side resources and attempt to build a supply portfolio that is appropriately diversified. The resource acquisition and commodity procurement programs resulting from our evaluation consider physical and financial risks, market-related risks and procurement execution risks and identify the methods we deploy to mitigate these risks.

We manage our natural gas procurement and related activities on a system-wide basis. We have a number of regional supply options available to serve our core customers. These include firm and non-firm supplies, firm and interruptible transportation on six interstate pipelines and storage. Because Avista's core customers span three states, the diversity of delivery points and demand requirements adds to the options available to meet customers' needs. The utilization of these components varies depending on demand and operating conditions. In this chapter, we discuss the available regional commodity resources and our procurement plan strategies, the regional pipeline resource options available to deliver the commodity to our customers, and the storage resource options available which provide additional supply diversity, enhanced reliability, favorable price opportunities and flexibility to meet a varied demand profile. Beyond these traditional supply-side resources we discuss non-traditional resources which are also considered.

## COMMODITY RESOURCES

### SUPPLY BASINS

Avista is fortunate to be located in relatively close proximity to the two largest natural gas producing regions in North America – the Western Canadian Sedimentary Basin (WCSB), which is located primarily in the Canadian provinces of Alberta and British Columbia, and the Rocky Mountain (Rockies) gas basin, located primarily in Wyoming, Utah and Colorado. Avista sources virtually all of its natural gas supplies from these two basins.

The WCSB and Rockies gas basins used to have limited pipeline export potential, which has historically resulted in lower regional natural gas prices when compared to other parts of the country. Over the last decade, however, several large pipelines have been completed (or capacities of existing pipelines increased) connecting the WCSB and Rockies gas basins to the Southwest, Midwest and Northeast sections of the continent. This has at times diminished the discounted price advantage the Region has enjoyed. Furthermore, the prolific amounts of shale gas located across North America (particularly in the East) have and will continue to change the flow dynamics. Forecasts show a continued price advantage for the region in both the WCSB and Rockies basins as the need for these supplies to move East diminishes.

Increased availability of North American natural gas has prompted a change in the LNG landscape. More supply than demand has changed the plans of many LNG import facilities. Now owners of these facilities are looking to switch from importing to exporting gas in order to capture better pricing in the Asian and European markets. Regionally, Kitimat LNG has received authorization to export natural gas off the coast of British Columbia. Two proposed import LNG facilities in Oregon have petitioned FERC to become export facilities. While there is much uncertainty about how many facilities actually get built the bigger question is how regional markets will be impacted by potential exports.

## REGIONAL MARKET HUBS

Extending out from the two primary basins are numerous regional market hubs where natural gas is traded. These typically are located at pipeline interconnects. Avista is located near and transacts at most of the Pacific Northwest regional market hubs, enabling flexible access to a diversity of supply points. These supply points include:

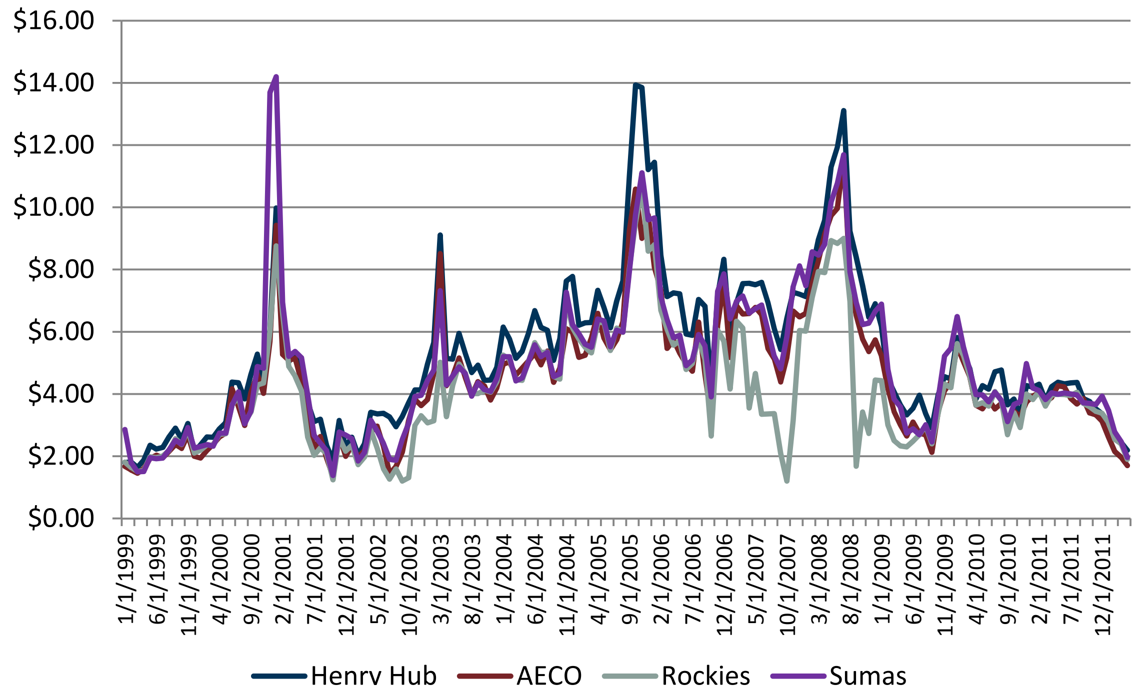
- **AECO –** The AECO-C/Nova Inventory Transfer market center is a major connection region to long-distance transportation systems, which take gas to points throughout Canada and the United States. Alberta has historically produced 90% of Canada's natural gas and is the source of most Canadian natural gas exports to the U.S. representing volume that accounts for approximately 13% of U.S. natural gas requirements.
- **ROCKIES** – This pricing “point” actually represents several locations on the southern end of the NWP system in the Rocky Mountain region. The system draws on Rocky Mountain gas-producing areas clustered in areas of Colorado, Utah, and Wyoming.
- **SUMAS/HUNTINGDON** – This pricing point at Sumas, Wash., is on the U.S./Canadian border where the northern end of the NWP system connects with Spectra Energy’s Westcoast Pipeline, and is predominantly Canadian gas coming south from Northern British Columbia.
- **MALIN** – this pricing point is at Malin, Ore. on the California/Oregon border where the pipelines of TransCanada Gas Transmission Northwest (GTN) and Pacific Gas & Electric Co. connect.
- **STATION 2** – Located at the center of the Spectra Energy/Westcoast Pipeline system connecting to northern British Columbia production.
- **STANFIELD** – Located near the Washington/Oregon border at the intersection of the NWP and GTN pipelines
- **KINGSGATE** – Located at the U.S./Canadian (Idaho) border where the GTN pipeline connects with the TransCanada Foothills pipeline.

Given the ability to transport natural gas to other portions of North America natural gas pricing is often compared to the Henry Hub price for natural gas. Henry Hub is a natural gas trading point located in Louisiana is widely recognized as the primary natural gas pricing point in the U.S. and is also the trading point used in NYMEX futures contracts.

Figure 5.1 shows historic natural gas prices for first-of-month index physical purchases at AECO, Sumas, Rockies and Henry Hub. The figure illustrates there is usually a tight relationship among the various locations; however, there have been periods where one or more price points have disconnected. In winter 2000-2001 Sumas rallied on a combination of the Western energy crisis and unusually cold local weather conditions. In fall of 2005 hurricanes Katrina and Rita disrupted significant Gulf of Mexico regional production causing the Henry Hub to spike disproportionately to Northwest hubs. Since 2007 increased production in the Rocky Mountain basin has exceeded the takeaway pipeline capacity forcing concessions on Rockies prices pending completion of major phases of the Rockies Express pipeline project. This significant project – completed in late summer 2009 – enables substantial volumes to reach Midwestern and

Northeastern demand centers. Consequently, Rockies prices have resumed tighter tracking with Henry Hub prices. As prices have declined the pricing differentials among the basins have tightened.

**Figure 5.1 - Monthly Index Prices**




Natural gas prices among the Northwest regional supply points typically move together as well; however, the basis differential can change depending on market or operational factors. This includes differences in weather patterns, pipeline constraints at different locations and the ability to shift supplies to higher-priced delivery points in the U.S. or Canada. By monitoring these price shifts we are often able to purchase at the lowest-priced trading hubs on a given day, subject to operational and contractual constraints.

Liquidity is generally sufficient in the day-markets at most northwest supply points. AECO continues to be the most liquid supply point, especially for longer-term transactions. Sumas has historically been the least liquid of the four major supply points (AECO, Rockies, Sumas, Malin). This illiquidity contributes to generally higher relative prices in the high demand winter months.

Procurement of natural gas is done via contracts. There are a number of contract specifics that vary from transaction-to-transaction, and many of those terms or conditions impact commodity pricing. Some of the agreed-upon terms and conditions include:

- **FIRM VS. NON-FIRM** – Most term contracts specify that supplies are firm except for force majeure conditions. In the case of non-firm supplies the standard provision is that they may be cut for reasons other than force majeure conditions.
- **FIXED VS. FLOATING PRICING** – The agreed-upon price for the delivered gas may be fixed or based upon a daily or monthly index.
- **PHYSICAL VS. FINANCIAL** – Certain counterparties, such as banking institutions, may not trade physical natural gas but are still active in the natural gas markets. Rather than managing physical

supplies, those counterparties choose to transact financially rather than physically. Financial transactions provide another way for Avista to financially hedge price.

- **LOAD FACTOR/VARIABLE TAKE** – Some contracts have fixed reservation charges assessed during each of the winter months, while others have minimum daily or monthly take requirements. Depending on the specific provisions, the resulting commodity price will contain a discount or premium compared to standard terms.
- **LIQUIDATED DAMAGES** – Most contracts contain provisions for symmetrical penalties for failure to take or supply natural gas.

For this IRP, the SENDOUT® model assumes the natural gas is purchased as a firm, physical, fixed-price contract regardless of when the contract is executed and what type of contract it is. However, in reality, we pursue a variety of contractual terms and conditions in order to capture the most value from each transaction.

## AVISTA'S PROCUREMENT PLAN

We cannot accurately predict future natural gas prices but market conditions and experience help shape our overall approach. Avista has designed a natural gas procurement plan process that seeks to competitively acquire natural gas supplies while reducing exposure to short-term price volatility. Our procurement strategy includes hedging, storage utilization and index purchases. Although the specific provisions of the procurement plan will change as a result of ongoing analysis and experience, the following principles guide Avista's development of its procurement plan:

**Avista employs a time, location and counterparty diversified hedging strategy.** It is appropriate to hedge over a period of time and we establish hedge periods within which portions of future demand are physically and/or financially hedged. The hedges may not be completed at the lowest possible price but they will protect our customers from price volatility. With access to multiple supply basins, when we transact we seek the lowest priced basin. Furthermore, we transact with a range of counterparties.

**Avista establishes a disciplined but flexible hedging approach**. In addition to establishing hedge periods within which hedges are to be completed we also set upper and lower pricing points. In a rising market this reduces Avista's exposure to extreme price spikes. In a declining market this encourages capturing the benefit associated with lower prices.

**Avista regularly reviews its procurement plan in light of changing market conditions and opportunities.** Avista's plan is open to change in response to ongoing review of the assumptions that led to the procurement plan. Although we establish various targets in the initial plan design, policies provide flexibility to exercise judgment to revise/adjust targets in response to changing conditions.

A number of tools are utilized to help mitigate financial risks. Avista purchases gas in the spot market as well as the forward market. Spot purchases are made on a day for the next day or weekend. Forward purchases are made on a day for a designated future delivery period. Many of these tools are financial instruments or derivatives that can be utilized to provide fixed prices or dampen price volatility. We continue to evaluate how to manage daily demand volatility, whether through option tools available from counterparties or through access to additional storage capacity and/or transportation.

## TRANSPORTATION RESOURCES

Although proximity to the liquid hubs is important from a cost perspective those supplies are only as reliable or firm as the pipeline transportation from the hubs to Avista's service territories. Capturing favorable price differentials and mitigating price and operational risk can also be realized by holding multiple pipeline transport options. Consequently, we have contracted for a sufficient amount of diversified firm pipeline capacity from various receipt and delivery points (including out of storage facilities) so that firm deliveries will meet peak day demand. We believe the combination of firm transportation rights to our service territory, storage facilities and access to liquid supply basins will ensure peak supplies are available to our core customers.

The major pipelines servicing our region are as follows:

- **WILLIAMS - NORTHWEST PIPELINE (NWP)**
  A natural gas transmission pipeline serving the Pacific Northwest moving natural gas from the US/Canadian border in Washington and from the Rocky Mtn. region of the US.
- **TRANSCANADA GAS TRANSMISSION NORTHWEST (GTN)**
  A natural gas transmission pipeline originating at Kingsgate, Idaho (Canadian/U.S. border) and terminating at the California/Oregon border close to Malin, Ore.
- **TRANSCANADA ALBERTA SYSTEM**
  A natural gas gathering and transmission pipeline in Alberta Canada that delivers natural gas into the TransCanada Foothills pipeline at the Alberta/British Columbia border.
- **TRANSCANADA FOOTHILLS SYSTEM**
  A natural gas transmission pipeline that delivers natural gas between the Alberta, British Columbia border and the Canadian/U.S. border at Kingsgate, Idaho.
- **TRANSCANADA TUSCARORA GAS TRANSMISSION**
  A natural gas transmission pipeline originating at Malin, Ore and terminating at Wadsworth, Nev.
- **SPECTRA ENERGY - WESTCOAST PIPELINE**
  A natural gas transmission pipeline originating at Fort Nelson, British Columbia and terminating at the Canadian/U.S. border at Huntington, British Columbia/Sumas, Wash.
- **EL PASO NATURAL GAS– RUBY PIPELINE**
  A natural gas transmission pipeline bringing supplies from the Rocky Mountain region of the U.S. to interconnections near Malin, Ore. Ruby Pipeline began operating in July 2011.

Avista has contracts with all of the above pipelines (with the exception of Ruby Pipeline) for firm transportation to serve our core customers. Table 5.1 details the firm transportation/resource services contracted by Avista. These contracts are of different vintages, thus different expiration dates; however, all have the right to be renewed by Avista. This gives Avista and its customers the knowledge that Avista will have available capacity to meet existing core demand now and in the future.

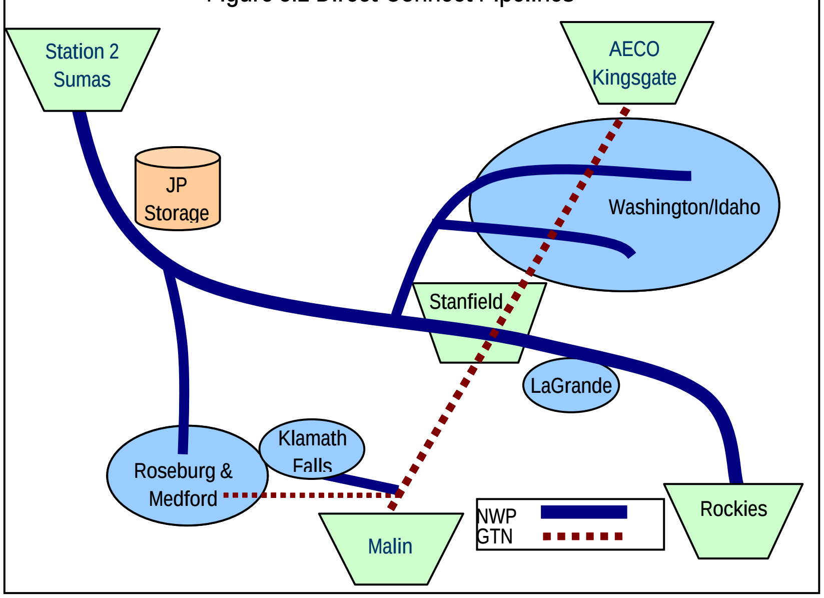
**Table 5.1**
**Firm Transportation/Resources Contracted***
**Dth/Day**

| | Avista North | | Avista South | |
|---|---|---|---|---|
| **Firm Transportation** | **Winter** | **Summer** | **Winter** | **Summer** |
| NWP TF-1 | 157,869 | 157,869 | 42,699 | 42,699 |
| GTN T-1 | 100,605 | 75,782 | 42,260 | 20,640 |
| NWP TF-2 | 91,200 | | 2,623 | |
| **Total** | **349,674** | **233,651** | **87,582** | **63,339** |
| **Firm Storage Resources - Max Deliverability** | | | | |
| Jackson Prairie (Owned and Contracted) | 346,667 | | 54,623 | |
| **Total** | **346,667** | | **54,623** | |

** Represents original contract amounts after releases expire.*

Avista defines two categories of interstate pipeline capacity. "Direct-connect" pipelines deliver supplies directly to our local distribution system from production areas, storage facilities or interconnections with other pipelines. "Upstream" pipelines deliver natural gas to the direct-connect pipelines from remote production areas, market centers and out of area storage facilities. Figure 5.2 illustrates the direct-connect pipeline network relative to our supply sources and service territories1.

Figure 5.2 Direct-Connect Pipelines




1 Avista has a small amount of pipeline capacity with TransCanada Tuscarora Gas Transmission, a natural gas transmission pipeline originating at Malin, Oregon, to service a small number of Oregon customers near the southern border of the state.

Supply-side resource decisions focus on where to purchase natural gas and how to deliver it to customers. Each LDC has distinctive service territories and geography relative to supply sources and pipeline infrastructure. Solutions that deliver supply to service territories among regional LDCs are similar but are rarely generic – instead they are almost always unique.

The NWP system for the most part is a fully contracted system. With the exception of La Grande our service territories lie at the end of various NWP pipeline laterals. Washington/Idaho is served via the Spokane, Coeur d' Alene and Lewiston laterals while Roseburg and Medford are served by the Grants Pass lateral. Capacity expansions on each of these laterals are lengthy and costly endeavors which Avista would likely bear most of the incremental costs.

The GTN system, on the other hand, currently has ample unsubscribed capacity. This pipeline runs directly through or lies in close proximity to most of our service territories. Mileage based rates and backhaul potential provide attractive options for securing incremental resource needs.

Peak day planning aside, both pipelines provide an array of options to flexibly manage daily operations. Our two largest service territories are directly served by both pipelines providing diversification and risk management with respect to supply source, price and reliability. The NWP system (a bi-directional, fixed reservation fee-based pipeline) provides direct access to Rockies and British Columbian supply and facilitates excellent optionality for storage facility management. The Stanfield interconnect of the two lines is also geographically well situated to our service territories.

The rates we use in our planning model start with filed rates that are currently in effect (See Appendix 5.1). Forecasting future pipeline rates is challenging. Our assumptions for future rate changes are the result of market information on comparable pipeline projects, prior rate case experience and informal discussions. It is generally assumed that the pipelines will file to recover costs at rates equal to the GDP with adjustments made for specific project conditions.

NWP and GTN also offer interruptible transportation services. The level of service of interruptible transportation is subject to curtailment when pipeline capacity constraints limit the amount of natural gas that may be moved. Although the commodity cost per dekatherm transported is the same as firm transportation, there are no demand or reservation charges in these transportation contracts. As the marketplace for release of transportation capacity by the pipeline companies and other third parties has become more prevalent, the use of interruptible transportation services has diminished. We do not rely on interruptible capacity to meet peak day core demand requirements.

Avista's transportation acquisition strategy is to contract for firm transportation to serve core customers should a peak day occur in the near-term planning horizon. Since contracts for pipeline capacity are often lengthy in tenor and core customer demand needs can vary over time determining the appropriate level of firm transportation is a complex analysis of many factors. The analysis includes the projected number of firm customers and their expected annual and peak day demand, opportunities for future pipeline or storage expansions and relative costs between pipelines and their upstream supplies. This analysis is done on an annual basis as well as through the IRP. Active management of underutilized capacity through the capacity release market and engaging in optimization transactions offsets some of the transportation costs. Timely analysis is also important in order to maintain an appropriate time cushion to allow for required lead times should the need for securing new capacity arise.

## STORAGE RESOURCES

Storage is a valuable strategic resource that enables improved management of a highly seasonal and varied demand profile. Storage benefits include:

- Flexibility to serve peak period needs
- Access to typically lower cost off-peak supplies
- Reduced need for higher cost annual firm transportation
- Improved utilization of existing firm transportation via off-season storage injections
- Additional supply point diversity

While there are a number of different storage facilities available to the region, Avista's existing storage resources consist solely of ownership and leasehold rights at the Jackson Prairie storage facility.

### JACKSON PRAIRIE STORAGE

Avista is one-third owner, with NWP and Puget Sound Energy (PSE) in the Jackson Prairie storage project for the benefit of its core customers in all three states. Jackson Prairie Storage is an underground reservoir facility located near Chehalis, Wash. approximately 30 miles south of Olympia, Wash. The total working gas capacity of the facility is approximately 25 Bcf. Avista's current share of this capacity for core customers is approximately 8.5 Bcf and includes 398,667 Dth of daily deliverability rights.

Outside of Avista's ownership rights, we have leased an additional 95,565 Dth of Jackson Prairie capacity with 2,623 Dth of deliverability from NWP to serve Oregon customers.

## INCREMENTAL SUPPLY-SIDE RESOURCE OPTIONS

Our existing portfolio of supply-side resources provides a good mix of assets to manage demand requirements for an average day and peak day events. But in anticipation of growing and changing demand requirements, we monitor the following potential resource options to meet future requirements.

### SYSTEM ENHANCEMENTS

Within the context of the IRP, distribution planning plays a role but is not the primary focus. Distribution works hand in hand with supply to ensure that customer demand is met on both and average day and a peak day. There are modifications, enhancements, or upgrades that occur on the distribution system that are routine projects enhancing reliability of our system. However, in certain instances, Avista can facilitate additional peak and base load-serving capabilities through a modification or upgrade of our distribution facilities. These projects would enable more takeaway capacity from the interstate pipelines. These opportunities are geographically specific and require case-by-case study. Costs of these types of enhancements are included in the context of the IRP. A more detailed description of system enhancements (including both routine and non-routine) can be found in Chapter 8.

### CAPACITY RELEASE RECALL

As discussed earlier, pipeline transportation that is not utilized to serve core customer demand can be released to other parties or optimized through daily or term transactions. Released capacity is generally marketed through a competitive bidding process and can be done on a short-term (month-to-month) or long-term basis.

We actively participate in the capacity release market and have both short-term and long-term capacity releases.

We assess the need to recall capacity or extend a release of capacity on an on-going basis. The IRP process also helps evaluate if or when we need to recall some or all of our long-term releases.

## EXISTING AVAILABLE CAPACITY

In some instances there is currently available capacity on existing pipelines. NWP's mainline is currently fully subscribed; however GTN mainline has available capacity. There is some uncertainty about the future capacity availability as the demand needs of utilities and end-users vary across the region. We do model access to the GTN forward- haul and backhaul capacity as an option to meet our future demand needs.

## GTN BACKHAULS

GTN backhaul services have always been available on a relatively reliable basis via displacement. However, the interconnection with the Ruby Pipeline has enabled GTN the physical capability to provide this service with minor modifications to their system. Effective in April 2012 the GTN system offers long-term firm backhaul services. Fees for utilizing this service will be provided under the existing Firm Rate Schedule (FTS-1) and currently no fuel charges will be assessed. Additional requests for firm backhaul service may necessitate the need for additional facilities and compression (i.e. fuel).

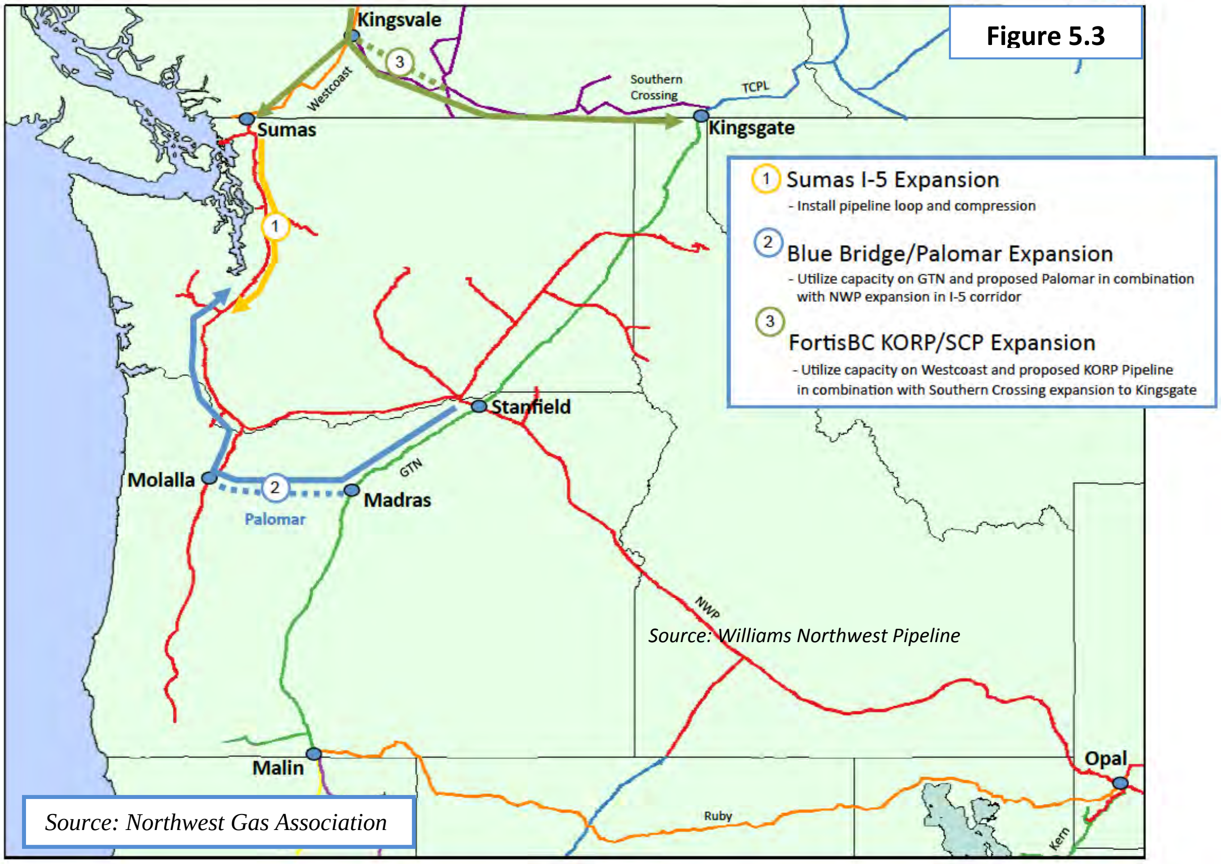
This service has the potential to be a particularly interesting solution for our Oregon customers. For example, Avista can purchase supplies at Malin, Ore. and transport those supplies to our service territory at either Klamath Falls or Medford. Malin-based natural gas supplies typically price at a premium to AECO supplies but are generally less expensive than the cost of forward-haul transporting those traditional supplies and paying the associated demand charges. The GTN system is a mileage-based system so we pay only a fraction of the forward rate if it is transporting supplies from Malin to Medford and Klamath Falls. The GTN system is approximately 612 miles long and the distance from Malin to the Medford lateral is only about 12 miles.

## NEW PIPELINE TRANSPORTATION

Additional firm pipeline transportation resources are viable and attractive resource options. However, determining the appropriate level, supply source and associated pipeline path, costs and timing and determining whether or not existing resources will be available at the appropriate time, make this resource difficult to analyze. Firm pipeline capacity provides several advantages; it provides the ability to receive firm supplies at the production basin, it provides for base-load demand and it can be a low-cost option given optimization and capacity release opportunities. Pipeline capacity also has several drawbacks, including typically long-dated contract requirements, limited need in the summer months (many pipelines require annual contracts) and limited availability and/or inconvenient sizing/timing relative to resource need.

Pipeline expansions are typically more expensive than existing pipeline capacity and often require long-term annual contracts. Even though expansions may be more expensive than existing capacity, this approach may still provide the best option to us given that some of the other options discussed in this section require matching pipeline transportation anyway. Expansions may also provide reliability or access to supply that cannot otherwise be obtained through existing pipelines.

Several specific projects have been proposed for the region. The following summaries describe these projects while Figure 5.3 illustrates their location:




## SUMAS I-5 EXPANSION

NWP continues to explore options to expand its service from Sumas, WA to markets along the I-5 corridor. Looping sections of 36-inch diameter pipeline with the existing pipeline and additional compression at existing compressor stations can add incremental capacity. Actual miles of pipe and incremental compression will determine the amount of capacity created, but can be scaled to meet market demand.

## BLUE BRIDGE/PALOMAR EXPANSION

NWP has begun working with Palomar Gas Transmission (a partnership between NW Natural and TransCanada) to develop the Cascade (eastern) section of the previously proposed Palomar in conjunction with an expansion of NWP's existing system. The proposed 106-mile, 30-inch-diameter pipeline would extend from TransCanada's GTN's mainline, to NW Natural's system near Molalla, Ore. It would be a bi-directional pipeline with an initial capacity of up to 300 MMcf/d expandable up to 750 MMcf/d.

## KINGSVALE-OLIVER REINFORCEMENT EXPANSION

Fortis, British Columbia and Spectra Energy are considering a 100-mile, 24-inch expansion project from Kingsvale to Oliver, British Columbia to expand service to the Pacific Northwest and California markets. Removing constraints will allow expansion of Spectra's T-South enhanced service offering, which provides shippers the options of delivering to Sumas or the Kingsgate market. Expansion of the bi-directional Southern Crossing system would increase capacity at Sumas during peak demand periods. Initial capacity from the Spectra system to Kingsgate would be 300 MMcf/d, expandable to 450 MMcf/d. Expanded east-to-west flow will increase delivery of supply to Sumas by an additional 150 MMcf/d.

Avista is supportive of proposals that bring supply diversity and reliability to the region. We actively engage in discussions and analysis of the potential impact to Avista of each regional proposal from a demand serving and reliability/supply diversity perspective. None of the above projects provide direct delivery connection to any of our service territories. For Avista to consider them to be a viable incremental resource to meet demand needs would require combining with additional capacity on existing pipeline resources. Given this situation we did not model these specific projects. However we do model a generic NWP expansion that extends beyond the proposed I-5 expansion to Avista's service territories.

## IN-GROUND STORAGE

In-ground storage provides many advantages when gas from storage can be delivered to Avista's service territory city-gates. It can enable deliveries of natural gas to customers during cold weather events when they need it most. It also facilitates potentially lower cost supply for our customers by capturing peak/non-peak pricing differentials and potential arbitrage opportunities within individual months. Although additional storage can be a valuable resource, without deliverability to Avista's service territory, this storage cannot be considered an incremental firm peak serving resource.

### JACKSON PRAIRIE

Jackson Prairie is a potential resource for expansion opportunities. Any future storage expansion capacity does not include transportation and therefore cannot be considered an incremental peak day resource. However, we will continue to look for exchange and transportation release opportunities that could fully utilize these additional resource options. Even without deliverability, we believe it can make financial sense to utilize Jackson Prairie capacity to optimize time spreads within the natural gas market and provide net revenue offsets to customer gas costs. There are no current plans for immediate expansion of Jackson Prairie. Should those plans materialize Avista would evaluate its cost-effectiveness within the context of future IRP's.

### OTHER IN-GROUND STORAGE

Other regional storage facilities exist and may be cost-effective. Additional capacity at Northwest Natural's Mist facility, capacity at one of the Alberta area storage facilities, Questar's Clay Basin facility in northeast Utah, Ryckman Creek in Uinta County, Wyoming, and northern California storage are all possibilities. Again, transportation to and from these facilities to Avista's service territories continues to be the largest impediment to contracting for these options. Northern California storage opportunities may be able to overcome this hurdle by using backhaul transportation for deliveries to some of the Washington/Idaho and Oregon customers. Another issue is whether sellers of storage capacity will offer multi-year contracts or contracts with beginning dates during the timeframes that we may need these incremental resources.

### SATELLITE LNG

Satellite LNG is another storage option that could be constructed within Avista's service territories and is ideal for meeting peak day or cold weather events. Satellite LNG uses natural gas that is trucked to the facilities in liquid form rather than liquefying on site. Locating the facility in the service area would avoid interstate pipeline transportation and related charges. Permitting issues notwithstanding, facilities could be located in optimal locations within the distribution system.

Estimates for this type of resource are somewhat varied because of sizing and location issues. For our modeling, we have used estimates from other facilities constructed in the area and believe these to be reasonable estimates for planning purposes. We will continue to monitor and refine the costs of developing satellite LNG while remaining mindful of lead time requirements and environmental issues.

### PLYMOUTH LNG

NWP owns and operates an LNG storage facility located at Plymouth, Washington, which provides a gas liquefaction, storage, and vaporization service under its LS-1 and LS-2F tariffs. An example ratio of injection and withdrawal rates are such that it can take more than 200 days to fill to capacity, but only 3-5 days to empty. As such, the resource is best suited for needle-peak demands. Incremental transportation capacity to our service territories would have to be obtained in order for it to be a truly effective peaking resource.

This peaking resource is fully contracted and not available for contracting at this time. Given this situation, this option is not being modeled in SENDOUT® for this IRP. However, due to the fact that many of the current capacity holders are on one-year rolling evergreen contracts, it is possible that this option will again become viable in the future.

### COMPANY OWNED LIQUEFACTION LNG

Instead of leasing LNG capacity from Plymouth, Avista could construct a liquefaction LNG facility within our service area. Doing so could use excess transportation during off-peak periods to fill the facility but avoid tying up transportation during peak weather events. Additional annual pipeline charges could probably be avoided.

Construction would be dependent on regulatory and environmental approval as well as cost-effectiveness requirements. Preliminary estimates of the construction, environmental, right of way, legal, operating and maintenance, required lead times, and inventory costs indicate company-owned LNG facilities have significant development risks. Due to these risks we did not include this resource in our modeling, recognizing this type of project is highly complex and there are many risk considerations that require evaluation and monitoring.

### BIOGAS

Biogas typically refers to a gas produced by the biological breakdown of organic matter in the absence of oxygen. One type of biogas is produced by anaerobic digestion or fermentation of biodegradable materials such as biomass, manure or sewage, municipal waste, green waste and energy crops. This type of biogas comprises primarily methane and carbon dioxide.

Biogas is a renewable fuel so it sometimes attracts renewable energy subsidies in some parts of the world. We are not aware of any current subsidies but future stimulus or energy policies could lead to some form of financial incentives at a later time.

Biogas projects are inherently individualized, making reasonable and reliable cost estimates difficult to obtain. Project sponsorship has many complex issues and the more likely participation in such a project is as a long-term contracted purchaser.  We did not consider biogas as a resource in this planning cycle but remain receptive to such projects as they are proposed.

## SUPPLY SCENARIOS

For this IRP we modeled three supply scenarios. Table 5.2 lists the supply scenarios and Appendix 5.2 provides the details on what is included in each of these scenarios. Additional detail about the results of these supply scenarios modeled is included in Chapters 6 and 7.

| Table 5.2 Supply Scenarios |
|---|
| Existing Resources |
| Existing + Expected Available |
| GTN Fully Subscribed |

- **EXISTING RESOURCES**
  Represents all resources currently owned or contracted by Avista.
- **EXISTING + EXPECTED AVAILABLE**
  Existing resources plus supply resource options expected to be available when resource needs are identified. This includes: currently available forward and backhaul GTN, capacity release recalls, NWP expansions and satellite LNG.
- **GTN FULLY SUBSCRIBED**
  Availability of GTN capacity is unavailable due to significant contracting driven by increased demand.

## SUPPLY ISSUES

The importance of shale gas in the North American supply mix has fundamentally altered current and the outlook of future natural gas prices and infrastructure. While it appears certain that North American supply is in good shape there are issues that can impact the cost and availability.

- **HYDRAULIC FRACTURING**
  "Fracking" has become the bad word of the natural gas and oil industry. Improvements in hydraulic fracturing (HF), a sixty-year-old technique used to extract oil and natural gas from shale rock formations, has enabled access to previously uneconomic resources. However, the process does not come without its challenges. Movies and articles in the national newspapers have further fueled a movement to cease this drilling practice. There is worry that HF is contaminating aquifers, increasing air pollution, and most recently causing earthquakes. The wide spread publicity generated interest in the production process and caused some states to issue bans or moratoriums on drilling until further research was conducted.

  To that end many levels of government, industry, and universities have or are engaged in conducting studies to better understand the actual and potential impacts of HF. Industry has been working to refute these claims by focusing on ensuring companies use "best practices" for well drilling, disclosing the fluids used in the HF processing, and implementing "green completions" for wells. The state governments are participating in independent audits of their regulations to ensure that proper oversight is in place. The EPA is engaged in a study and will issue a report in late 2012 to determine the effects of HF on water and air. Finally, the United States Geological Survey (USGS) has begun to study the correlation between seismic activity and HF. The outcome of these audits, studies, and further research could greatly impact both the cost and availability of natural gas and oil.
- **LNG – EXPORT IS THE NEW IMPORT**
  A few short years ago, North America was going to be reliant on importing LNG in order to fill the supply and demand gap and the gas market was heading to a more global pricing structure. Now wide

spread shale availability and low production costs have upended the US importing LNG industry. Europe and Asia have prices that are more favorable so in an effort to maximize margins many import facilities have petitioned to become exporters.

On a national level, in April 2012 Sabine Pass LNG was granted the authority by FERC to export 2.2 Bcf/d. Sabine Pass LNG is the first in the US to be granted permission, however there are many more in the queue. Regionally, two proposed LNG terminals in Oregon, Jordan Cove LNG and Oregon LNG are looking to export. In Canada, the National Energy Board (NEB) granted Kitimat LNG in British Columbia a twenty year license to export LNG to serve international markets. When and where this happens, how many, what volume and how our natural gas prices are affected are continuing to be debated.

### ǁ GREEN TURNS TO BLUE

The desire to reduce reliance on fossil fuels, improve the carbon footprint, and lessen our need for foreign oil sparked a flurry of legislative activity. State mandated renewable portfolio standards (RPS), carbon taxes or cap and trade programs, and natural gas vehicles (NGV) became common news.

RPS mandates required electric utilities to “green up” their portfolios. In many cases, this means reducing reliance on coal and investing in renewable sources of energy such as wind, solar, and nuclear. Wind and solar in particular became the resource of choice for most utilities, unfortunately these are intermittent and would require reliable and controllable backup. Additional gas fired power generation will be necessary to support the renewable fleet.

Helping to encourage the change to cleaner and greener energy was the concept of a carbon tax. This would provide a means to make the cost of renewable on par with less expensive fossil fuels. There were many different plans proposed on how to implement the additional costs. However, rapid adoption of such legislation did not occur. As the depth of the recession began to be felt, legislators realized burdening already strapped taxpayers would be detrimental to an already fragile economy. The economy is still healing, but that does not change the importance of reducing our carbon footprint. There continues to be discussion about a carbon tax. The timing and magnitude of the tax has been pushed out many years and is at a much lower level than originally proposed.

With oil prices surging and driving high gasoline prices, many are looking to reduce the nation’s need for foreign oil. This push has renewed investments in NGV infrastructure. T. Boone Pickens and Clean Energy are often in the headlines discussing how NGV can play an important role in the energy and transportation future. Much of the transportation focus has been on long haul trucks and fleet vehicles such as refuse trucks and public transportation. The cost to convert these vehicles is significant, however many are making the switch.

### ǁ PIPELINE AVAILABILITY

The pipeline infrastructure of the Northwest is sparse when compared to the Gulf or East Coast. As we move closer and closer to a more renewable energy future demand for natural gas via gas-fired generation will increase. Pipeline capacity is the link between gas and power. LDCs will have to compete with power generators for pipeline capacity. The new mix could alter current pipeline operations and the potential availability of infrastructure to the region.

## MARKET-RELATED RISKS AND RISK MANAGEMENT

While risk management can be defined in a variety of ways, the integrated resource plan focuses on two areas of risk: the financial risk under which the cost to supply customers will be unreasonably high or unreasonably volatile, and the physical risk that there may not be enough natural gas resources (either the transportation capacity or the commodity) to serve core customers.

Avista has a Risk Management Policy that describes the policies and procedures associated with financial and physical risk management. The Risk Management Policy addresses, among other things, issues related to management oversight and responsibilities, internal reporting requirements, documentation and transaction tracking, and credit risk.

There are two internal organizations that assist in the establishment, reporting and review of Avista's business activities as they relate to management of natural gas business risks:

- The Risk Management Committee consists of several corporate officers and senior-level management. The committee establishes the Risk Management Policy and monitors compliance. They receive regular reports on natural gas activity and meet regularly to discuss market conditions, hedging activity and other natural gas-related matters.
- The Strategic Oversight Group exists to coordinate natural gas matters among internal natural gas-related stakeholders and to serve as a reference/sounding board for strategic decisions, including hedges, made by the Natural Gas Supply department. Members include representatives from the Accounting, Regulatory, Credit, Power Resources and Risk Management departments. While the Natural Gas Supply department is responsible for implementing hedge transactions, the Group provides input and advice.

## ACTION ITEMS

With no immediate need to acquire incremental supply side resources to meet peak day demands Avista's focus in the near term will include the following:

- Continue to monitor supply resource trends including the availability and price of natural gas to the regions, exporting LNG, Canadian natural gas imports, regional plans for gas fired generation and its affect on pipeline availability, as well as future regional pipeline and storage infrastructure plans.
- We will also monitor new resource lead time requirements relative to when resources are needed to preserve resource option flexibility.

## CONCLUSION

Avista is committed to providing reliable supplies of natural gas to its customers. We procure these supplies with a diversified plan that seeks to competitively acquire natural gas supplies while reducing exposure to short-term price volatility through a strategy that includes hedging, storage utilization and index purchases. We have long-term contracts for firm pipeline transportation capacity from many supply points and also own and lease firm natural gas storage capacity sufficient to serve customer demand during peak weather events and throughout the year.

# CHAPTER 6 – INTEGRATED RESOURCE PORTFOLIO

## OVERVIEW

This chapter combines all previously discussed IRP components and the model used to determine resource deficiencies during the 20-year planning horizon. This chapter also provides an analysis of potential resource options and displays the model-selected best cost/risk resource options to meet resource deficiencies.

The foundation for integrated resource planning is the demand planning criteria used for developing demand forecasts. Avista currently uses the "coldest day on record" as its weather planning standard for determining peak-day demand. This is consistent with our past IRPs and is more fully described in Chapter 3 – Demand Forecasts. We utilize historic peak and average weather data for each demand region for this IRP. We plan to serve our expected peak day in each demand region with firm resources. Firm resources include natural gas supplies, pipeline transportation and storage resources. In addition to planning for peak requirements, we also plan for non-peak periods such as winter, shoulder and summer demand. Our modeling process includes running an optimization for every day of the 20-year planning period.

It is assumed that on a peak day all interruptible customers have left the system in order to provide service to firm customers. Avista does not make firm commitments to serve interruptible customers. Therefore, our IRP analysis of demand-serving capabilities only focuses on the residential, commercial and firm industrial classes.

Our supply forecasts are increased between 1.0 percent and 3.0 percent on both an annual and peak-day basis to account for additional supplies that are purchased primarily for pipeline compressor station fuel. The percentage of additional supply that must be purchased is governed through FERC and National Energy Board approved tariffs.

## SENDOUT® PLANNING MODEL

The SENDOUT® Gas Planning System from Ventyx is used to perform integrated resource optimization. The SENDOUT® model was purchased in April 1992 and has been used in preparing all IRPs since then. Avista has a long-term maintenance agreement with Ventyx that allows us to receive software updates and enhancements. These enhancements include software corrections and improvements brought on by industry change.

SENDOUT® is a linear programming model widely used to solve natural gas supply and transportation optimization questions. Linear programming is a proven technique used to solve minimization/maximization problems. SENDOUT® looks at the complete problem at one time within the study horizon, while taking into account physical limitations and contractual constraints

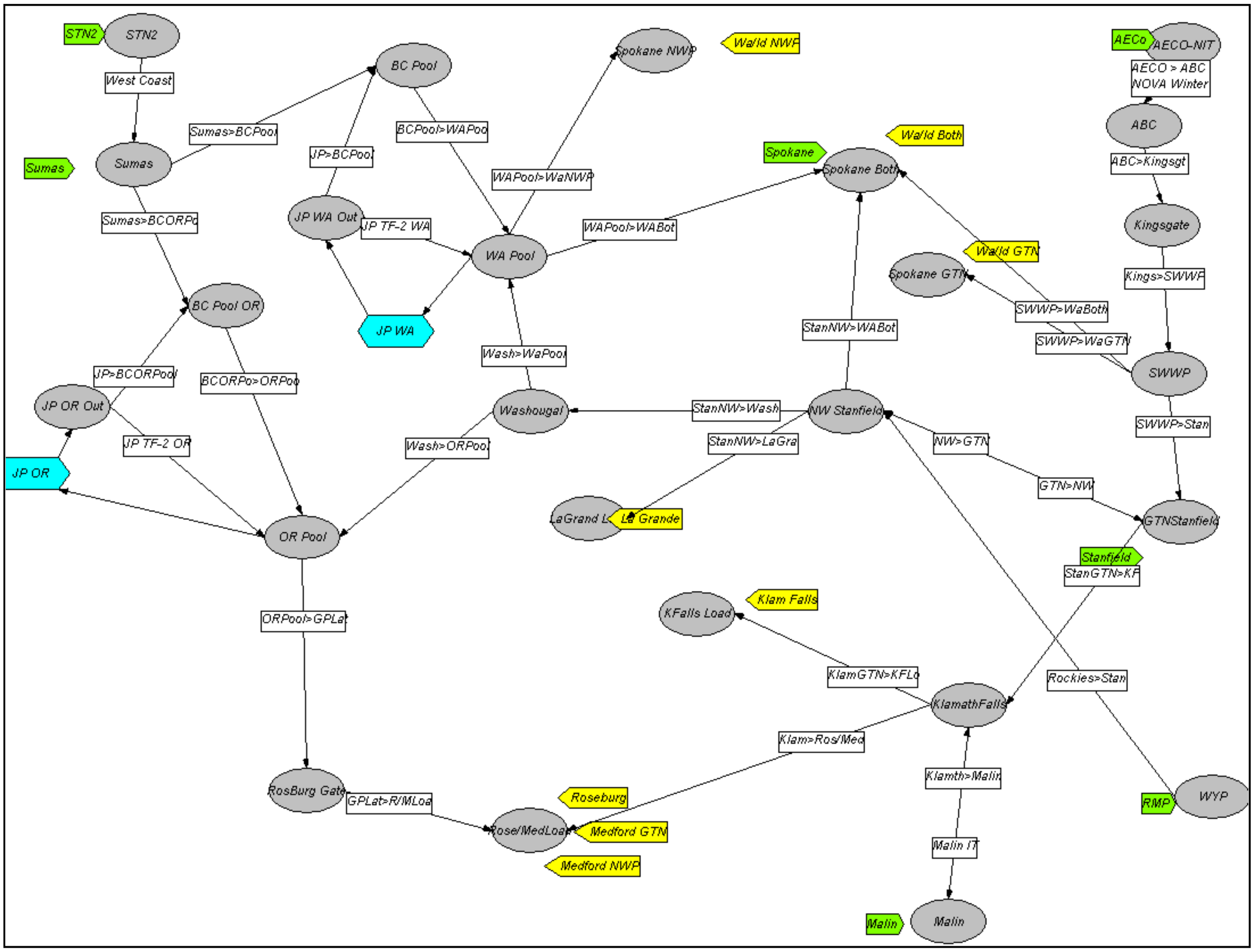
The software analyzes thousands of variables and evaluates possible solutions to generate a least cost solution. The model uses the following variables:

- Demand data, such as customer count forecasts and demand coefficients by customer type (e.g. residential, commercial and industrial)
- Weather data – minimum, maximum and average temperatures
- Existing and potential transportation data which describes to the model the network for the physical movement of the natural gas and associated pipeline costs

- Existing and potential supply options including supply basins, revenue requirements as the key cost metric for all asset additions, and prices
- Natural gas storage options with injection/withdrawal rates, capacities and costs
- DSM potential

Figure 6.1 is a SENDOUT® network diagram of our demand centers and resources. This diagram illustrates Avista’s current transportation and storage assets, flow paths and constraint points.

**FIGURE 6.1 SENDOUT® MODEL DIAGRAM**




The SENDOUT® model also provides a flexible tool to analyze potential scenarios such as:

- Pipeline capacity needs and capacity releases
- Effects of different weather patterns upon demand
- Effects of natural gas price increases upon total natural gas costs
- Storage optimization studies
- Resource mix analysis for DSM
- Weather pattern testing and analysis
- Transportation cost analysis

- Avoided cost calculations
- Short-term planning comparisons

SENDOUT® also includes Monte Carlo capabilities, which facilitates price and demand uncertainty modeling and detailed portfolio optimization techniques to produce probability distributions. More information and analytical results are located in Chapter 7 – Alternate Scenarios, Portfolios and Stochastic Analysis.

## RESOURCE INTEGRATION

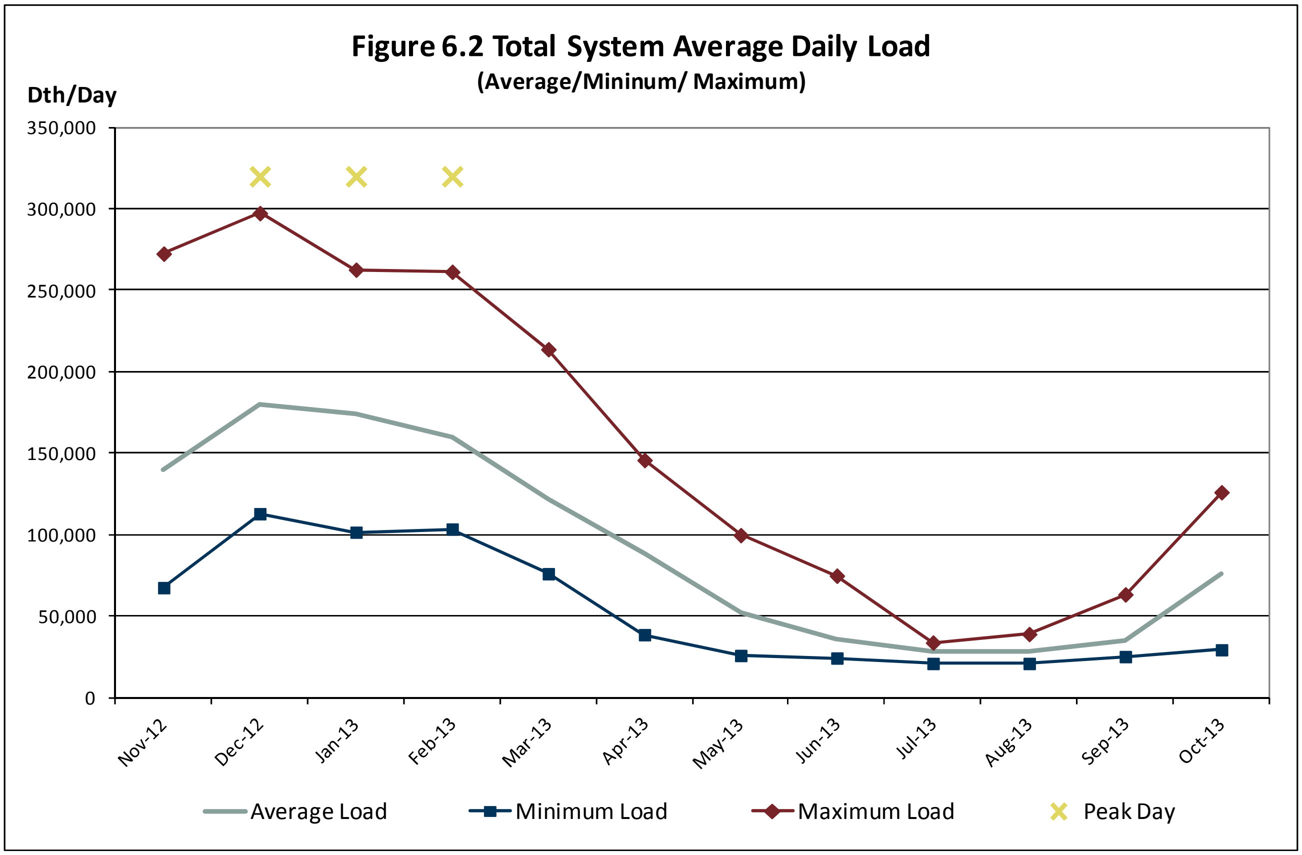
We have defined the planning methodologies, described the modeling tools and identified the existing and potential resources. The following summarizes the comprehensive analysis of bringing demand forecasting and existing and potential supply and demand-side resources together to form our 20-year, risk adjusted least-cost plan.

### DEMAND FORECASTING

Avista's demand forecasting approach is described in detail in the Chapter 3 - Demand Forecasts.

We forecast demand in the SENDOUT® model in eight service areas given the existence of distinct weather and demand patterns for each area and pipeline infrastructure dynamics. The SENDOUT® areas are Washington/Idaho (disaggregated into three sub-areas because of pipeline flow limitations), Medford (disaggregated into two sub-areas because of pipeline flow limitations) and Roseburg, Klamath Falls and La Grande. In addition to area distinction, we also model demand by customer class within each area. The relevant customer classes in Avista's service territories are residential, commercial and firm industrial customers.

Customer demand reflects a highly weather-sensitive component. Avista's customer demand is not only highly seasonable but also highly variable. Figure 6.2 captures this variability showing our monthly system-wide average demand, minimum demand day observed in each month, and maximum demand day observed in each month, and our winter projected peak day demand for the first year of our Expected Case forecast as determined in SENDOUT®.



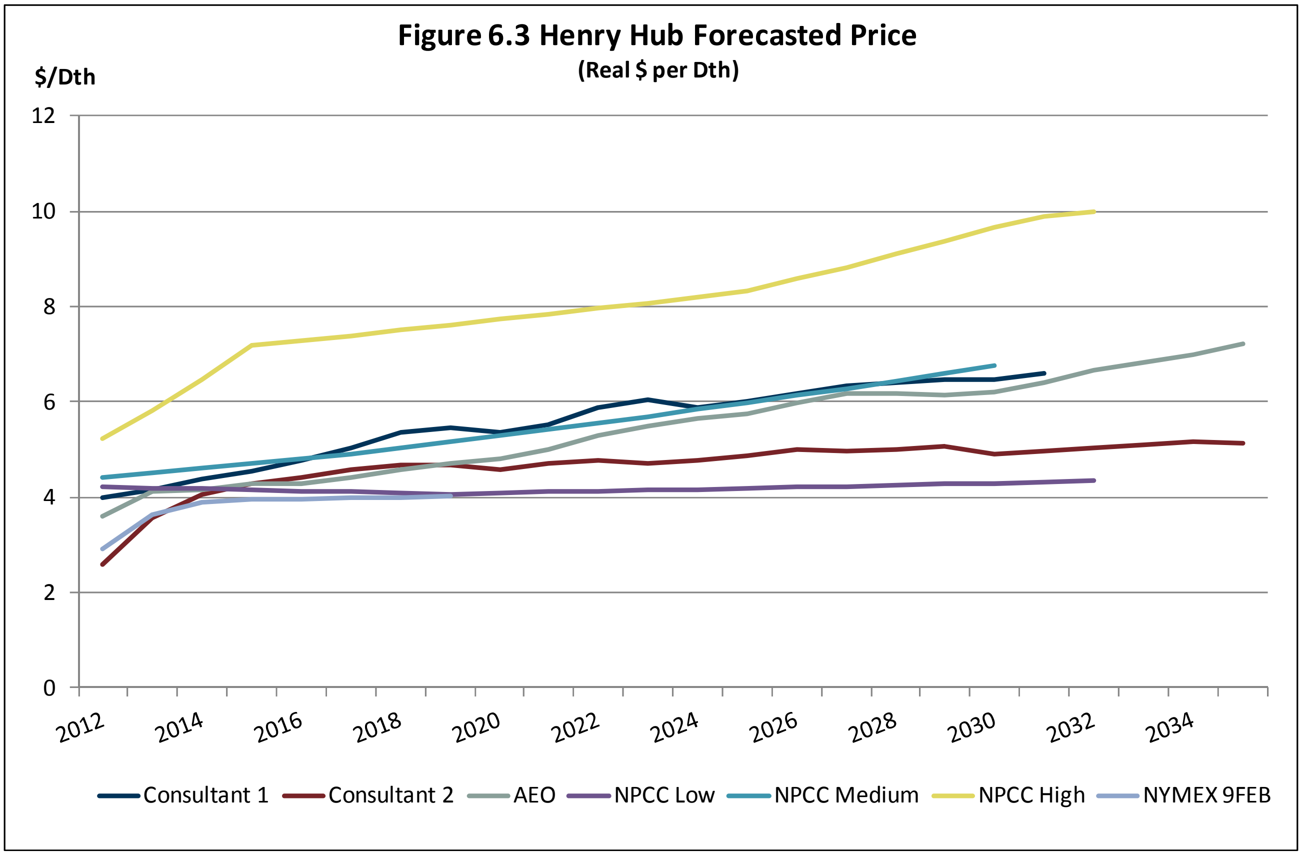

## NATURAL GAS PRICE FORECASTS

Natural gas prices are a fundamental component of the IRP. The commodity price is a significant component of the total cost of a resource option. This in turn affects the avoided cost threshold for determining cost-effectiveness of conservation measures. We also recognize the price of natural gas influences consumption, so we include price elasticity analysis in our demand evaluation (see Chapter 3 – Demand Forecasts).

The natural gas price outlook has changed dramatically in recent years in response to several influential events and trends affecting the industry. The recession, shale gas production and potential climate change legislation encouraging natural gas-fired power generation to replace coal burning power plants. Due to the rapidly changing environment and uncertainty in predicting future events and trends, modeling a range of forecasts is necessary.

Many additional factors influence natural gas pricing and volatility, such as regional supply/demand issues, weather conditions, hurricanes/storms, storage levels, gas-fired generation, infrastructure disruptions and infrastructure additions (e.g. new pipelines, LNG terminals).

Even though we continually monitor these factors, we cannot accurately predict future prices for the 20-year horizon of this IRP. We have reviewed several price forecasts from credible sources. Figure 6.3 depicts the price forecasts we considered in our analyses.




Selecting the price curves can be more art than science. With assistance and concurrence of the TAC we selected high, expected and low price curves to consider possible outcomes and the impact on resource planning. The price curves we have selected have variation and provide reasonable upper and lower bounds, which is consistent with our theme of stretching modeling assumptions to address uncertainty in the planning environment. These curves are shown in real dollars in Figure 6.4 and nominal dollars in Figure 6.5. Additionally, stochastic modeling of natural gas prices is also completed. The results from that analysis are shown in Chapter 7 – Alternate Scenarios, Portfolios, and Stochastic Analysis.

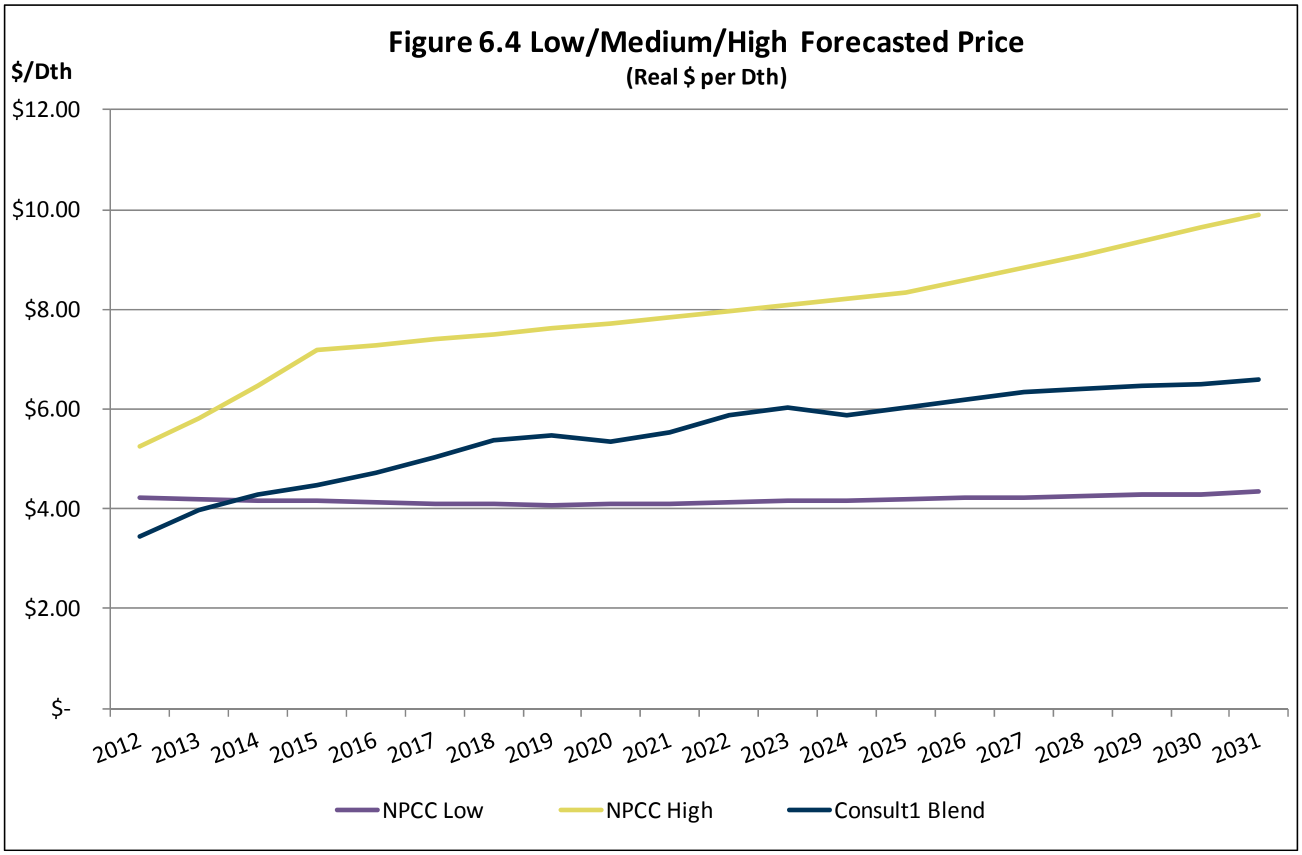


Figure 6.4 Low/Medium/High Forecasted Price
(Real $ per Dth)
$/Dth
$12.00
$10.00
$8.00
$6.00
$4.00
$2.00
$-
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
NPCC Low
NPCC High
Consult1 Blend

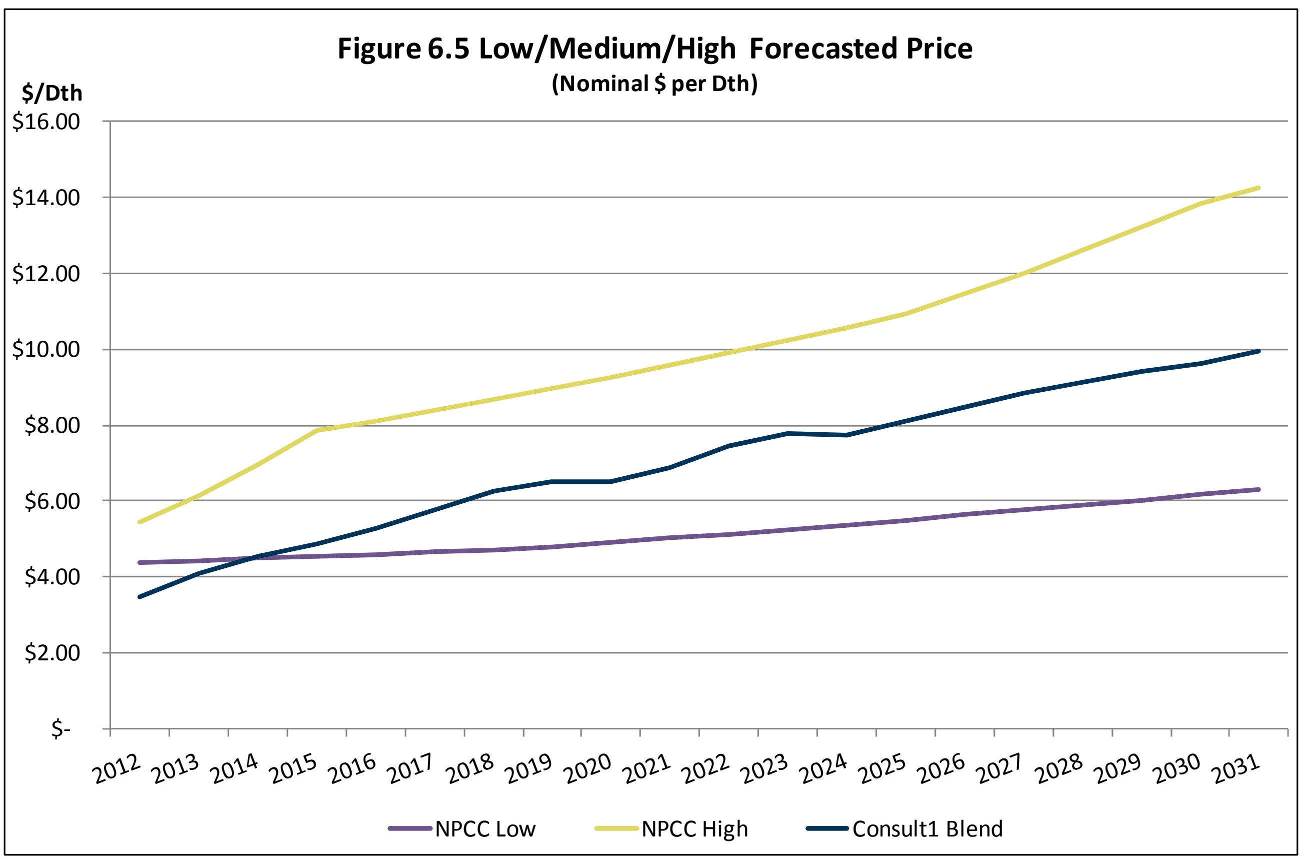


Figure 6.5 Low/Medium/High Forecasted Price
(Nominal $ per Dth)
$/Dth
$16.00
$14.00
$12.00
$10.00
$8.00
$6.00
$4.00
$2.00
$-
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
NPCC Low
NPCC High
Consult1 Blend

Each of the price forecasts above are for Henry Hub, which is located in Louisiana just onshore from the Gulf of Mexico. Henry Hub is widely recognized as the most important pricing point in the U.S. because of its proximity to a large portion of U.S. natural gas production and the sheer volume traded in the daily or spot market as well as the forward markets via the New York Mercantile Exchange's (NYMEX) futures contracts. Consequently, all other trading points tend to be priced off of the Henry Hub.

The primary physical supply points at Sumas, AECO, and the Rockies (and other secondary regional market hubs) ultimately determine Avista's costs. Prices at these points typically trade at a discount or negative basis differential to Henry Hub primarily because of their relative close proximity to the two largest natural gas basins in North America (the WCSB and the Rockies).

Table 6.1 shows the Pacific Northwest regional prices from our consultants, historic averages, and the prior IRP as a percent of Henry Hub price along with historical comparisons.

**Table 6.1 Regional Price as a Percent of Henry Hub Price**

| | AECO | Sumas | Rockies | Malin | Stanfield |
|---|---|---|---|---|---|
| Consultant1 Forecast Average | 88.60% | 89.90% | 90.80% | 92.30% | 91.40% |
| Consultant2 Forecast Average | 86.20% | 92.50% | 92.80% | 94.10% | 92.60% |
| Historic Cash Three-Year Average | 89.90% | 95.50% | 88.10% | 97.00% | 95.60% |
| Prior IRP | 92.70% | 95.20% | 85.60% | 94.10% | 93.70% |

This IRP used monthly prices for modeling purposes because of our heavily winter-weighted demand profile. Table 6.2 depicts the monthly price shape we used in this IRP. A slight change to the shape of the pricing curve has occurred since the last IRP. Driven primarily by supply availability, the forecasted differential between winter and summer pricing has come in to some extent when compared to historic data.

**Table 6.2 Monthly Price as a Percent of Average Price**

| | Jan | Feb | Mar | Apr | May | Jun |
|---|---|---|---|---|---|---|
| Consult1 | 101% | 101% | 98% | 98% | 98% | 100% |
| Consult2 | 103% | 102% | 99% | 98% | 99% | 101% |
| Historic First of Month Index Three-Year Average | 130% | 113% | 101% | 94% | 96% | 96% |
| Prior IRP | 107% | 108% | 103% | 93% | 93% | 94% |
| | **Jul** | **Aug** | **Sep** | **Oct** | **Nov** | **Dec** |
| Consult1 | 102% | 103% | 100% | 100% | 100% | 102% |
| Consult2 | 101% | 101% | 97% | 97% | 98% | 104% |
| Historic First of Month Index Three-Year Average | 104% | 100% | 84% | 93% | 92% | 97% |
| Prior IRP | 94% | 94% | 95% | 96% | 101% | 106% |

Consistent with our selection for Henry Hub prices, we selected Consultant 1's forecast of regional prices and monthly shape. Appendix 6.1 contains detailed monthly price data behind the summary table information discussed above.

## TRANSPORTATION AND STORAGE

Valuing natural gas supplies is a critical first step in resource integration. Equally important is capturing all costs to deliver the gas to the customer. Daily capacity of our existing transportation resources (described in Chapter 5 – Supply-Side Resources) is represented by the firm resource duration curves depicted in Figures 6.6 and 6.7.

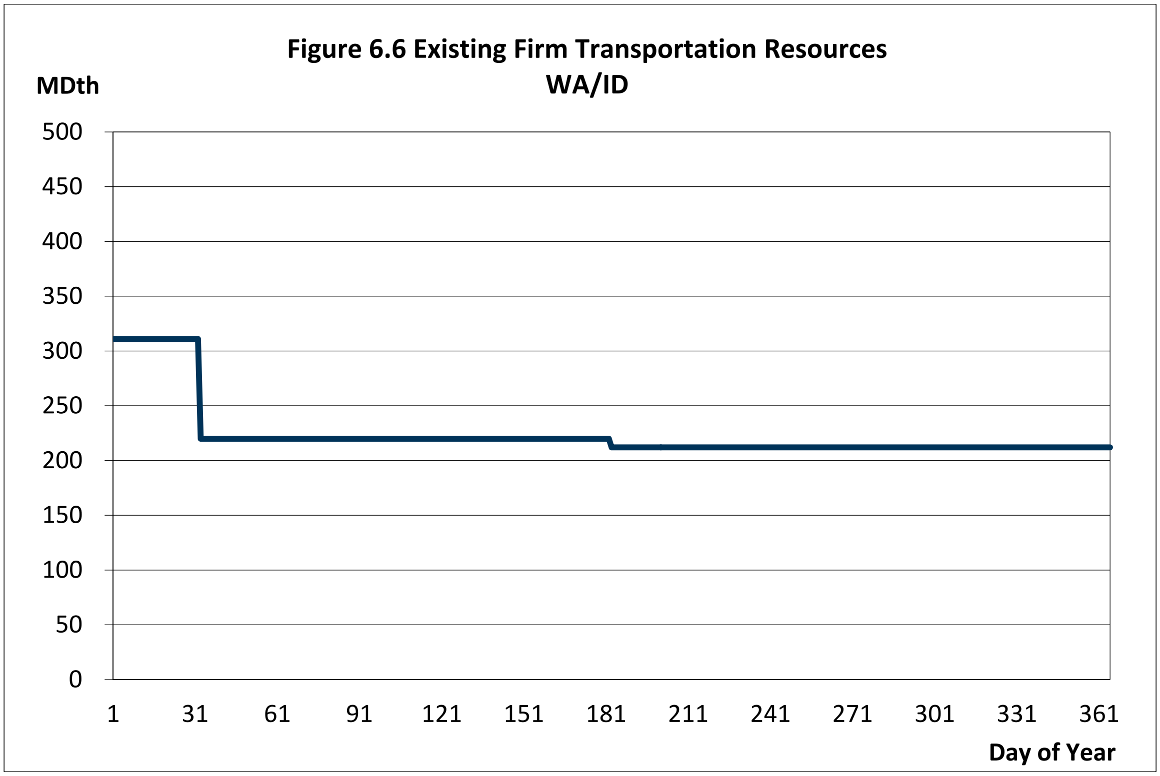
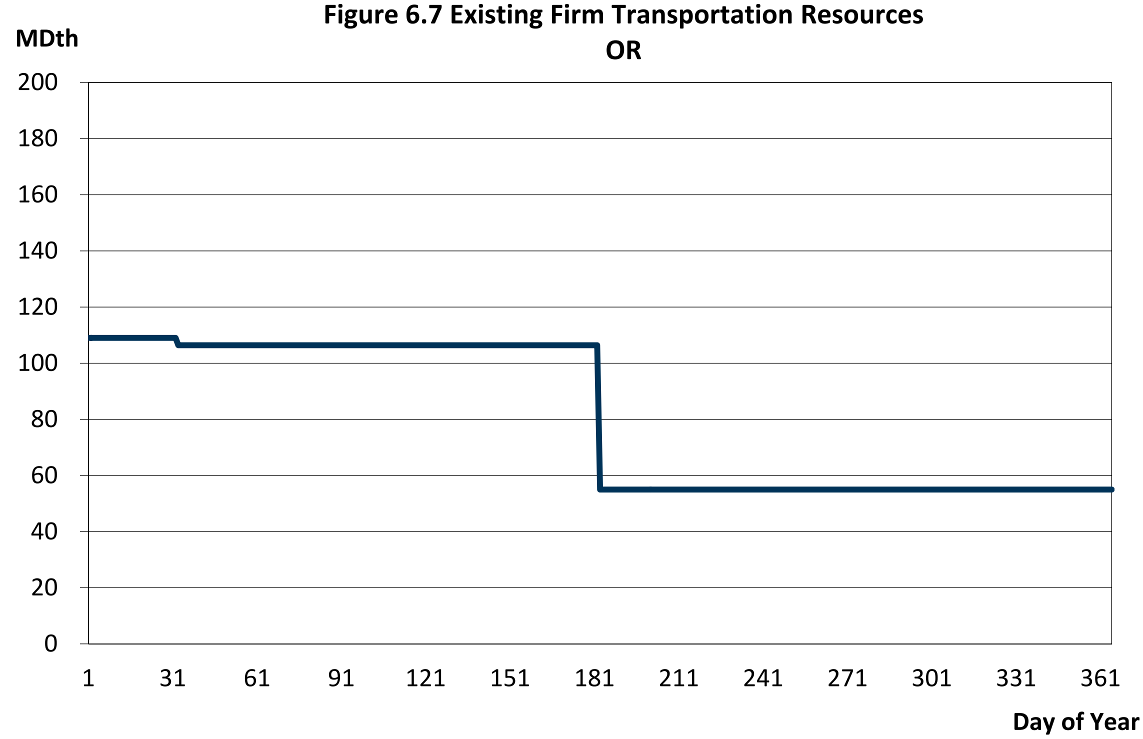


**Figure 6.7 Existing Firm Transportation Resources OR**




Current rates for capacity are in Appendix 5.1. Forecasting future pipeline rates can be a challenge as we need to estimate the amount and timing of rate changes. Our estimates and timing of future rate increases are based on knowledge obtained from industry discussions and participation in various pipeline rate cases. This IRP assumes that pipelines will file to recover costs at rates equal to increases in GDP (see Appendix 6.2 – General Assumptions).

### DEMAND-SIDE MANAGEMENT

Chapter 4 – Demand-side Resources describes the methodology used to identify conservation potential and the interactive process deployed in SENDOUT® that computes avoided cost thresholds for determining cost effectiveness of conservation measures on an equivalent basis with supply-side resources.

## PRELIMINARY RESULTS

After incorporating the above data into the SENDOUT® model, we then generate an assessment of demand compared to existing resources for several scenarios. The demand results from these cases are discussed in Chapter 3 – Demand Forecasts, with additional details supported in the Appendices 3.1 through 3.10.

Figures 6.8 through 6.11 graphically represent summaries of Average Case demand compared to existing resources. This demand is net of DSM savings and shows the adequacy of our resources under normal weather conditions. For this case, current resources meet our demand needs over the planning horizon.

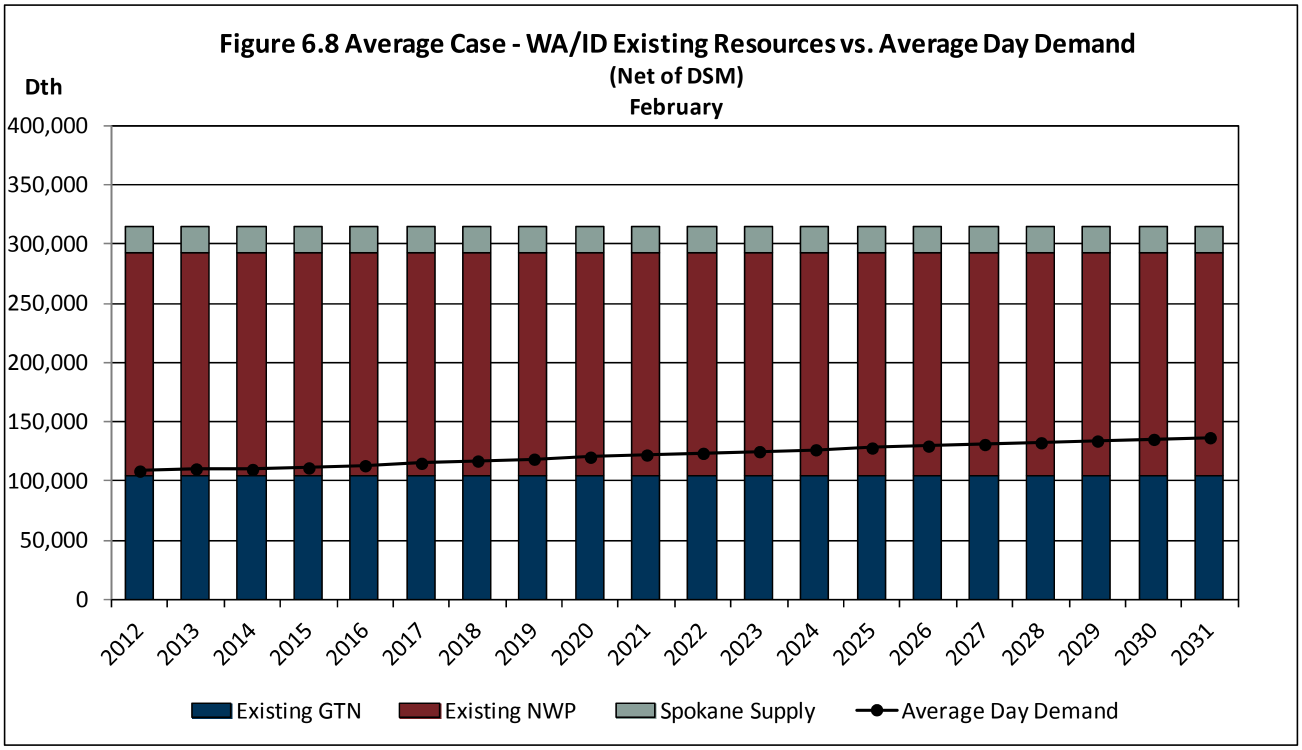


Figure 6.8 Average Case - WA/ID Existing Resources vs. Average Day Demand
(Net of DSM)
February
Dth
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031
Existing GTN
Existing NWP
Spokane Supply
Average Day Demand

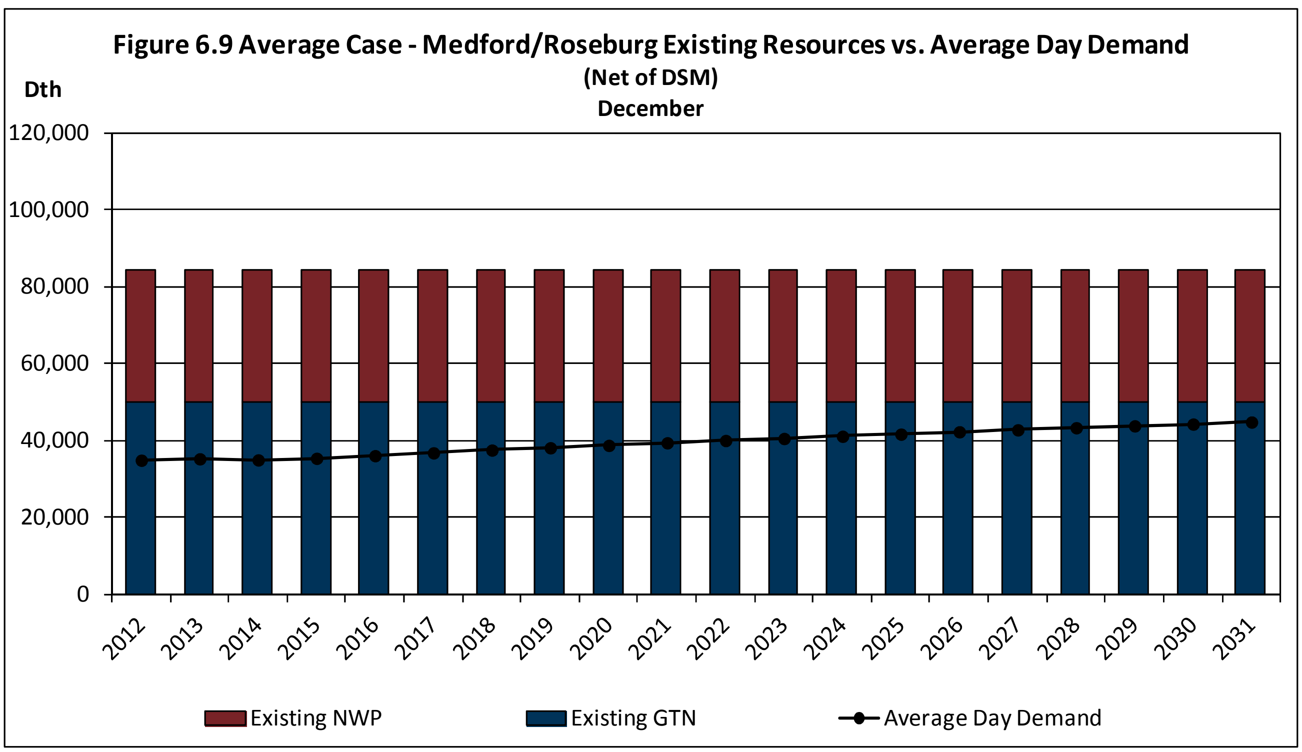


Figure 6.9 Average Case - Medford/Roseburg Existing Resources vs. Average Day Demand
(Net of DSM)
December
Dth
120,000
100,000
80,000
60,000
40,000
20,000
0
2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031
Existing NWP
Existing GTN
Average Day Demand

**Figure 6.10 Average Case - Klamath Falls Existing Resources vs. Average Day Demand**

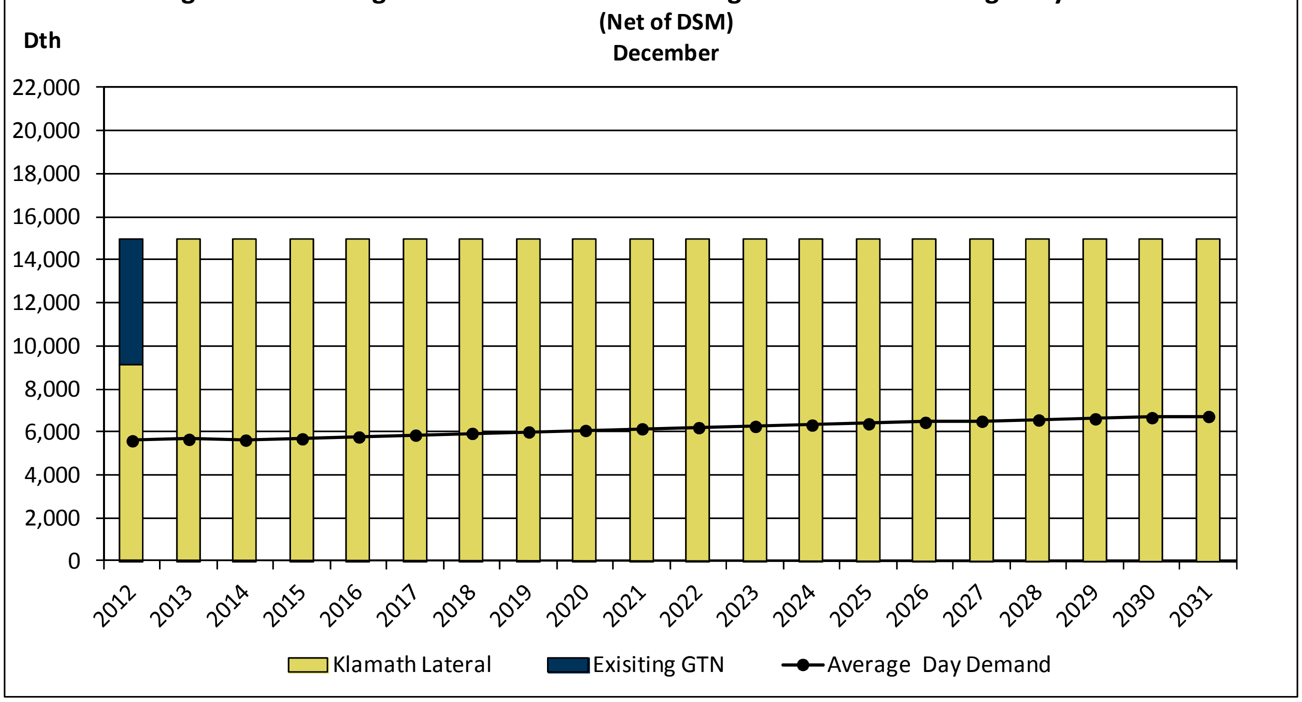
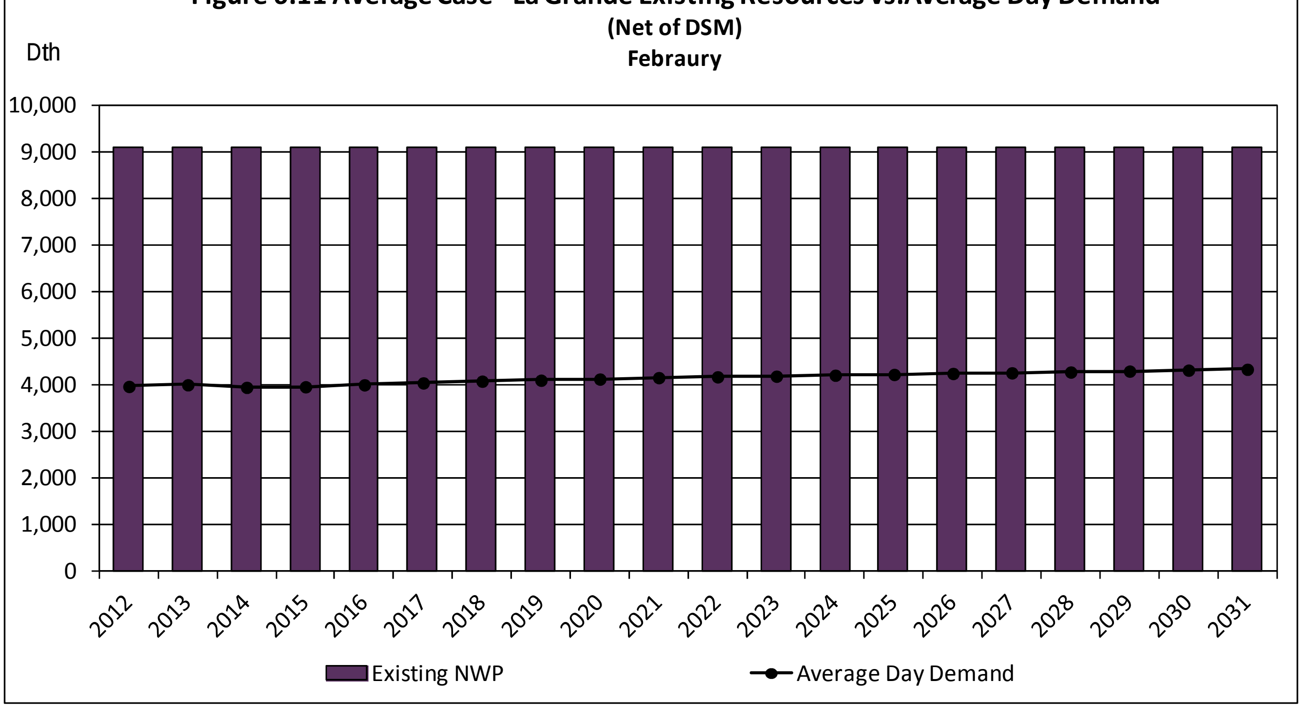



**Figure 6.11 Average Case - La Grande Existing Resources vs.Average Day Demand**




Figures 6.12 through 6.15 graphically represent summaries of Expected Case peak day demand compared to existing resources, as well as demand comparisons to our prior IRP. This demand is net of DSM savings. This comparison shows by service territory the amount and timing of deficits over the planning horizon.

**Figure 6.12 Expected Case - WA/ID Existing Resources vs. Peak Day Demand**

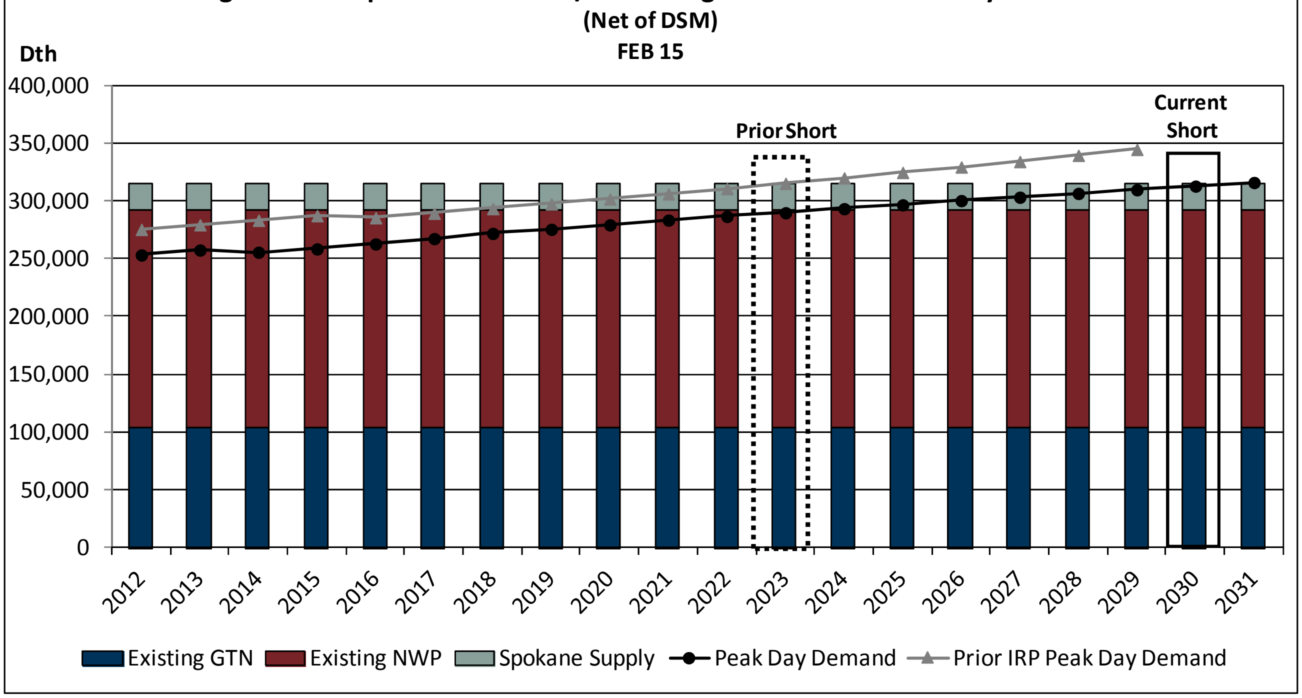
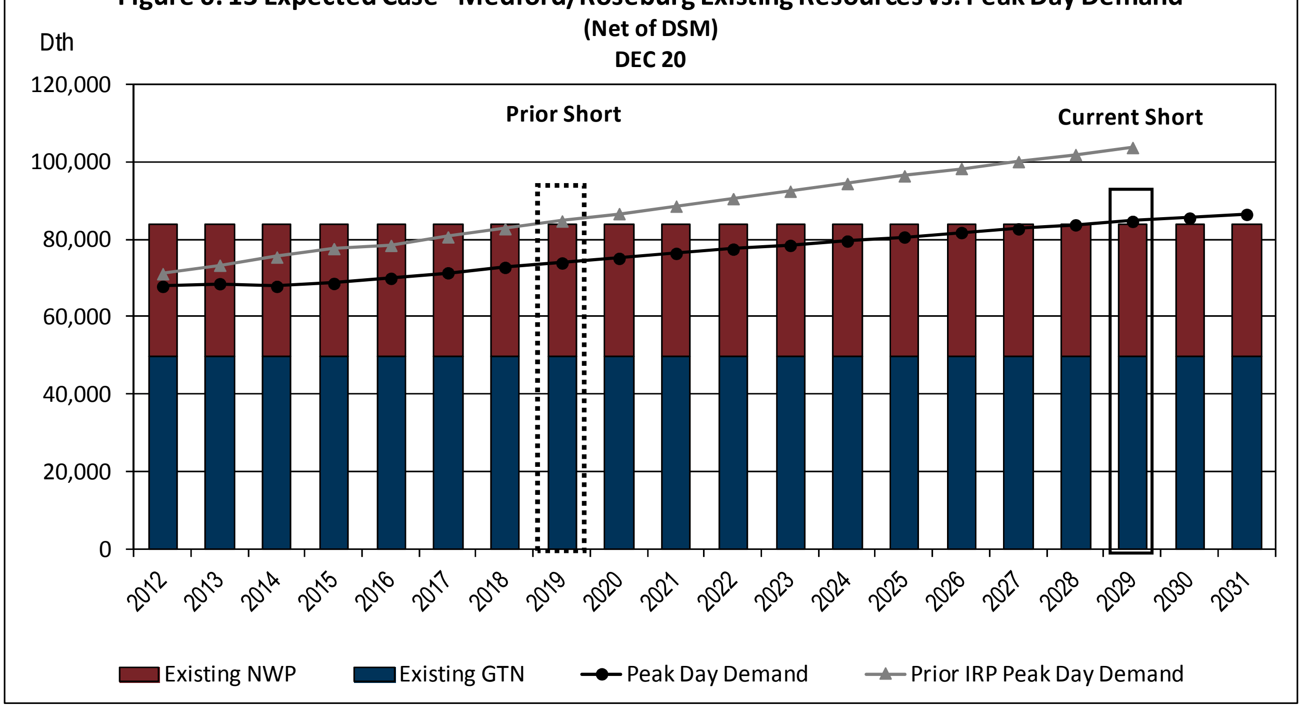



**Figure 6. 13 Expected Case - Medford/Roseburg Existing Resources vs. Peak Day Demand**



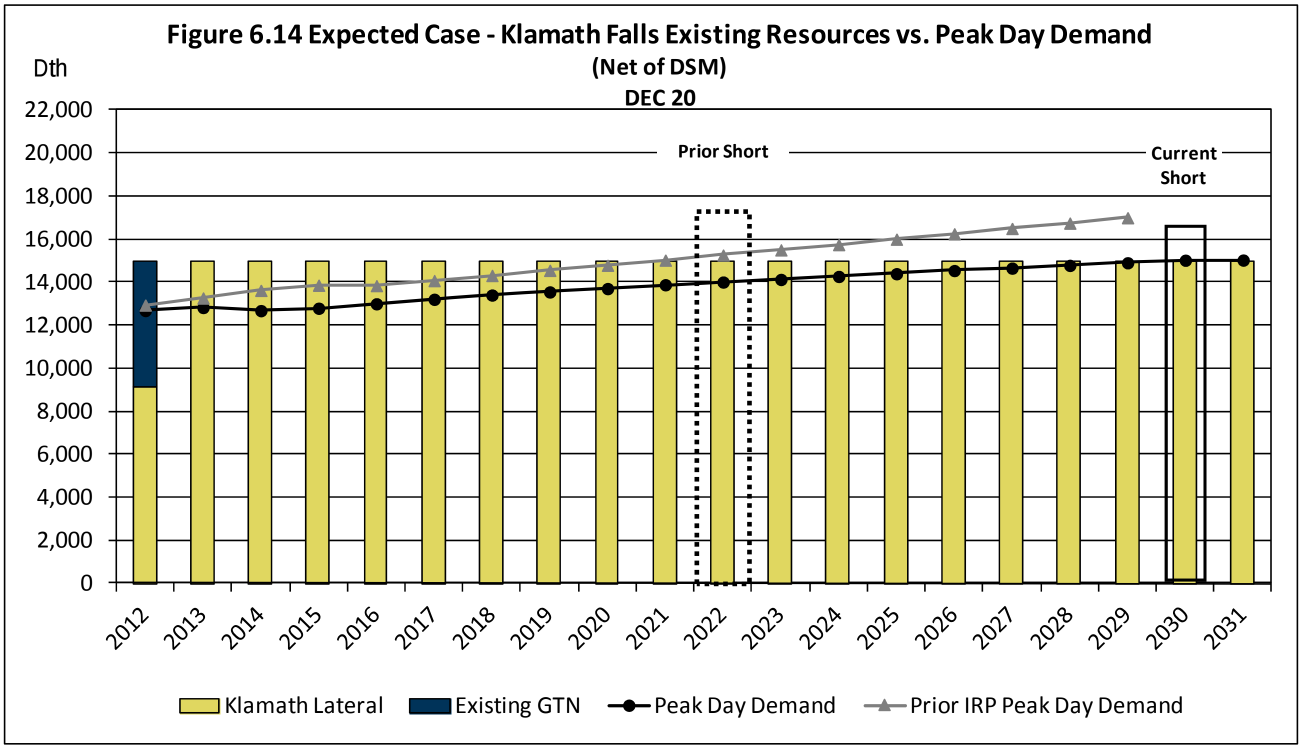



**Figure 6.14 Expected Case - Klamath Falls Existing Resources vs. Peak Day Demand**

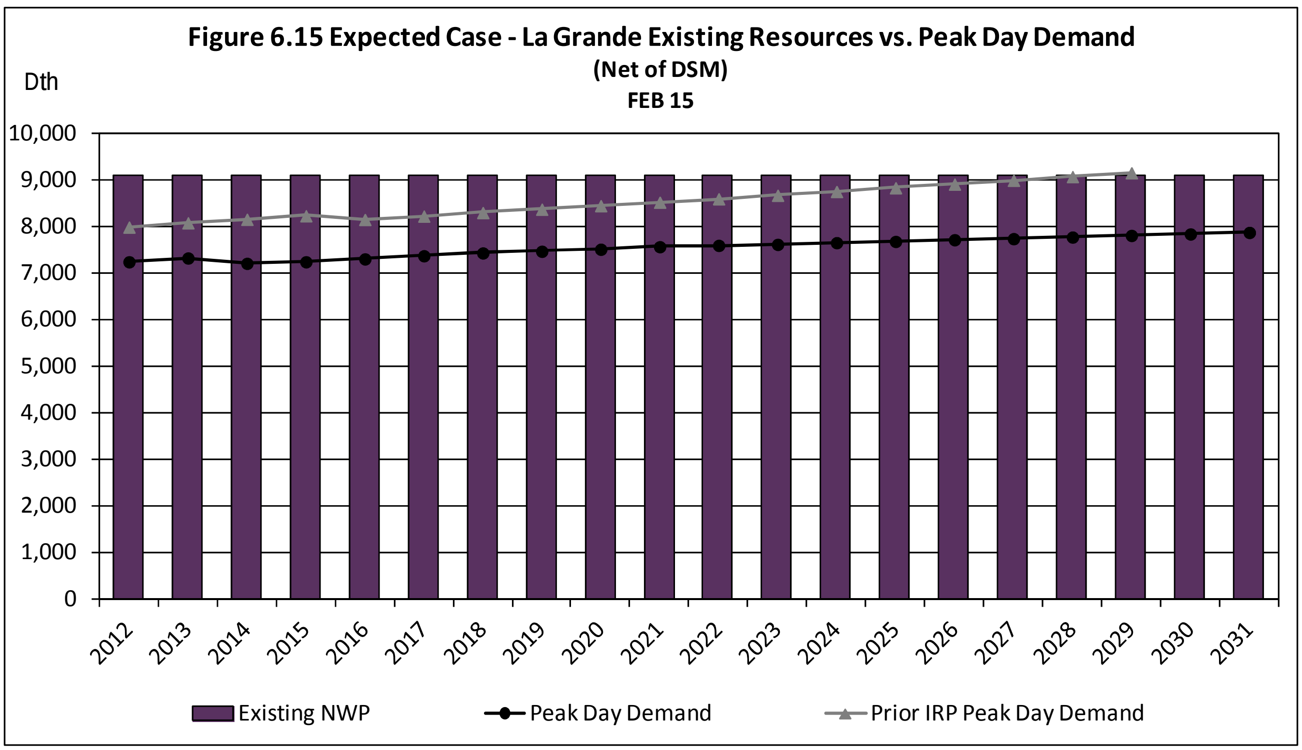



**Figure 6.15 Expected Case - La Grande Existing Resources vs. Peak Day Demand**

These charts show that when resource shortages occur they are well into the future. In the Expected Case for Washington and Idaho, the system first becomes unserved in 2030. In Oregon, the first unserved year is in Medford/Roseburg in 2029 followed by Klamath Falls in 2030. The La Grande service territory does not go unserved at any time during the 20-year planning horizon. This surplus resource situation provides ample time to carefully monitor, plan and act on potential resource additions.

However, an important risk with respect to identified capacity shortages is the slope of forecasted demand growth which is almost flat. However, if demand accelerates the need for additional resources will also accelerate by several years. This "flat demand risk" necessitates close monitoring of signs of accelerating demand and careful evaluation of lead times to acquire preferred incremental resources.

Table 6.3 quantifies the forecasted total demand (net of DSM savings) and unserved demand from the above charts, identifying the amount of deficiencies by region and growth in deficiencies over time. The next step is to determine the best risk/least cost resources to satisfy these deficiencies.

**Table 6.3 Peak Day Demand – Served and Unserved (MDth/d)**
**Before Resource Additions & Net of DSM Savings**

| Case | Gas Year | La Grande Served | La Grande Unserved | La Grande Total | La Grande % of Peak Day Served | WA/ID Served | WA/ID Unserved | WA/ID Total | WA/ID % of Peak Day Served |
|---|---|---|---|---|---|---|---|---|---|
| Expected | 2012 | 7.23 | - | 7.23 | 100% | 253.37 | - | 253.37 | 100% |
| Expected | 2013 | 7.31 | - | 7.31 | 100% | 257.65 | - | 257.65 | 100% |
| Expected | 2014 | 7.20 | - | 7.20 | 100% | 255.77 | - | 255.77 | 100% |
| Expected | 2015 | 7.23 | - | 7.23 | 100% | 258.58 | - | 258.58 | 100% |
| Expected | 2016 | 7.29 | - | 7.29 | 100% | 262.92 | - | 262.92 | 100% |
| Expected | 2017 | 7.36 | - | 7.36 | 100% | 267.56 | - | 267.56 | 100% |
| Expected | 2018 | 7.42 | - | 7.42 | 100% | 272.04 | - | 272.04 | 100% |
| Expected | 2019 | 7.46 | - | 7.46 | 100% | 275.59 | - | 275.59 | 100% |
| Expected | 2020 | 7.50 | - | 7.50 | 100% | 279.39 | - | 279.39 | 100% |
| Expected | 2021 | 7.56 | - | 7.56 | 100% | 283.59 | - | 283.59 | 100% |
| Expected | 2022 | 7.58 | - | 7.58 | 100% | 286.78 | - | 286.78 | 100% |
| Expected | 2023 | 7.61 | - | 7.61 | 100% | 289.92 | - | 289.92 | 100% |
| Expected | 2024 | 7.64 | - | 7.64 | 100% | 293.46 | - | 293.46 | 100% |
| Expected | 2025 | 7.67 | - | 7.67 | 100% | 296.78 | - | 296.78 | 100% |
| Expected | 2026 | 7.70 | - | 7.70 | 100% | 300.44 | - | 300.44 | 100% |
| Expected | 2027 | 7.73 | - | 7.73 | 100% | 303.38 | - | 303.38 | 100% |
| Expected | 2028 | 7.76 | - | 7.76 | 100% | 306.66 | - | 306.66 | 100% |
| Expected | 2029 | 7.80 | - | 7.80 | 100% | 309.85 | - | 309.85 | 100% |
| Expected | 2030 | 7.83 | - | 7.83 | 100% | 311.74 | 1.25 | 312.99 | 100% |
| Expected | 2031 | 7.86 | - | 7.86 | 100% | 311.74 | 4.38 | 316.12 | 98.6% |

| Case | Gas Year | Klamath Falls Served | Klamath Falls Unserved | Klamath Falls Total | Klamath Falls % of Peak Day Served | Medford/ Roseburg Served | Medford/ Roseburg Unserved | Medford/ Roseburg Total | Medford/ Roseburg % of Peak Day Served |
|---|---|---|---|---|---|---|---|---|---|
| Expected | 2012 | 12.69 | - | 12.69 | 100% | 67.91 | - | 67.91 | 100% |
| Expected | 2013 | 12.83 | - | 12.83 | 100% | 68.59 | - | 68.59 | 100% |
| Expected | 2014 | 12.68 | - | 12.68 | 100% | 67.90 | - | 67.90 | 100% |
| Expected | 2015 | 12.79 | - | 12.79 | 100% | 68.66 | - | 68.66 | 100% |
| Expected | 2016 | 13.00 | - | 13.00 | 100% | 69.98 | - | 69.98 | 100% |
| Expected | 2017 | 13.21 | - | 13.21 | 100% | 71.41 | - | 71.41 | 100% |
| Expected | 2018 | 13.40 | - | 13.40 | 100% | 72.81 | - | 72.81 | 100% |
| Expected | 2019 | 13.55 | - | 13.55 | 100% | 73.94 | - | 73.94 | 100% |
| Expected | 2020 | 13.70 | - | 13.70 | 100% | 75.13 | - | 75.13 | 100% |
| Expected | 2021 | 13.88 | - | 13.88 | 100% | 76.42 | - | 76.42 | 100% |
| Expected | 2022 | 14.01 | - | 14.01 | 100% | 77.53 | - | 77.53 | 100% |
| Expected | 2023 | 14.13 | - | 14.13 | 100% | 78.49 | - | 78.49 | 100% |
| Expected | 2024 | 14.27 | - | 14.27 | 100% | 79.60 | - | 79.60 | 100% |
| Expected | 2025 | 14.40 | - | 14.40 | 100% | 80.65 | - | 80.65 | 100% |
| Expected | 2026 | 14.54 | - | 14.54 | 100% | 81.80 | - | 81.80 | 100% |
| Expected | 2027 | 14.65 | - | 14.65 | 100% | 82.76 | - | 82.76 | 100% |
| Expected | 2028 | 14.78 | - | 14.78 | 100% | 83.79 | - | 83.79 | 100% |
| Expected | 2029 | 14.91 | - | 14.91 | 100% | 84.09 | 0.60 | 84.69 | 99.3% |
| Expected | 2030 | 15.00 | 0.02 | 15.02 | 99.9% | 84.08 | 1.46 | 85.54 | 98.3% |
| Expected | 2031 | 15.00 | 0.14 | 15.14 | 99.1% | 84.09 | 2.41 | 86.50 | 97.2% |

## NEW RESOURCE OPTIONS

When existing resources are not sufficient to meet expected demand, there are many considerations that are important in determining the appropriateness of potential resources.

### RESOURCE COST

Resource cost is the primary consideration when evaluating resource options although other factors mentioned below also influence resource decisions. We have found that newly constructed resources are typically more expensive than existing resources but existing resources are in shorter supply. Newly constructed resources provided by a third party, such as a pipeline, may require a significant contractual commitment. Newly constructed resources are often less expensive per unit if a larger facility is constructed, because of economies of scale.

### LEAD TIME REQUIREMENTS

New resource options can take from one to five or more years to put in service. Open season processes, planning and permitting, environmental review, design, construction and testing are some of the aspects contributing to lead time requirements for new physical facilities. Recalls of released pipeline capacity typically require advance notice of up to a year. Even DSM programs require significant time from program development and rollout to the point when natural gas savings are realized.

### PEAK VERSUS BASE LOAD

Our planning efforts include the ability to serve a peak day as well as all other demand periods. Avista's core loads are considerably higher in the winter than the summer. Due to the winter-peaking nature of Avista's demand, resources that cost-effectively serve the winter without an associated summer commitment may be preferable. Alternatively, it is possible that the costs of a winter-only resource may exceed the cost of annual resources after capacity release or optimization opportunities are considered.

### RESOURCE USEFULNESS

It is paramount that an available resource effectively delivers natural gas to the intended geographical region. Given Avista's unique service territories it is often impossible to deliver resources from a resource option such as storage without acquiring additional pipeline transportation. Pairing together resources increases the cost. Other key factors that can contribute to the usefulness of a resource are viability and reliability. If the potential resource is either not available currently (e.g., new technology) or not reliable on a peak day (e.g., firm) then may not be considered as an option for meeting unserved demand.

### "LUMPINESS" OF RESOURCE OPTIONS

Newly constructed resource options are often "lumpy." This means that new resources may only be available in larger-than-needed quantities and only available every few years. This lumpiness of resources is driven by the cost dynamics of new construction, the fact that lower unit costs are available with larger expansions and the economics of expansion of existing pipelines or the construction of new resources dictate additions infrequently. Lumpiness provides a cushion for future growth. Given the economies of scale for pipeline construction, we are afforded the opportunity to secure resources to serve future demand increases.

### COMPETITION

LDCs, end-users and marketers all compete for regional resources. The Northwest has been particularly efficient in the utilization of existing resources, which means the system is neither overbuilt nor under built.

Currently, the region is able to sufficiently handle the demand needs of varying parties. However, the future needs vary and regional LDCs may find they are competing with each other and other parties in order to secure firm resources for customers.

### RISKS AND UNCERTAINTIES

Investigation, identification and assessment of risks and uncertainties are critical considerations when evaluating supply resource options. For example, resource costs determinations are subject to various degrees of estimation, partly influenced by the expected timeframe of the resource need and degree of rigor determining estimates or estimation difficulties because of the uniqueness of a resource. Lead times can have varying degrees of certainty ranging from securing currently available transport (high certainty) to building in service territory underground storage (low certainty).

## RESOURCE SELECTION

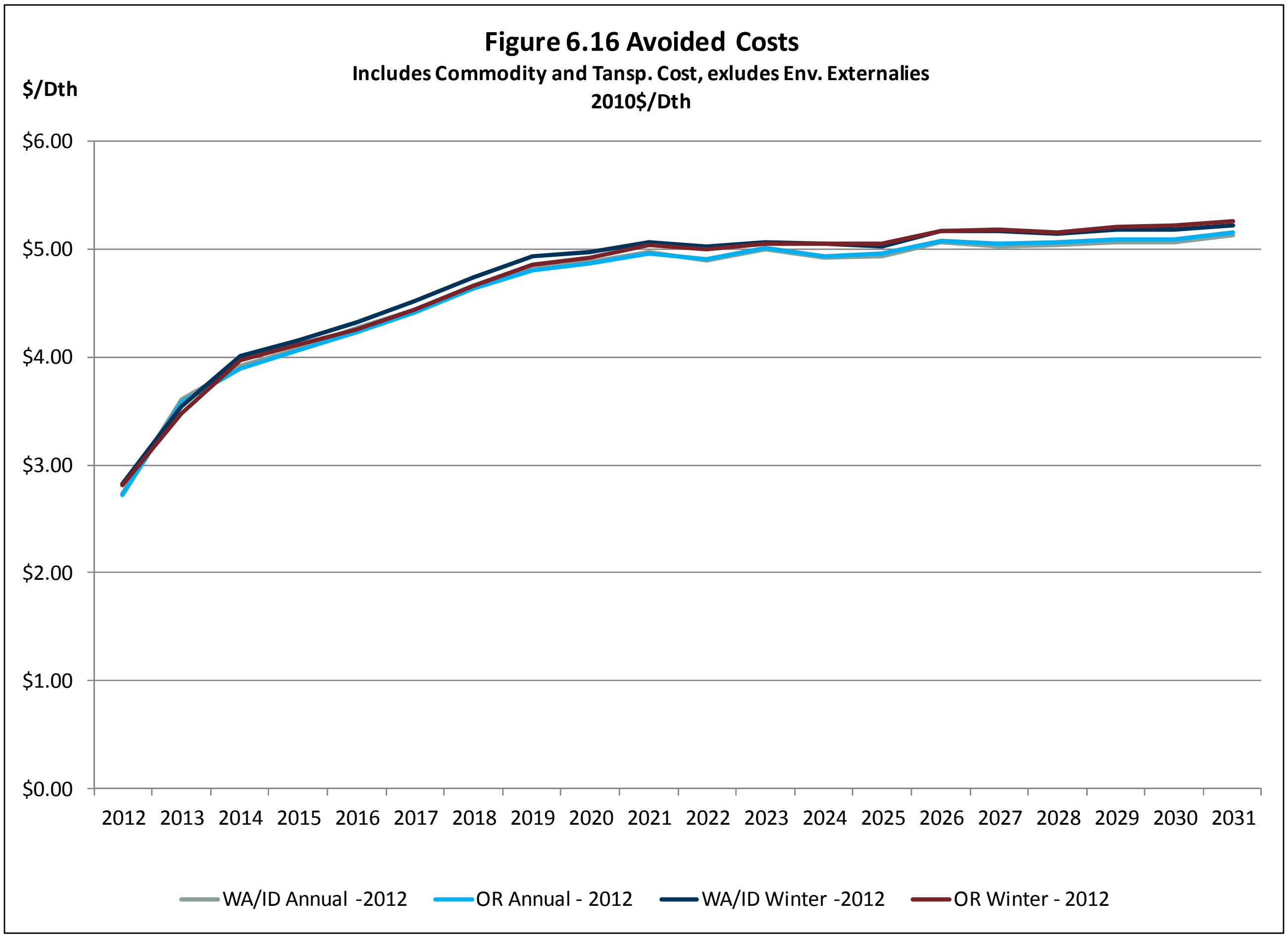
After identifying supply-side resource options and evaluating them based on the above considerations, we entered these supply-side scenarios (see Table 5.2) along with conservation measures (see Chapter 4 - Demand-side Resources) into the SENDOUT® model for it to select the least cost approach to meeting resource deficiencies. SENDOUT® compares demand-side and supply-side resources (see Appendix 6.3 for a list of supply-side resource options) using PVRR analysis to determine which resource is the best risk adjusted/least cost resource.

## DEMAND-SIDE RESOURCES

### AVOIDED COST

The SENDOUT® model determined avoided cost figures represent the unit cost to serve the next unit of demand with a supply-side resource option during a given period. If a conservation measure's total resource cost is less than this avoided cost, it will cost effectively reduce customer demand and Avista can "avoid" possible commodity, storage, transportation and other supply resource costs.

SENDOUT® calculates marginal cost data by day, month and year for each demand area. A summarized graphical depiction of avoided annual and winter costs for the Washington/Idaho and Oregon areas is in Figure 6.16. The detailed data is presented in Appendix 6.4. The avoided costs do not include environmental externality adders to monetarily recognize adverse environmental impacts. Appendix 4.2 discusses this concept more fully and includes specific requirements required in our Oregon service territory.




## SELECTED MEASURES

Using the above avoided cost thresholds; SENDOUT® selected all DSM potential. Table 6.4 details the potential DSM savings in each region from the selected conservation potential for our Expected Case.

**Table 6.4 Annual, Annual Average and Peak Day Demand Served by DSM**

| Case | Gas Year | Annual Klamath DSM (Dth) | Daily Klamath DSM (Dth/day) | Peak Day Klamath DSM (Dth/day) | Annual La Grande DSM (Dth) | Daily La Grande DSM (Dth/day) | Peak Day La Grande DSM (Dth/day) | Annual Medford/ Roseburg DSM (Dth) | Daily Medford/ Roseburg DSM (Dth/day) | Peak Day Medford/ Roseburg DSM (Dth/day) |
|---|---|---|---|---|---|---|---|---|---|---|
| Expected | 2012 | 3.804 | 0.010 | 0.041 | 1.125 | 0.003 | 0.017 | 17.318 | 0.047 | 0.218 |
| Expected | 2013 | 9.197 | 0.025 | 0.085 | 3.762 | 0.010 | 0.036 | 39.691 | 0.109 | 0.456 |
| Expected | 2014 | 17.066 | 0.047 | 0.152 | 7.479 | 0.020 | 0.064 | 73.108 | 0.200 | 0.797 |
| Expected | 2015 | 28.448 | 0.078 | 0.249 | 12.841 | 0.035 | 0.104 | 121.001 | 0.332 | 1.295 |
| Expected | 2016 | 43.646 | 0.120 | 0.377 | 19.585 | 0.054 | 0.157 | 184.206 | 0.505 | 1.938 |
| Expected | 2017 | 61.501 | 0.168 | 0.530 | 27.493 | 0.075 | 0.221 | 258.310 | 0.708 | 2.703 |
| Expected | 2018 | 80.223 | 0.220 | 0.690 | 35.789 | 0.098 | 0.286 | 336.087 | 0.921 | 3.517 |
| Expected | 2019 | 98.644 | 0.270 | 0.853 | 43.949 | 0.120 | 0.354 | 412.643 | 1.131 | 4.334 |
| Expected | 2020 | 117.151 | 0.321 | 1.015 | 52.118 | 0.143 | 0.421 | 489.317 | 1.341 | 5.158 |
| Expected | 2021 | 127.102 | 0.348 | 1.111 | 56.567 | 0.155 | 0.460 | 531.201 | 1.455 | 5.649 |
| Expected | 2022 | 137.231 | 0.376 | 1.205 | 61.086 | 0.167 | 0.499 | 573.753 | 1.572 | 6.132 |
| Expected | 2023 | 148.183 | 0.406 | 1.308 | 65.943 | 0.181 | 0.542 | 619.449 | 1.697 | 6.663 |
| Expected | 2024 | 162.586 | 0.445 | 1.442 | 72.437 | 0.198 | 0.597 | 680.881 | 1.865 | 7.362 |
| Expected | 2025 | 175.765 | 0.482 | 1.567 | 78.308 | 0.215 | 0.651 | 736.135 | 2.017 | 8.025 |
| Expected | 2026 | 189.001 | 0.518 | 1.691 | 84.187 | 0.231 | 0.701 | 791.406 | 2.168 | 8.633 |
| Expected | 2027 | 200.574 | 0.550 | 1.788 | 89.385 | 0.245 | 0.743 | 840.303 | 2.302 | 9.160 |
| Expected | 2028 | 212.097 | 0.581 | 1.881 | 94.588 | 0.259 | 0.783 | 889.359 | 2.437 | 9.620 |
| Expected | 2029 | 221.425 | 0.607 | 1.962 | 98.711 | 0.270 | 0.817 | 927.903 | 2.542 | 10.060 |
| Expected | 2030 | 231.638 | 0.635 | 2.050 | 103.227 | 0.283 | 0.853 | 970.169 | 2.658 | 10.492 |
| Expected | 2031 | 242.347 | 0.664 | 2.141 | 107.971 | 0.296 | 0.890 | 1,014.565 | 2.780 | 10.937 |

| Case | Gas Year | Annual Oregon DSM (Dth) | Daily Oregon DSM (Dth/day) | Peak Day Oregon DSM (Dth/day) | Annual WA/ID DSM (Dth) | Daily WA/ID DSM (Dth/day) | Peak Day WA/ID DSM (Dth/day) | Annual Total System DSM (Dth) | Daily Total System DSM (Dth/day) | Peak Day Total System DSM (Dth/day) |
|---|---|---|---|---|---|---|---|---|---|---|
| Expected | 2012 | 22.247 | 0.061 | 0.275 | 116.058 | 0.318 | 1.198 | 138.305 | 0.379 | 1.474 |
| Expected | 2013 | 52.650 | 0.144 | 0.577 | 244.960 | 0.671 | 2.432 | 297.610 | 0.815 | 3.009 |
| Expected | 2014 | 97.653 | 0.268 | 1.013 | 425.533 | 1.166 | 4.149 | 523.186 | 1.433 | 5.162 |
| Expected | 2015 | 162.291 | 0.445 | 1.648 | 631.464 | 1.730 | 5.994 | 793.755 | 2.175 | 7.642 |
| Expected | 2016 | 247.438 | 0.678 | 2.472 | 869.181 | 2.381 | 7.975 | 1,116.619 | 3.059 | 10.447 |
| Expected | 2017 | 347.304 | 0.952 | 3.454 | 1,102.398 | 3.020 | 10.193 | 1,449.702 | 3.972 | 13.647 |
| Expected | 2018 | 452.098 | 1.239 | 4.493 | 1,333.820 | 3.654 | 12.440 | 1,785.918 | 4.893 | 16.934 |
| Expected | 2019 | 555.236 | 1.521 | 5.540 | 1,570.968 | 4.304 | 14.837 | 2,126.204 | 5.825 | 20.377 |
| Expected | 2020 | 658.587 | 1.804 | 6.594 | 1,818.742 | 4.983 | 17.303 | 2,477.328 | 6.787 | 23.897 |
| Expected | 2021 | 714.870 | 1.959 | 7.220 | 2,060.492 | 5.645 | 19.892 | 2,775.361 | 7.604 | 27.112 |
| Expected | 2022 | 772.070 | 2.115 | 7.836 | 2,260.822 | 6.194 | 21.888 | 3,032.892 | 8.309 | 29.724 |
| Expected | 2023 | 833.575 | 2.284 | 8.513 | 2,453.430 | 6.722 | 23.941 | 3,287.005 | 9.005 | 32.454 |
| Expected | 2024 | 915.904 | 2.509 | 9.402 | 2,661.143 | 7.291 | 25.837 | 3,577.047 | 9.800 | 35.240 |
| Expected | 2025 | 990.208 | 2.713 | 10.243 | 2,855.741 | 7.824 | 27.887 | 3,845.949 | 10.537 | 38.130 |
| Expected | 2026 | 1,064.594 | 2.917 | 11.025 | 3,052.666 | 8.363 | 29.847 | 4,117.260 | 11.280 | 40.872 |
| Expected | 2027 | 1,130.262 | 3.097 | 11.692 | 3,251.635 | 8.909 | 31.865 | 4,381.898 | 12.005 | 43.556 |
| Expected | 2028 | 1,196.045 | 3.277 | 12.284 | 3,469.294 | 9.505 | 33.928 | 4,665.338 | 12.782 | 46.212 |
| Expected | 2029 | 1,248.039 | 3.419 | 12.839 | 3,617.612 | 9.911 | 35.500 | 4,865.651 | 13.331 | 48.339 |
| Expected | 2030 | 1,305.035 | 3.575 | 13.395 | 3,779.664 | 10.355 | 36.994 | 5,084.699 | 13.931 | 50.390 |
| Expected | 2031 | 1,364.884 | 3.739 | 13.968 | 3,928.219 | 10.762 | 38.536 | 5,293.102 | 14.502 | 52.504 |

## DSM ACQUISITION GOALS

The avoided cost established in SENDOUT®, the demand-side potential selected and the resulting calculated therm savings is the basis for determining DSM acquisition goals and subsequent program implementation planning. While the model selected essentially all DSM potential, the subsequent business planning process yielded different results. Chapter 4 – Demand-Side Resources has additional details on this process.

## SUPPLY-SIDE RESOURCES

SENDOUT® considered all options entered into the model, determined when and what resources were needed and rejected options that were determined to not be cost effective. These selected resources represent the least cost solution, within given constraints, to serve anticipated customer requirements. Table 6.5 shows the SENDOUT® selected supply-side resources for the Expected Case.

Table 6.5 Supply Side Resource Selected in SENDOUT®

| Case | Additional Resources | Jurisdiction | Size | Cost/Rates | Availability | Notes |
|---|---|---|---|---|---|---|
| **Expected Case** | | | | | | |
| | GTN Capacity | WA/ID | 25,000 Dth/d | GTN rate | Currently | Currently available unsubscribed capacity. |
| | GTN Medford Lateral Expansion | OR | 10,000 Dth/d | GTN rate | 2014 | Additional compression to allow more gas to flow from GTN mainline to the lateral. |
| | Malin Backhaul | OR | 10,000 Dth/d | GTN rate | Currently | Backhaul capacity is provided by tarrif. In order to facilitate additional deliveries to our OR properties an expansion of the Medford Lateral is necessary. |
| | Klamath Falls Lateral Purchase | OR | 15,000 Dth/d | Net Book Value | 12/31/2012 | Purchase of the NWP Klamath Falls Lateral. This was the perferred resource identified in the 2009 IRP. |
| | GTN Capacity | OR | 2,000 Dth/d | GTN rate | Currently | Currently available unsubscribed capacity. |

With additional research and investigation, we may later determine that alternative resources are more cost effective than those resources selected in this IRP. Since resource additions are not anticipated until late in the planning horizon, we will continue to review and refine knowledge of resource options and will act to secure these best cost/risk options when necessary or advantageous.

## RESOURCE SELECTION RESULTS

Figures 6.17 through 6.19 summarize modeling results when comparing regional peak day demand against existing and incremental resources for the Expected Case over the 20-year planning period.

**Figure 6.17 - Expected Case - WA/ID Selected Resources vs. Peak Day Demand**
**(Net of DSM )**
**FEB 15**

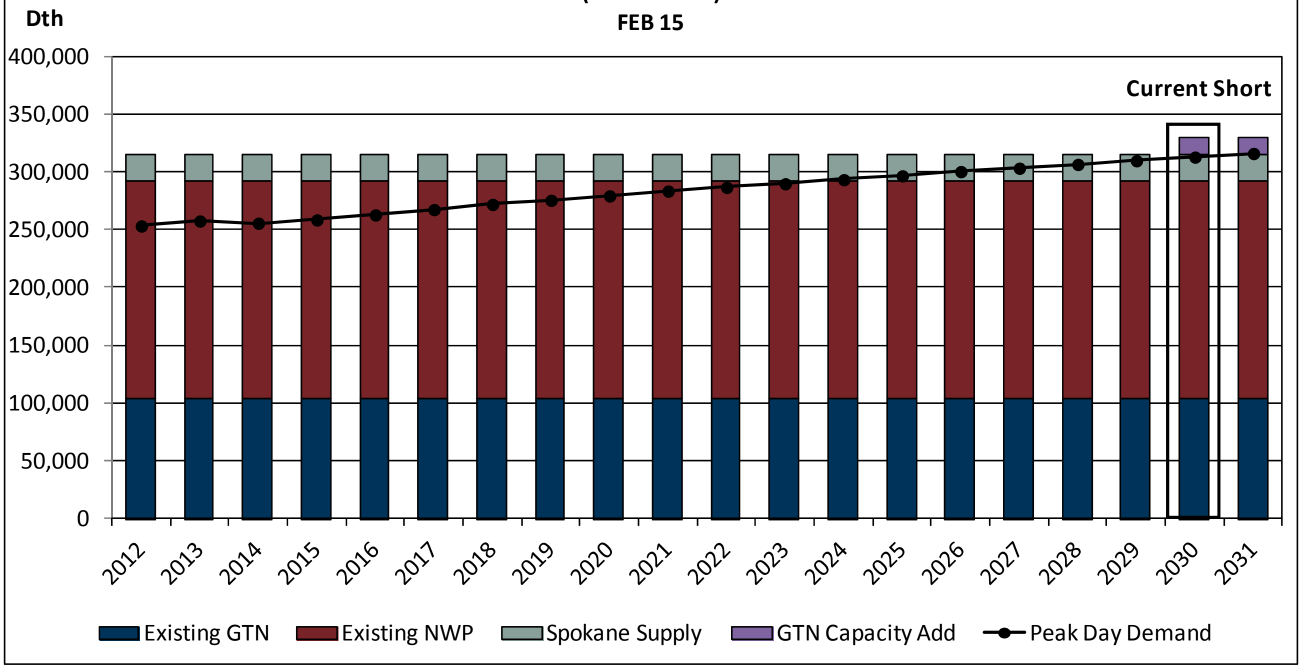
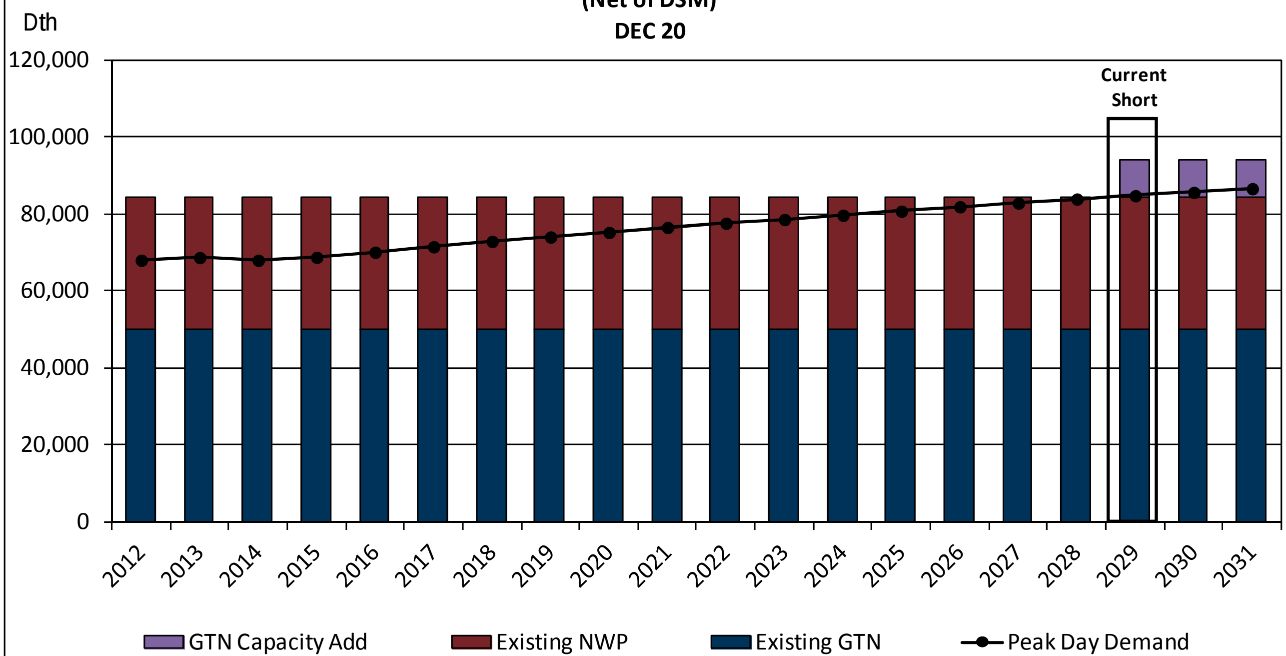



**Figure 6.18 - Expected Case - Medford/Roseburg Selected Resources vs. Peak Day Demand**
**(Net of DSM)**
**DEC 20**



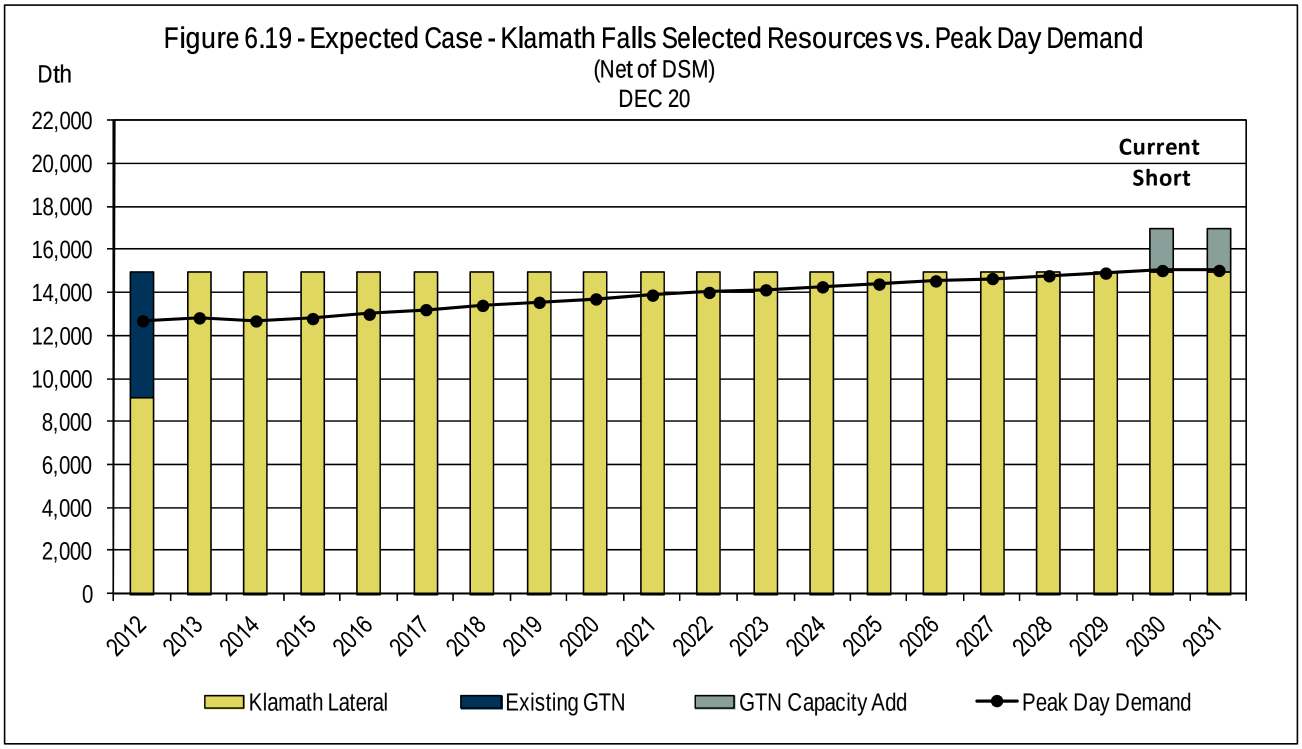


Figure 6.19 - Expected Case - Klamath Falls Selected Resources vs. Peak Day Demand

As indicated in the figures, after DSM savings the model shows a general preference for incremental transportation resources from existing pipelines and supply basins to resolve capacity deficiencies.

## RESOURCE UTILIZATION

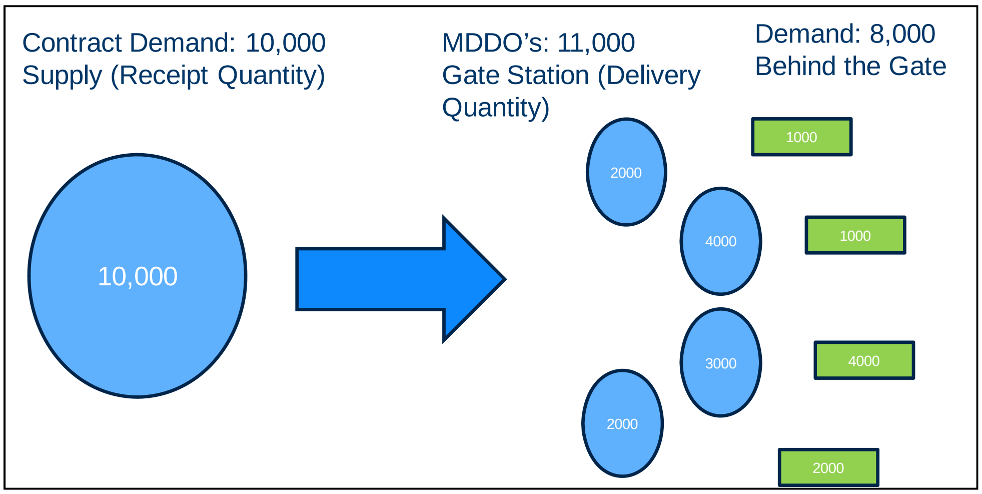
Our primary purpose is to meet our customer's demand needs in a cost effective manner. As the analysis indicates, we have ample resources to meet highly variable demand under multiple scenarios, including peak weather events, for the foreseeable future. With primary needs addressed, utilization of excess resource capacity is considered. There are many short term and long term opportunities to utilize and capture value for our customers using these resources. Each year a comprehensive evaluation of our demand forecasts and existing resource portfolio are reviewed. The following are some examples of how resources can be utilized:

- Serving interruptible demand
- Storage injections
- Storage optimization
- Capacity releases – short-term and long-term
- Basin optimization
- Transportation optimization
- Intra and/or inter-seasonal optimization

## GATE STATION ANALYSIS

In previous IRP's we identified a risk associated with our aggregated methodology for supply and demand forecasting. Our forecasting methodology is consistent with operational practices which aggregate capacity at individual points for scheduling/nomination purposes. Typically, the amount of natural gas that can flow from a contract demand (CD) (i.e. receipt/supply quantity) is fixed and the amount that can be delivered (i.e. maximum daily delivery obligation (MDDO) or delivery quantity) to various gate stations is greater. (See Figure 6.20) However, aggregation could mask deficiencies at individual gate stations.

**Figure 6.20 – Gate Station Modeling Challenge**




In order to address this concern, a gate by gate analysis was developed outside of SENDOUT®. The analysis involved coordination between Gas Supply, Gas Engineering, and intrastate pipeline personnel. Utilizing historical gate station flow data and demand forecasting methodologies detailed in our IRP, forecasted peak day gate station demand was calculated. This demand was then compared to contracted and operational capacities at each gate station.

If forecasted demand exceeded contracted and/or operational capacities further analysis is completed. The additional analysis would involve assessing the most economic way to address the gate deficiency. This could involve a gate station expansion, re-assigning MDDO's, targeted DSM, or distribution system enhancements.

For example, the analysis identified a gate station on NWP's Coeur d'Alene Lateral where forecasted peak day demand exceeded both the gate station MDDO's and physical capacity. Working together with all parties, numerous solutions were examined. Current analysis indicates the optimal solution is to take advantage of a pre-existing plan to build a new gate station at Chase Road off of GTN's mainline (See Chapter 8 for further details). The project originally was designed to alleviate capacity constraints at GTN's Rathdrum gate, however, the new gate's location allows for the potential to displace gas on the NWP Coeur d'Alene Lateral.

## ‖ ACTION ITEM

With no immediate need to acquire incremental supply side resources to meet peak day demands Avista's focus in the near term will include the following:

- Continuing to coordinate analytic efforts between Gas Supply, Gas Engineering, and the intrastate pipelines to perform gate station analysis and if deficiencies are identified seek least cost solutions.

## CONCLUSION

The integrated resource portfolio analysis process summarized in this chapter was first performed on our Average Case and then on the Expected Case demand scenario. We have chosen to utilize the Expected Case for our peak operational planning activities because this case is the most likely outcome given our experience, industry knowledge and our understanding of future natural gas markets. This case provides for reasonable demand growth given current expectations of natural gas prices over the planning horizon. If realized, this case is at a level that allows us to be well protected against resource shortages and does not over commit to additional long-term resources.

We fully recognize that there are numerous other potential outcomes. The process described in this chapter was applied to alternate demand and supply resource scenarios, which is covered in the Chapter 7 – Alternate Scenarios, Portfolios and Stochastic Analysis.

# CHAPTER 7 ▌▌ ALTERNATE SCENARIOS, PORTFOLIOS AND STOCHASTIC ANALYSIS

## OVERVIEW

The integrated resource portfolio analysis process described in Chapter 6 was applied to several alternate demand and supply resource scenarios to develop a sufficient range of possible alternate portfolios. This deterministic modeling approach considered a host of underlying assumptions which were vetted with significant discussion and recommendations from our TAC to develop a consensus number of cases to model and analyze.

We also performed stochastic modeling for estimating probability distributions of potential outcomes by allowing for random variation in natural gas prices and weather based on fluctuations observed in historical data. This statistical analysis, in conjunction with our deterministic analysis, enabled us to statistically quantify the risk from a reliability and cost perspective related to resource portfolios under varying price and weather environments.

## ALTERNATE DEMAND SCENARIOS

As discussed in the Demand Forecasting section, we have identified several alternate scenarios for detailed analysis to capture a wide range of possible outcomes over the planning horizon. These scenarios are summarized in Table 7.1 and are described in detail in the Chapter 3 - Demand Forecasts and Appendices 3.6 and 3.7. These alternate scenarios consider different demand influencing factors as well as price elasticity effects for various price influencing factors.

| Table 7.1<br>Demand Scenarios |
|---|
| Average Case |
| Expected Case |
| High Growth/Low Price |
| Low Growth/High Price |
| Alternate Weather Standard |

Demand profiles over the planning horizon for each of the alternate scenarios shown in Figures 7.1 and 7.2 reflect the two winter peaks we model for the different service territories (Dec. 20 and Feb. 15).

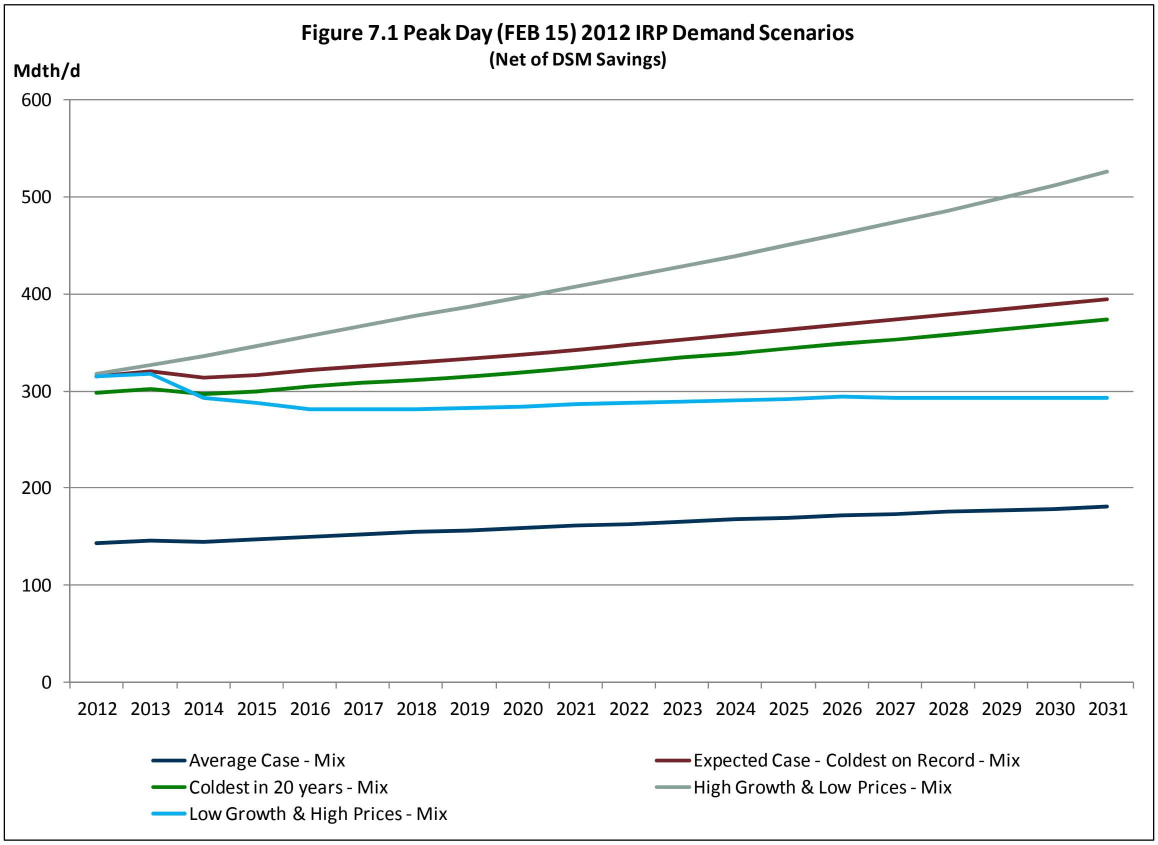


Figure 7.1 Peak Day (FEB 15) 2012 IRP Demand Scenarios
(Net of DSM Savings)
Mdth/d
600
500
400
300
200
100
0
2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031
Average Case - Mix
Expected Case - Coldest on Record - Mix
Coldest in 20 years - Mix
High Growth & Low Prices - Mix
Low Growth & High Prices - Mix

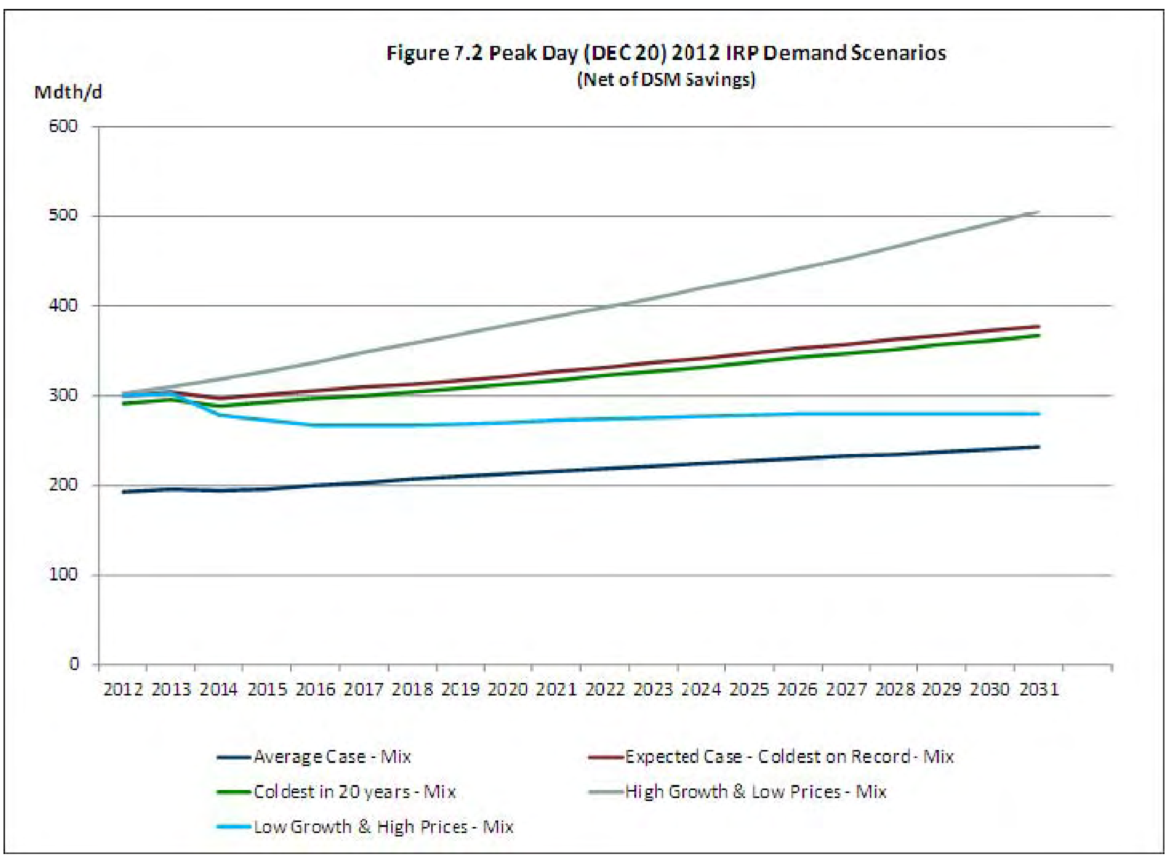
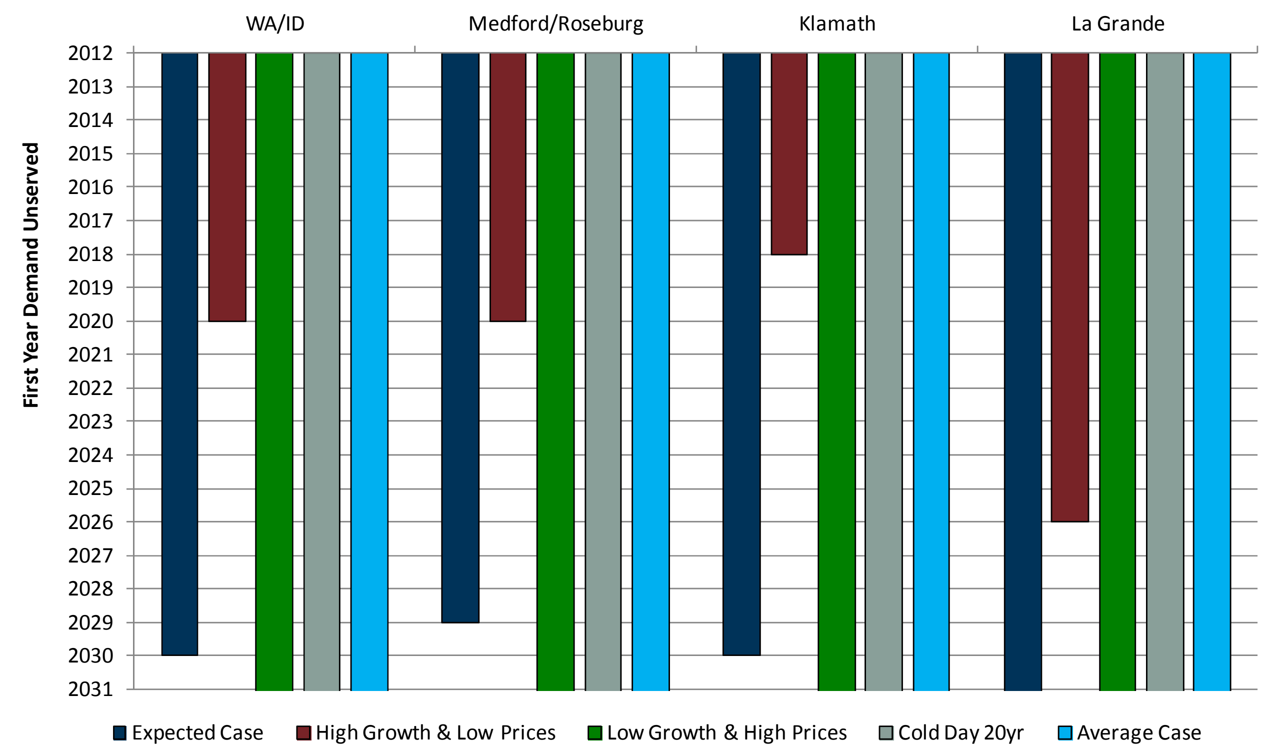


Figure 7.2 Peak Day (DEC 20) 2012 IRP Demand Scenarios
(Net of DSM Savings)
Mdth/d
600
500
400
300
200
100
0
2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031
Average Case - Mix
Expected Case - Coldest on Record - Mix
Coldest in 20 years - Mix
High Growth & Low Prices - Mix
Low Growth & High Prices - Mix

As in the Expected Case, we modeled in SENDOUT® the same resource integration and optimization process described in this section for each of the other five demand scenarios (see Appendix 3.7 for a complete listing of all portfolios considered). This identified first year unserved dates for each scenario by service territory (Figure 7.3).

**Figure 7.3 - First Year Peak Demand Not Met with Existing Resources**
**Scenario Comparisons**




As anticipated, our High Growth, Low Price scenario has the most rapid growth and the earliest first year unserved dates. This scenario includes customer growth rates 60% higher than the Expected Case, incremental demand driven by NGV/CNG vehicles, and no adjustment for price elasticity. Even with these aggressive assumptions, resource shortages do not occur until late in the planning horizon.

- 2020 in Washington/Idaho
- 2020 in Medford/Roseburg
- 2018 in Klamath
- 2026 in La Grande

This "steeper" demand highlights the "flat demand risk" discussed earlier. The likelihood of this scenarios occurrence is remote; however any potential for accelerated unserved dates warrants close monitoring of demand trends and resource lead times.

The remaining scenarios do not identify any resource deficiencies in the planning horizon.

Detailed information on certain selected scenarios is included in the following appendices:

- Demand and Selected Resources graphs by service territory (High Growth Case only) – Appendix 7.1
- Peak Day Demand, Served and Unserved table (all cases) – Appendix 7.2
- Avoided cost curve detail and graphs for High Growth and Low Growth cases – Appendix 6.4

## ALTERNATE SUPPLY SCENARIOS

We identified many supply-side resources which could be considered to meet resource deficiencies should they occur. Chapter 6 details available supply-side resource options that were considered for this IRP. The list includes resources we considered but did not input into SENDOUT® because of various restrictions.

For example, contracted city gate deliveries in the form of a structured purchase transaction could be a viable and desirable option to meet peak conditions. However, the market-based price and other terms are difficult to reliably determine until a formal agreement is negotiated. Exchange agreements also have market-based terms and are hard to reliably model especially when the resource is not needed in the near term.

Exported LNG was also a considered primarily as a price influencing factor. However, if one of the proposed export LNG terminals in Oregon were to be approved and a pipeline was to be built to supply that facility it potentially could bring supply through Avista's service territory. This scenario is interesting however; there is much uncertainty about export LNG. New pipeline builds are expensive and there are currently existing pipeline options that would be more cost effective. We will continue to monitor this situation and will consider inclusion of this supply scenario for future IRPs.

For our Washington/Idaho and Medford/Roseburg service territories unsubscribed firm capacity on GTN and/or firm backhaul plus lateral expansion is a preferred resource selection from our existing resources plus currently available supply scenario for most demand scenarios. However, assumptions on future availability could change over time. Therefore, we ran an additional alternate supply-side scenario with changed assumptions on GTN capacity as per Table 7.2.

| Table 7.2<br>Supply Scenarios |
|---|
| Existing Resources |
| Existing + Expected Available |
| GTN Fully Subscribed |

In our alternate supply scenario we assumed increased need for GTN capacity. This could be driven by power generators who require firm transportation to fuel combustion turbines or significant investments made by the transportation industry for fueling long haul trucks. The increased contracting leads to GTN becoming fully subscribed. The result of this scenario using our Expected Case demand profile is that in Washington and Idaho and Oregon recalls of existing capacity and satellite LNG is selected as the preferred resource portfolio. (Figures detailing the resources selected based on this scenario are included in Appendix 7.1.)

## PORTFOLIO SELECTION

The alternate demand scenarios and supply scenarios are matched together to form portfolios. Each of these unique portfolios is run through SENDOUT® where the supply resources and demand-side resources are compared and selected on a least cost basis. Once the resources are determined, a net present value of the revenue requirement (PVRR) is calculated.

In the Expected Case, the Expected Demand with Existing Resources plus Expected Available portfolio has the lowest PVRR and was therefore selected as our preferred portfolio. In this portfolio, the supply-side resources selected to meet unserved demand include the acquisition of currently available pipeline capacity on GTN, additional compression and capacity on the GTN Medford Lateral. These resources are the least cost/risk adjusted options currently available to meet peak day demand.

Table 7.3 summarizes the PVRR of all the portfolios considered. Each of these portfolios is based on unique assumptions and therefore a simple comparison of PVRR cannot be made.

**Table 7.3 Net Present Value of Revenue Requirement (PVRR) by Portfolio**

| | Portfolio | Unserved Demand | PVRR in (000's) |
|---|---|---|---|
| ***Average Case*** | Average Demand with Existing Resources (before resource additions) | No | $ 5,826,401 |
| ***Expected Case*** | | | |
| | Expected Demand with Existing Resources (before resource additions) | Yes | $ 5,902,214 |
| | Expected Demand with Existing Resources plus Expected Available | No | $ 5,972,641 |
| | Expected Demand with GTN Fully Subscribed | No | $ 6,245,354 |
| ***Additional Demand Scenarios*** | | | |
| | High Growth, Low Price Demand with Existing Resources | Yes | $ 6,315,432 |
| | High Growth, Low Price Demand with Existing Resource plus Expected Available | No | $ 6,645,781 |
| | High Growth, Low Price Demand with GTN Fully Subscribed | No | $ 6,954,112 |
| | Alternate Weather Standard Demand with Existing Resources | No | $ 5,888,614 |
| | Low Growth, High Price with Existing Resources | No | $ 8,281,177 |

## STOCHASTIC ANALYSIS[1]

The scenario (deterministic) analysis described earlier in this document represents specific "what if" situations based on predetermined assumptions including price and weather. These two factors are an integral part of scenario analysis. To better understand a particular portfolio's response to price and weather, we applied stochastic analysis to generate a wide variety of price and weather events.

Deterministic analysis is a valuable tool for selecting the optimal portfolio. The model selects resources to meet peak weather conditions in each of the 20 years. However, due to the recurrence of design conditions in each of the 20 years, total system costs over the planning horizon can be overstated because of annual recurrence of design conditions and the recurrence of price increases in the forward price curve. As a result, deterministic analysis does not provide a comprehensive look at future events. This type of analysis is only one piece of the puzzle. Utilizing Monte Carlo simulation in conjunction with deterministic analysis provides a more complete picture of how the portfolio performs under multiple weather and price profiles.

For this IRP, Monte Carlo analysis was employed in two ways. The first was to test our weather planning standard and the second was to assess the risk related to costs of our Expected portfolio under varying price environments.

[1] SENDOUT® uses Monte Carlo simulation to support stochastic analysis, which is a mathematical technique for evaluating risk and uncertainty. Monte Carlo simulation is a statistical modeling method used to imitate the many future possibilities that exist with a real-life system.

## WEATHER

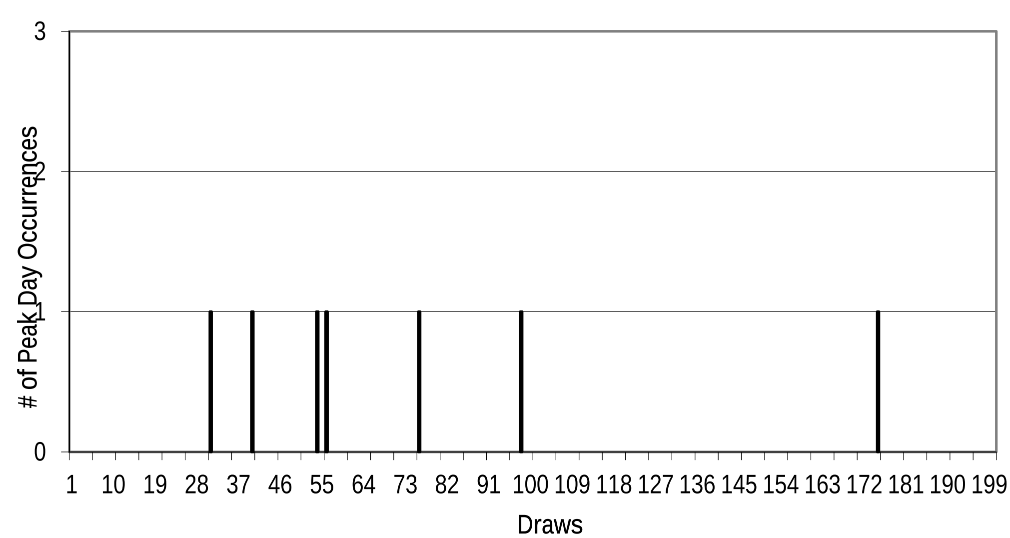
In order to evaluate weather and its effect on our portfolio we derived 200 simulations (draws) through the use of SENDOUT®'s Monte Carlo capabilities. Unlike deterministic scenarios or sensitivities the draws have more variability from month-to-month and year-to-year. In the model, random monthly total HDD draw values (subject to Monte Carlo parameters – see Table 7.4) are distributed on a daily basis for a month in history with similar HDD totals. The resulting draws provide a weather pattern with variability in the total HDD values, as well as variability in the shape of the weather pattern. This provides more robust basis for stress testing the deterministic analysis.

Table 7.4 Example of Monte Carlo Weather Inputs
Spokane

| | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HDD Mean | 895 | 1,152 | 1,145 | 913 | 781 | 546 | 331 | 143 | 37 | 37 | 191 | 544 |
| HDD Std Dev | 132 | 141 | 159 | 115 | 85 | 73 | 72 | 52 | 28 | 28 | 77 | 70 |
| HDD Max | 1,361 | 1,506 | 1,681 | 1,204 | 953 | 694 | 471 | 248 | 151 | 97 | 343 | 677 |
| HDD Min | 699 | 918 | 897 | 716 | 598 | 392 | 192 | 61 | - | 1 | 54 | 361 |

Avista models five weather areas: Spokane, Medford, Roseburg, Klamath Falls and La Grande. From the simulation data we were able to assess the frequency that the peak day occurs in each area. The stochastic analysis shows that in over 200 twenty-year simulations, while still remote, peak day (or more) does occur with enough frequency to maintain our current planning standard for this IRP though this topic remains a subject of continued analysis. For example, in our Medford weather pattern over the 200 twenty-year draws (i.e. 4000 years, HDDs at or above peak weather (61 HDD) occur 128 times. This equates to a peak day occurrence once every 31 years (4000 simulation years divided by 128 occurrences). The Spokane area has the least occurrences of peak day (or more) occurrences in our simulations while La Grande has the most occurrences. This is primarily due to the frequency in which each region's peak day HDD occurs within the historical data as well as near peak day HDDs. See Figures 7.9 through 7.13 for the number of peak day occurrences for a weather area.

Figure 7.4 - Frequency of Peak Day Occurrences
Spokane



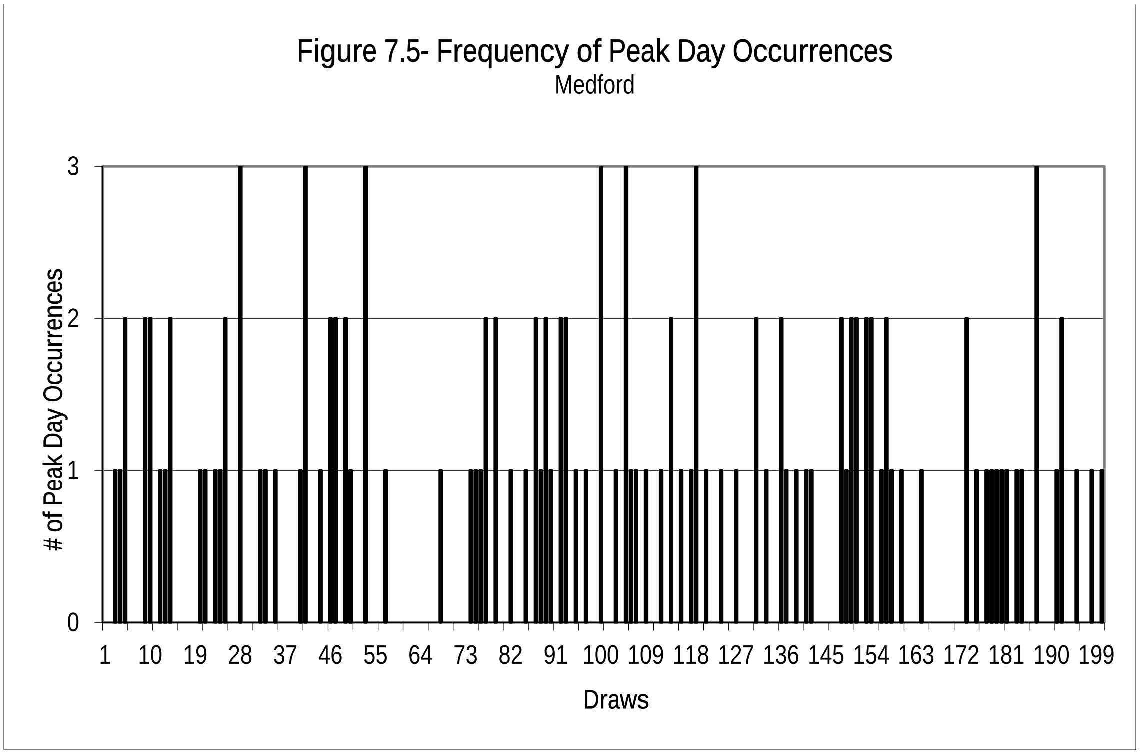


Figure 7.5- Frequency of Peak Day Occurrences
Medford
# of Peak Day Occurrences
3
2
1
0
1 10 19 28 37 46 55 64 73 82 91 100 109 118 127 136 145 154 163 172 181 190 199
Draws

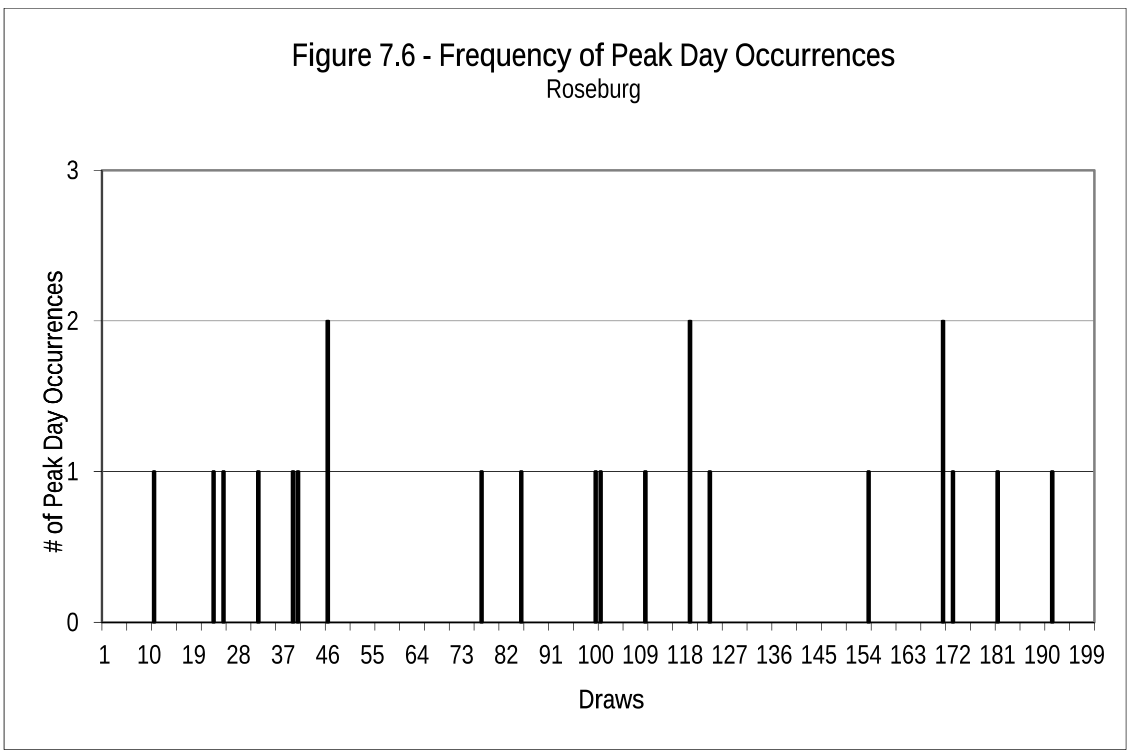
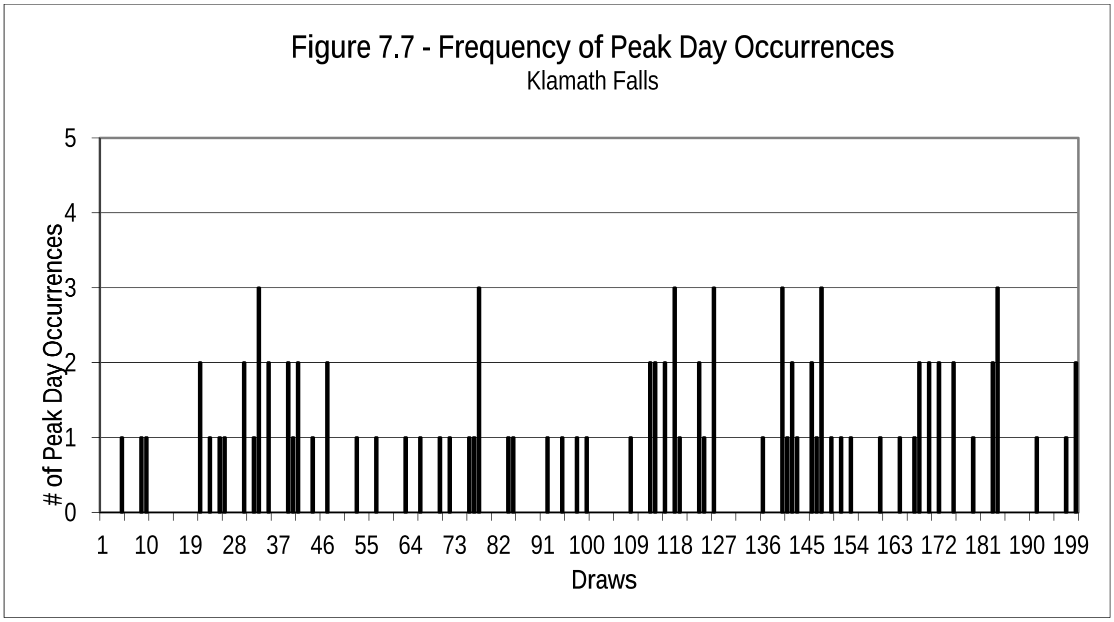
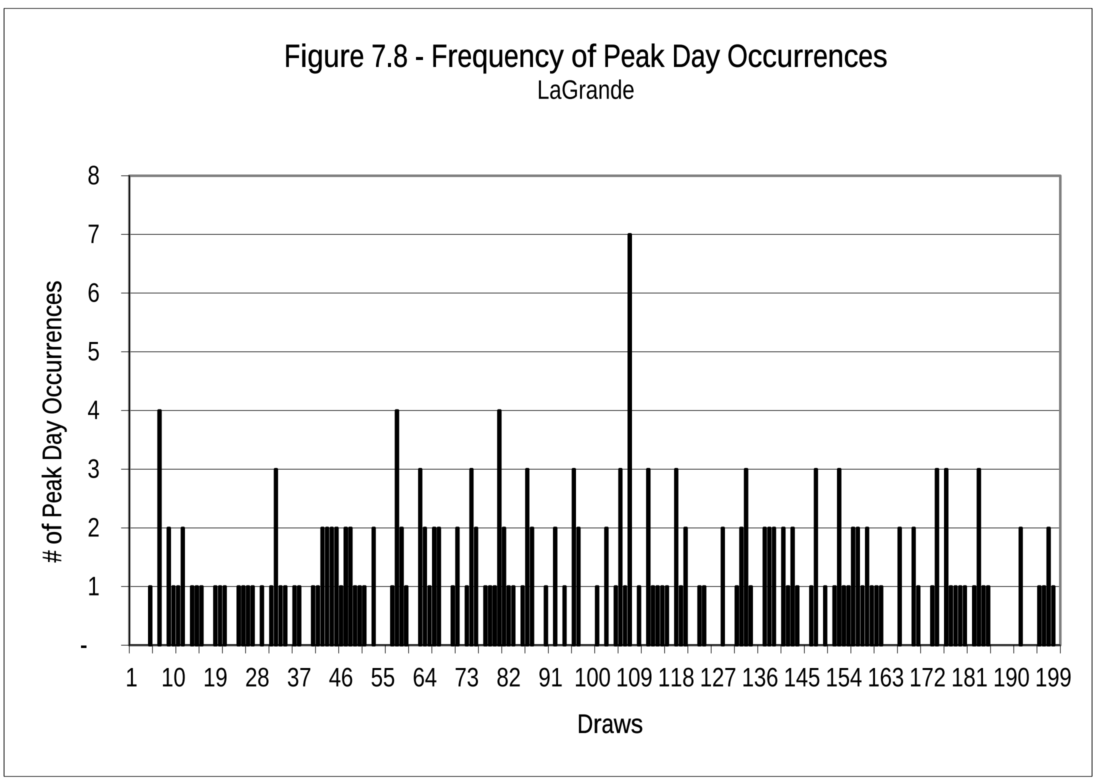


Figure 7.6 - Frequency of Peak Day Occurrences
Roseburg
# of Peak Day Occurrences
3
2
1
0
1 10 19 28 37 46 55 64 73 82 91 100 109 118 127 136 145 154 163 172 181 190 199
Draws



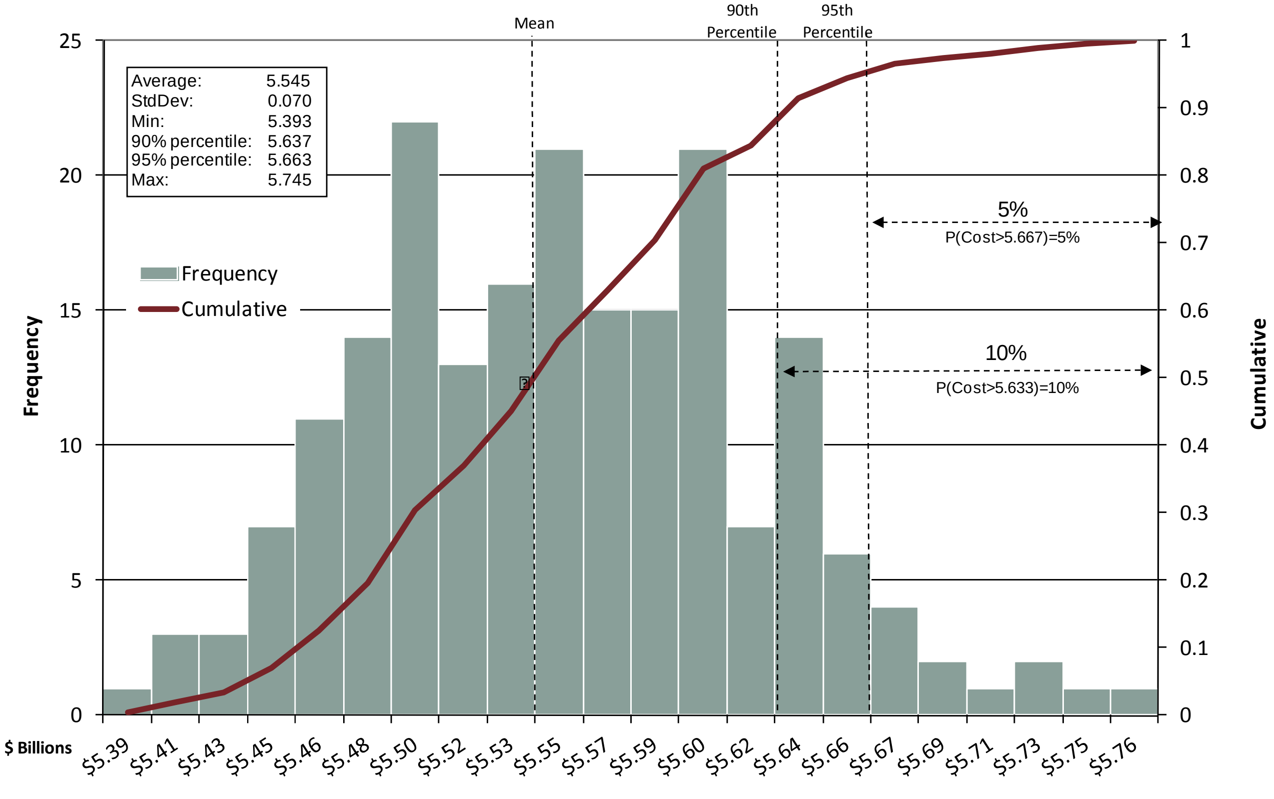




## PRICE

While weather is an important driver for IRP planning price is also important. As seen in recent years, there can be significant price volatility that can affect the portfolio. In deterministic modeling a single price curve for each scenario is used to perform analysis. There is risk, however, that the price curve used in the scenario will not reflect actual results.

Through Monte Carlo simulation we are able to test our portfolio and quantify the risk to our customers when prices do not materialize as forecasted. We performed a simulation of 200 draws, varying prices, to investigate whether the Expected Case total portfolio costs from our deterministic analysis is within the range of occurrences in our stochastic analysis. Figure 7.9 shows a histogram of the total portfolio cost of all 200 draws plus the Expected Case results. This histogram depicts the frequency and the total cost of the portfolio among all the draws, the mean of the draws, the standard deviation of the total costs and the total costs from the Expected Case. The figure confirms that our Expected Case total portfolio cost is within an acceptable range of total portfolio costs based on 200 unique pricing scenarios.

**Figure 7.9**
**Avista IRP Total 20-Year Cost**




Performing stochastic analysis on two key variables of weather and price in our demand analysis provided a statistically supported approach to evaluate and confirm the findings reached from our scenario analysis with respect to adequacy and reasonableness of our weather planning standard and our selected natural gas price forecast. This alternative analytical perspective provides us better confidence in our conclusions and helps us stress test our assumption, thereby mitigating analytical risks.

## REGULATORY REQUIREMENTS

IRP regulatory requirements in Washington, Oregon and Idaho call for several key components. The completed plan must demonstrate that we have:

- Examined a range of demand forecasts
- Examined feasible means of meeting demand with both supply-side and demand-side resources
- Treated supply-side and demand-side resources equally

- Described our long-term plan for meeting expected demand growth
- Described our plan for resource acquisitions between planning cycles
- Taken planning uncertainties into consideration
- Involved the public in the planning process
- We have addressed the applicable requirements throughout this document. Appendix 2.2 lists the specific requirements and guidelines of each jurisdiction and describes our compliance in detail

We are also required to consider risks and uncertainties throughout our planning and analysis. Our approach in addressing this requirement was to identify factors that could cause significant deviation from our Expected Case planning conclusions. We employed dynamic demand analytical methods and incorporated sensitivity analysis on various demand drivers that impacted demand forecast assumptions. From this, we created 14 demand sensitivities and modeled five demand scenario alternatives, which incorporated differing customer growth, use per customer, weather and price elasticity assumptions. We developed three supply scenarios to consider various risks of resource uncertainties. This resulted in nine distinct portfolios analyzed within SENDOUT®.

We performed analysis on our peak day weather planning standard, performing sensitivity on HDDs and modeling an alternate weather planning standard using coldest day in 20 years. We supplemented this analysis with stochastic analysis running Monte Carlo simulations in SENDOUT®. We also used simulations from SENDOUT® to analyze price uncertainty and the effect on total portfolio cost.

We examined risk factors and uncertainties that could impact expectations and assumptions with respect to DSM programs and supply-side scenarios. From this, we developed three supply-side scenarios and included potential DSM savings for evaluation.

This investigation, identification and assessment of risks and uncertainties in our IRP process should reasonably mitigate surprise outcomes.

## ‖ CONCLUSION

The High Growth and Low Growth Case demand analysis provides a sufficient range for evaluating possible demand trajectories relative to our Expected Case. Based on this analysis we feel comfortable that we have sufficient time to plan for forecasted resource needs. Even under a very extreme growth scenario our first forecasted deficiency does not occur until 2018. The analysis shows a preference to meet the forecasted demand needs with the purchase of existing incremental pipeline capacity. We recognize that many things could happen between now and when our resource needs occur, therefore we will carefully monitor our demand trends and continually updated and evaluate all demand side and supply side alternatives.

# CHAPTER 8 || DISTRIBUTION PLANNING

## OVERVIEW

Avista's integrated resource planning encompasses evaluation of safe, economical and reliable full-path delivery of natural gas from basin to burner tip. Securing adequate natural gas supply and ensuring sufficient pipeline transportation capacity to our city gates become secondary issues if the distribution system behind the city gates is not adequately planned and becomes severely constrained. An important part of the planning process is to forecast future local demand growth, determine potential areas of distribution system constraints, analyze possible solutions and estimate costs for eliminating constraints.

Analyzing our resource needs to this point has focused on ensuring adequate capacity to our city gates, especially during a peak event (i.e. "Is there adequate volume for a peak day?"). Distribution planning focuses on "Is there adequate pressure during a peak hour?" Despite this altered perspective distribution planning shares many of the same goals, objectives, risks and solutions.

Avista's natural gas distribution system consists of approximately 5,400 miles of distribution main pipelines in Washington, 3,000 miles in Idaho and 3,500 miles in Oregon as well as numerous regulator stations, service distribution lines, monitoring and metering devices, and other equipment. Currently, there are no storage facilities or compression systems within our distribution system. System pressure is maintained by pressure regulating stations that utilize pipeline pressures from the interstate transportation pipelines before natural gas enters our distribution networks.

## DISTRIBUTION SYSTEM PLANNING

Avista conducts two primary types of evaluations in its distribution system planning efforts to determine the need for resource additions including distribution system reinforcements and expansions. Reinforcements are upgrades in existing infrastructure or new system additions that increase system capacity, reliability and safety. Expansions are new system additions to accommodate new demand. Collectively we refer to these as distribution enhancements.

Ongoing evaluations of each distribution network in our four primary service territories are conducted to identify strategies for addressing local distribution requirements resulting from customer growth. Customer growth assessments are made based on many factors including our IRP demand forecasts[1], monitoring of gate station flows and other system metering, ongoing communication with construction staff and local area management regarding new service requests, field personnel discussion and inquiries from major developers.

Additionally, Avista regularly conducts integrity assessments of its distribution systems. This type of ongoing system evaluation can also indicate distribution upgrading requirements, but as a result of system maintenance needs rather than customer and load growth. In some cases, however, the timing for system integrity upgrades can coincide with growth related expansion requirements.

[1] Distribution Planning forecasts customer growth rates by town code to generate local demand growth projections in its forecasting model consistent with the broader IRP customer forecasting methodology facilitating consistent integrated planning efforts. A town code is an unincorporated area within a county or a municipality within a county.

These planning efforts provide a long-term planning and strategy outlook and are integrated into our capital planning and budgeting process which incorporates planning for other types of distribution capital expenditures and infrastructure upgrades.

## NETWORK DESIGN FUNDAMENTALS

Natural gas distribution networks rely on pressure differentials to flow gas from one place to another. When pressures are the same on both ends of a pipe the gas does not move. When gas is removed from a point on the network the pressure at that point drops lower than the pressure upstream in the network. Gas then moves from the higher pressure in the network to the point of removal attempting to equalize the pressure throughout the network. If gas removed is not sufficiently replaced by new gas entering the network the pressure differential will decrease, flow will stall and the network could run out of pressure. Therefore, it is important to design a distribution network so that the intake pressure (from gate stations and/or regulator stations) within the network is high enough to maintain an adequate pressure differential when gas leaves the network.

Not all gas flows equally throughout a network. Certain points within the network can constrain flow and thus restrict overall network capacity. Network constraints can occur over time as demand requirements on the network evolve. Anticipating these demand requirements, identifying potential constraints and forming cost-effective solutions with sufficient lead times without overbuilding infrastructure are the key challenges in network design.

## COMPUTER MODELING

Developing and maintaining effective network design is significantly aided by computer modeling to perform network demand studies. Demand studies have evolved with technology in the past decade to become a highly technical and powerful means for analyzing the operation of a distribution system. Using a pipeline fluid flow formula a specified parameter of each pipe element can be simultaneously solved. A variety of pipeline equations exist, each tailored to a specific flow behavior. Through years of research these equations have been refined to the point where modeling solutions produced closely resemble actual system behavior.

Avista conducts network load studies using GL Noble Denton's SynerGEE® 4.6.0 software. This computer-based modeling tool runs on a Windows operating system and allows users to analyze and interpret solutions graphically. Appendix 8.1 describes in detail our computer modeling methodology while Appendix 8.2 provides an example load study presentation including graphical interface and output examples.

## DETERMINING PEAK DEMAND

For ease of maintenance and operation, safety to the public, reliable service and cost considerations, distribution networks operate at a relatively low pressure. Avista operates its distribution networks at a maximum operating pressure of 60 pounds per square inch (psig). Since distribution systems operate at pressure through relatively small diameter pipes there is essentially no line-pack capability for managing hourly demand fluctuations.

Core demand typically has a morning peaking period between 6 a.m. and 10 a.m. and an evening peaking period between 5 p.m. and 9 pm. The peak hour demand for these customers can be as much as 50% above the hourly average of the daily demand. Because of the importance of responding to hourly peaking in the distribution system, planning capacity requirements for our distribution systems are based on peak hour demand[2]. Included in Appendix 8.1 is the detailed methodology we use for determining peak demand.

## DISTRIBUTION SYSTEM ENHANCEMENTS

Computer-aided demand studies facilitate modeling numerous "what if" demand forecasting scenarios, constraint identification and corresponding optimum combination of pipe modification and pressure modification solutions to maintain adequate pressures throughout the network over time.

Distribution system enhancements do not reduce demand nor do they create additional supply. However, they can increase the overall capacity of a distribution pipeline system while utilizing existing gate station supply points. The three broad categories of distribution enhancement solutions are pipelines, regulators and compression.

### PIPELINES

Pipeline solutions consist of looping, upsizing and uprating.

- **PIPELINE LOOPING** is the most common method of increasing capacity within an existing distribution system. It involves constructing new pipe parallel to an existing pipeline that has, or may become, a constraint point. Constraint points inhibit pressure capacities downstream of the constraint creating inadequate pressure during periods of high demand. When the parallel line is connected to the system this second alternative path allows natural gas flow to bypass the original constraint point and bolster downstream pressure capacities. The feasibility of looping a pipeline is primarily dependent upon the location where the pipeline will be constructed. Installing gas pipelines through private easements, residential areas, existing asphalt and steep or rocky terrain can greatly increase the cost to amounts that are unjustifiable so that other alternative solutions offer a more cost effective solution.
- **PIPELINE UPSIZING** is simply replacing existing pipe with a larger size pipe. The increased pipe capacity relative to surface area of the pipe results in less friction and therefore a lower pressure drop. This option is usually pursued when there is damaged pipe or pipe integrity issues exist. If the existing pipe is otherwise in satisfactory condition looping is usually pursued, allowing the existing pipe to remain in use.
- **PIPELINE UPRATING** involves increasing the maximum allowable operating pressure of an existing pipeline. This enhancement can be a quick and relatively inexpensive method of increasing capacity in the existing distribution system before constructing more costly additional system facilities. However, safety considerations and pipe regulations may prohibit feasibility or lengthen the time before completion of this option. Also, increasing line pressure may produce leaks and other pipeline damage creating unanticipated costly repairs.

### REGULATORS

Regulators or regulator stations are used to reduce pipeline pressure at various stages within the distribution. The primary purpose of regulation is to provide a specified and constant outlet pressure before gas continues its downstream travel to a city's distribution system, customer's property or gas appliance. Regulators also ensure that flow requirements are met at a desired pressure regardless of fluctuations upstream of the regulator. Regulators can be found at city gate stations, district regulators stations, farm taps and customer services.

[2] This method differs from the approach that we use for broader IRP peak demand planning which focuses on peak day requirements to the city gate.

### COMPRESSION

Compressor stations present a capacity enhancing option for pipelines with significant gas flow and the ability to operate at higher pressures. For pipelines experiencing a relatively high and constant flow of gas a single, large volume compressor can be installed in the optimal position along the pipeline to boost downstream pressure. However, this type of compressor configuration will not function effectively if the flow in the pipeline has high variability.

A second option is the installation of multiple, smaller compressors located close together or strategically placed in different locations along a pipeline. Multiple compressors accommodate a large flow range and the use of smaller and very reliable compressors. These smaller compressor stations are well suited for areas where gas demand is growing at a relatively slow and steady pace so that purchasing and installing these less expensive compressors can be done over time allowing a pipeline to serve growing customer demand for many years into the future.

Compressors can be a cost effective, feasible option to resolving constraint points; however, regulatory and environmental approvals to install a station along with engineering and construction time can be a significant deterrent. Also, adding compressor stations within a distribution system typically involves considerable capital expenditure. Based on our detailed knowledge of our distribution system, we do not currently envision or have any foreseeable plans to add compressors to our distribution network.

## CONSERVATION RESOURCES

Included in our evaluation of distribution system constraints is consideration of targeted conservation resources that could reduce or delay distribution system enhancements. We are mindful; however, that the consumer is still the ultimate decision-maker regarding the purchase of a conservation measure. Because of this we attempt to influence these decisions but we do not depend on estimates of peak day demand reductions from conservation to eliminate near-term distribution system constraint areas. Over longer-term planning we do recognize that targeted conservation programs provide a cumulative benefit that offsets potential constraint areas and may be an effective strategy.

## PLANNING RESULTS

Table 8.1 summarizes the cost of major distribution system enhancement projects which address future growth-related system constraints as well as system integrity issues and the anticipated timing of expenditures. These proposed projects are preliminary estimates of timing and costs of reinforcement solutions. The scope and needs of these projects can evolve over time with new information requiring ongoing reassessment. Actual solutions may be different due to differences in actual growth patterns and/or construction conditions from those assumed in the initial assessment.

The following discussion provides further information on our key near-term projects:

**3203 - EAST MEDFORD REINFORCEMENT** – Observed local growth and our IRP indicate increased gas deliveries will likely be needed from the TransCanada Pipeline source at Phoenix Road Gate Station in southeast Medford. To facilitate distribution receipt of the increased gas volumes, a new HP gas line encircling Medford to the east and tying into an existing high-pressure feeder in White City will improve delivery capacity and provide a much needed reinforcement in the East Medford area which is forecasting higher growth.

**3237 – U.S. 2 NORTH SPOKANE REINFORCEMENT –** This project will reinforce the area north of Spokane along U.S. Highway 2. This mixed-use area with residential, commercial and industrial demand experiences low pressure at unpredictable times given varied demand profiles of the diverse customer base. Completion of this reinforcement will improve pressures in the U.S. 2 north Kaiser area. Approximately 8,000 feet of HP steel will be installed in a newly established easement along U.S. Highway 2.

**3296 – CHASE RD GATE STATION, POST FALLS, ID –** This gate station will allow Avista to split the large load at the Rathdrum Gate Station. Approximately 18,000 feet of high-pressure line will be built to connect Chase Rd Gate Station to the existing high pressure. This gate station will also give Avista the opportunity to feed the growing the Post Falls and Coeur d'Alene areas from the north.

*Table 8.1 Distribution Planning Capital Projects*

| | | | | Estimated Budget and Timing | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Ref #** | **Title** | **State** | **2012** | **2013** | **2014** | **2015** | **Beyond 2015** | **Total** |
| | 3000 | Gas Reinfrc-Minor Blanket | ALL | 800,002 | 1,050,000 | 1,050,000 | 1,050,000 | 1,050,000 | 5,000,002 |
| | 3001 | Rep Deteriorating Gas Systems (Non-Aldyl-A) | ALL | 800,006 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 4,800,006 |
| | 3002 | Reg Reliable - Blanket | ALL | 400,006 | 500,000 | 500,000 | 500,000 | 500,000 | 2,400,006 |
| | 3003 | Gas Replc-St&Hwy | ALL | 2,200,007 | 2,250,000 | 2,250,000 | 2,250,000 | 2,250,000 | 11,200,007 |
| | 3004 | Cath Prot-Minor Blanket | ALL | 500,003 | 500,000 | 500,000 | 500,000 | 500,000 | 2,500,003 |
| | 3005 | Gas Dist Non-Rev Blanket | ALL | 3,823,013 | 3,937,703 | 4,055,834 | 4,177,510 | 4,302,835 | 20,296,895 |
| | 3006 | Overbuild Pipe Replacement | ALL | 500,002 | 500,000 | 500,000 | 500,000 | 500,000 | 2,500,002 |
| | 3007 | Isolated Steel Pipe Replacement, Various Locations | ALL | 1,095,004 | 990,000 | 1,000,000 | 1,000,000 | 1,000,000 | 5,085,004 |
| | 3117 | Gas Telemetry | ALL | 370,801 | 100,000 | 100,000 | | | 570,801 |
| | 3296 | Upgrade - YZ Odorizers, Various Locations (6ea.) | ALL | 150,000 | | | | | 150,000 |
| * | 3246 | Chase Rd Gate Station, Post Falls, ID | ID | | 2,100,000 | 2,164,000 | | | 4,264,000 |
| | 3275 | Upgrade - Coeur d'Alene East Tap Upgrade, Coeur d'Alene, ID | ID | | | | | | |
| | 3279 | Reinforcement - HP Main Extension south from CDA East Gate, CDA ID | ID | | | | | | |
| | 3292 | Reinforcement - Sprit lake HP Main, Athol ID | ID | | | | | | |
| | 3297 | Hwy 95 Relocation, CDA ID | ID | 3,000,000 | | | | | 3,000,000 |
| | 3298 | Old Hwy 95 Relocation, CDA ID | ID | 1,250,000 | | | | | 1,250,000 |
| | TBD | Post Falls HP Extension | ID | | | 2,000,000 | 3,000,000 | 3,000,000 | 8,000,000 |
| * | 3203 | East Medford | OR | 550,000 | | 4,100,000 | | | 4,650,000 |
| | 3242 | Reinforce Talent OR Gate Station&Piping | OR | | | | | | |
| | 3257 | Oakland Bridge Bore and Relocation, Oakland OR | OR | 181,000 | | | | | 181,000 |
| | 3274 | Reinforcement, Loop the existing 6" HP from Tolo to White City | OR | | | | | | |
| | 3112 | Re-Rte Kettle Falls Feed & Gate Station | WA | | | | | | |
| * | 3237 | US2 N Spo Gas HP Reinforce(Kaiser Prop) | WA | | 1,300,000 | | | | 1,300,000 |
| | 3245 | Cheney 8" HP Feeder Project | WA | | | | | | |
| | 3264 | Appleway to Henry Reinforcement, Spokane Valley WA | WA | | | | | | |
| * | Details of project described in IRP | | | **14,819,842** | **13,177,703** | **18,169,834** | **12,927,510** | **13,052,835** | **72,147,724** |

## CONCLUSION

Avista's goal is to maintain its distribution systems reliably and cost effectively to deliver natural gas to every customer. This goal can be achieved with computer modeling, which increases the reliability of the distribution system by identifying specific areas within the system that may require changes.

The ability to meet our goal of reliable cost effective gas delivery is also enhanced through the recent integration of customer growth forecasting at the town code level and localized distribution planning enabling coordinated targeting of distribution projects that are responsive to detailed customer growth patterns.

# CHAPTER 9 ▪ ACTION PLAN

## 2010-2011 ACTION PLAN REVIEW

The 2010-2011 Action Plan focused on the following areas:

- Integrated Resource Portfolio
- Demand Forecasting
- Demand-Side Management
- Supply-Side Resources

A discussion of the specific action items and the plan results follows.

### ▪ ACTION ITEM

Monitor actual demand closely for indications of faster growth exceeding our forecasted growth to respond aggressively to address potential accelerated resource deficiencies arising from our exposure to “flat demand” risk. This includes researching and refining the evaluation of resource alternatives, including implementation risk factors and timelines, updated cost estimates and feasibility assessments targeting options for the service territories with nearer-term unserved demand exposure.

### ▪ RESULTS

We continue to monitor demand and compare actual results to IRP forecasted demand. Trends so far indicate slower than anticipated customer growth and continued declines in weather normalized use-per-customer, which has delayed the need for resource acquisitions.

### ▪ ACTION ITEM

Analyze actual use-per-customer data and DSM program results for indications of price elasticity response trends that may have been influenced by evolving economic conditions. Investigate contemporary analytical sources for information on natural gas price elasticity. Explore persuading the AGA to update their analytical work and/or consider hiring a third-party price elasticity study including assessing interest of other utilities in pursuing a regional project.

### ▪ RESULTS

As part of our reconciliation of forecasted demand to actual demand we analyze weather normalized use – per customer. While rates have remained relatively stable over the last few years, customers have decreased their overall usage. Trying economic times, successful adoption of demand-side management initiatives and appliance and building code efficiencies have contributed to the lower use per customer. Long run price elasticity does not change much over time; however we did approach the AGA to update their analytic work. Like man, the AGA was managing a tight budget and did not have the dollars to undertake an updated study.

## ACTION ITEM

Continue our pursuit of cost effective demand-side solutions to reduce demand. In Washington and Idaho conservation measures are targeted to reduce demand by approximately 2,193,000 therms in the first year. In Oregon conservation measures are targeted to reduce demand by approximately 303,000 therms in the first year. These goals represent increases of 54 percent in Washington and Idaho and 1 percent in Oregon from our prior 2007 IRP.

## RESULTS

Avista actively pursues cost-effective demand-side management solutions to reduce demand. In 2010 and 2011 Washington and Idaho conservation measures reduced demand by approximately 1,850,000 therms and 1,730,000 therms. In Oregon demand was reduced by 312,000 therms and 313,000 therms.

## ACTION ITEM

Research and engage a conservation consultant to perform an updated assessment of conservation technical and achievable potential in our service territories prior to the next IRP.

## RESULTS

Global Energy Partners performed a conservation potential assessment for Avista's natural gas and electric demand-side management programs. Results from this analysis were used in the 2012 Natural Gas IRP and a copy of the assessment is included in Appendix 4.1.

## ACTION ITEM

Continue to monitor the discussion around diminishing Canadian gas exports looking for signals that indicate increased risk of disrupted supply over the 20-year planning horizon. Since much of our supply comes from Canadian natural gas exports the notion that this supply could diminish significantly remains a concern.

## RESULTS

During the 2009 IRP supplies available for import into the United States were showing signs of decline. Since then the supply picture for North America has changed dramatically. The widespread availability of shale gas throughout the U.S. and Canada has greatly reduced the concern that supplies will diminish.

## ACTION ITEM

Explore and evaluate alternative and additional forecasting methodologies for potential inclusion in our next IRP. Methodologies to be evaluated include statistical, non-statistical, quantitative, qualitative and terrain overview approaches.

## RESULTS

We continue to believe our forecasting methodology is sound, cost effective and adequate; however we have explored several alternative forecasting methodologies for possible consideration in our IRP planning.  Our methodology allows the ability to vary the results of our statistical inputs by considering both qualitative and quantitative factors. These factors can be derived from data or surveys of market information, fundamental forecasters, and industry experts. We are always open to new methods of forecasting demand and are assessing which, if any, alternative methodologies to include in future IRPs.

## ACTION ITEM

Meet regularly with Commission Staff members to provide information on market activities, material changes to risk management programs, and significant changes in assumptions and/or status of company activity related to the IRP or procurement practices.

## RESULTS

We have met and will continue to meet no less than biannually with Commission Staff members to provide updates on market fundamentals, procurement planning initiatives, changes to risk management programs, and significant changes of assumptions related to the IRP.

# 2013-2014 ACTION PLAN

Since our 2009 IRP customer growth has slowed and it is not anticipated to rebound in the near term. We have also seen use per customer reductions as customers have become more household budget conscience, changed usage behavior, and over the last few years have invested in conservation measures. These factors have reduced overall and peak day demand when compared to our 2009 IRP.

Based on the analysis conducted for the 2012 IRP, under our Expected Case, we do not anticipate the need to acquire additional supply side resources in the next two to three years. Furthermore, even our most aggressive High Growth/Low Price scenario did not indicate supply side needs within the next few years. The Average, Alternate Planning Standard, and Low Growth/High Price scenarios do not indicate any resource deficiencies within the planning horizon. We will actively monitor our demand looking for indications of deviations away from our Expected Case.

The demand forecast was not the only thing that changed dramatically. The price of natural gas has dropped significantly since our last IRP. Robust North American supplies lead by shale gas developments coupled with lackluster demand due to the economy has pushed prices down to levels not seen in the last decade. These low prices, while good for our customers, challenge the cost-effectiveness of DSM at the program level. Since the drafting of this document, Avista has filed in Washington and Idaho to suspend natural gas DSM programs and is currently evaluating programs in Oregon.

Over the next two to three years, Avista will be watching natural gas prices as a sign post for the cost-effectiveness of DSM programs. Should prices move significantly Avista will again be proactive in seeking to reinstate a full complement of our natural gas DSM programs.

Continued enhancement of our gate station analysis will also be completed to assess if there are individual gate station deficiencies that are masked by our aggregated IRP analysis. Should any deficiencies be identified we will discuss findings and potential solutions with Commission Staff. We will continue to coordinate analytic efforts between Gas Supply, Gas Engineering, and the intrastate pipelines to perform gate station analysis and if deficiencies are identified seek least cost solutions.

## ONGOING ACTION ITEMS

- Monitor actual demand for indications of growth exceeding our forecast to respond aggressively to address potential accelerated resource deficiencies arising from exposure to “flat demand” risk. This will include providing commission staff with IRP demand forecast to actual variance analysis on customer growth and use per customer. This information will be provided in Avista's updates to each commission staff at least biannually.

- Pursue the possibility of a regional elasticity study through the Northwest Gas Association or possibly the American Gas Association.
- Assess potential demand impact from NGV/CNG vehicles and other new uses of natural gas to Avista.
- Continue to monitor supply resource trends including the availability and price of natural gas to the regions, exporting LNG, Canadian natural gas imports and interprovincial consumption, regional plans for gas-fired generation and its affect on pipeline availability, as well as regional pipeline and storage infrastructure plans.
- Monitor new resource lead time requirements relative to when resources are needed to preserve resource option flexibility.
- Regularly meet with Commission Staff members to provide information on market activities and significant changes in assumptions and/or status of Avista activities related to the IRP or natural gas procurement practices.

# CHAPTER 10 || GLOSSARY OF TERMS AND ACRONYMS

**ACHIEVABLE POTENTIAL**
Represents a realistic assessment of expected energy savings recognizing and accounting for economic and other constraints that preclude full installation of every identified conservation measure.

**AGA**
American Gas Association

**ANNUAL MEASURES**
Conservation measures that achieve generally uniform year round energy savings independent of weather temperature changes. Annual measures are also often called base load measures.

**AVISTA**
The regulated Operating Division of Avista Corp.; separated into north (Washington and Idaho) and south (Oregon) regions; Avista Utilities generates, transmits and distributes electricity in addition to the transmission and distribution of natural gas.

**BACKHAUL**
A transaction where gas is transported the opposite direction of normal flow on a unidirectional pipeline.

**BASE LOAD**
As applied to natural gas, a given demand for natural gas that remains fairly constant over a period of time, usually not temperature sensitive.

**BASE LOAD MEASURES**
Conservation measures that achieve generally uniform year round energy savings independent of weather temperature changes. Base load measures are also often called annual measures.

**BASIS DIFFERENTIAL**
The difference in price between any two natural gas pricing points or time periods. One of the more common references to basis differential is the pricing difference between Henry Hub and any other pricing point in the continent.

**BRITISH THERMAL UNIT (BTU)**
The amount of heat required to raise the temperature of one pound of pure water one degree Fahrenheit under stated conditions of pressure and temperature; a therm (see below) of natural gas has an energy value of 100,000 BTUs and is approximately equivalent to 100 cubic feet of natural gas.

**CD**
Contract Demand

**C&I**
Commercial and Industrial

**CITY GATE (ALSO KNOWN AS GATE STATION OR PIPELINE DELIVERY POINT)**
The point at which natural gas deliveries transfer from the interstate pipelines to Avista's distribution system.

**CNG**
Compressed Natural Gas

**COMPRESSION**
Increasing the pressure of natural gas in a pipeline by means of a mechanically driven compressor station to increase flow capacity.

**CONSERVATION MEASURES**
Installations of appliances, products or facility upgrades that result in energy savings.

**CONTRACT DEMAND (CD)**
The maximum daily, monthly, seasonal or annual quantities of natural gas, which the supplier agrees to furnish, or the pipeline agrees to transport, and for which the buyer or shipper agrees to pay a demand charge.

**CORE LOAD**
Firm delivery requirements of Avista, which are comprised of residential, commercial and firm industrial customers.

**COST EFFECTIVENESS**
The determination of whether the present value of the therm savings for any given conservation measure is greater than the cost to achieve the savings.

**CPA**
Conservation Potential Assessment

**CPI**
Consumer Price Index, as calculated and published by the U.S. Department of Labor, Bureau of Labor Statistics

**CUBIC FOOT (CF)**
A measure of natural gas required to fill a volume of one cubic foot under stated conditions of temperature, pressure and water vapor; one cubic foot of natural gas has the energy value of approximately 1,000 BTUs and 100 cubic feet of natural gas equates to one therm (see below).

**CURTAILMENT**
A restriction or interruption of natural gas supplies or deliveries; may be caused by production shortages, pipeline capacity or operational constraints or a combination of operational factors.

**DEKATHERM**
Unit of measurement for natural gas; a dekatherm is 10 therms, which is one thousand cubic feet (volume) or one million BTUs (energy).

**DEMAND-SIDE MANAGEMENT (DSM)**
The activity pursued by an energy utility to influence its customers to reduce their energy consumption or change their patterns of energy use away from peak consumption periods.

### DEMAND-SIDE RESOURCES
Energy resources obtained through assisting customers to reduce their "demand" or use of natural gas. Also represents the aggregate energy savings attained from installation of conservation measures.

### DSM
Demand-Side Management

### DTH
Unit of measurement for natural gas; a dekatherm is 10 therms, which is one thousand cubic feet (volume) or one million BTUs (energy).

### EIA
Energy Information Administration

### EXTERNAL ENERGY EFFICIENCY BOARD
Also known as the "Triple-E" board, this non-binding external oversight group was established in 1999 to provide Avista with input on DSM issues.

### EXTERNALITIES
Cost and benefits that are not reflected in the price paid for goods or services.

### FEDERAL ENERGY REGULATORY COMMISSION (FERC)
The government agency charged with the regulation and oversight of interstate natural gas pipelines, wholesale electric rates and hydroelectric licensing; the FERC regulates the interstate pipelines with which Avista does business and determines rates charged in interstate transactions.

### FERC
Federal Energy Regulatory Commission

### FIRM SERVICE
Service offered to customers under schedules or contracts that anticipate no interruptions; the highest quality of service offered to customers.

### FORCE MAJEURE
An unexpected event or occurrence not within the control of the parties to a contract, which alters the application of the terms of a contract; sometimes referred to as "an act of God;" examples include severe weather, war, strikes, pipeline failure and other similar events.

### FORWARD PRICE
The future price for a quantity of natural gas to be delivered at a specified time.

### GAS TRANSMISSION NORTHWEST (GTN)
A subsidiary of TransCanada Pipeline which owns and operates a natural gas pipeline that runs from the Canada/USA border to the Oregon/California border. One of the six natural gas pipelines Avista transacts with directly.

**Geographic Information System (GIS)**
A system of computer software, hardware and spatially referenced data that allows information to be modeled and analyzed geographically.

**GHG**
Greenhouse Gas

**Global Insight, Inc.**
A national economic forecasting company.

**GTN**
Gas Transmission Northwest

**Heating Degree Day (HDD)**
A measure of the coldness of the weather experienced, based on the extent to which the daily average temperature falls below 65 degrees Fahrenheit; a daily average temperature represents the sum of the high and low readings divided by two.

**Henry Hub**
The physical location found in Louisiana that is widely recognized as the most important pricing point in the United States. It is also the trading hub for the New York Mercantile Exchange (NYMEX).

**HP**
High Pressure

**Injection**
The process of putting natural gas into a storage facility; also called liquefaction when the storage facility is a liquefied natural gas plant.

**Integrity Management Plan**
A federally regulated program that requires companies to evaluate the integrity of their natural gas pipelines based on population density. The program requires companies to identify high consequence areas, assess the risk of a pipeline failure in the identified areas and provide appropriate mitigation measures when necessary.

**Interruptible Service**
A service of lower priority than firm service offered to customers under schedules or contracts that anticipate and permit interruptions on short notice; the interruption happens when the demand of all firm customers exceeds the capability of the system to continue deliveries to all of those customers.

**IPUC**
Idaho Public Utilities Commission

**IRP**
Integrated Resource Plan; the document that explains Avista's plans and preparations to maintain sufficient resources to meet customer needs at a reasonable price.

### Jackson Prairie

An underground storage project jointly owned by Avista Corp., Puget Sound Energy, and NWP; the project is a naturally occurring aquifer near Chehalis, Washington, which is located some 1,800 feet beneath the surface and capped with a very thick layer of dense shale.

### Liquefaction

Any process in which natural gas is converted from the gaseous to the liquid state; for natural gas, this process is accomplished through lowering the temperature of the natural gas (see LNG).

### Liquefied Natural Gas (LNG)

Natural gas that has been liquefied by reducing its temperature to minus 260 degrees Fahrenheit at atmospheric pressure.

### Linear Programming

A mathematical method of solving problems by means of linear functions where the multiple variables involved are subject to constraints; this method is utilized in the SENDOUT® Gas Model.

### Load Duration Curve

An array of daily send outs observed that is sorted from highest send out day to lowest to demonstrate both the peak requirements and the number of days it persists.

### Load Factor

The average load of a customer, a group of customers, or an entire system, divided by the maximum load; can be calculated over any time period.

### Local Distribution Company (LDC)

A utility that purchases natural gas for resale to end-use customers and/or delivers customer's natural gas or electricity to end users' facilities.

### Looping

The construction of a second pipeline parallel to an existing pipeline over the whole or any part of its length, thus increasing the capacity of that section of the system.

### MCF

A unit of volume equal to a thousand cubic feet.

### MDDO

Maximum Daily Delivery Obligation

### MDQ

Maximum Daily Quantity

### MMBTU

A unit of heat equal to one million British thermal units (BTUs) or 10 therms. Can be used interchangeably with Dth.

### National Energy Board

The Canadian equivalent to the Federal Energy Regulatory Commission (FERC).

**NATIONAL OCEANIC ATMOSPHERIC ADMINISTRATION (NOAA)**
Publishes the latest weather data; the 30-year weather study included in this IRP is based on this information.

**NATURAL GAS**
A naturally occurring mixture of hydrocarbon and non-hydrocarbon gases found in porous geologic formations beneath the earth's surface, often in association with petroleum; the principal constituent is methane, and it is lighter than air.

**NEW YORK MERCANTILE EXCHANGE (NYMEX)**
An organization that facilitates the trading of several commodities including natural gas.

**NGV**
Natural Gas Vehicles

**NOAA**
National Oceanic and Atmospheric Administration

**NOMINAL**
Discounting method that includes inflation.

**NOMINATION**
The scheduling of daily natural gas requirements.

**NON-COINCIDENTAL PEAK DEMAND**
The demand forecast for a 24-hour period for multiple regions that includes at least one peak day and one non-peak day.

**NON-FIRM OPEN MARKET SUPPLIES**
Natural gas purchased via short-term purchase arrangements; may be used to supplement firm contracts during times of high demand or to displace other volumes when it is cost-effective to do so; also referred to as spot market supplies.

**NORTHWEST PIPELINE CORPORATION (NWP)**
A principal interstate pipeline serving the Pacific Northwest and one of six natural gas pipelines Avista transacts with directly. NWP is a subsidiary of The Williams Companies and is headquartered in Salt Lake City, Utah.

**NOVA GAS TRANSMISSION (NOVA)**
See TransCanada Alberta System

**NORTHWEST POWER AND CONSERVATION COUNCIL (NPCC)**
A regional energy planning and analysis organization headquartered in Portland, Ore.

**NPCC**
Northwest Power and Conservation Council

**NWP**
Williams-Northwest Pipeline

**NYMEX**
New York Mercantile Exchange

**OPUC**
Oregon Public Utility Commission

**PEAK DAY**
The greatest total natural gas demand forecasted in a 24-hour period used as a basis for planning peak capacity requirements.

**PEAK DAY CURTAILMENT**
Curtailment imposed on a day-to-day basis during periods of extremely cold weather when demands for natural gas exceed the maximum daily delivery capability of a pipeline system.

**PEAKING CAPACITY**
The capability of facilities or equipment normally used to supply incremental natural gas under extreme demand conditions (i.e. peaks); generally available for a limited number of days at this maximum rate.

**PEAKING FACTOR**
A ratio of the peak hourly flow and the total daily flow at the city-gate stations used to convert daily loads to hourly loads.

**PRESCRIPTIVE MEASURES**
Avista's DSM tariffs require the application of a formula to determine customer incentives for natural gas-efficiency projects. For commonly encountered efficiency applications that are relatively uniform in their characteristics the utility has the option to define a standardized incentive based upon the typical application of the efficiency measure. This standardized incentive takes the place of a customized calculation for each individual customer. This streamlining reduces both the utility and customer administrative costs of program participation and enhances the marketability of the program.

**PSIG**
Pounds per square inch gauge – a measure of the pressure at which natural gas is delivered.

**PVRR**
Present Value Revenue Requirement

**RATE BASE**
The investment value established by a regulatory authority upon which a utility is permitted to earn a specified rate of return; generally this represents the amount of property used and useful in service to the public.

**REAL**
Discounting method that excludes inflation.

**RESOURCE STACK**
Sources of natural gas infrastructure or supply available to serve Avista's customers.

**Seasonal Capacity**
Natural gas transportation capacity designed to service in the winter months.

**Sendout**
The amount of natural gas consumed on any given day.

**SENDOUT®**
Natural gas planning system from Ventyx; a linear programming model used to solve gas supply and transportation optimization questions.

**Service Area**
Territory in which a utility system is required or has the right to provide natural gas service to ultimate customers.

**Spot Market Gas**
Natural gas purchased under short-term agreements as available on the open market; prices are set by market pressure of supply and demand.

**Storage**
The utilization of facilities for storing natural gas which has been transferred from its original location for the purposes of serving peak loads, load balancing and the optimization of basis differentials; the facilities are usually natural geological reservoirs such as depleted oil or natural gas fields or water-bearing sands sealed on the top by an impermeable cap rock; the facilities may be man-made or natural caverns. LNG storage facilities generally utilize above ground insulated tanks.

**TAC**
Technical Advisory Committee

**Tariff**
A published volume of regulated rate schedules plus general terms and conditions under which a product or service will be supplied.

**TF-I**
NWP's rate schedule under which Avista moves natural gas supplies on a firm basis.

**TF-2**
NWP's rate schedule under which Avista moves natural gas supplies out of storage projects on a firm basis.

**Technical Advisory Committee (TAC)**
Industry, customer and regulatory representatives that advise Avista during the IRP planning process.

**Technical Potential**
An estimate of all energy savings that could theoretically be accomplished if every customer that could potentially install a conservation measure did so without consideration of market barriers such as cost and customer awareness.

**THERM**
A unit of heating value used with natural gas that is equivalent to 100,000 British thermal units (BTU); also approximately equivalent to 100 cubic feet of natural gas.

**TOWN CODE**
A town code is an unincorporated area within a county and a municipality within a county served by Avista natural gas retail services.

**TRANSCANADA ALBERTA SYSTEM**
Previously known as NOVA Gas Transmission; a natural gas gathering and transmission corporation in Alberta that delivers natural gas into the TransCanada BC System pipeline at the Alberta/British Columbia border; one of six natural gas pipelines Avista transacts with directly.

**TRANSCANADA BC SYSTEM**
Previously known as Alberta Natural Gas; a natural gas transmission corporation of British Columbia that delivers natural gas between the TransCanada-Alberta System and GTN pipelines that runs from the Alberta/British Columbia border to the United States border; one of six natural gas pipelines Avista transacts with directly.

**TRANSPORTATION GAS**
Natural gas purchased either directly from the producer or through a broker and is used for either system supply or for specific end-use customers, depending on the transportation arrangements; NWP and GTN transportation may be firm or interruptible.

**TRC**
Total Resource Cost

**TRIPLE E**
External Energy Efficiency Board

**TUSCARORA GAS TRANSMISSION COMPANY**
Tuscarora is a subsidiary of Sierra Pacific Resources and TransCanada; this natural gas pipeline runs from the Oregon/California border to Reno, Nevada; one of the six natural gas pipelines Avista transacts with directly;

**VAPORIZATION**
Any process in which natural gas is converted from the liquid to the gaseous state.

**WCSB**
Western Canadian Sedimentary Basin

**WEIGHTED AVERAGE COST OF GAS (WACOG)**
The price paid for a volume of natural gas and associated transportation based on the prices of individual volumes of natural gas that make up the total quantity supplied over an established time period.

**WEATHER NORMALIZATION**
The estimation of the average annual temperature in a typical or "normal" year based on examination of historical weather data; the normal year temperature is used to forecast utility sales revenue under a procedure called sales normalization.

**WEATHER SENSITIVE MEASURES**

Conservation measures whose energy savings are influenced by weather temperature changes. Weather sensitive measures are also often referred to as winter measures.

**WINTER MEASURES**

Conservation measures whose energy savings are influenced by weather temperature changes. Winter measures are also often referred to as weather sensitive measures.

**WITHDRAWAL**

The process of removing natural gas from a storage facility, making it available for delivery into the connected pipelines; vaporization is necessary to make withdrawals from an LNG plant.

**WUTC**

Washington Utilities and Transportation Commission

# 2012 Natural Gas Integrated Resource Plan Appendices

**August 31, 2012**

www.avistautilities.com

AVISTA

# Table of Contents – Appendices

# APPENDIX 1.1 ▌▌ TAC MEMBER LIST

| ORGANIZATION | REPRESENTATIVES | |
|---|---|---|
| **Avista** | Bruce Folsom<br>Christopher Williams<br>Greg Rahn<br>Heather Rosentrater<br>Jeff Webb<br>John Lyons<br>Jon Powell<br>Kelly Irvine<br>Kerry Shroy | Steve Harper<br>Kris Ransom<br>Linda Gervais<br>Lori Hermanson<br>Pat Ehrbar<br>Randy Barcus<br>Shawn Bonfield<br>Tom Pardee |
| **Cascade Natural Gas Company** | Mark Sellers-Vaughn | Mike Parvinen |
| **Fortis BC** | Christina Lemire | Ken Ross |
| **Intermountain Gas** | Dave Swenson<br>Mike McGrath | Shelli Chase |
| **Idaho Public Utility Commission** | Donn English<br>Kathleen McHugh<br>Matt Elam | Rick Sterling<br>Terri Carlock |
| **Northwest Gas Association** | Ben Hemson | Dan Kirschner |
| **Northwest Industrial Gas Users** | Paula Pyron | |
| **Northwest Natural Gas** | John Sohl<br>Mark Thompson | Sarah Dammen<br>Jennifer Gross |
| **Northwest Pipeline** | Dave Allred<br>Mike Rasmuson | Teresa Hagins |
| **Northwest Power and Conservation Council** | Terry Morlan | |
| **Oregon Public Utility Commission** | Ken Zimmerman | Lisa Gorsuch |
| **Oregon CUB** | Bob Jenks | |
| **Puget Sound Energy** | Gurvinder Singh | Phillip Popoff |
| **TransCanada** | Celeste Rudolph<br>David White | Lee Bennett |
| **Washington Attorney General's Office** | Lea Daeschel | |
| **Washington Utility and Transportation Commission** | David Nightingale<br>Deborah Reynolds<br>Rick Applegate | Steven Johnson<br>Vonda Novak |
| **WA Department of Commerce** | Greg Nothstein | |

## APPENDIX 1.2 COMMENTS AND RESPONSES TO 2012 DRAFT INTEGRATED RESOURCE PLAN

The following table summarizes the significant comments on our DRAFT as submitted by TAC members and Avista's responses. The planning environment in this IRP cycle was especially challenging given some of the most challenging economic volatility seen in decades coupled with industry changing dynamics in natural gas production. We continued our robust, flexible demand forecasting methodology that captured a broad range of demand forecasts fully vetted with our TAC. This IRP produced reduced forecasted demand scenarios and no near term resource needs even in our most robust demand scenario. We appreciate the time and effort invested by all our TAC members throughout the IRP process. Many good suggestions have been made and we have incorporated those that enhance the document.

| Document Reference[1] | Comment/Question | Avista Response |
|---|---|---|
| 3.1 - DEMAND | Once again Staff requests that Avista Reverse this process. Evaluate need vs. resources in terms of annual average normal demand first and then move to need vs. resources in terms of peak demand. This builds demand and resources from the bottom up, which better represents how customer demand is actually built up and served. | We start with annual average demand and then do the peak demand forecast. We have enhanced the wording to make it clear that this is our process. |
| 3.2 – DEMAND | Storage is a peak and near-peak resource only, correct? | Storage is to serve annual average demand as well as providing the delivery capacity to meet our peak or near-peak day requirements. Our plan is designed to ensure that there is sufficient gas available should a peak weather event occur. |
| 3.2 - DEMAND | Do the analysis for each of these equations separately, and only later do the analysis for the two combined. See notes above. | The base usage factor is not annual average demand. Base usage is non-weather sensitive usage. This represents customer usage that is consistent throughout the year for applications like heating water in a residential home. The weather sensitive is usage that is dependent on temperature. When moving from annual average demand to peak the heating degree day assumption changes, thereby changing the amount of heat sensitive demand. |

[1] All references are in reference to the DRAFT IRP submitted to the TAC on May 25, 2012.

| Document Reference[1] | Comment/Question | Avista Response |
|---|---|---|
| 3.2 - DEMAND | Basic questions to answer:<br><br>Why would someone become a gas customer?<br><br>After becoming a customer how much will that customer consume? | These questions are considered when developing the customer growth forecast. It is a combination of historical analysis and forward estimates driven primarily off of economics. The how much a customer will use is based initially on historical values but is altered for anticipated future issues. For example we adjust usage based on the change in natural gas prices through a price elasticity adjustment and demand side management measure adoption. |
| 3.3 - DEMAND | So this average base and weather sensitive demand forecast, not design or extreme peak? | The use per customer coefficients is applied based on heating degree days. Base usage factors are multiplied by customers to develop base usage. Then heat sensitive coefficients are multiplied by customers and HDDs and are then added together. This methodology allows us to vary the weather assumption so we can do the build up from average load to peak load. Again we start by using the base and heat sensitive coefficients to develop an annual average demand forecast. We then change the weather assumption to incorporate peak weather and calculate the peak demand forecast. |
| 3.6 - DEMAND | And these are ... ? | The worst case scenario would be the death or injury of a customer due to an outage at extremely cold temperatures. However, the potential cost due to appliance destruction, freezing pipes, etc. should also be a consideration. |
| 3.12 - DEMAND | So the expected case for demand is that on average it will not grow over the next 20 years? Correct? Where is the expected case on this graph? | Total demand is expected to grow, but the elasticity adjustment and global warming also affect total annual demand. The difference between annual demand in the expected case and the alternate planning standard is minimal and so the lines lie almost on top of one another. |

| Document Reference[1] | Comment/Question | Avista Response |
|---|---|---|
| 3.12 - DEMAND | Why is expected case peak demand growing? What are the primary and secondary elements underlying this growth? | Peak day demand is growing as customer counts grow. Additionally, we do not apply a price elastic adjustment to the peak factors, we assume that people are using at that level due to extreme temperatures not necessarily economically driven. Peak HDDs are also not adjusted for global warming. |
| 3.13 - DEMAND | But you are still not checking your "statistical" or "stochastic" forecasting results with non-statistical approaches, so there is no cross verification? | We have researched many non-statistical forecasting methodologies and found them to be not relevant for our forecasting needs. Which non-statistical would provide proper verification? If we cannot find a valid non-statistical forecast then verification is not possible. |
| 3.14 - DEMAND | But for IRP purposes you still need to focus on an "expected" case demand forecast and then integrate this into the expected case planning portfolio for the IRP. | We first do an average case, which shows that we are not resource deficient within the planning horizon. We then layer in the peak weather planning assumption which is our Expected case. The process is fully integrated. |
| 4.1 - DSM | So potential estimates are not used? Isn't this contrary to the IRP guidelines? | Potential estimates are used. Before the DSM potential estimates were developed Global Energy Partners need to create a baseline demand forecast without any incremental DSM. From there Global developed its DSM potential which is used in the IRP. |
| 5.8 – SUPPLY SIDE RESOURCES | But these must be included in the preferred portfolio and assessed in terms of cost and risk via that portfolio. | They are if the proposed enhancement solves a resource shortage in a particular region it is assessed in term of cost and risk in the same manner as other demand and supply side options. Many distribution projects are routine maintenance and reliability enhancements. These costs are not included in the IRP analysis. |

| Document Reference[1] | Comment/Question | Avista Response |
|---|---|---|
| 6.21 – INTEGRATED PORTFOLIO | Highlighted conclusion statement | The sentence will be changed to reflect that the analysis is performed on the Average Demand case first and then the Expected Peak Demand case. |
| 7.5 – ALTERNATE PORTFOLIO ANALYSIS | Does this include the $4.6M in distribution upgrades by 2014? See Table 8.1, Ref #3203. | Yes, the Medford project costs were included in the 2009 IRP and this IRP. However, it is important to understand that not all the capital projects detailed in Table 8.1 are included in the IRP analysis. Many of the capital projects are part of routine capital maintenance or are distribution system reliability/reinforcement issues and are not IRP issues. The IRP will include the costs necessary to facilitate additional interstate pipeline capacity takeaway when an area is resource deficient from a supply side, as was the case in Medford. |

| Document Reference[1] | Comment/Question | Avista Response |
| --- | --- | --- |
| 9.4 – ACTION PLAN | What supply-side resources does the IRP indicate are needed in the next two-three years?<br><br>What demand-side resources does the IRP indicate are needed in the next two-three years?<br><br>Which of those from #1 and #2 are included in the IRP for assessment?<br><br>Any other resources shown in the IRP needed over next two-three years?<br><br>Identify top 3-5 resource portfolios in terms of cost (NPVRR) and risk, and the portfolio chosen by the Company for this IRP (with all reasoning behind that choice laid out). Most of these values are included in Chapter 7, particularly the section called “Portfolio Selection” and in Table 7.3, as well as at the “Conclusion” section form Chapter 7. Also the chapter 7 analysis should be at least summarized in this chapter. Also, as noted on my notes for Table 7.3 an explanation needs to be included of whether the NPVRRs include the distribution resources and costs from Chapter 8, and summarized here. | The Action Plan was re-written to address these items. |

| Document Reference[1] | Comment/Question | Avista Response |
|---|---|---|
| Chapter 4 - DSM | Commission staff has some concerns that every one of the company's demand forecasts includes a Demand Side Management (DSM) effects adjustment on top of each forecast. Commission staff would like to see each one of the company's forecasts without this downward adjustment in load. This is due to current relative uncertainty of actual net effect that DSM has on load, and various off-setting factors that may be present and unaccounted for when calculating an estimated impact on the company's overall load. The company may include a forecast which incorporates this downward adjustment, but also alongside that forecast, have a picture of load without this adjustment. Commission staff would also like see the performance of these downward adjusted forecasts historically. | We show the graphs which will be included in Appendix 6 where we compare demand with and without DSM. The updated CPA provided less DSM potential than previous IRPs. There is not a material difference between the two which the graphs will show.<br><br>Historic numbers which are used to generate the use per customer coefficients have embedded in them demand side management. A comparison of IRP use to actual is provided to staff each quarter as a part of our quarterly update. |
| Chapter 3 - DEMAND | In this current IRP, the company has developed Use Per Customer models for average use and for peak use, to better allow the company to depict (and predict) customer responses in terms of gas use in various temperature situations. For the company's super peak coefficients (which are utilized to model extreme occurrences, beyond typical annual peaks), it is necessary for the company to define what "very cold temperatures" were. | Very cold is defined as HDDs equal to or greater than 65. |

| Document Reference[1] | Comment/Question | Avista Response |
| --- | --- | --- |
| Chapter 3 - DEMAND | Commission staff has concerns that the three years of data the Company used is not sufficient to establish its use per customer coefficients, and that Avista should consider using at least five years of data. The company has stated in its IRP that "five years incorporate some years of higher use per customer, which may overstate use due to changes in building codes and investments made in conservation initiatives[1]." Looking at figure 3.3[2] which shows a graph of the three-year Use Per Customer versus the five-year Use Per Customer on a total system basis, it appears the three-year and five-year lines lay relatively on top of one another. The speed of energy efficiency measure implementation and building code changes does not seem to commission staff to make such significant advances in a span of two years that these additional historical years must be excluded to prevent future bias in the company's Use Per Customer coefficients. Due to this observation, it makes sense to commission staff to utilize the five years of data points, to ensure that sufficient data points are used to allow development of a strong relationship. | The difference between 3 years and 5 years is not significantly different for Washington and Idaho. However, there is a significant difference for our Oregon service territory. In order to maintain consistency in our modeling and because the difference is insignificant in Washington and Idaho we utilized 3 years of data. There is a strong correlation, R-squared of over 90% with the three years of data. |

[1] Chapter 3, Demand Forecasts, page 3.4

[2] Chapter 3, Demand Forecasts, page 3.5

| Document Reference[1] | Comment/Question | Avista Response |
|---|---|---|
| Chapter 3 - DEMAND | Commission staff also has concerns about what seems to be a "conditional global warming" trend in its forecasts of future heating degree days in the planning period. The company claims that there has arisen from the analysis of historical weather data, a distinct warming trend in average weather data, yet the warming trend is absent, at least with any certainty, from the peak weather data. This caused the company to make adjustments downward in forecasts for future expected weather conditions, but not make any adjustments in future peak weather conditions. Commission staff is of the opinion that if a global warming trend exists, it should apply universally. At a minimum, the Company should explain in its next IRP why the trend is absent in the peak weather conditions. | We discussed the issue with the TAC at our first meeting. Consistent with our previous IRP we do not apply the global warming adjustment to our peak day weather planning assumption as we have not found evidence that global warming does in fact affect extreme events. If anything we have heard that volatility in weather may in fact be greater due to the overall global warming trend. To the extent we discover research counter to our current assumption we will assess it in our next IRP cycle. |

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| Chapter 4 – DSM | The company has included in this overview of conservation, the low natural gas prices, and they have stated in their IRP that this is impacting the cost-effectiveness of measures due to the low avoided costs resulting from low natural gas prices. In WAC 480-90-238 (2) (b), the section titled “definitions”, there is stated lowest reasonable cost mix of resources must, at a minimum, consider the following:<br><br>Resource costs<br>Market-volatility risks<br>Demand-side resource uncertainties<br>Risks imposed on ratepayers<br>Resource effect on system operations<br>Public policies regarding resource preference adopted by Washington state or the federal government<br>Costs of risks associated with environmental effects including emissions of carbon dioxide<br>Need for security of supply<br><br>Commission staff has concerns that Avista’s avoided costs calculation resulted in omitting many conservation measures, due to heavily emphasizing the relatively low cost of gas in this current time period, and the failure to consider appropriately the other variables which should play a larger role in the calculation. The nature of an IRP was meant to be utilized as a long-range planning tool, and commission staff considers the other variables mentioned in WAC 280-90-238 (2) (b) to be important, and not to be minimized.<br><br>Specifically, commission staff would like the company to make a comparative avoided costs analysis to that shown in NW Natural’s 2010 Natural Gas IRP, Docket UG-100245 in Chapter 6.2 and present the results in its revision of their draft plan. Commission staff notes that NW Natural included a 10% conservation adder to avoided costs to account for unquantifiable benefits of DSM as suggested by the NW Power and Conservation Council, as well as a CO2 emission adder. Commission staff would like to see these components added to Avista’s avoided costs calculation. | The IRP selected essentially all the DSM that was given to the model. The avoided cost stream that comes from SENDOUT® does include a CO2 adder, as it is embedded in the expected price curve. The avoided costs also include variable charges (volumetric pipeline charges and fuel). This cost stream is provided to our DSM department for business planning purposes and program development/measurement, where they further incorporate the 10% conservation adder as well as a distribution system cost adder.<br><br>Avista agrees with staff that the IRP is a long term plan and appropriately incorporates variables into the calculation. We agree that the low cost of gas in this current time period provides challenges for DSM programs; however the low cost is good for our customers. Additionally, we run a scenario with high prices to understand what implications that may have on our customer usage and portfolio costs and ultimately the avoided cost used to determine the cost effectiveness of DSM programs. Evaluation of the avoided costs will be ongoing. Should the price of natural gas rise rendering programs cost effective we will be proactive in requesting reinstatement our natural gas DSM programs. |

# APPENDIX 2.1 ‖ AVISTA CORPORATION 2012 NATURAL GAS INTEGRATED RESOURCE PLAN WORK PLAN

## IRP WORK PLAN REQUIREMENTS

Section 480-90-238 (4), of the natural gas Integrated Resource Plan ("IRP") rules, specify requirements for the IRP Work Plan:

> Not later than twelve months prior to the due date of a plan, the utility must provide a work plan for informal commission review. The work plan must outline the content of the integrated resource plan to be developed by the utility and the method for assessing potential resources.

Additionally, Section 480-90-238 (5) of the WAC states:

> The work plan must outline the timing and extent of public participation.

## OVERVIEW

This Work Plan outlines the process Avista will follow to complete its 2012 Natural Gas IRP by Aug. 31, 2012. Avista uses a public process to obtain technical expertise and guidance throughout the planning period via Technical Advisory Committee (TAC) meetings. The TAC will be providing input into assumptions, scenarios, and modeling techniques.

## PROCESS

The 2012 IRP process will be similar to that used to produce the previously published plan. Avista will use SENDOUT® (a PC based linear programming model widely used to solve natural gas supply and transportation optimization questions) to develop the risk adjusted least-cost resource mix for the 20 year planning period.

This plan will continue to include demand analysis, demand side management and avoided cost determination, existing and potential supply-side resource analysis, resource integration and alternative sensitivities and scenario analysis.

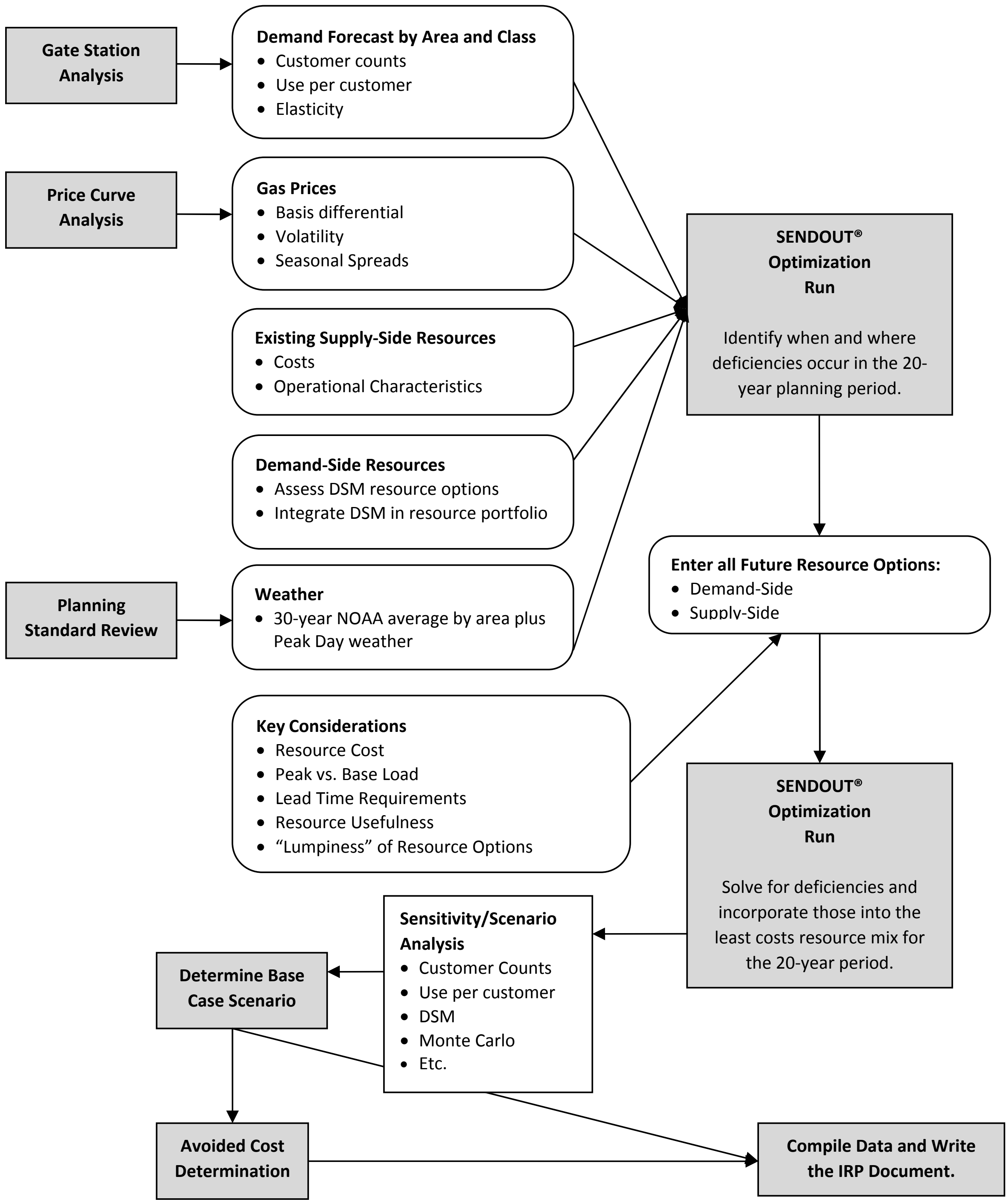
Additionally, Avista intends to incorporate action plan items identified in the 2009 Natural Gas IRP including more detailed demand analysis regarding use per customer, demand side management results and possible price elastic responses to evolving economic conditions, an updated assessment of conservation potential in our service territories, consideration of alternate forecasting methodologies, and the changing landscape of natural gas supply (i.e. shale gas, Canadian exports, and US LNG exports) and its implications to the planning process. Further details about Avista's process for determining the risk adjusted least-cost resource mix is shown in Exhibit 1.

## TIMELINE

The following is Avista's TENTATIVE 2012 Natural Gas IRP timeline:

| | | |
|---|---|---|
| August 31, 2011 | Work Plan filed with WUTC | |
| January through April 2012 | Technical Advisory Committee meetings (exact meeting dates ***subject to change***). Meeting topics will include: | |
| | January 17 | Demand Forecast & Demand-Side Management |
| | February 21 | Distribution Planning & Supply/Infrastructure and Potential Case Discussion |
| | March 20 | SENDOUT® Preliminary Output Results and Further Case Discussion |
| | April 17 | SENDOUT® results |
| May 11, 2012 | Draft of IRP document to TAC | |
| June 29, 2012 | Comments on draft due back to Avista | |
| July 17, 2012 | TAC final review meeting (if necessary) | |
| August 31, 2012 | File finalized IRP document | |

## EXHIBIT 1: AVISTA'S 2012 NATURAL GAS IRP MODELING PROCESS



# APPENDIX 2.2 II WASHINGTON PUBLIC UTILITY COMMISSION IRP POLICIES AND GUIDELINES – WAC 480-90-238

## Avista Natural Gas IRP Review

| Rule | Requirement | Plan Citation |
|---|---|---|
| WAC 480-90-238(4) | Work plan filed no later than 12 months before next IRP due date. | Work plan submitted to the WUTC on August 31, 2011, See attachment to this Appendix 2.1. |
| WAC 480-90-238(4) | Work plan outlines content of IRP. | See workplan attached to this Appendix 2.1. |
| WAC 480-90-238(4) | Work plan outlines method for assessing potential resources. (See LRC analysis below) | See Appendix 2.1. |
| WAC 480-90-238(5) | Work plan outlines timing and extent of public participation. | See Appendix 2.1. |
| WAC 480-90-238(4) | Integrated resource plan submitted within two years of previous plan. | Last Integrated Resource Plan was submitted on December 31, 2009. In March 2011 the company asked to extend the deadline of filing to August 31, 2012 due to the lack of immediate resource needs and in order to alleviate resource burdens. |
| WAC 480-90-238(5) | Commission issues notice of public hearing after company files plan for review. | TBD |
| WAC 480-90-238(5) | Commission holds public hearing. | TBD |
| WAC 480-90-238(2)(a) | Plan describes mix of natural gas supply resources. | See Chapter 5 on Supply Side Resources |
| WAC 480-90-238(2)(a) | Plan describes conservation supply. | See Chapter 4 on Demand Side Resources |
| WAC 480-90-238(2)(a) | Plan addresses supply in terms of current and future needs of utility and ratepayers. | See Chapter 5 on Supply Side Resources and Chapter 6 Integrated Resource Portfolio |
| WAC 480-90-238(2)(a)&(b) | Plan uses lowest reasonable cost (LRC) analysis to select mix of resources. | See Chapters 4 and 5 for Demand and Supply Side Resources. Chapter 6 details how Demand and Supply come together to select the least cost/best risk portfolio for ratepayers. |
| WAC 480-90-238(2)(b) | LRC analysis considers resource costs. | See Chapters 4 and 5 for Demand and Supply Side Resources. Chapter 6 details how Demand and Supply come together to select the least cost/best risk portfolio for ratepayers. |
| WAC 480-90-238(2)(b) | LRC analysis considers market-volatility risks. | See Chapter 5 on Supply Side Resources |
| WAC 480-90-238(2)(b) | LRC analysis considers demand side uncertainties. | See Chapter 3 Demand Forecasting |
| WAC 480-90-238(2)(b) | LRC analysis considers resource effect on system operation. | See Chapter 5 and Chapter 6 |
| WAC 480-90-238(2)(b) | LRC analysis considers risks imposed on ratepayers. | See Chapter 5 procurement plan section. We seek to minimize but cannot eliminate price risk for our customers. |
| WAC 480-90-238(2)(b) | LRC analysis considers public policies regarding resource preference adopted by Washington state or federal government. | See Chapter 3 demand scenarios |
| WAC 480-90-238(2)(b) | LRC analysis considers cost of risks associated with environmental effects including emissions of carbon dioxide. | See Chapter 3 on demand scenarios |
| WAC 480-90-238(2)(b) | LRC analysis considers need for security of supply. | See Chapter 5 on Supply Side Resources |

| Rule | Requirement | Plan Citation |
|---|---|---|
| WAC 480-90-238(2)(c) | Plan defines conservation as any reduction in natural gas consumption that results from increases in the efficiency of energy use or distribution. | See Chapter 4 on Demand Side Resources |
| WAC 480-90-238(3)(a) | Plan includes a range of forecasts of future demand. | See Chapter 3 on Demand Forecast |
| WAC 480-90-238(3)(a) | Plan develops forecasts using methods that examine the effect of economic forces on the consumption of natural gas. | See Chapter 3 on Demand Forecast |
| WAC 480-90-238(3)(a) | Plan develops forecasts using methods that address changes in the number, type and efficiency of natural gas end-uses. | See Chapter 3 on Demand Forecast |
| WAC 480-90-238(3)(b) | Plan includes an assessment of commercially available conservation, including load management. | See Chapter 4 on Demand Side Management including demand response section. |
| WAC 480-90-238(3)(b) | Plan includes an assessment of currently employed and new policies and programs needed to obtain the conservation improvements. | See Chapter 4 and Appendix 4.1. |
| WAC 480-90-238(3)(c) | Plan includes an assessment of conventional and commercially available nonconventional gas supplies. | See Chapter 5 on Supply Side Resources |
| WAC 480-90-238(3)(d) | Plan includes an assessment of opportunities for using company-owned or contracted storage. | See Chapter 5 on Supply Side Resources |
| WAC 480-90-238(3)(e) | Plan includes an assessment of pipeline transmission capability and reliability and opportunities for additional pipeline transmission resources. | See Chapter 5 on Supply Side Resources |
| WAC 480-90-238(3)(f) | Plan includes a comparative evaluation of the cost of natural gas purchasing strategies, storage options, delivery resources, and improvements in conservation using a consistent method to calculate cost-effectiveness. | See Chapter 4 on Demand Side Resources and Chapter 5 on Supply Side Resources |
| WAC 480-90-238(3)(g) | Plan includes at least a 10 year long-range planning horizon. | Our plan is a comprehensive 20 year plan. |
| WAC 480-90-238(3)(g) | Demand forecasts and resource evaluations are integrated into the long range plan for resource acquisition. | Chapter 6 Integrated Resource Portfolio details how demand and supply come together to form the least cost/best risk portfolio. |
| WAC 480-90-238(3)(h) | Plan includes a two-year action plan that implements the long range plan. | See Section 9 Action Plan |
| WAC 480-90-238(3)(i) | Plan includes a progress report on the implementation of the previously filed plan. | See Section 9 Action Plan |
| WAC 480-90-238(5) | Plan includes description of consultation with commission staff. (Description not required) | See Section 1 Introduction |
| WAC 480-90-238(5) | Plan includes description of completion of work plan. (Description not required) | See Appendix 2.1. |

# APPENDIX 2.2 ‖ IDAHO PUBLIC UTILITY COMMISSION IRP POLICIES AND GUIDELINES – ORDER NO. 25342

| | DESCRIPTION OF REQUIREMENT | FULLFILLMENT OF REQUIREMENT |
|---|---|---|
| 1 | Purpose and Process. Each gas utility regulated by the Idaho Public Utilities Commission with retail sales of more than 10,000,000,000 cubic feet in a calendar year (except gas utilities doing business in Idaho that are regulated by contract with a regulatory commission of another State) has the responsibility to meet system demand at least cost to the utility and its ratepayers. Therefore, an ''integrated resource plan'' shall be developed by each gas utility subject to this rule. | Avista prepares a comprehensive 20 year Integrated Resource Plan every two years. Avista will be filing its 2012 IRP on or before August 31, 2012. |
| 2 | Definition. Integrated resource planning. ''Integrated resource planning'' means planning by the use of any standard, regulation, practice, or policy to undertake a systematic comparison between demand-side management measures and the supply of gas by a gas utility to minimize life-cycle costs of adequate and reliable utility services to gas customers. Integrated resource planning shall take into account necessary features for system operation such as diversity, reliability, dispatchability, and other factors of risk and shall treat demand and supply to gas consumers on a consistent and integrated basis. | Avista's IRP brings together dynamic demand forecasts and matches them against demand-side and supply-side resources in order to evaluate the least cost/best risk portfoio for its core customers. While the primiary focus has been to ensure customer's needs are met under peak or design weather conditions, this process also evaluates the resource portfolio under normal/average operating conditions. The IRP provides the framework and methodology for evaluating Avista's natural gas demand and resources. |
| 3 | Elements of Plan. Each gas utility shall submit to the Commission on a biennial basis an integrated resource plan that shall include: | 2012 IRP to be filed on or before August 31, 2012. The last IRP was filed on December 31, 2009. In March 2011 Avista asked for an extention in meeting the filing deadline. The lack of immediate resource needs coupled with better balancing of work load needs facilitated a change to the August 31, 2012 filing date. |
| | | |
| a. | A range of forecasts of future gas demand in firm and interruptible markets for each customer class for one, five, and twenty years using methods that examine the effect of economic forces on the consumption of gas and that address changes in the number, type and e-fficiency of gas end-uses. | See **Chapter 3 - Demand Forecasts** and **Appendix 3 et. al.** for a detailed discussion of how demand was forecasted for this IRP. |
| | | |
| b. | An assessment for each customer class of the technically feasible improvements in the efficient use of gas, including load management, as well as the policies and programs needed to obtain the efficiency improvements. | See **Chapter 4 - Demand Side Management** and **DSM Appendicies 4 et.al.** for detailed information on the DSM potential evaluated and selected for this IRP and the operational implementation process. |
| | | |
| c. | An analysis for each customer class of gas supply options, including: (1) a projection of spot market versus long-term purchases for both firm and interruptible markets; (2) an evaluation of the opportunities for using company-owned or contracted storage or production; (3) an analysis of prospects for company participation in a gas futures market; and (4) an assessment of opportunities for access to multiple pipeline suppliers or direct purchases from producers. | See **Chapter 5 - Supply-Side Resources** for details about the market, storage, and pipeline transportation as well as other resource options considered in this IRP. See also the procurement plan section in this same chapter for supply procurement strategies. |
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| d. | A comparative evaluation of gas purchasing options and improvements in the efficient use of gas based on a consistent method for calculating cost-effectiveness. | See Methodology section of **Chapter 4 - Demand-Side Resources** where we describe our process on how demand-side and supply-side resources are compared on par with each other in the SENDOUT® model. Chapter 4 also includes how results from the IRP are then utilized to create operational business plans. Operational implementation may differ from IRP results due to modeling assumptions. |
| | | |
| e. | The integration of the demand forecast and resource evaluations into a long-range (e.g., twenty-year) integrated resource plan describing the strategies designed to meet current and future needs at the lowest cost to the utility and its ratepayers. | See **Chapter 6 - Integrated Resource Portfolio** for details on how we model demand and supply coming together to provide the least cost/best risk portfolio of resources. |
| | | |
| f. | A short-term (e.g., two-year) plan outlining the specific actions to be taken by the utility in implementing the integrated resource plan. | See **Chapter 9 - Action Plan** for actions to be taken in implementing the IRP. |
| | | |
| 4 | Relationship Between Plans. All plans following the initial integrated resource plan shall include a progress report that relates the new plan to the previously filed plan. | Avista strives to meet at least bi-annually with Staff and/or Commisioners to discuss the state of the market, procurement planning practices, and any other issues that may impact resource needs or other analysis within the IRP. |
| | | |
| 5 | Plans to Be Considered in Rate Cases. The integrated resource plan will be considered with other available information to evaluate the performance of the utility in rate proceedings before the Commission. | We prepare and file our plan in part to establish a public record of our plan. |
| | | |
| 6 | Public Participation. In formulating its plan, the gas utility must provide an opportunity for public participation and comment and must provide methods that will be available to the public of validating predicted performance. | Avista held four Technical Advisory Committee meetings beginning in January and ending in April. See **Chapter 1 - Introduction** for more detail about public participation in the IRP process. |

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| 7 | Legal Effect of Plan. The plan constitutes the base line against which the utility's performance will ordinarily be measured. The requirement for implementation of a plan does not mean that the plan must be followed without deviation. The requirement of implementation of a plan means that a gas utility, having made an integrated resource plan to provide adequate and reliable service to its gas customers at the lowest system cost, may and should deviate from that plan when presented with responsible, reliable opportunities to further lower its planned system cost not anticipated or identified in existing or earlier plans and not undermining the utility's reliability. | See section titled "Avista's Procurement Plan" in **Chapter 5 - Supply-Side Resources**. Among other details we discuss plan revisions in response to changing market conditions. |
| | In order to encourage prudent planning and prudent deviation from past planning when presented with opportunities for improving upon a plan, a gas utility's plan must be on file with the Commission and available for public inspection. But the filing of a plan does not constitute approval or disa-pproval of the plan having the force and effect of law, and deviation from the plan would not constitute violation of the Commission's Orders or rules. The prudence of a utility's plan and the utility's prudence in following or not following a plan are matters that may be considered in a general rate proceeding or other proce-edings in which those issues have been noticed. | See also section titled "Alternate Supply-Side Scenarios" in **Chapter 6 - Integrated Resource Portfolio** where we discuss different supply portfolios that are resonsive to changing assumptions about resource alternatives. |

# APPENDIX 2.2 ǁ OREGON PUBLIC UTILITY COMMISSION IRP STANDARD AND GUIDELINES – ORDER 07- 002

| Guideline 1: Substantive Requirements | | |
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| **1.a.1** | All resources must be evaluated on a consistent and comparable basis. | All resource options considered, including demand-side and supply-side are modeled in SENDOUT® utilizing the same common general assumptions, approach and methodology. |
| **1.a.2** | All known resources for meeting the utility's load should be considered, including supply-side options which focus on the generation, purchase and transmission of power – or gas purchases, transportation, and storage – and demand-side options which focus on conservation and demand response. | Avista considered a range of resources including demand-side management, distribution system enhancements, capacity release recalls, interstate pipeline transportation, interruptible customer supply, and storage options including liquefied natural gas. Chapter 4 and Appendix 4.1 documents Avista's demand-side management resources considered. Chapter 5 and Appendix 6.3 documents supply-side resources. Chapter 6 and 7 documents how Avista developed and assessed each of these resources. |
| **1.a.3** | Utilities should compare different resource fuel types, technologies, lead times, in-service dates, durations and locations in portfolio risk modeling. | Avista considered various combinations of technologies, lead times, in-service dates, durations, and locations. Chapter 6 provides details about the modeling methodology and results. Chapter 5 describes resource attributes and Appendix 6.3 summarizes the resources' lead times, in-service dates and locations. |
| **1.a.4** | Consistent assumptions and methods should be used for evaluation of all resources. | Appendix 6.2 documents general assumptions used in Avista's SENDOUT® modeling software. All portfolio resources both demand and supply-side were evaluated within SENDOUT® using the same sets of inputs. |
| **1.a.5** | The after-tax marginal weighted-average cost of capital (WACC) should be used to discount all future resource costs. | Avista applied its after-tax WACC of 5.35% to discount all future resource costs. (See general assumptions at Appendix 6.2) |
| **1.b.1** | Risk and uncertainty must be considered. Electric utilities only | Not Applicable |
| **1.b.2** | Risk and uncertainty must be considered. Natural gas utilities should consider demand (peak, swing and base-load), commodity supply and price, transportation availability and price, and costs to comply with any regulation of greenhouse gas (GHG) emissions. | Risk and uncertainty are key considerations in long term planning. In order to address risk and uncertainties a wide range of sensitivity, scenario and portfolio analysis is completed. A description of risk associated with each scenario is included in Appendix 3.6.<br><br>One of the key risks is the "flat demand" risk as described in Chapter 2. Avista performed 14 sensitivities on demand. From there five demand scenarios were developed (Table 1.1) for SENDOUT® modeling purposes. Monthly demand coefficients were developed for base, heating demand while peak demand was contemplated through modeling a weather planning standard of the coldest day on record (see heating degree day data in Appendix 3.4).<br><br>Avista evaluated several price forecasts and selected high, medium and low price scenarios for modeling purposes. The annual average prices are then weighted by month using fundamental forecast data. Additionally, the Henry Hub price forecasts are basis adjusted using the same fundamental forecast data. |

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| | | Four supply scenarios were also evaluated, see Table 5.3. These supply scenarios were combined with demand scenarios in order to establish portfolios for evaluation. Ultimately 9 portfolios were evaluated (See Table 7.3 for the PVRR results).<br><br>Avista stochastic modeling techniques for price and weather variables to analyze weather sensitivity and to quantify the risk to customers under varying price environments. While there continues to be some uncertainty around GHG emission, Avista considered GHG emissions regulatory compliance costs in Appendix 4.2. As currently modeled, we include a carbon adder to our price curve to capture the costs of emission regulation. |
| | Utilities should identify in their plans any additional sources of risk and uncertainty. | Avista evaluated additional risks and uncertainties. Risks associated with the planning environment are detailed in Chapter 1 Introduction. Avista also analyzed demand risk which is detailed in Chapter 3. Chapter 4 discusses the uncertainty around how much DSM is achievable. Supply-side resource risks are discussed in Chapter 5. Chapter 6 and 7 discusses the variables modeled for scenario and stochastic risk analysis. |
| **1c** | The primary goal must be the selection of a portfolio of resources with the best combination of expected costs and associated risks and uncertainties for the utility and its customers. | Avista evaluated cost/risk tradeoffs for each of the risk analysis portfolios considered. See Chapter 6 and 7 plus supporting information in Appendix 3.6 for Avista's portfolio risk analysis and determination of the preferred portfolio. |
| | The planning horizon for analyzing resource choices should be at least 20 years and account for end effects. Utilities should consider all costs with a reasonable likelihood of being included in rates over the long term, which extends beyond the planning horizon and the life of the resource. | Avista used a 20-year study period for portfolio modeling. Avista contemplated possible costs beyond the planning period that could affect rates including end effects such as infrastructure decommission costs and concluded there were no significant costs reasonably likely to impact rates under different resource selection scenarios. |
| | Utilities should use present value of revenue requirement (PVRR) as the key cost metric. The plan should include analysis of current and estimated future costs of all long-lived resources such as power plants, gas storage facilities and pipelines, as well as all short-lived resources such as gas supply and short-term power purchases. | Avista's SENDOUT® modeling software utilizes a PVRR cost metric methodology applied to both long and short-lived resources. |
| | To address risk, the plan should include at a minimum: 1) Two measures of PVRR risk: one that measures the variability of costs and one that measures the severity of bad outcomes. 2) Discussion of the proposed use and impact on costs and risks of physical and financial hedging. | Avista, through its stochastic analysis, modeled 200 scenarios around varying gas price inputs via Monte Carlo iterations developing a distribution of Total 20 year cost estimates utilizing SENDOUT®'s PVRR methodology. Chapter 7 further describes this analysis. The variability of costs is plotted against the Expected Case while the scenarios beyond the $95^{th}$ percentile capture the severity of outcomes. Chapter 5 discusses Avista's physical and financial hedging methodology. |
| | The utility should explain in its plan how its resource choices appropriately | Chapter 5, 6, and 7 describe various specific resource considerations and related risks, and describes what criteria |

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| | balance cost and risk. | we used to determine what resource combinations provide an appropriate balance between cost and risk. |
| **1d** | The plan must be consistent with the long-run public interest as expressed in Oregon and federal energy policies. | Avista considered current and expected state and federal energy policies in portfolio modeling. Chapter 6 describes the decision process used to derive portfolios, which includes consideration of state resource policy directions. |
| **Guideline 2: Procedural Requirements** | | |
| **2a** | The public, including other utilities, should be allowed significant involvement in the preparation of the IRP. Involvement includes opportunities to contribute information and ideas, as well as to receive information. Parties must have an opportunity to make relevant inquiries of the utility formulating the plan. | Chapter 1 provides an overview of the public process and documents the details on public meetings held for the 2012 IRP. Avista encourages participation in the development of the plan, as each party brings a unique perspective and the ability to exchange information and ideas makes for a more robust plan. |
| | While confidential information must be protected, the utility should make public, in its plan, any non-confidential information that is relevant to its resource evaluation and action plan. | The entire IRP, as well as the TAC process, includes all of the non-confidential information the company used for portfolio evaluation and selection. Avista also provided stakeholders with non-confidential information to support public meeting discussions via email. The document and appendices will be available on the company website for viewing. |
| | The utility must provide a draft IRP for public review and comment prior to filing a final plan with the Commission. | Avista distributed a draft IRP document for external review to all TAC members on May 25, 2012 and requested comments by July 13, 2012. |
| **Guideline 3: Plan Filing, Review and Updates** | | |
| **3a** | Utility must file an IRP within two years of its previous IRP acknowledgement order. | This Plan complies with this requirement as the 2009 Natural Gas IRP was acknowledged on 6/08/2010. |
| **3b** | Utility must present the results of its filed plan to the Commission at a public meeting prior to the deadline for written public comment. | Avista will work with Staff to fulfill this guideline following filing of the IRP. |
| **3c** | Commission staff and parties should complete their comments and recommendations within six months of IRP filing | Pending |
| **3d** | The Commission will consider comments and recommendations on a utility's plan at a public meeting before issuing an order on acknowledgment. The Commission may provide the utility an opportunity to revise the plan before issuing an acknowledgment order | Pending |
| **3e** | The Commission may provide direction to a utility regarding any additional analyses or actions that the utility should undertake in its next IRP. | Pending |
| **3f** | Each utility must submit an annual update on its most recently acknowledged plan. The update is due on or before the acknowledgment order anniversary date. Once a utility | An annual update was filed on May 9, 2011. No request for acknowledgement was required. |

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| | anticipates a significant deviation from its acknowledged IRP, it must file an update with the Commission, unless the utility is within six months of filing its next IRP. The utility must summarize the update at a Commission public meeting. The utility may request acknowledgment of changes in proposed actions identified in an update | |
| **3g** | Unless the utility requests acknowledgement of changes in proposed actions, the annual update is an informational filing that:<br>‖ Describes what actions the utility has taken to implement the plan;<br>‖ Provides an assessment of what has changed since the acknowledgment order that affects the action plan, including changes in such factors as load, expiration of resource contracts, supply-side and demand-side resource acquisitions, resource costs, and transmission availability; and<br>‖ Justifies any deviations from the acknowledged action plan. | The annual update filed on May 9, 2011 was an informational filing updating changes since acknowledgment of the 2009 IRP and an update of emerging planning issues. The update did not request acknowledgement of any changes. A request to present the information at a public meeting was not requested. |
| **Guideline 4: Plan Components** | | |
| | At a minimum, the plan must include the following<br>elements: | |
| **4a** | An explanation of how the utility met each of the substantive and procedural requirements. | This table summarizes guideline compliance by providing an overview of how Avista met each of the substantive and procedural requirements for a natural gas IRP. |
| **4b** | Analysis of high and low load growth scenarios in addition to stochastic load risk analysis with an explanation of major assumptions. | Avista developed five demand growth forecasts for scenario analysis. Stochastic variability of demand was also captured in the risk analysis. Chapter 2 describes the demand forecast data and Chapter 6 provides the scenario and risk analysis results. Appendix 6 details major assumptions. |
| **4c** | For electric utilities only | Not Applicable |
| **4d** | A determination of the peaking, swing and base-load gas supply and associated transportation and storage expected for each year of the plan, given existing resources; and identification of gas supplies (peak, swing and base-load), transportation and storage needed to bridge the gap between expected loads and resources. | Figures 1.11 and 1.12 summarize graphically projected annual peak day demand and the existing and selected resources by year to meet demand for the expected case. Appendix 7.1 and 7.2 summarizes the peak day demand for the other demand scenarios. |
| **4e** | Identification and estimated costs of all supply-side and demand-side resource options, taking into account anticipated advances in technology | Chapter 4 and Appendix 4.1 identify the demand-side potential included in this IRP. Chapter 5 and 6 and Appendix 6.3 identify the supply-side resources. |
| **4f** | Analysis of measures the utility intends to take to provide reliable service, including cost-risk tradeoffs. | Chapter 6, 7, and 8 discusses the modeling tools, customer growth forecasting and cost-risk considerations used to maintain and plan a reliable gas delivery system. These Chapters also captures a summary of the reliability analysis process demonstrated at the second TAC meeting. |

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| | | Chapter 5 discusses the diversified infrastructure and multiple supply basin approach that acts to mitigate certain reliability risks. Appendix 3.6 highlights key risks associated with each portfolio. |
| **4g** | Identification of key assumptions about the future (e.g. fuel prices and environmental compliance costs) and alternative scenarios considered. | Appendix 6 and Chapter 6 describe the key assumptions and alternative scenarios used in this IRP. |
| **4h** | Construction of a representative set of resource portfolios to test various operating characteristics, resource types, fuels and sources, technologies, lead times, in-service dates, durations and general locations - system-wide or delivered to a specific portion of the system. | This Plan documents the development and results for portfolios evaluated in this IRP (see Table 5.3 for supply scenarios considered). |
| **4i** | Evaluation of the performance of the candidate portfolios over the range of identified risks and uncertainties. | We evaluated our candidate portfolio by performing stochastic analysis using SENDOUT® varying price under 200 different scenarios. Additionally, we test the portfolio of options with the use of SENDOUT® under deterministic scenarios where demand and price vary. For resources selected, we assess other risk factors such as varying lead times required and potential for cost overruns outside of the amounts included in the modeling assumptions. |
| **4j** | Results of testing and rank ordering of the portfolios by cost and risk metric, and interpretation of those results. | Avista's four distinct geographic Oregon service territories limit many resource option synergies which inherently reduces available portfolio options. Feasibility uncertainty, lead time variability and uncertain cost escalation around certain resource options also reduce reasonably viable options. Chapter 5 describes resource options reviewed including discussion on uncertainties in lead times and costs as well as viability and resource availability (e.g. LNG). Appendix 6.3 summarizes the potential resource options identifying investment and variable costs, asset availability and lead time requirements while results of resources selected are identified in Table 6.5 as well as graphically presented in Figure 6.18 and 6.19 for the Expected Case and Appendix 7.1 for the High Growth case. |
| **4k** | Analysis of the uncertainties associated with each portfolio evaluated | See the responses to 1.b above. |
| **4l** | Selection of a portfolio that represents the best combination of cost and risk for the utility and its customers | Avista evaluated cost/risk tradeoffs for each of the risk analysis portfolios considered. Chapter 6 and Appendix 3.6 show the company's portfolio risk analysis, as well as the process and determination of the preferred portfolio. |
| **4m** | Identification and explanation of any inconsistencies of the selected portfolio with any state and federal energy policies that may affect a utility's plan and any barriers to implementation | This IRP is presumed to have no inconsistencies. |
| **4n** | An action plan with resource activities the utility intends to undertake over the next two to four years to acquire the identified resources, regardless of whether the activity was acknowledged in a previous IRP, with the key attributes of each resource specified as | Chapter 9 presents the IRP Action Plan with focus on the following areas:<br>ll Modeling<br>ll Supply/capacity<br>ll Forecasting<br>ll Regulatory communication<br>ll DSM |

| | | |
|---|---|---|
| | in portfolio testing. | |
| **Guideline 5: Transmission** | | |
| **5** | Portfolio analysis should include costs to the utility for the fuel transportation and electric transmission required for each resource being considered. In addition, utilities should consider fuel transportation and electric transmission facilities as resource options, taking into account their value for making additional purchases and sales, accessing less costly resources in remote locations, acquiring alternative fuel supplies, and improving reliability. | Not applicable to Avista's gas utility operations. |
| **Guideline 6: Conservation** | | |
| **6a** | Each utility should ensure that a conservation potential study is conducted periodically for its entire service territory. | Global Energy Inc. performed a conservation potential assessment study for our 2012 IRP. A discussion of the study is included in Chapter 4. The full study document is in Appendix 4.1. Avista incorporates a comprehensive assessment of the potential for utility acquisition of energy-efficiency resources into the regularly-scheduled Integrated Resource Planning process. |
| **6b** | To the extent that a utility controls the level of funding for conservation programs in its service territory, the utility should include in its action plan all best cost/risk portfolio conservation resources for meeting projected resource needs, specifying annual savings targets. | A discussion on the treatment of conservation programs is included in Chapter 4 while selection methodology is documented in Chapter 6. The action plan details conservation targets, if any, as developed through the operational business planning process. These targets are updated annually, with the most current avoided costs. Given the challenge of the low cost environment, current operational planning and program evaluation is still underway and targets for Oregon have not yet been set. |
| **6c** | To the extent that an outside party administers conservation programs in a utility's service territory at a level of funding that is beyond the utility's control, the utility should: 1) determine the amount of conservation resources in the best cost/ risk portfolio without regard to any limits on funding of conservation programs; and 2) identify the preferred portfolio and action plan consistent with the outside party's projection of conservation acquisition. | Not applicable. See the response for 6.b above. |
| **Guideline 7: Demand Response** | | |
| **7** | Plans should evaluate demand response resources, including voluntary rate programs, on par with other options for meeting energy, capacity, and transmission needs (for electric utilities) or gas supply and transportation needs (for natural gas utilities). | Avista has periodically evaluated conceptual approaches to meeting capacity constraints using demand-response and similar voluntary programs. Technology, customer characteristics and cost issues are hurdles for developing effective programs. See Chapter 4 Demand Response section for more discussion. |
| **Guideline 8: Environmental Costs** | | |
| **8** | Utilities should include, in their base-case analyses, the regulatory | Avista's current direct gas distribution system infrastructure does not result in any $CO_2$, $NO_x$, $SO_2$, or Hg emissions. |

| | | |
|---|---|---|
| | compliance costs they expect for CO2, NOx, SO2, and Hg emissions. Utilities should analyze the range of potential CO2 regulatory costs in Order No. 93-695, from $0 - $40 (1990$). In addition, utilities should perform sensitivity analysis on a range of reasonably possible cost adders for NOx, SO2, and Hg, if applicable. | Upstream gas system infrastructure (pipelines, storage facilities, and gathering systems) do produce CO2 emissions via compressors used to pressurize and move gas throughout the system. The Environmental Externalities discussion in Appendix 4.2 describes our analysis performed. See also the guidelines addendum reflecting revised guidance for environmental costs per Order 08-339. |
| **Guideline 9: Direct Access Loads** | | |
| **9** | An electric utility's load-resource balance should exclude customer loads that are effectively committed to service by an alternative electricity supplier. | Not applicable to Avista's gas utility operations. |
| **Guideline 10: Multi-state utilities** | | |
| **10** | Multi-state utilities should plan their generation and transmission systems, or gas supply and delivery, on an integrated-system basis that achieves a best cost/risk portfolio for all their retail customers. | The 2012 IRP conforms to the multi-state planning approach. |
| **Guideline 11: Reliability** | | |
| **11** | Electric utilities should analyze reliability within the risk modeling of the actual portfolios being considered. Loss of load probability, expected planning reserve margin, and expected and worst-case unserved energy should be determined by year for top-performing portfolios. Natural gas utilities should analyze, on an integrated basis, gas supply, transportation, and storage, along with demand-side resources, to reliably meet peak, swing, and base-load system requirements. Electric and natural gas utility plans should demonstrate that the utility's chosen portfolio achieves its stated reliability, cost and risk objectives. | Avista's storage and transport resources while planned around meeting a peak day planning standard, also provides opportunities to capture off season pricing while providing system flexibility to meet swing and base-load requirements. Diversity in our transport options enables at least dual fuel source options in event of a transport disruption. For areas with only one fuel source option the cost of duplicative infrastructure is not feasible relative to the risk of generally high reliability infrastructure. |
| **Guideline 12: Distributed Generation** | | |
| **12** | Electric utilities should evaluate distributed generation technologies on par with other supply-side resources and should consider, and quantify where possible, the additional benefits of distributed generation. | Not applicable to Avista's gas utility operations. |
| **Guideline 13: Resource Acquisition** | | |
| **13a** | An electric utility should: identify its proposed acquisition strategy for each resource in its action plan; Assess the advantages and disadvantages of owning a resource instead of purchasing power from another party; identify any | Not applicable to Avista's gas utility operations. |

| | | |
|---|---|---|
| | Benchmark Resources it plans to consider in competitive bidding. | |
| **13b** | Natural gas utilities should either describe in the IRP their bidding practices for gas supply and transportation, or provide a description of those practices following IRP acknowledgment. | A discussion of Avista's procurement practices is detailed in Chapter 5. |
| **Guideline 8: Environmental Costs** | | |
| **a.** | BASE CASE AND OTHER COMPLIANCE SCENARIOS: The utility should construct a base-case scenario to reflect what it considers to be the most likely regulatory compliance future for carbon dioxide ($CO_2$), nitrogen oxides, sulfur oxides, and mercury emissions. The utility also should develop several compliance scenarios ranging from the present $CO_2$ regulatory level to the upper reaches of credible proposals by governing entities. Each compliance scenario should include a time profile of $CO_2$ compliance requirements. The utility should identify whether the basis of those requirements, or "costs", would be $CO_2$ taxes, a ban on certain types of resources, or $CO_2$ caps (with or without flexibility mechanisms such as allowance or credit trading or a safety valve). The analysis should recognize significant and important upstream emissions that would likely have a significant impact on its resource decisions. Each compliance scenario should maintain logical consistency, to the extent practicable, between the $CO_2$ regulatory requirements and other key inputs. | Avista's current direct gas distribution system infrastructure does not result in any CO2, NOx, SO2, or Hg emissions. Upstream gas system infrastructure (pipelines, storage facilities, and gathering systems) do produce CO2 emissions via compressors used to pressurize and move gas throughout the system.<br><br>The Environmental Externalities discussion in Appendix 4.2 describes our process for addressing these costs. |
| **b.** | TESTING ALTERNATIVE PORTFOLIOS AGAINST THE COMPLIANCE SCENARIOS: The utility should estimate, under each of the compliance scenarios, the present value of revenue requirement (PVRR) costs and risk measures, over at least 20 years, for a set of reasonable alternative portfolios from which the preferred portfolio is selected. The utility should incorporate end-effect considerations in the analyses to allow for comparisons of portfolios containing resources with economic or physical lives that extend beyond the planning period. The utility should also modify projected lifetimes | The Environmental Externalities discussion in Appendix 4.2 describes our process for addressing these costs. |

| | | |
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| | as necessary to be consistent with the compliance scenario under analysis. In addition, the utility should include, if material, sensitivity analyses on a range of reasonably possible regulatory futures for nitrogen oxides, sulfur oxides, and mercury to further inform the preferred portfolio selection. | |

# APPENDIX 3.1 ‖ ECONOMIC OUTLOOK AND CUSTOMER COUNT FORECAST

## INTRODUCTION

For over twenty five years, Avista has produced natural gas customer forecasts which assume there is a direct relationship between economic growth and customer growth. This update of the Natural Gas Integrated Resource Plan continues this tradition. It would come as no surprise to readers that other utilities around the country use similar methods and procedures to produce customer forecasts. What follows is a narrative description of the methodology. A verbal description was provided at the 1st Technical Advisory Committee meeting held in Portland, Oregon, on January 17, 2012.

The Avista customer forecast is the primary driver of natural gas demand from firm natural gas customers. The forecast is produced by staff in the Finance Department, Financial Planning and Analysis group. These forecasts are produce annually in June of each calendar year and provide the basis for revenue forecasts, demand forecasts, purchased gas adjustments and general rate cases. The company employs the “one forecast” concept, wherein consistency across all parts of the business and regulatory environment is synchronized. However, the company does from time to time update forecasts when there is turbulence in the economy. This provides for flexibility as opposed to rigidity in terms of making good decisions for customers during unusual times. It would be accurate to say that between 2007 and 2010 the economy was moving downward as the recession evolved and the impacts on near term projections of customer growth were significant. The company updated their forecasts more frequently during this period, but now that the economy has settled down into a less volatile state forecast updates have returned to an annual update cycle. The forecast presented in this document was produced in June 2011 and relied on economic forecasts and actual customer data from May 2011. At this writing, an update to the customer forecast is being prepared for completion in June 2012. Early indications suggest the new forecast will not have material short term or long term adjustments from the base case.

In order to stress test the demand forecast, alternative customer forecasts have been prepared using publically available data from reliable sources. For at least the last five company natural gas plans, Avista has relied on high and low population forecasts from the State of Washington, Office of Financial Management, to provide alternative trajectories of customer growth. The principal economic drivers for the base case customer forecast are purchased from IHS Global Insight, Inc. As in previous plans, Avista’s contract with Global Insight provides the company with a twenty five year forecast of economic drivers in the three metropolitan areas where we provide the bulk of our natural gas services (Spokane, Coeur d’Alene and Medford.) Avista also purchases limited economic forecasts from Global Insight on the other counties where we provide natural gas service. However, we rely on these metro-area forecasts as the primary drivers of customer forecasts in our Washington, Idaho and Oregon service areas.

What follows in order are discussions of the county-level forecasts, customer regressions and customer forecasts, with the final section addressing the alternative higher and lower forecasts.

## SERVICE AREA ECONOMY

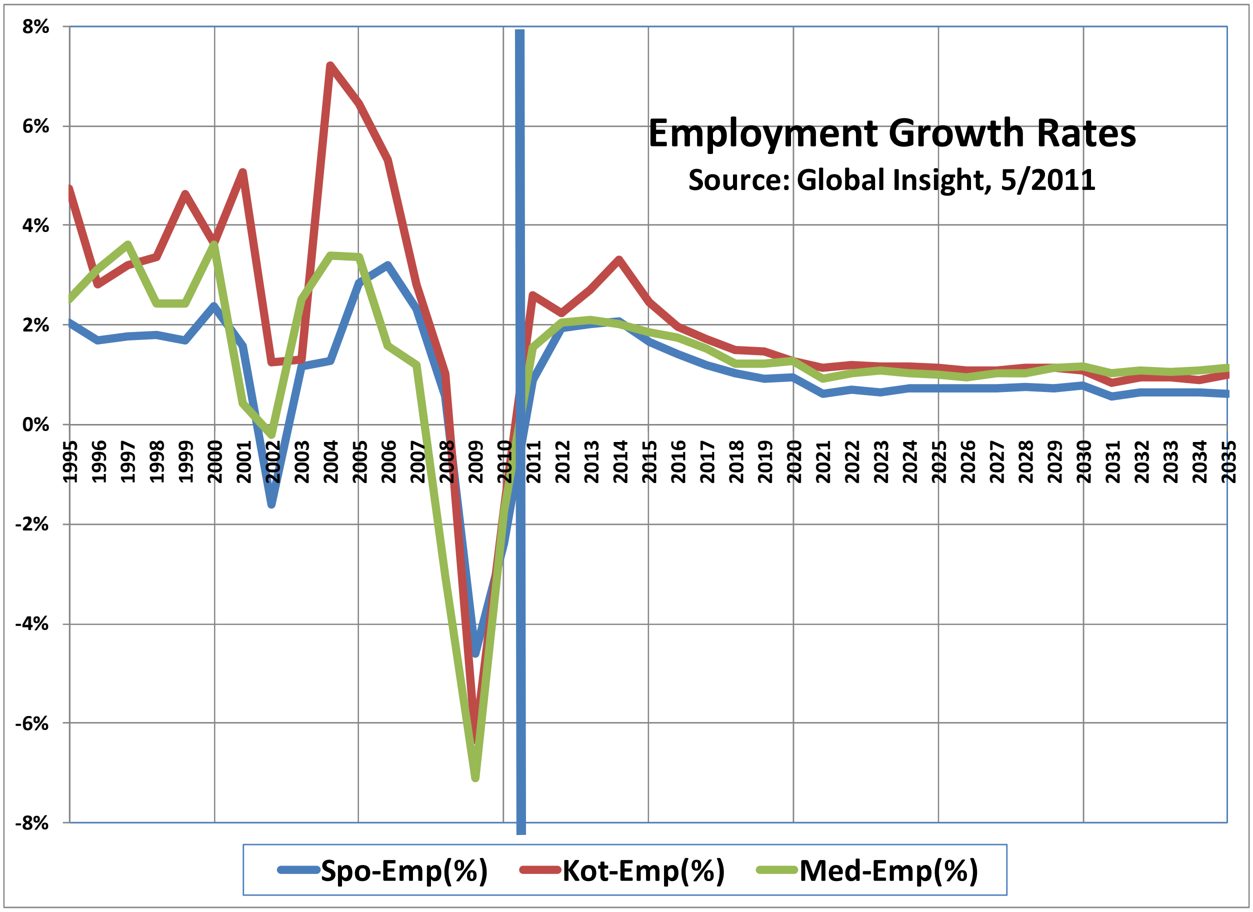
The service area economy in Washington includes ten mostly rural agriculture and resource extraction counties plus Spokane County, the regional metropolitan statistical area (MSA).  Spokane County (hereinafter referred to as Spokane) has a well diversified economy dominated by manufacturing, health care, retail and government. Spokane as well is a regional banking center and has a number of professional services firms (like architecture, engineering and information). One of the distinguishing characteristics of the company's Washington service area is the location of Washington State University roughly 75 miles south of downtown Spokane. But Spokane does have a large and growing public and private higher education sector. As the primary employment center for eastern Washington and northern Idaho, Spokane is also the largest area of customers and customer growth. In both 2010 and 2011, the Spokane area accounted for 45 percent of system customer growth, while Coeur d'Alene averaged 16 percent and Medford 14 percent. The remaining 25 percent of customer growth was widely spread between other counties in Washington, Idaho and Oregon. Subsequent paragraphs will detail information for Coeur d'Alene and Medford.

The service area in rural northern Idaho is similar to Washington but does substitute forestry for agriculture and Kootenai County (Coeur d'Alene) for Spokane. The metro area of Coeur d'Alene has been one of the faster growing parts of our service area and during the last census decade was one of the fastest growing counties in Idaho. Coeur d'Alene has an economic base that includes light manufacturing, health care and government services while its hospitality sector is a significant contributor to jobs. The remaining six counties have several notable large employers in the pulp and paper, mining and smelting and lumber and wood product industries. While Spokane has a very large higher education sector, Coeur d'Alene does not. In Idaho higher education is concentrated at the University of Idaho in Moscow, Idaho, and Lewis and Clark State in Lewiston, Idaho.

The company's Oregon service territory is made up of the urban areas of five counties, four of which are in southwestern Oregon and one small county in northeastern Oregon. Jackson County (with Medford as the largest city) is a metropolitan statistical area. Josephine County lies to the west of Jackson County and together the two counties, tied together by Interstate 5, comprise the Medford division of Avista. Due north of Josephine County is Douglas County, but the cities of Roseburg, Green, Winston, Sutherlin and Myrtle Creek lie in a different climate zone from Medford and the service area division of Roseburg is forecasted separately. The other geographic separation of the Oregon region occurs with Klamath County which lies due east of Jackson County but is separated by the Cascade mountain range not to mention being a few thousand feet higher elevation. For example, the Medford airport is at 1,335' elevation, while Klamath Falls airport is at 4,095' elevation. Due to the geographic separation and elevation differences, Klamath Falls and surrounding cities have a much colder climate than Medford and Roseburg. In order to accurately forecast customer demand, the Klamath Falls division is forecast separately. Last but not least, Union County (La Grande) is on Interstate 84 about 50 miles southeast of Pendleton, Oregon, represents less than 2 percent of customer growth but because of its climate and location isolation is forecast separately. Of the five counties, Jackson, Klamath Falls and La Grande are higher education centers with Southern Oregon, Oregon Institute of Technology and Eastern Oregon universities, respectively, located therein. With over 60 percent of Oregon customer growth, the Medford division of the company gets disproportionate scrutiny, but each of the four divisions employ the same customer forecast methodology.

The slides from Technical Advisory Committee #1 are available online. A brief summary of the forecasts follows. As mentioned previously, the company purchases county level forecasts from Global Insight. The charts provide a long term perspective, with historical data from 1995 to 2010 and forecasts from 2011 to 2035. Overall, it is clear from the slides that all three metro areas were briefly impacted by the brief recession in 2001 and were significantly impacted by the so-called "Great Recession" which began in 2007 and ended in 2009. Lackluster employment growth and slowly declining unemployment rates have been the recent story. Global Insight forecasts a mild recovery in jobs begins during 2012 and gains steam in the 2013 to 2015 time period before settling back to its long term growth.

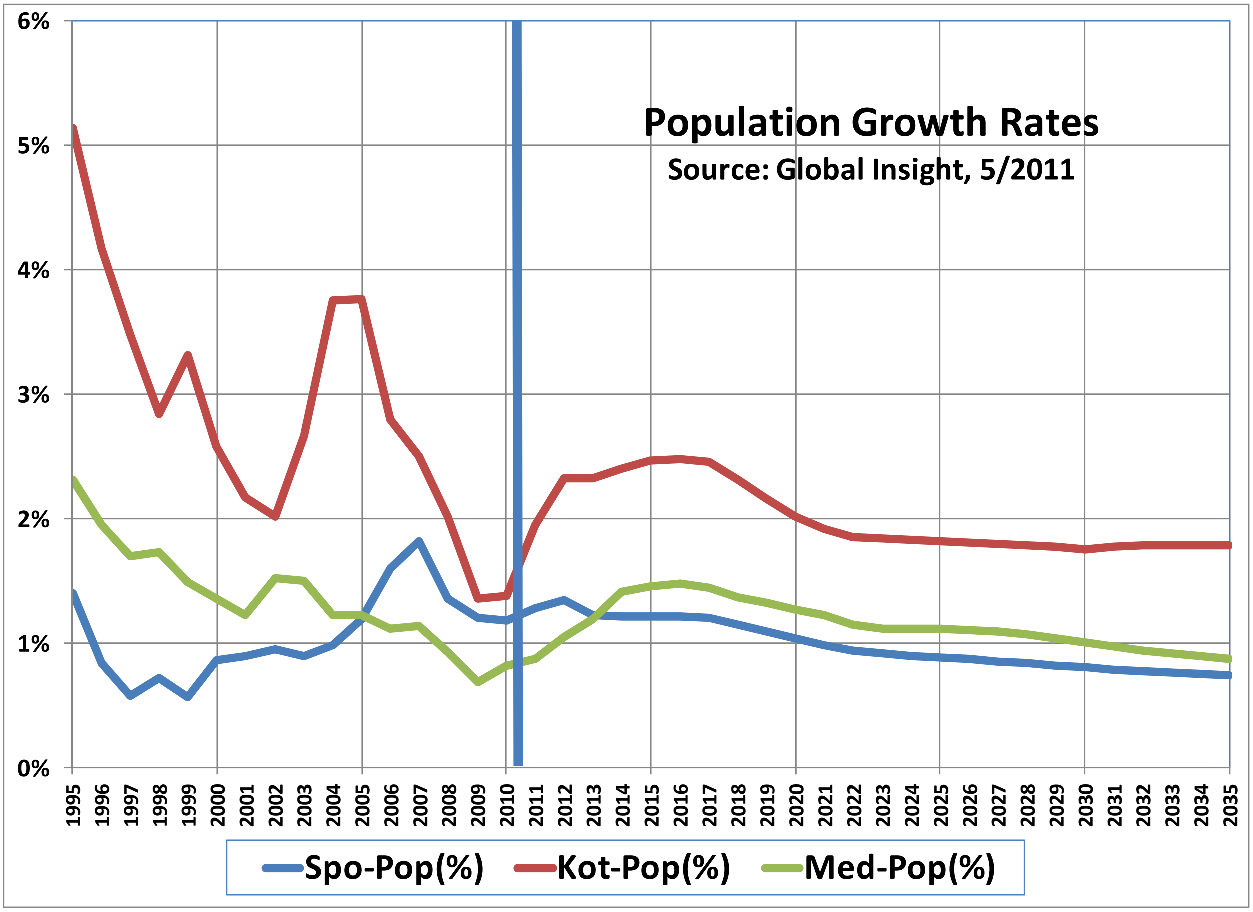
**Chart F.1**




It is clear from the chart above that employment growth rates which averaged over two percent in the prior fifteen years will be below two percent longer term in the next twenty-five years.

Global Insight largely drives their population forecast from their employment forecast although they do take into account changes in higher education enrollment and retirement and other migration impacts. The annual rates of growth of population in the three metro areas are shown on the following chart.

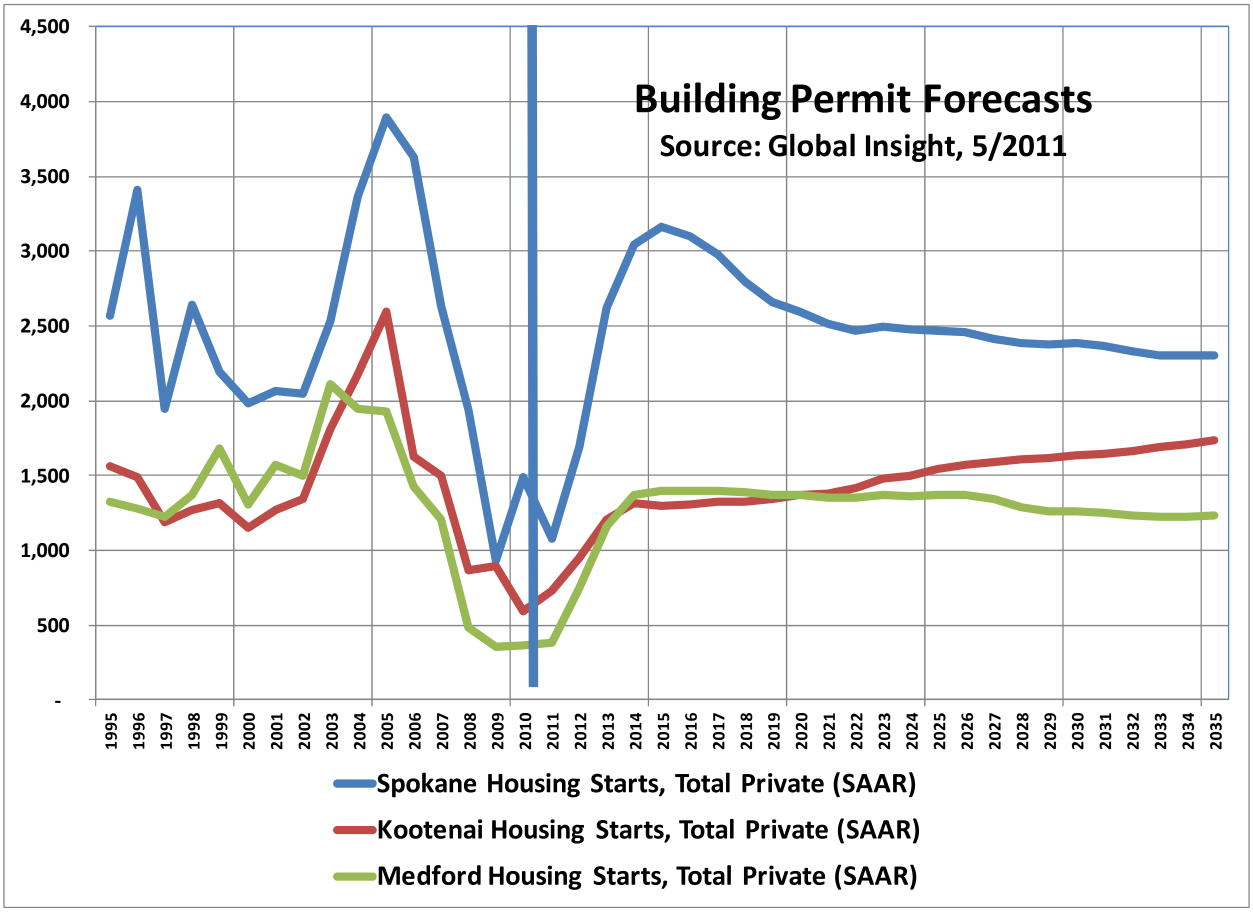
**Chart F.2**




Population growth rates have been highest in Kootenai County, Idaho as the "bedroom" effect of cross border commuting has been observed over the years. After a modest pause in population growth due to issues with labor mobility and recession –induced impacts, population growth is expected to rebound modestly consistent with the jobs forecast.

The population forecast becomes the key driver for the building permit forecasts for the three metro areas. After some recession induced absorption of foreclosures get worked out of the housing market and consistent with our observations and discussions locally with homebuilders and real estate professionals, the housing market forecasts shows a modest rebound.

**Chart F.3**




As we understand it, Global Insight has assumed banks and other financial institutions are expected to be more disciplined in lending practices such that the longer range forecasts do not include more housing bubbles or popped bubbles like we have observed in the recent history. Although we remain skeptical about this notion that housing cycles will be tempered, we do believe that these fundamentals based forecasts of housing are appropriate for long term natural gas customer forecasting. We have one additional observation about chart F.3; the apparent amplified rebound in Spokane housing permits is impacted by a large number of multi-family units being built to satisfy the growing higher education sector in Spokane which is largely absent in Coeur d'Alene. Although Medford has several higher education institutions, the growth there is expected to be muted due to state government policies and spending plans.

The final feature of economic data used to inform the customer forecast comes to us from using the State of Washington Office of Financial Management. In Washington, OFM's population forecasting division is the agency by law that produces population estimates for the Growth Management Act. At the time of the production of this Plan, OFM had produced a high, medium and low population forecast for Spokane County in 2007. At the 1st Technical Advisory Committee, we showed the members a table of population forecasts with these forecasts for 2010-2030. The high forecast in 2030 had 1.6 times the population growth of the medium forecast, and the low forecast during the same period had 0.6 times the population growth of the medium forecast. We proposed applying these ratios of population variation to our expected growth in residential customers because the logic of the building permit forecast ties to population growth. We agreed it was a shortcut and represented to the committee this approach was reasonable and logical. We did not record any disagreement and have proceeded with this approach to scenarios.

## CUSTOMER FORECAST REGRESSIONS

The process of customer forecasting employs regression analysis to utilize forecasts of building permits to produce forecasts of residential customer additions. We also use regression analysis to produce commercial customer additions as a function of residential customer additions. Indirectly, the logic and rationale is borrowed from Global Insight as follows. Employment drives population, population drives building permits, building permits drive residential customer growth, and residential customer growth drives commercial customer growth. Taking this full circle, employees have to work somewhere, and they largely work in commercial buildings. The forecasts for industrial employment are stable, and therefore we forecast firm industrial customers to grow slowly into the future. Important also is that firm industrial customers (and the therms they consume) are a very small portion of total firm sales.

## CUSTOMER FORECASTS USED BY SENDOUT®

The company produces customer forecasts used by Sendout® in the following format. Monthly customer forecasts for residential, firm commercial and firm industrial for the combined Washington/Idaho service areas and the same customer forecasts for Oregon broken out by the four divisions, namely Medford, Roseburg, Klamath Falls and La Grande.

An annual summary for the Washington/Idaho region and for Oregon is shown in the table below. The term CGR is the compound growth rate from 2011-2031.

**Table F.1**

| | Residential Customers | Commercial Customers | Industrial Customers |
|---|---|---|---|
| 2006 | 185,897 | 20,884 | 247 |
| 2007 | 190,433 | 21,350 | 242 |
| 2008 | 194,316 | 21,844 | 238 |
| 2009 | 196,920 | 22,162 | 235 |
| 2010 | 198,604 | 22,344 | 230 |
| 2011 | 200,451 | 22,466 | 225 |
| 2012 | 203,404 | 22,621 | 228 |
| 2013 | 207,309 | 22,997 | 229 |
| 2014 | 211,420 | 23,442 | 231 |
| 2015 | 215,536 | 23,908 | 235 |
| 2016 | 219,611 | 24,370 | 237 |
| 2017 | 223,624 | 24,826 | 239 |
| 2018 | 227,540 | 25,267 | 241 |
| 2019 | 231,424 | 25,705 | 243 |
| 2020 | 235,300 | 26,141 | 244 |
| 2021 | 239,151 | 26,569 | 247 |
| 2022 | 243,002 | 26,998 | 248 |
| 2023 | 246,923 | 27,431 | 250 |
| 2024 | 250,835 | 27,864 | 251 |
| 2025 | 254,765 | 28,298 | 255 |
| 2026 | 258,699 | 28,732 | 256 |
| 2027 | 262,615 | 29,163 | 258 |
| 2028 | 266,515 | 29,593 | 259 |
| 2029 | 270,407 | 30,022 | 262 |
| 2030 | 274,312 | 30,446 | 263 |
| 2031 | 278,218 | 30,872 | 266 |
| 2032 | 282,115 | 31,295 | 267 |
| 2033 | 286,021 | 31,719 | 270 |
| 2034 | 289,943 | 32,145 | 271 |
| 2035 | 293,886 | 32,572 | 273 |
| | | | |
| 20 yr CGR 2011-31 | 1.65% | 1.60% | 0.84% |

# Table F.2

| | Residential Medford Customers | Residential Roseburg Customers | Residential Klamath Falls Customers | Residential La Grande Customers | Commercial Medford Customers | Commercial Roseburg Customers | Commercial Klamath Falls Customers | Commercial La Grande Customers | Industrial Medford Customers | Industrial Roseburg Customers | Industrial Klamath Falls Customers | Industrial La Grande Customers |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2006 | 49,002 | 12,726 | 13,424 | 6,296 | 6,263 | 2,134 | 1,585 | 878 | 1 | 2 | 0 | 3 |
| 2007 | 49,833 | 12,990 | 13,777 | 6,382 | 6,367 | 2,125 | 1,612 | 873 | 9 | 2 | 5 | 3 |
| 2008 | 50,239 | 13,037 | 13,859 | 6,441 | 6,427 | 2,120 | 1,624 | 886 | 10 | 2 | 5 | 3 |
| 2009 | 50,381 | 13,054 | 13,863 | 6,449 | 6,386 | 2,136 | 1,636 | 895 | 14 | 2 | 6 | 2 |
| 2010 | 50,682 | 13,077 | 13,886 | 6,473 | 6,433 | 2,124 | 1,635 | 895 | 13 | 2 | 7 | 2 |
| 2011 | 50,857 | 13,132 | 13,965 | 6,493 | 6,483 | 2,129 | 1,650 | 885 | 15 | 3 | 7 | 1 |
| 2012 | 51,282 | 13,250 | 14,090 | 6,528 | 6,513 | 2,149 | 1,670 | 895 | 15 | 3 | 7 | 1 |
| 2013 | 52,182 | 13,475 | 14,265 | 6,578 | 6,563 | 2,174 | 1,695 | 910 | 15 | 3 | 7 | 1 |
| 2014 | 53,432 | 13,775 | 14,515 | 6,628 | 6,643 | 2,204 | 1,725 | 925 | 15 | 3 | 7 | 1 |
| 2015 | 54,732 | 14,100 | 14,790 | 6,678 | 6,763 | 2,234 | 1,755 | 945 | 16 | 3 | 7 | 1 |
| 2016 | 56,027 | 14,434 | 15,059 | 6,737 | 6,886 | 2,258 | 1,780 | 958 | 16 | 3 | 7 | 1 |
| 2017 | 57,327 | 14,745 | 15,312 | 6,791 | 7,009 | 2,281 | 1,804 | 970 | 16 | 3 | 7 | 1 |
| 2018 | 58,616 | 15,034 | 15,553 | 6,842 | 7,131 | 2,303 | 1,827 | 981 | 16 | 3 | 7 | 1 |
| 2019 | 59,882 | 15,323 | 15,794 | 6,891 | 7,251 | 2,324 | 1,849 | 992 | 16 | 3 | 7 | 1 |
| 2020 | 61,139 | 15,614 | 16,034 | 6,940 | 7,369 | 2,346 | 1,872 | 1,002 | 17 | 3 | 7 | 1 |
| 2021 | 62,374 | 15,902 | 16,271 | 6,988 | 7,486 | 2,367 | 1,894 | 1,013 | 17 | 3 | 7 | 1 |
| 2022 | 63,608 | 16,189 | 16,506 | 7,036 | 7,603 | 2,388 | 1,916 | 1,023 | 17 | 3 | 7 | 1 |
| 2023 | 64,875 | 16,478 | 16,741 | 7,083 | 7,723 | 2,410 | 1,939 | 1,034 | 17 | 3 | 7 | 1 |
| 2024 | 66,137 | 16,771 | 16,977 | 7,130 | 7,842 | 2,431 | 1,961 | 1,044 | 17 | 3 | 7 | 1 |
| 2025 | 67,420 | 17,068 | 17,214 | 7,176 | 7,964 | 2,453 | 1,983 | 1,054 | 18 | 3 | 7 | 1 |
| 2026 | 68,698 | 17,368 | 17,452 | 7,223 | 8,085 | 2,476 | 2,006 | 1,064 | 18 | 3 | 7 | 1 |
| 2027 | 69,937 | 17,675 | 17,687 | 7,271 | 8,202 | 2,498 | 2,028 | 1,075 | 18 | 3 | 7 | 1 |
| 2028 | 71,120 | 17,906 | 17,919 | 7,321 | 8,314 | 2,515 | 2,050 | 1,086 | 18 | 3 | 7 | 1 |
| 2029 | 72,271 | 18,133 | 18,147 | 7,373 | 8,423 | 2,532 | 2,071 | 1,097 | 18 | 3 | 7 | 1 |
| 2030 | 73,426 | 18,361 | 18,375 | 7,424 | 8,532 | 2,549 | 2,093 | 1,108 | 19 | 3 | 7 | 1 |
| 2031 | 74,569 | 18,590 | 18,602 | 7,475 | 8,640 | 2,566 | 2,114 | 1,119 | 19 | 3 | 7 | 1 |
| 2032 | 75,684 | 18,814 | 18,828 | 7,525 | 8,746 | 2,583 | 2,135 | 1,131 | 19 | 3 | 7 | 1 |
| 2033 | 76,786 | 19,042 | 19,056 | 7,576 | 8,850 | 2,599 | 2,157 | 1,142 | 19 | 3 | 7 | 1 |
| 2034 | 77,893 | 19,272 | 19,285 | 7,627 | 8,955 | 2,616 | 2,178 | 1,153 | 19 | 3 | 7 | 1 |
| 2035 | 79,008 | 19,500 | 19,513 | 7,678 | 9,060 | 2,633 | 2,200 | 1,164 | 19 | 3 | 7 | 1 |
| 20 yr CGR 2011-2031 | 1.93% | 1.75% | 1.44% | 0.71% | 1.45% | 0.94% | 1.25% | 1.18% | 1.26% | 0.14% | 0.00% | -1.30% |

# APPENDIX 3.2 ‖ CUSTOMER FORECASTS BY REGION WASHINGTON AND IDAHO

| | Washington and Idaho - Expected Growth | | | Washington and Idaho - High Growth | | | Washington and Idaho - Low Growth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Residential Customers | Commercial Customers | Industrial Customers | Residential Customers | Commercial Customers | Industrial Customers | Residential Customers | Commercial Customers | Industrial Customers |
| Jan-12 | 202,574 | 22,501 | 228 | 203,572 | 22,510 | 228 | 201,908 | 22,495 | 228 |
| Feb-12 | 202,563 | 22,523 | 227 | 203,555 | 22,545 | 227 | 201,902 | 22,508 | 227 |
| Mar-12 | 202,688 | 22,547 | 227 | 203,755 | 22,584 | 227 | 201,977 | 22,523 | 227 |
| Apr-12 | 202,517 | 22,561 | 227 | 203,481 | 22,606 | 227 | 201,874 | 22,531 | 227 |
| May-12 | 202,633 | 22,564 | 227 | 203,667 | 22,611 | 227 | 201,944 | 22,533 | 227 |
| Jun-12 | 202,521 | 22,612 | 227 | 203,488 | 22,688 | 227 | 201,877 | 22,562 | 227 |
| Jul-12 | 202,830 | 22,623 | 228 | 203,982 | 22,705 | 228 | 202,062 | 22,568 | 228 |
| Aug-12 | 203,492 | 22,641 | 228 | 205,041 | 22,734 | 228 | 202,459 | 22,579 | 228 |
| Sep-12 | 203,900 | 22,676 | 228 | 205,694 | 22,790 | 228 | 202,704 | 22,600 | 228 |
| Oct-12 | 204,313 | 22,699 | 228 | 206,355 | 22,827 | 228 | 202,952 | 22,614 | 228 |
| Nov-12 | 204,999 | 22,735 | 228 | 207,452 | 22,884 | 228 | 203,363 | 22,635 | 228 |
| Dec-12 | 205,820 | 22,764 | 228 | 208,766 | 22,931 | 228 | 203,856 | 22,653 | 228 |
| Jan-13 | 206,379 | 22,812 | 229 | 209,660 | 23,008 | 229 | 204,191 | 22,682 | 229 |
| Feb-13 | 206,368 | 22,839 | 228 | 209,643 | 23,051 | 228 | 204,185 | 22,698 | 228 |
| Mar-13 | 206,493 | 22,868 | 228 | 209,843 | 23,097 | 228 | 204,260 | 22,715 | 228 |
| Apr-13 | 206,322 | 22,902 | 228 | 209,569 | 23,152 | 228 | 204,157 | 22,736 | 228 |
| May-13 | 206,538 | 22,930 | 228 | 209,915 | 23,196 | 228 | 204,287 | 22,752 | 228 |
| Jun-13 | 206,426 | 22,993 | 228 | 209,736 | 23,297 | 228 | 204,220 | 22,790 | 228 |
| Jul-13 | 206,735 | 23,019 | 229 | 210,230 | 23,339 | 229 | 204,405 | 22,806 | 229 |
| Aug-13 | 207,397 | 23,042 | 229 | 211,289 | 23,376 | 229 | 204,802 | 22,820 | 229 |
| Sep-13 | 207,905 | 23,092 | 229 | 212,102 | 23,456 | 229 | 205,107 | 22,850 | 229 |
| Oct-13 | 208,318 | 23,120 | 229 | 212,763 | 23,500 | 229 | 205,355 | 22,866 | 229 |
| Nov-13 | 209,004 | 23,156 | 229 | 213,860 | 23,558 | 229 | 205,766 | 22,888 | 229 |
| Dec-13 | 209,825 | 23,185 | 229 | 215,174 | 23,604 | 229 | 206,259 | 22,905 | 229 |
| Jan-14 | 210,490 | 23,257 | 232 | 216,238 | 23,720 | 232 | 206,658 | 22,949 | 232 |
| Feb-14 | 210,479 | 23,284 | 231 | 216,220 | 23,763 | 231 | 206,651 | 22,965 | 231 |
| Mar-14 | 210,604 | 23,313 | 231 | 216,420 | 23,809 | 231 | 206,726 | 22,982 | 231 |
| Apr-14 | 210,433 | 23,347 | 231 | 216,147 | 23,864 | 231 | 206,624 | 23,003 | 231 |
| May-14 | 210,649 | 23,375 | 231 | 216,492 | 23,908 | 231 | 206,753 | 23,019 | 231 |
| Jun-14 | 210,537 | 23,438 | 231 | 216,313 | 24,009 | 231 | 206,686 | 23,057 | 231 |
| Jul-14 | 210,846 | 23,464 | 231 | 216,808 | 24,051 | 231 | 206,872 | 23,073 | 231 |
| Aug-14 | 211,508 | 23,487 | 231 | 217,867 | 24,088 | 231 | 207,269 | 23,087 | 231 |
| Sep-14 | 212,016 | 23,537 | 231 | 218,680 | 24,168 | 231 | 207,574 | 23,117 | 231 |
| Oct-14 | 212,429 | 23,565 | 231 | 219,340 | 24,212 | 231 | 207,821 | 23,133 | 231 |
| Nov-14 | 213,115 | 23,601 | 231 | 220,438 | 24,270 | 231 | 208,233 | 23,155 | 231 |
| Dec-14 | 213,936 | 23,630 | 231 | 221,752 | 24,316 | 231 | 208,726 | 23,172 | 231 |
| Jan-15 | 214,606 | 23,723 | 235 | 222,824 | 24,465 | 235 | 209,128 | 23,228 | 235 |
| Feb-15 | 214,595 | 23,750 | 234 | 222,806 | 24,508 | 234 | 209,121 | 23,244 | 234 |
| Mar-15 | 214,720 | 23,779 | 234 | 223,006 | 24,555 | 234 | 209,196 | 23,262 | 234 |
| Apr-15 | 214,549 | 23,813 | 234 | 222,732 | 24,609 | 234 | 209,093 | 23,282 | 234 |
| May-15 | 214,765 | 23,841 | 234 | 223,078 | 24,654 | 234 | 209,223 | 23,299 | 234 |
| Jun-15 | 214,653 | 23,904 | 234 | 222,899 | 24,755 | 234 | 209,156 | 23,337 | 234 |
| Jul-15 | 214,962 | 23,930 | 235 | 223,393 | 24,796 | 235 | 209,341 | 23,352 | 235 |
| Aug-15 | 215,624 | 23,953 | 235 | 224,452 | 24,833 | 235 | 209,738 | 23,366 | 235 |
| Sep-15 | 216,132 | 24,003 | 235 | 225,265 | 24,913 | 235 | 210,043 | 23,396 | 235 |
| Oct-15 | 216,545 | 24,031 | 235 | 225,926 | 24,958 | 235 | 210,291 | 23,413 | 235 |
| Nov-15 | 217,231 | 24,067 | 235 | 227,024 | 25,016 | 235 | 210,703 | 23,435 | 235 |
| Dec-15 | 218,052 | 24,096 | 235 | 228,337 | 25,062 | 235 | 211,195 | 23,452 | 235 |
| Jan-16 | 218,664 | 24,182 | 237 | 229,316 | 25,200 | 237 | 211,562 | 23,504 | 237 |
| Feb-16 | 218,652 | 24,210 | 236 | 229,298 | 25,244 | 236 | 211,555 | 23,520 | 236 |

# APPENDIX 3.2 ▌▌ CUSTOMER FORECASTS BY REGION WASHINGTON AND IDAHO

| | Washington and Idaho - Expected Growth | | | Washington and Idaho - High Growth | | | Washington and Idaho - Low Growth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Residential Customers | Commercial Customers | Industrial Customers | Residential Customers | Commercial Customers | Industrial Customers | Residential Customers | Commercial Customers | Industrial Customers |
| Mar-16 | 218,780 | 24,239 | 236 | 229,502 | 25,291 | 236 | 211,632 | 23,538 | 236 |
| Apr-16 | 218,606 | 24,274 | 236 | 229,223 | 25,347 | 236 | 211,527 | 23,559 | 236 |
| May-16 | 218,826 | 24,303 | 236 | 229,575 | 25,393 | 236 | 211,659 | 23,576 | 236 |
| Jun-16 | 218,712 | 24,367 | 236 | 229,393 | 25,495 | 236 | 211,591 | 23,614 | 236 |
| Jul-16 | 219,026 | 24,393 | 237 | 229,896 | 25,538 | 237 | 211,780 | 23,630 | 237 |
| Aug-16 | 219,701 | 24,417 | 237 | 230,975 | 25,575 | 237 | 212,185 | 23,644 | 237 |
| Sep-16 | 220,219 | 24,468 | 237 | 231,804 | 25,657 | 237 | 212,495 | 23,675 | 237 |
| Oct-16 | 220,639 | 24,496 | 237 | 232,477 | 25,702 | 237 | 212,748 | 23,692 | 237 |
| Nov-16 | 221,338 | 24,533 | 237 | 233,595 | 25,761 | 237 | 213,167 | 23,714 | 237 |
| Dec-16 | 222,175 | 24,563 | 237 | 234,934 | 25,808 | 237 | 213,669 | 23,732 | 237 |
| Jan-17 | 222,659 | 24,634 | 239 | 235,708 | 25,923 | 239 | 213,959 | 23,775 | 239 |
| Feb-17 | 222,647 | 24,662 | 238 | 235,689 | 25,968 | 238 | 213,952 | 23,792 | 238 |
| Mar-17 | 222,777 | 24,693 | 238 | 235,897 | 26,016 | 238 | 214,030 | 23,810 | 238 |
| Apr-17 | 222,599 | 24,728 | 238 | 235,613 | 26,073 | 238 | 213,924 | 23,831 | 238 |
| May-17 | 222,823 | 24,757 | 238 | 235,972 | 26,119 | 238 | 214,058 | 23,849 | 238 |
| Jun-17 | 222,707 | 24,822 | 238 | 235,786 | 26,224 | 238 | 213,988 | 23,888 | 238 |
| Jul-17 | 223,028 | 24,849 | 239 | 236,299 | 26,267 | 239 | 214,181 | 23,904 | 239 |
| Aug-17 | 223,715 | 24,873 | 239 | 237,398 | 26,306 | 239 | 214,593 | 23,918 | 239 |
| Sep-17 | 224,242 | 24,925 | 239 | 238,241 | 26,389 | 239 | 214,909 | 23,949 | 239 |
| Oct-17 | 224,670 | 24,954 | 239 | 238,926 | 26,435 | 239 | 215,166 | 23,967 | 239 |
| Nov-17 | 225,382 | 24,992 | 239 | 240,065 | 26,495 | 239 | 215,593 | 23,989 | 239 |
| Dec-17 | 226,234 | 25,022 | 239 | 241,428 | 26,543 | 239 | 216,104 | 24,007 | 239 |
| Jan-18 | 226,558 | 25,072 | 241 | 241,946 | 26,623 | 241 | 216,299 | 24,038 | 241 |
| Feb-18 | 226,546 | 25,100 | 240 | 241,928 | 26,669 | 240 | 216,292 | 24,055 | 240 |
| Mar-18 | 226,678 | 25,131 | 240 | 242,139 | 26,718 | 240 | 216,371 | 24,073 | 240 |
| Apr-18 | 226,498 | 25,167 | 240 | 241,850 | 26,776 | 240 | 216,263 | 24,095 | 240 |
| May-18 | 226,726 | 25,197 | 240 | 242,215 | 26,823 | 240 | 216,399 | 24,112 | 240 |
| Jun-18 | 226,607 | 25,263 | 240 | 242,026 | 26,930 | 240 | 216,328 | 24,152 | 240 |
| Jul-18 | 226,934 | 25,291 | 241 | 242,548 | 26,974 | 241 | 216,524 | 24,169 | 241 |
| Aug-18 | 227,632 | 25,315 | 241 | 243,666 | 27,012 | 241 | 216,943 | 24,183 | 241 |
| Sep-18 | 228,169 | 25,368 | 241 | 244,524 | 27,097 | 241 | 217,265 | 24,215 | 241 |
| Oct-18 | 228,605 | 25,397 | 241 | 245,222 | 27,144 | 241 | 217,527 | 24,233 | 241 |
| Nov-18 | 229,329 | 25,435 | 241 | 246,380 | 27,205 | 241 | 217,961 | 24,256 | 241 |
| Dec-18 | 230,196 | 25,466 | 241 | 247,767 | 27,254 | 241 | 218,481 | 24,274 | 241 |
| Jan-19 | 230,425 | 25,507 | 243 | 248,134 | 27,319 | 243 | 218,619 | 24,298 | 243 |
| Feb-19 | 230,413 | 25,536 | 242 | 248,115 | 27,366 | 242 | 218,612 | 24,316 | 242 |
| Mar-19 | 230,547 | 25,567 | 242 | 248,330 | 27,415 | 242 | 218,692 | 24,335 | 242 |
| Apr-19 | 230,364 | 25,603 | 242 | 248,036 | 27,474 | 242 | 218,582 | 24,356 | 242 |
| May-19 | 230,596 | 25,634 | 242 | 248,407 | 27,522 | 242 | 218,721 | 24,375 | 242 |
| Jun-19 | 230,475 | 25,701 | 242 | 248,215 | 27,630 | 242 | 218,649 | 24,415 | 242 |
| Jul-19 | 230,807 | 25,729 | 243 | 248,745 | 27,675 | 243 | 218,848 | 24,432 | 243 |
| Aug-19 | 231,518 | 25,754 | 243 | 249,883 | 27,715 | 243 | 219,275 | 24,447 | 243 |
| Sep-19 | 232,063 | 25,808 | 243 | 250,755 | 27,801 | 243 | 219,602 | 24,479 | 243 |
| Oct-19 | 232,507 | 25,838 | 243 | 251,465 | 27,849 | 243 | 219,868 | 24,497 | 243 |
| Nov-19 | 233,243 | 25,877 | 243 | 252,643 | 27,911 | 243 | 220,310 | 24,520 | 243 |
| Dec-19 | 234,125 | 25,908 | 243 | 254,054 | 27,961 | 243 | 220,839 | 24,539 | 243 |
| Jan-20 | 234,284 | 25,939 | 244 | 254,309 | 28,011 | 244 | 220,935 | 24,558 | 244 |
| Feb-20 | 234,272 | 25,969 | 243 | 254,290 | 28,058 | 243 | 220,927 | 24,576 | 243 |
| Mar-20 | 234,409 | 26,000 | 243 | 254,508 | 28,109 | 243 | 221,009 | 24,595 | 243 |
| Apr-20 | 234,222 | 26,038 | 243 | 254,210 | 28,169 | 243 | 220,897 | 24,617 | 243 |

# APPENDIX 3.2 II CUSTOMER FORECASTS BY REGION WASHINGTON AND IDAHO

| | Washington and Idaho - Expected Growth | | | Washington and Idaho - High Growth | | | Washington and Idaho - Low Growth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Residential Customers | Commercial Customers | Industrial Customers | Residential Customers | Commercial Customers | Industrial Customers | Residential Customers | Commercial Customers | Industrial Customers |
| May-20 | 234,458 | 26,068 | 243 | 254,587 | 28,218 | 243 | 221,039 | 24,635 | 243 |
| Jun-20 | 234,336 | 26,137 | 243 | 254,391 | 28,328 | 243 | 220,965 | 24,677 | 243 |
| Jul-20 | 234,673 | 26,166 | 244 | 254,931 | 28,373 | 244 | 221,168 | 24,694 | 244 |
| Aug-20 | 235,396 | 26,191 | 244 | 256,087 | 28,414 | 244 | 221,601 | 24,709 | 244 |
| Sep-20 | 235,950 | 26,245 | 244 | 256,975 | 28,501 | 244 | 221,934 | 24,742 | 244 |
| Oct-20 | 236,401 | 26,276 | 244 | 257,696 | 28,550 | 244 | 222,205 | 24,760 | 244 |
| Nov-20 | 237,150 | 26,315 | 244 | 258,894 | 28,613 | 244 | 222,654 | 24,784 | 244 |
| Dec-20 | 238,046 | 26,347 | 244 | 260,328 | 28,664 | 244 | 223,192 | 24,803 | 244 |
| Jan-21 | 238,119 | 26,364 | 247 | 260,444 | 28,691 | 247 | 223,235 | 24,813 | 247 |
| Feb-21 | 238,106 | 26,394 | 246 | 260,424 | 28,739 | 246 | 223,228 | 24,831 | 246 |
| Mar-21 | 238,245 | 26,426 | 246 | 260,646 | 28,791 | 246 | 223,311 | 24,850 | 246 |
| Apr-21 | 238,055 | 26,464 | 246 | 260,343 | 28,851 | 246 | 223,197 | 24,873 | 246 |
| May-21 | 238,295 | 26,495 | 246 | 260,726 | 28,901 | 246 | 223,341 | 24,892 | 246 |
| Jun-21 | 238,171 | 26,565 | 246 | 260,527 | 29,013 | 246 | 223,266 | 24,934 | 246 |
| Jul-21 | 238,514 | 26,594 | 247 | 261,076 | 29,059 | 247 | 223,472 | 24,951 | 247 |
| Aug-21 | 239,248 | 26,620 | 247 | 262,251 | 29,100 | 247 | 223,913 | 24,966 | 247 |
| Sep-21 | 239,812 | 26,675 | 247 | 263,153 | 29,189 | 247 | 224,251 | 25,000 | 247 |
| Oct-21 | 240,270 | 26,706 | 247 | 263,886 | 29,239 | 247 | 224,526 | 25,018 | 247 |
| Nov-21 | 241,031 | 26,746 | 247 | 265,104 | 29,303 | 247 | 224,983 | 25,042 | 247 |
| Dec-21 | 241,942 | 26,779 | 247 | 266,561 | 29,354 | 247 | 225,529 | 25,062 | 247 |
| Jan-22 | 241,953 | 26,790 | 248 | 266,579 | 29,372 | 248 | 225,536 | 25,068 | 248 |
| Feb-22 | 241,941 | 26,820 | 247 | 266,559 | 29,420 | 247 | 225,529 | 25,086 | 247 |
| Mar-22 | 242,082 | 26,853 | 247 | 266,785 | 29,473 | 247 | 225,613 | 25,106 | 247 |
| Apr-22 | 241,889 | 26,891 | 247 | 266,477 | 29,534 | 247 | 225,497 | 25,129 | 247 |
| May-22 | 242,133 | 26,923 | 247 | 266,866 | 29,585 | 247 | 225,644 | 25,148 | 247 |
| Jun-22 | 242,006 | 26,994 | 247 | 266,664 | 29,699 | 247 | 225,568 | 25,191 | 247 |
| Jul-22 | 242,355 | 27,023 | 248 | 267,222 | 29,746 | 248 | 225,777 | 25,208 | 248 |
| Aug-22 | 243,101 | 27,049 | 248 | 268,416 | 29,787 | 248 | 226,225 | 25,224 | 248 |
| Sep-22 | 243,674 | 27,106 | 248 | 269,332 | 29,878 | 248 | 226,568 | 25,258 | 248 |
| Oct-22 | 244,139 | 27,137 | 248 | 270,077 | 29,928 | 248 | 226,848 | 25,277 | 248 |
| Nov-22 | 244,913 | 27,178 | 248 | 271,315 | 29,993 | 248 | 227,312 | 25,301 | 248 |
| Dec-22 | 245,838 | 27,211 | 248 | 272,796 | 30,046 | 248 | 227,867 | 25,321 | 248 |
| Jan-23 | 245,857 | 27,220 | 250 | 272,825 | 30,060 | 250 | 227,878 | 25,326 | 250 |
| Feb-23 | 245,844 | 27,251 | 249 | 272,805 | 30,110 | 249 | 227,871 | 25,345 | 249 |
| Mar-23 | 245,988 | 27,284 | 249 | 273,034 | 30,163 | 249 | 227,957 | 25,365 | 249 |
| Apr-23 | 245,792 | 27,323 | 249 | 272,721 | 30,225 | 249 | 227,839 | 25,388 | 249 |
| May-23 | 246,039 | 27,355 | 249 | 273,117 | 30,277 | 249 | 227,987 | 25,407 | 249 |
| Jun-23 | 245,911 | 27,427 | 249 | 272,911 | 30,392 | 249 | 227,910 | 25,451 | 249 |
| Jul-23 | 246,265 | 27,457 | 250 | 273,478 | 30,440 | 250 | 228,123 | 25,469 | 250 |
| Aug-23 | 247,023 | 27,484 | 250 | 274,691 | 30,482 | 250 | 228,578 | 25,485 | 250 |
| Sep-23 | 247,605 | 27,541 | 250 | 275,622 | 30,574 | 250 | 228,927 | 25,519 | 250 |
| Oct-23 | 248,078 | 27,573 | 250 | 276,379 | 30,625 | 250 | 229,211 | 25,538 | 250 |
| Nov-23 | 248,864 | 27,614 | 250 | 277,637 | 30,692 | 250 | 229,683 | 25,563 | 250 |
| Dec-23 | 249,805 | 27,648 | 250 | 279,142 | 30,745 | 250 | 230,247 | 25,583 | 250 |
| Jan-24 | 249,752 | 27,649 | 251 | 279,058 | 30,747 | 251 | 230,215 | 25,584 | 251 |
| Feb-24 | 249,739 | 27,680 | 250 | 279,037 | 30,797 | 250 | 230,208 | 25,603 | 250 |
| Mar-24 | 249,885 | 27,714 | 250 | 279,270 | 30,851 | 250 | 230,295 | 25,623 | 250 |
| Apr-24 | 249,686 | 27,754 | 250 | 278,951 | 30,914 | 250 | 230,176 | 25,647 | 250 |
| May-24 | 249,937 | 27,786 | 250 | 279,354 | 30,967 | 250 | 230,326 | 25,666 | 250 |
| Jun-24 | 249,807 | 27,860 | 250 | 279,145 | 31,084 | 250 | 230,248 | 25,710 | 250 |

# APPENDIX 3.2 ‖ CUSTOMER FORECASTS BY REGION
# WASHINGTON AND IDAHO

| | Washington and Idaho - Expected Growth | | | Washington and Idaho - High Growth | | | Washington and Idaho - Low Growth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Residential Customers | Commercial Customers | Industrial Customers | Residential Customers | Commercial Customers | Industrial Customers | Residential Customers | Commercial Customers | Industrial Customers |
| Jul-24 | 250,167 | 27,890 | 251 | 279,720 | 31,133 | 251 | 230,464 | 25,728 | 251 |
| Aug-24 | 250,937 | 27,917 | 251 | 280,953 | 31,175 | 251 | 230,926 | 25,745 | 251 |
| Sep-24 | 251,528 | 27,975 | 251 | 281,899 | 31,269 | 251 | 231,281 | 25,780 | 251 |
| Oct-24 | 252,009 | 28,008 | 251 | 282,668 | 31,321 | 251 | 231,569 | 25,799 | 251 |
| Nov-24 | 252,807 | 28,050 | 251 | 283,945 | 31,388 | 251 | 232,048 | 25,824 | 251 |
| Dec-24 | 253,763 | 28,084 | 251 | 285,474 | 31,442 | 251 | 232,622 | 25,845 | 251 |
| Jan-25 | 253,666 | 28,080 | 255 | 285,320 | 31,436 | 255 | 232,564 | 25,842 | 255 |
| Feb-25 | 253,653 | 28,112 | 254 | 285,299 | 31,487 | 254 | 232,556 | 25,862 | 254 |
| Mar-25 | 253,801 | 28,146 | 254 | 285,535 | 31,542 | 254 | 232,644 | 25,882 | 254 |
| Apr-25 | 253,599 | 28,186 | 254 | 285,212 | 31,607 | 254 | 232,523 | 25,906 | 254 |
| May-25 | 253,854 | 28,220 | 254 | 285,620 | 31,660 | 254 | 232,676 | 25,926 | 254 |
| Jun-25 | 253,722 | 28,294 | 254 | 285,409 | 31,779 | 254 | 232,597 | 25,971 | 254 |
| Jul-25 | 254,087 | 28,325 | 255 | 285,993 | 31,828 | 255 | 232,816 | 25,989 | 255 |
| Aug-25 | 254,869 | 28,352 | 255 | 287,245 | 31,872 | 255 | 233,286 | 26,006 | 255 |
| Sep-25 | 255,470 | 28,411 | 255 | 288,206 | 31,967 | 255 | 233,646 | 26,041 | 255 |
| Oct-25 | 255,958 | 28,445 | 255 | 288,987 | 32,020 | 255 | 233,939 | 26,061 | 255 |
| Nov-25 | 256,769 | 28,487 | 255 | 290,284 | 32,088 | 255 | 234,425 | 26,087 | 255 |
| Dec-25 | 257,739 | 28,521 | 255 | 291,837 | 32,143 | 255 | 235,008 | 26,107 | 255 |
| Jan-26 | 257,583 | 28,510 | 256 | 291,587 | 32,124 | 256 | 234,914 | 26,100 | 256 |
| Feb-26 | 257,570 | 28,542 | 255 | 291,566 | 32,176 | 255 | 234,906 | 26,120 | 255 |
| Mar-26 | 257,720 | 28,577 | 255 | 291,806 | 32,232 | 255 | 234,996 | 26,141 | 255 |
| Apr-26 | 257,515 | 28,618 | 255 | 291,477 | 32,297 | 255 | 234,873 | 26,165 | 255 |
| May-26 | 257,774 | 28,652 | 255 | 291,892 | 32,351 | | 235,028 | 26,185 | 255 |
| Jun-26 | 257,639 | 28,727 | 255 | 291,677 | 32,472 | 255 | 234,948 | 26,231 | 255 |
| Jul-26 | 258,010 | 28,759 | 256 | 292,270 | 32,522 | 256 | 235,170 | 26,250 | 256 |
| Aug-26 | 258,805 | 28,786 | 256 | 293,542 | 32,567 | 256 | 235,647 | 26,266 | 256 |
| Sep-26 | 259,415 | 28,846 | 256 | 294,517 | 32,663 | 256 | 236,013 | 26,302 | 256 |
| Oct-26 | 259,910 | 28,880 | 256 | 295,310 | 32,717 | 256 | 236,310 | 26,322 | 256 |
| Nov-26 | 260,734 | 28,923 | 256 | 296,628 | 32,786 | 256 | 236,804 | 26,348 | 256 |
| Dec-26 | 261,719 | 28,958 | 256 | 298,204 | 32,842 | 256 | 237,395 | 26,369 | 256 |
| Jan-27 | 261,482 | 28,938 | 258 | 297,825 | 32,809 | 258 | 237,253 | 26,357 | 258 |
| Feb-27 | 261,468 | 28,971 | 257 | 297,803 | 32,862 | 257 | 237,245 | 26,377 | 257 |
| Mar-27 | 261,621 | 29,006 | 257 | 298,047 | 32,918 | 257 | 237,336 | 26,398 | 257 |
| Apr-27 | 261,412 | 29,048 | 257 | 297,714 | 32,984 | 257 | 237,211 | 26,423 | 257 |
| May-27 | 261,676 | 29,082 | 257 | 298,135 | 33,039 | 257 | 237,369 | 26,443 | 257 |
| Jun-27 | 261,539 | 29,159 | 257 | 297,917 | 33,162 | 257 | 237,287 | 26,490 | 257 |
| Jul-27 | 261,916 | 29,190 | 258 | 298,519 | 33,213 | 258 | 237,513 | 26,509 | 258 |
| Aug-27 | 262,722 | 29,218 | 258 | 299,809 | 33,258 | 258 | 237,997 | 26,525 | 258 |
| Sep-27 | 263,341 | 29,279 | 258 | 300,800 | 33,355 | 258 | 238,369 | 26,562 | 258 |
| Oct-27 | 263,844 | 29,313 | 258 | 301,605 | 33,410 | 258 | 238,671 | 26,582 | 258 |
| Nov-27 | 264,680 | 29,357 | 258 | 302,942 | 33,480 | 258 | 239,172 | 26,609 | 258 |
| Dec-27 | 265,681 | 29,393 | 258 | 304,543 | 33,537 | 258 | 239,772 | 26,630 | 258 |
| Jan-28 | 265,365 | 29,365 | 259 | 304,038 | 33,492 | 259 | 239,583 | 26,613 | 259 |
| Feb-28 | 265,351 | 29,398 | 258 | 304,016 | 33,546 | 258 | 239,575 | 26,633 | 258 |
| Mar-28 | 265,506 | 29,434 | 258 | 304,263 | 33,603 | 258 | 239,667 | 26,655 | 258 |
| Apr-28 | 265,294 | 29,476 | 258 | 303,925 | 33,670 | 258 | 239,541 | 26,680 | 258 |
| May-28 | 265,561 | 29,511 | 258 | 304,352 | 33,726 | 258 | 239,701 | 26,701 | 258 |
| Jun-28 | 265,423 | 29,589 | 258 | 304,131 | 33,851 | 258 | 239,618 | 26,748 | 258 |
| Jul-28 | 265,805 | 29,621 | 259 | 304,742 | 33,902 | 259 | 239,847 | 26,767 | 259 |
| Aug-28 | 266,624 | 29,650 | 259 | 306,052 | 33,948 | 259 | 240,338 | 26,784 | 259 |

# APPENDIX 3.2 II CUSTOMER FORECASTS BY REGION WASHINGTON AND IDAHO

| | Washington and Idaho Expected Growth | | | Washington and Idaho - High Growth | | | Washington and Idaho - Low Growth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Residential Customers | Commercial Customers | Industrial Customers | Residential Customers | Commercial Customers | Industrial Customers | Residential Customers | Commercial Customers | Industrial Customers |
| Sep-28 | 267,252 | 29,711 | 259 | 307,057 | 34,047 | 259 | 240,715 | 26,821 | 259 |
| Oct-28 | 267,762 | 29,746 | 259 | 307,874 | 34,102 | 259 | 241,021 | 26,842 | 259 |
| Nov-28 | 268,611 | 29,791 | 259 | 309,231 | 34,173 | 259 | 241,530 | 26,869 | 259 |
| Dec-28 | 269,626 | 29,827 | 259 | 310,855 | 34,231 | 259 | 242,140 | 26,890 | 259 |
| Jan-29 | 269,240 | 29,790 | 262 | 310,237 | 34,172 | 262 | 241,908 | 26,868 | 262 |
| Feb-29 | 269,226 | 29,824 | 261 | 310,215 | 34,227 | 261 | 241,900 | 26,889 | 261 |
| Mar-29 | 269,383 | 29,860 | 261 | 310,466 | 34,285 | 261 | 241,994 | 26,911 | 261 |
| Apr-29 | 269,168 | 29,903 | 261 | 310,123 | 34,353 | 261 | 241,865 | 26,936 | 261 |
| May-29 | 269,439 | 29,938 | 261 | 310,557 | 34,409 | 261 | 242,027 | 26,957 | 261 |
| Jun-29 | 269,299 | 30,017 | 261 | 310,332 | 34,536 | 261 | 241,943 | 27,005 | 261 |
| Jul-29 | 269,686 | 30,050 | 262 | 310,952 | 34,588 | 262 | 242,176 | 27,024 | 262 |
| Aug-29 | 270,517 | 30,079 | 262 | 312,281 | 34,634 | 262 | 242,674 | 27,042 | 262 |
| Sep-29 | 271,154 | 30,142 | 262 | 313,301 | 34,735 | 262 | 243,056 | 27,079 | 262 |
| Oct-29 | 271,672 | 30,177 | 262 | 314,130 | 34,791 | 262 | 243,367 | 27,100 | 262 |
| Nov-29 | 272,533 | 30,222 | 262 | 315,507 | 34,863 | 262 | 243,884 | 27,128 | 262 |
| Dec-29 | 273,563 | 30,258 | 262 | 317,155 | 34,922 | 262 | 244,502 | 27,149 | 262 |
| Jan-30 | 273,128 | 30,211 | 263 | 316,459 | 34,846 | 263 | 244,241 | 27,121 | 263 |
| Feb-30 | 273,114 | 30,246 | 262 | 316,436 | 34,901 | 262 | 244,232 | 27,142 | 262 |
| Mar-30 | 273,273 | 30,283 | 262 | 316,691 | 34,961 | 262 | 244,328 | 27,164 | 262 |
| Apr-30 | 273,055 | 30,326 | 262 | 316,343 | 35,030 | 262 | 244,197 | 27,190 | 262 |
| May-30 | 273,330 | 30,362 | 262 | 316,783 | 35,087 | 262 | 244,362 | 27,211 | 262 |
| Jun-30 | 273,188 | 30,442 | 262 | 316,554 | 35,215 | 262 | 244,277 | 27,259 | 262 |
| Jul-30 | 273,581 | 30,475 | 263 | 317,184 | 35,268 | 263 | 244,513 | 27,279 | 263 |
| Aug-30 | 274,424 | 30,504 | 263 | 318,532 | 35,315 | 263 | 245,018 | 27,297 | 263 |
| Sep-30 | 275,070 | 30,568 | 263 | 319,566 | 35,417 | 263 | 245,406 | 27,335 | 263 |
| Oct-30 | 275,596 | 30,604 | 263 | 320,407 | 35,474 | 263 | 245,721 | 27,357 | 263 |
| Nov-30 | 276,469 | 30,649 | 263 | 321,804 | 35,547 | 263 | 246,245 | 27,384 | 263 |
| Dec-30 | 277,514 | 30,686 | 263 | 323,476 | 35,606 | 263 | 246,872 | 27,406 | 263 |
| Jan-31 | 277,018 | 30,633 | 266 | 322,682 | 35,522 | 266 | 246,575 | 27,374 | 266 |
| Feb-31 | 277,004 | 30,668 | 265 | 322,660 | 35,578 | 265 | 246,566 | 27,395 | 265 |
| Mar-31 | 277,165 | 30,706 | 265 | 322,918 | 35,638 | 265 | 246,663 | 27,418 | 265 |
| Apr-31 | 276,944 | 30,750 | 265 | 322,565 | 35,708 | 265 | 246,530 | 27,444 | 265 |
| May-31 | 277,223 | 30,786 | 265 | 323,011 | 35,766 | 265 | 246,698 | 27,466 | 265 |
| Jun-31 | 277,078 | 30,867 | 265 | 322,779 | 35,896 | 265 | 246,611 | 27,515 | 265 |
| Jul-31 | 277,477 | 30,901 | 266 | 323,418 | 35,950 | 266 | 246,850 | 27,535 | 266 |
| Aug-31 | 278,332 | 30,930 | 266 | 324,785 | 35,997 | 266 | 247,363 | 27,553 | 266 |
| Sep-31 | 278,988 | 30,995 | 266 | 325,834 | 36,100 | 266 | 247,757 | 27,591 | 266 |
| Oct-31 | 279,521 | 31,031 | 266 | 326,687 | 36,158 | 266 | 248,076 | 27,613 | 266 |
| Nov-31 | 280,406 | 31,078 | 266 | 328,104 | 36,233 | 266 | 248,608 | 27,641 | 266 |
| Dec-31 | 281,466 | 31,115 | 266 | 329,799 | 36,293 | 266 | 249,244 | 27,663 | 266 |
| Jan-32 | 280,897 | 31,053 | 267 | 328,890 | 36,194 | 267 | 248,902 | 27,626 | 267 |
| Feb-32 | 280,883 | 31,089 | 266 | 328,867 | 36,251 | 266 | 248,894 | 27,648 | 266 |
| Mar-32 | 281,047 | 31,127 | 266 | 329,129 | 36,311 | 266 | 248,992 | 27,670 | 266 |
| Apr-32 | 280,823 | 31,171 | 266 | 328,771 | 36,382 | 266 | 248,858 | 27,697 | 266 |
| May-32 | 281,106 | 31,208 | 266 | 329,223 | 36,441 | 266 | 249,027 | 27,719 | 266 |
| Jun-32 | 280,959 | 31,290 | 266 | 328,988 | 36,573 | 266 | 248,939 | 27,769 | 266 |
| Jul-32 | 281,363 | 31,324 | 267 | 329,635 | 36,628 | 267 | 249,182 | 27,789 | 267 |
| Aug-32 | 282,230 | 31,355 | 267 | 331,022 | 36,676 | 267 | 249,702 | 27,807 | 267 |
| Sep-32 | 282,895 | 31,420 | 267 | 332,086 | 36,780 | 267 | 250,101 | 27,846 | 267 |
| Oct-32 | 283,435 | 31,457 | 267 | 332,951 | 36,839 | 267 | 250,425 | 27,868 | 267 |

# APPENDIX 3.2 ‖ CUSTOMER FORECASTS BY REGION WASHINGTON AND IDAHO

| | Washington and Idaho - Expected Growth | | | Washington and Idaho - High Growth | | | Washington and Idaho - Low Growth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Residential Customers | Commercial Customers | Industrial Customers | Residential Customers | Commercial Customers | Industrial Customers | Residential Customers | Commercial Customers | Industrial Customers |
| Nov-32 | 284,333 | 31,504 | 267 | 334,387 | 36,914 | 267 | 250,964 | 27,897 | 267 |
| Dec-32 | 285,408 | 31,542 | 267 | 336,107 | 36,975 | 267 | 251,609 | 27,919 | 267 |
| Jan-33 | 284,787 | 31,474 | 270 | 335,113 | 36,867 | 270 | 251,236 | 27,879 | 270 |
| Feb-33 | 284,772 | 31,510 | 269 | 335,090 | 36,924 | 269 | 251,227 | 27,900 | 269 |
| Mar-33 | 284,938 | 31,548 | 269 | 335,355 | 36,986 | 269 | 251,327 | 27,923 | 269 |
| Apr-33 | 284,711 | 31,593 | 269 | 334,992 | 37,058 | 269 | 251,191 | 27,950 | 269 |
| May-33 | 284,998 | 31,631 | 269 | 335,451 | 37,117 | 269 | 251,363 | 27,973 | 269 |
| Jun-33 | 284,849 | 31,714 | 269 | 335,213 | 37,251 | 269 | 251,274 | 28,023 | 269 |
| Jul-33 | 285,259 | 31,749 | 270 | 335,869 | 37,306 | 270 | 251,520 | 28,044 | 270 |
| Aug-33 | 286,138 | 31,779 | 270 | 337,274 | 37,355 | 270 | 252,047 | 28,062 | 270 |
| Sep-33 | 286,812 | 31,846 | 270 | 338,353 | 37,461 | 270 | 252,451 | 28,102 | 270 |
| Oct-33 | 287,360 | 31,883 | 270 | 339,230 | 37,521 | 270 | 252,780 | 28,124 | 270 |
| Nov-33 | 288,270 | 31,930 | 270 | 340,686 | 37,597 | 270 | 253,326 | 28,153 | 270 |
| Dec-33 | 289,360 | 31,969 | 270 | 342,430 | 37,659 | 270 | 253,980 | 28,176 | 270 |
| Jan-34 | 288,692 | 31,897 | 271 | 341,361 | 37,544 | 271 | 253,579 | 28,133 | 271 |
| Feb-34 | 288,677 | 31,933 | 270 | 341,338 | 37,602 | 270 | 253,570 | 28,154 | 270 |
| Mar-34 | 288,846 | 31,972 | 270 | 341,607 | 37,664 | 270 | 253,671 | 28,178 | 270 |
| Apr-34 | 288,615 | 32,018 | 270 | 341,239 | 37,737 | 270 | 253,533 | 28,205 | 270 |
| May-34 | 288,906 | 32,056 | 270 | 341,704 | 37,798 | 270 | 253,708 | 28,228 | 270 |
| Jun-34 | 288,755 | 32,140 | 270 | 341,463 | 37,933 | 270 | 253,617 | 28,279 | 270 |
| Jul-34 | 289,171 | 32,175 | 271 | 342,128 | 37,989 | 271 | 253,867 | 28,300 | 271 |
| Aug-34 | 290,062 | 32,206 | 271 | 343,553 | 38,038 | 271 | 254,401 | 28,318 | 271 |
| Sep-34 | 290,745 | 32,274 | 271 | 344,646 | 38,146 | 271 | 254,811 | 28,359 | 271 |
| Oct-34 | 291,301 | 32,311 | 271 | 345,535 | 38,206 | 271 | 255,144 | 28,381 | 271 |
| Nov-34 | 292,223 | 32,360 | 271 | 347,011 | 38,284 | 271 | 255,698 | 28,410 | 271 |
| Dec-34 | 293,328 | 32,399 | 271 | 348,778 | 38,346 | 271 | 256,361 | 28,434 | 271 |
| Jan-35 | 292,617 | 32,321 | 273 | 347,642 | 38,221 | 273 | 255,934 | 28,387 | 273 |
| Feb-35 | 292,602 | 32,357 | 272 | 347,618 | 38,280 | 272 | 255,925 | 28,409 | 272 |
| Mar-35 | 292,773 | 32,397 | 272 | 347,890 | 38,343 | 272 | 256,028 | 28,433 | 272 |
| Apr-35 | 292,540 | 32,443 | 272 | 347,517 | 38,418 | 272 | 255,888 | 28,460 | 272 |
| May-35 | 292,834 | 32,481 | 272 | 347,989 | 38,479 | 272 | 256,064 | 28,483 | 272 |
| Jun-35 | 292,681 | 32,567 | 272 | 347,744 | 38,616 | 272 | 255,973 | 28,535 | 272 |
| Jul-35 | 293,103 | 32,603 | 273 | 348,418 | 38,673 | 273 | 256,226 | 28,556 | 273 |
| Aug-35 | 294,005 | 32,634 | 273 | 349,863 | 38,723 | 273 | 256,767 | 28,575 | 273 |
| Sep-35 | 294,698 | 32,702 | 273 | 350,971 | 38,832 | 273 | 257,183 | 28,616 | 273 |
| Oct-35 | 295,261 | 32,740 | 273 | 351,872 | 38,893 | 273 | 257,521 | 28,639 | 273 |
| Nov-35 | 296,196 | 32,789 | 273 | 353,368 | 38,971 | 273 | 258,082 | 28,668 | 273 |
| Dec-35 | 297,316 | 32,829 | 273 | 355,160 | 39,034 | 273 | 258,754 | 28,692 | 273 |

# APPENDIX 3.2 II CUSTOMER FORECASTS BY REGION MEDFORD

| | Oregon - Expected Growth | | | Oregon - High Growth | | | Oregon - Low Growth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Residential Medford Customers | Commercial Medford Customers | Industrial Medford Customers | Residential Medford Customers | Commercial Medford Customers | Industrial Medford Customers | Residential Medford Customers | Commercia l Medford Customers | Industrial Medford Customers |
| Jan-12 | 51,338 | 6,544 | 15 | 51,762 | 6,581 | 15 | 51,056 | 6,520 | 15 |
| Feb-12 | 51,254 | 6,553 | 15 | 51,627 | 6,595 | 15 | 51,005 | 6,525 | 15 |
| Mar-12 | 51,297 | 6,489 | 15 | 51,696 | 6,493 | 15 | 51,031 | 6,487 | 15 |
| Apr-12 | 51,214 | 6,510 | 15 | 51,563 | 6,526 | 15 | 50,981 | 6,499 | 15 |
| May-12 | 51,264 | 6,505 | 18 | 51,643 | 6,518 | 18 | 51,011 | 6,496 | 18 |
| Jun-12 | 51,177 | 6,500 | 15 | 51,504 | 6,510 | 15 | 50,959 | 6,493 | 15 |
| Jul-12 | 51,096 | 6,494 | 15 | 51,374 | 6,501 | 15 | 50,910 | 6,490 | 15 |
| Aug-12 | 51,095 | 6,492 | 15 | 51,373 | 6,497 | 15 | 50,910 | 6,488 | 15 |
| Sep-12 | 51,027 | 6,502 | 15 | 51,264 | 6,513 | 15 | 50,869 | 6,494 | 15 |
| Oct-12 | 51,232 | 6,513 | 15 | 51,592 | 6,531 | 15 | 50,992 | 6,501 | 15 |
| Nov-12 | 51,508 | 6,527 | 15 | 52,034 | 6,553 | 15 | 51,158 | 6,509 | 15 |
| Dec-12 | 51,884 | 6,531 | 15 | 52,635 | 6,560 | 15 | 51,383 | 6,512 | 15 |
| Jan-13 | 52,038 | 6,594 | 15 | 52,882 | 6,661 | 15 | 51,476 | 6,550 | 15 |
| Feb-13 | 51,954 | 6,603 | 15 | 52,747 | 6,675 | 15 | 51,425 | 6,555 | 15 |
| Mar-13 | 51,997 | 6,539 | 15 | 52,816 | 6,573 | 15 | 51,451 | 6,517 | 15 |
| Apr-13 | 52,014 | 6,560 | 15 | 52,843 | 6,606 | 15 | 51,461 | 6,529 | 15 |
| May-13 | 52,064 | 6,555 | 18 | 52,923 | 6,598 | 18 | 51,491 | 6,526 | 18 |
| Jun-13 | 52,077 | 6,550 | 15 | 52,944 | 6,590 | 15 | 51,499 | 6,523 | 15 |
| Jul-13 | 51,996 | 6,544 | 15 | 52,814 | 6,581 | 15 | 51,450 | 6,520 | 15 |
| Aug-13 | 52,095 | 6,542 | 15 | 52,973 | 6,577 | 15 | 51,510 | 6,518 | 15 |
| Sep-13 | 52,027 | 6,552 | 15 | 52,864 | 6,593 | 15 | 51,469 | 6,524 | 15 |
| Oct-13 | 52,332 | 6,563 | 15 | 53,352 | 6,611 | 15 | 51,652 | 6,531 | 15 |
| Nov-13 | 52,608 | 6,577 | 15 | 53,794 | 6,633 | 15 | 51,818 | 6,539 | 15 |
| Dec-13 | 52,984 | 6,581 | 15 | 54,395 | 6,640 | 15 | 52,043 | 6,542 | 15 |
| Jan-14 | 53,138 | 6,674 | 15 | 54,642 | 6,789 | 15 | 52,136 | 6,598 | 15 |
| Feb-14 | 53,054 | 6,683 | 15 | 54,507 | 6,803 | 15 | 52,085 | 6,603 | 15 |
| Mar-14 | 53,197 | 6,619 | 15 | 54,736 | 6,701 | 15 | 52,171 | 6,565 | 15 |
| Apr-14 | 53,214 | 6,640 | 15 | 54,763 | 6,734 | 15 | 52,181 | 6,577 | 15 |
| May-14 | 53,364 | 6,635 | 18 | 55,003 | 6,726 | 18 | 52,271 | 6,574 | 18 |
| Jun-14 | 53,377 | 6,630 | 15 | 55,024 | 6,718 | 15 | 52,279 | 6,571 | 15 |
| Jul-14 | 53,296 | 6,624 | 15 | 54,894 | 6,709 | 15 | 52,230 | 6,568 | 15 |
| Aug-14 | 53,395 | 6,622 | 15 | 55,053 | 6,705 | 15 | 52,290 | 6,566 | 15 |
| Sep-14 | 53,327 | 6,632 | 15 | 54,944 | 6,721 | 15 | 52,249 | 6,572 | 15 |
| Oct-14 | 53,632 | 6,643 | 15 | 55,432 | 6,739 | 15 | 52,432 | 6,579 | 15 |
| Nov-14 | 53,908 | 6,657 | 15 | 55,874 | 6,761 | 15 | 52,598 | 6,587 | 15 |
| Dec-14 | 54,284 | 6,661 | 15 | 56,475 | 6,768 | 15 | 52,823 | 6,590 | 15 |
| Jan-15 | 54,438 | 6,794 | 16 | 56,722 | 6,981 | 16 | 52,916 | 6,670 | 16 |
| Feb-15 | 54,354 | 6,803 | 16 | 56,587 | 6,995 | 16 | 52,865 | 6,675 | 16 |
| Mar-15 | 54,497 | 6,739 | 16 | 56,816 | 6,893 | 16 | 52,951 | 6,637 | 16 |
| Apr-15 | 54,514 | 6,760 | 16 | 56,843 | 6,926 | 16 | 52,961 | 6,649 | 16 |
| May-15 | 54,664 | 6,755 | 19 | 57,083 | 6,918 | 19 | 53,051 | 6,646 | 19 |
| Jun-15 | 54,677 | 6,750 | 16 | 57,104 | 6,910 | 16 | 53,059 | 6,643 | 16 |
| Jul-15 | 54,596 | 6,744 | 16 | 56,974 | 6,901 | 16 | 53,010 | 6,640 | 16 |
| Aug-15 | 54,695 | 6,742 | 16 | 57,133 | 6,897 | 16 | 53,070 | 6,638 | 16 |
| Sep-15 | 54,627 | 6,752 | 16 | 57,024 | 6,913 | 16 | 53,029 | 6,644 | 16 |
| Oct-15 | 54,932 | 6,763 | 16 | 57,512 | 6,931 | 16 | 53,212 | 6,651 | 16 |
| Nov-15 | 55,208 | 6,777 | 16 | 57,954 | 6,953 | 16 | 53,378 | 6,659 | 16 |
| Dec-15 | 55,584 | 6,781 | 16 | 58,555 | 6,960 | 16 | 53,603 | 6,662 | 16 |
| Jan-16 | 55,726 | 6,917 | 16 | 58,782 | 7,177 | 16 | 53,688 | 6,743 | 16 |

# APPENDIX 3.2 ‖ CUSTOMER FORECASTS BY REGION
# MEDFORD

| | Oregon - Expected Growth | | | Oregon - High Growth | | | Oregon - Low Growth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Residential Medford Customers | Commercial Medford Customers | Industrial Medford Customers | Residential Medford Customers | Commercial Medford Customers | Industrial Medford Customers | Residential Medford Customers | Commercia l Medford Customers | Industrial Medford Customers |
| Feb-16 | 55,640 | 6,926 | 16 | 58,644 | 7,192 | 16 | 53,637 | 6,749 | 16 |
| Mar-16 | 55,786 | 6,861 | 16 | 58,879 | 7,088 | 16 | 53,724 | 6,710 | 16 |
| Apr-16 | 55,803 | 6,882 | 16 | 58,906 | 7,122 | 16 | 53,735 | 6,723 | 16 |
| May-16 | 55,957 | 6,877 | 19 | 59,152 | 7,114 | 19 | 53,827 | 6,720 | 19 |
| Jun-16 | 55,970 | 6,872 | 16 | 59,173 | 7,106 | 16 | 53,835 | 6,717 | 16 |
| Jul-16 | 55,887 | 6,866 | 16 | 59,041 | 7,096 | 16 | 53,785 | 6,713 | 16 |
| Aug-16 | 55,989 | 6,864 | 16 | 59,203 | 7,093 | 16 | 53,846 | 6,712 | 16 |
| Sep-16 | 55,919 | 6,874 | 16 | 59,091 | 7,109 | 16 | 53,804 | 6,718 | 16 |
| Oct-16 | 56,231 | 6,885 | 16 | 59,591 | 7,127 | 16 | 53,992 | 6,724 | 16 |
| Nov-16 | 56,514 | 6,900 | 16 | 60,043 | 7,150 | 16 | 54,161 | 6,733 | 16 |
| Dec-16 | 56,899 | 6,904 | 16 | 60,659 | 7,156 | 16 | 54,392 | 6,735 | 16 |
| Jan-17 | 57,018 | 7,041 | 17 | 60,850 | 7,375 | 17 | 54,464 | 6,818 | 17 |
| Feb-17 | 56,930 | 7,050 | 17 | 60,710 | 7,390 | 17 | 54,411 | 6,823 | 17 |
| Mar-17 | 57,080 | 6,984 | 17 | 60,949 | 7,284 | 17 | 54,501 | 6,783 | 17 |
| Apr-17 | 57,098 | 7,005 | 17 | 60,978 | 7,319 | 17 | 54,512 | 6,796 | 17 |
| May-17 | 57,255 | 7,000 | 20 | 61,229 | 7,310 | 20 | 54,606 | 6,793 | 20 |
| Jun-17 | 57,269 | 6,995 | 17 | 61,251 | 7,302 | 17 | 54,614 | 6,790 | 17 |
| Jul-17 | 57,184 | 6,989 | 17 | 61,115 | 7,292 | 17 | 54,563 | 6,786 | 17 |
| Aug-17 | 57,288 | 6,987 | 17 | 61,281 | 7,289 | 17 | 54,625 | 6,785 | 17 |
| Sep-17 | 57,216 | 6,997 | 17 | 61,167 | 7,305 | 17 | 54,583 | 6,791 | 17 |
| Oct-17 | 57,536 | 7,008 | 17 | 61,678 | 7,324 | 17 | 54,774 | 6,798 | 17 |
| Nov-17 | 57,825 | 7,023 | 17 | 62,141 | 7,347 | 17 | 54,948 | 6,807 | 17 |
| Dec-17 | 58,219 | 7,027 | 17 | 62,771 | 7,354 | 17 | 55,184 | 6,809 | 17 |
| Jan-18 | 58,301 | 7,163 | 17 | 62,903 | 7,571 | 17 | 55,234 | 6,891 | 17 |
| Feb-18 | 58,211 | 7,173 | 17 | 62,759 | 7,586 | 17 | 55,180 | 6,897 | 17 |
| Mar-18 | 58,365 | 7,105 | 17 | 63,004 | 7,478 | 17 | 55,272 | 6,856 | 17 |
| Apr-18 | 58,383 | 7,127 | 17 | 63,033 | 7,514 | 17 | 55,282 | 6,870 | 17 |
| May-18 | 58,543 | 7,122 | 20 | 63,290 | 7,505 | 20 | 55,379 | 6,866 | 20 |
| Jun-18 | 58,557 | 7,117 | 17 | 63,312 | 7,497 | 17 | 55,387 | 6,863 | 17 |
| Jul-18 | 58,471 | 7,110 | 17 | 63,174 | 7,487 | 17 | 55,335 | 6,859 | 17 |
| Aug-18 | 58,577 | 7,108 | 17 | 63,343 | 7,484 | 17 | 55,399 | 6,858 | 17 |
| Sep-18 | 58,504 | 7,119 | 17 | 63,227 | 7,500 | 17 | 55,355 | 6,865 | 17 |
| Oct-18 | 58,830 | 7,130 | 17 | 63,749 | 7,519 | 17 | 55,551 | 6,871 | 17 |
| Nov-18 | 59,126 | 7,145 | 17 | 64,222 | 7,543 | 17 | 55,728 | 6,880 | 17 |
| Dec-18 | 59,529 | 7,149 | 17 | 64,867 | 7,549 | 17 | 55,970 | 6,883 | 17 |
| Jan-19 | 59,560 | 7,283 | 17 | 64,917 | 7,764 | 17 | 55,989 | 6,963 | 17 |
| Feb-19 | 59,469 | 7,293 | 17 | 64,770 | 7,779 | 17 | 55,934 | 6,969 | 17 |
| Mar-19 | 59,625 | 7,224 | 17 | 65,021 | 7,669 | 17 | 56,028 | 6,928 | 17 |
| Apr-19 | 59,644 | 7,247 | 17 | 65,051 | 7,705 | 17 | 56,039 | 6,941 | 17 |
| May-19 | 59,808 | 7,242 | 20 | 65,313 | 7,697 | 20 | 56,137 | 6,938 | 20 |
| Jun-19 | 59,822 | 7,236 | 17 | 65,336 | 7,688 | 17 | 56,146 | 6,935 | 17 |
| Jul-19 | 59,733 | 7,230 | 17 | 65,194 | 7,678 | 17 | 56,093 | 6,931 | 17 |
| Aug-19 | 59,842 | 7,228 | 17 | 65,367 | 7,675 | 17 | 56,158 | 6,930 | 17 |
| Sep-19 | 59,767 | 7,238 | 17 | 65,248 | 7,692 | 17 | 56,113 | 6,936 | 17 |
| Oct-19 | 60,101 | 7,250 | 17 | 65,782 | 7,711 | 17 | 56,313 | 6,943 | 17 |
| Nov-19 | 60,403 | 7,265 | 17 | 66,265 | 7,735 | 17 | 56,495 | 6,952 | 17 |
| Dec-19 | 60,814 | 7,270 | 17 | 66,924 | 7,741 | 17 | 56,741 | 6,955 | 17 |
| Jan-20 | 60,811 | 7,403 | 17 | 66,918 | 7,955 | 17 | 56,739 | 7,035 | 17 |
| Feb-20 | 60,717 | 7,413 | 17 | 66,768 | 7,971 | 17 | 56,683 | 7,041 | 17 |

# APPENDIX 3.2 II CUSTOMER FORECASTS BY REGION MEDFORD

| | Oregon - Expected Growth | | | Oregon - High Growth | | | Oregon - Low Growth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Residential Medford Customers | Commercial Medford Customers | Industrial Medford Customers | Residential Medford Customers | Commercial Medford Customers | Industrial Medford Customers | Residential Medford Customers | Commercia l Medford Customers | Industrial Medford Customers |
| Mar-20 | 60,876 | 7,343 | 17 | 67,023 | 7,859 | 17 | 56,779 | 6,999 | 17 |
| Apr-20 | 60,895 | 7,366 | 17 | 67,054 | 7,896 | 17 | 56,790 | 7,013 | 17 |
| May-20 | 61,063 | 7,360 | 21 | 67,322 | 7,887 | 21 | 56,891 | 7,009 | 21 |
| Jun-20 | 61,078 | 7,355 | 17 | 67,345 | 7,878 | 17 | 56,899 | 7,006 | 17 |
| Jul-20 | 60,987 | 7,348 | 17 | 67,200 | 7,868 | 17 | 56,845 | 7,002 | 17 |
| Aug-20 | 61,098 | 7,346 | 17 | 67,377 | 7,864 | 17 | 56,911 | 7,001 | 17 |
| Sep-20 | 61,022 | 7,357 | 17 | 67,255 | 7,882 | 17 | 56,866 | 7,007 | 17 |
| Oct-20 | 61,362 | 7,369 | 17 | 67,801 | 7,901 | 17 | 57,070 | 7,015 | 17 |
| Nov-20 | 61,671 | 7,384 | 17 | 68,294 | 7,925 | 17 | 57,255 | 7,024 | 17 |
| Dec-20 | 62,091 | 7,389 | 17 | 68,966 | 7,932 | 17 | 57,507 | 7,026 | 17 |
| Jan-21 | 62,039 | 7,520 | 18 | 68,883 | 8,143 | 18 | 57,476 | 7,105 | 18 |
| Feb-21 | 61,943 | 7,530 | 18 | 68,730 | 8,159 | 18 | 57,419 | 7,111 | 18 |
| Mar-21 | 62,106 | 7,459 | 18 | 68,990 | 8,045 | 18 | 57,516 | 7,069 | 18 |
| Apr-21 | 62,125 | 7,483 | 18 | 69,021 | 8,082 | 18 | 57,528 | 7,083 | 18 |
| May-21 | 62,296 | 7,477 | 21 | 69,295 | 8,074 | 21 | 57,631 | 7,079 | 21 |
| Jun-21 | 62,311 | 7,472 | 18 | 69,319 | 8,065 | 18 | 57,639 | 7,076 | 18 |
| Jul-21 | 62,219 | 7,465 | 18 | 69,171 | 8,054 | 18 | 57,584 | 7,072 | 18 |
| Aug-21 | 62,332 | 7,463 | 18 | 69,351 | 8,051 | 18 | 57,652 | 7,071 | 18 |
| Sep-21 | 62,254 | 7,474 | 18 | 69,227 | 8,068 | 18 | 57,605 | 7,077 | 18 |
| Oct-21 | 62,602 | 7,486 | 18 | 69,783 | 8,088 | 18 | 57,814 | 7,085 | 18 |
| Nov-21 | 62,916 | 7,501 | 18 | 70,287 | 8,112 | 18 | 58,003 | 7,094 | 18 |
| Dec-21 | 63,345 | 7,506 | 18 | 70,972 | 8,120 | 18 | 58,260 | 7,097 | 18 |
| Jan-22 | 63,266 | 7,638 | 18 | 70,847 | 8,330 | 18 | 58,213 | 7,176 | 18 |
| Feb-22 | 63,169 | 7,648 | 18 | 70,691 | 8,346 | 18 | 58,154 | 7,182 | 18 |
| Mar-22 | 63,335 | 7,576 | 18 | 70,957 | 8,231 | 18 | 58,254 | 7,139 | 18 |
| Apr-22 | 63,355 | 7,599 | 18 | 70,988 | 8,269 | 18 | 58,266 | 7,153 | 18 |
| May-22 | 63,529 | 7,594 | 21 | 71,267 | 8,260 | 21 | 58,370 | 7,149 | 21 |
| Jun-22 | 63,544 | 7,588 | 18 | 71,291 | 8,251 | 18 | 58,379 | 7,146 | 18 |
| Jul-22 | 63,450 | 7,581 | 18 | 71,141 | 8,240 | 18 | 58,323 | 7,142 | 18 |
| Aug-22 | 63,565 | 7,579 | 18 | 71,325 | 8,237 | 18 | 58,392 | 7,141 | 18 |
| Sep-22 | 63,486 | 7,590 | 18 | 71,198 | 8,255 | 18 | 58,344 | 7,147 | 18 |
| Oct-22 | 63,840 | 7,603 | 18 | 71,766 | 8,275 | 18 | 58,557 | 7,155 | 18 |
| Nov-22 | 64,161 | 7,618 | 18 | 72,279 | 8,300 | 18 | 58,750 | 7,164 | 18 |
| Dec-22 | 64,598 | 7,623 | 18 | 72,978 | 8,307 | 18 | 59,012 | 7,167 | 18 |
| Jan-23 | 64,526 | 7,758 | 18 | 72,863 | 8,523 | 18 | 58,968 | 7,248 | 18 |
| Feb-23 | 64,427 | 7,768 | 18 | 72,703 | 8,539 | 18 | 58,909 | 7,254 | 18 |
| Mar-23 | 64,596 | 7,695 | 18 | 72,974 | 8,422 | 18 | 59,010 | 7,210 | 18 |
| Apr-23 | 64,616 | 7,719 | 18 | 73,007 | 8,461 | 18 | 59,023 | 7,225 | 18 |
| May-23 | 64,794 | 7,713 | 22 | 73,291 | 8,452 | 22 | 59,129 | 7,221 | 22 |
| Jun-23 | 64,809 | 7,708 | 18 | 73,316 | 8,442 | 18 | 59,138 | 7,218 | 18 |
| Jul-23 | 64,713 | 7,701 | 18 | 73,162 | 8,432 | 18 | 59,081 | 7,214 | 18 |
| Aug-23 | 64,831 | 7,699 | 18 | 73,350 | 8,428 | 18 | 59,151 | 7,212 | 18 |
| Sep-23 | 64,750 | 7,710 | 18 | 73,221 | 8,446 | 18 | 59,103 | 7,219 | 18 |
| Oct-23 | 65,112 | 7,723 | 18 | 73,799 | 8,466 | 18 | 59,320 | 7,227 | 18 |
| Nov-23 | 65,439 | 7,739 | 18 | 74,323 | 8,492 | 18 | 59,516 | 7,236 | 18 |
| Dec-23 | 65,884 | 7,743 | 18 | 75,036 | 8,499 | 18 | 59,783 | 7,239 | 18 |
| Jan-24 | 65,782 | 7,878 | 19 | 74,872 | 8,715 | 19 | 59,722 | 7,320 | 19 |
| Feb-24 | 65,680 | 7,888 | 19 | 74,709 | 8,732 | 19 | 59,661 | 7,326 | 19 |
| Mar-24 | 65,853 | 7,814 | 19 | 74,986 | 8,613 | 19 | 59,765 | 7,282 | 19 |

# APPENDIX 3.2 ❚❚ CUSTOMER FORECASTS BY REGION
# MEDFORD

| | Oregon - Expected Growth | | | Oregon - High Growth | | | Oregon - Low Growth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Residential Medford Customers | Commercial Medford Customers | Industrial Medford Customers | Residential Medford Customers | Commercial Medford Customers | Industrial Medford Customers | Residential Medford Customers | Commercia l Medford Customers | Industrial Medford Customers |
| Apr-24 | 65,874 | 7,838 | 19 | 75,019 | 8,652 | 19 | 59,777 | 7,296 | 19 |
| May-24 | 66,055 | 7,833 | 22 | 75,309 | 8,642 | 22 | 59,886 | 7,293 | 22 |
| Jun-24 | 66,071 | 7,827 | 19 | 75,334 | 8,633 | 19 | 59,895 | 7,289 | 19 |
| Jul-24 | 65,973 | 7,820 | 19 | 75,177 | 8,622 | 19 | 59,836 | 7,285 | 19 |
| Aug-24 | 66,092 | 7,818 | 19 | 75,369 | 8,618 | 19 | 59,908 | 7,284 | 19 |
| Sep-24 | 66,010 | 7,829 | 19 | 75,237 | 8,637 | 19 | 59,859 | 7,291 | 19 |
| Oct-24 | 66,379 | 7,842 | 19 | 75,827 | 8,657 | 19 | 60,080 | 7,298 | 19 |
| Nov-24 | 66,712 | 7,858 | 19 | 76,360 | 8,683 | 19 | 60,280 | 7,308 | 19 |
| Dec-24 | 67,167 | 7,863 | 19 | 77,087 | 8,691 | 19 | 60,553 | 7,311 | 19 |
| Jan-25 | 67,057 | 8,000 | 19 | 76,913 | 8,910 | 19 | 60,487 | 7,393 | 19 |
| Feb-25 | 66,954 | 8,010 | 19 | 76,747 | 8,927 | 19 | 60,425 | 7,399 | 19 |
| Mar-25 | 67,130 | 7,935 | 19 | 77,029 | 8,806 | 19 | 60,531 | 7,354 | 19 |
| Apr-25 | 67,151 | 7,960 | 19 | 77,062 | 8,846 | 19 | 60,543 | 7,369 | 19 |
| May-25 | 67,336 | 7,954 | 22 | 77,358 | 8,836 | 22 | 60,654 | 7,366 | 22 |
| Jun-25 | 67,352 | 7,948 | 19 | 77,384 | 8,827 | 19 | 60,664 | 7,362 | 19 |
| Jul-25 | 67,252 | 7,941 | 19 | 77,224 | 8,816 | 19 | 60,604 | 7,358 | 19 |
| Aug-25 | 67,374 | 7,939 | 19 | 77,419 | 8,812 | 19 | 60,677 | 7,356 | 19 |
| Sep-25 | 67,290 | 7,950 | 19 | 77,285 | 8,831 | 19 | 60,627 | 7,363 | 19 |
| Oct-25 | 67,666 | 7,963 | 19 | 77,886 | 8,851 | 19 | 60,852 | 7,371 | 19 |
| Nov-25 | 68,006 | 7,980 | 19 | 78,430 | 8,878 | 19 | 61,056 | 7,381 | 19 |
| Dec-25 | 68,469 | 7,984 | 19 | 79,171 | 8,885 | 19 | 61,334 | 7,384 | 19 |
| Jan-26 | 68,329 | 8,121 | 19 | 78,947 | 9,104 | 19 | 61,250 | 7,466 | 19 |
| Feb-26 | 68,223 | 8,132 | 19 | 78,778 | 9,121 | 19 | 61,187 | 7,472 | 19 |
| Mar-26 | 68,403 | 8,056 | 19 | 79,065 | 8,999 | 19 | 61,295 | 7,427 | 19 |
| Apr-26 | 68,424 | 8,081 | 19 | 79,100 | 9,039 | 19 | 61,307 | 7,442 | 19 |
| May-26 | 68,613 | 8,075 | 23 | 79,401 | 9,030 | 23 | 61,420 | 7,438 | 23 |
| Jun-26 | 68,629 | 8,069 | 19 | 79,427 | 9,020 | 19 | 61,430 | 7,434 | 19 |
| Jul-26 | 68,527 | 8,062 | 19 | 79,264 | 9,009 | 19 | 61,369 | 7,430 | 19 |
| Aug-26 | 68,651 | 8,059 | 19 | 79,463 | 9,005 | 19 | 61,444 | 7,429 | 19 |
| Sep-26 | 68,566 | 8,071 | 19 | 79,327 | 9,024 | 19 | 61,392 | 7,436 | 19 |
| Oct-26 | 68,949 | 8,084 | 19 | 79,939 | 9,045 | 19 | 61,622 | 7,444 | 19 |
| Nov-26 | 69,295 | 8,101 | 19 | 80,493 | 9,072 | 19 | 61,830 | 7,454 | 19 |
| Dec-26 | 69,767 | 8,106 | 19 | 81,248 | 9,079 | 19 | 62,113 | 7,457 | 19 |
| Jan-27 | 69,561 | 8,239 | 20 | 80,918 | 9,293 | 20 | 61,989 | 7,537 | 20 |
| Feb-27 | 69,454 | 8,250 | 20 | 80,747 | 9,310 | 20 | 61,925 | 7,543 | 20 |
| Mar-27 | 69,636 | 8,172 | 20 | 81,039 | 9,186 | 20 | 62,035 | 7,497 | 20 |
| Apr-27 | 69,658 | 8,198 | 20 | 81,074 | 9,227 | 20 | 62,048 | 7,512 | 20 |
| May-27 | 69,850 | 8,192 | 23 | 81,380 | 9,217 | 23 | 62,163 | 7,508 | 23 |
| Jun-27 | 69,866 | 8,186 | 20 | 81,407 | 9,207 | 20 | 62,173 | 7,505 | 20 |
| Jul-27 | 69,763 | 8,178 | 20 | 81,241 | 9,196 | 20 | 62,111 | 7,500 | 20 |
| Aug-27 | 69,889 | 8,176 | 20 | 81,444 | 9,192 | 20 | 62,186 | 7,499 | 20 |
| Sep-27 | 69,803 | 8,188 | 20 | 81,305 | 9,211 | 20 | 62,134 | 7,506 | 20 |
| Oct-27 | 70,192 | 8,201 | 20 | 81,928 | 9,232 | 20 | 62,368 | 7,514 | 20 |
| Nov-27 | 70,545 | 8,218 | 20 | 82,493 | 9,260 | 20 | 62,580 | 7,524 | 20 |
| Dec-27 | 71,025 | 8,223 | 20 | 83,261 | 9,267 | 20 | 62,868 | 7,527 | 20 |
| Jan-28 | 70,738 | 8,351 | 20 | 82,801 | 9,472 | 20 | 62,695 | 7,604 | 20 |
| Feb-28 | 70,628 | 8,362 | 20 | 82,626 | 9,490 | 20 | 62,630 | 7,611 | 20 |
| Mar-28 | 70,814 | 8,284 | 20 | 82,924 | 9,364 | 20 | 62,741 | 7,563 | 20 |
| Apr-28 | 70,836 | 8,310 | 20 | 82,959 | 9,406 | 20 | 62,755 | 7,579 | 20 |

# APPENDIX 3.2 II CUSTOMER FORECASTS BY REGION
# MEDFORD

| | Oregon - Expected Growth | | | Oregon - High Growth | | | Oregon - Low Growth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Residential Medford Customers | Commercial Medford Customers | Industrial Medford Customers | Residential Medford Customers | Commercial Medford Customers | Industrial Medford Customers | Residential Medford Customers | Commercia l Medford Customers | Industrial Medford Customers |
| May-28 | 71,031 | 8,303 | 24 | 83,271 | 9,396 | 24 | 62,872 | 7,575 | 24 |
| Jun-28 | 71,048 | 8,297 | 20 | 83,298 | 9,386 | 20 | 62,882 | 7,572 | 20 |
| Jul-28 | 70,943 | 8,290 | 20 | 83,129 | 9,374 | 20 | 62,819 | 7,567 | 20 |
| Aug-28 | 71,072 | 8,288 | 20 | 83,335 | 9,370 | 20 | 62,896 | 7,566 | 20 |
| Sep-28 | 70,983 | 8,300 | 20 | 83,194 | 9,390 | 20 | 62,843 | 7,573 | 20 |
| Oct-28 | 71,379 | 8,313 | 20 | 83,828 | 9,412 | 20 | 63,080 | 7,581 | 20 |
| Nov-28 | 71,738 | 8,331 | 20 | 84,402 | 9,439 | 20 | 63,296 | 7,592 | 20 |
| Dec-28 | 72,227 | 8,335 | 20 | 85,183 | 9,447 | 20 | 63,589 | 7,594 | 20 |
| Jan-29 | 71,882 | 8,461 | 20 | 84,633 | 9,648 | 20 | 63,382 | 7,670 | 20 |
| Feb-29 | 71,772 | 8,472 | 20 | 84,455 | 9,665 | 20 | 63,316 | 7,676 | 20 |
| Mar-29 | 71,960 | 8,392 | 20 | 84,757 | 9,538 | 20 | 63,429 | 7,629 | 20 |
| Apr-29 | 71,983 | 8,418 | 20 | 84,793 | 9,580 | 20 | 63,443 | 7,644 | 20 |
| May-29 | 72,181 | 8,412 | 24 | 85,110 | 9,570 | 24 | 63,561 | 7,641 | 24 |
| Jun-29 | 72,198 | 8,406 | 20 | 85,138 | 9,560 | 20 | 63,572 | 7,637 | 20 |
| Jul-29 | 72,091 | 8,399 | 20 | 84,967 | 9,548 | 20 | 63,507 | 7,632 | 20 |
| Aug-29 | 72,222 | 8,396 | 20 | 85,176 | 9,544 | 20 | 63,586 | 7,631 | 20 |
| Sep-29 | 72,132 | 8,409 | 20 | 85,032 | 9,564 | 20 | 63,532 | 7,638 | 20 |
| Oct-29 | 72,535 | 8,422 | 20 | 85,676 | 9,586 | 20 | 63,774 | 7,647 | 20 |
| Nov-29 | 72,899 | 8,440 | 20 | 86,260 | 9,614 | 20 | 63,992 | 7,657 | 20 |
| Dec-29 | 73,396 | 8,445 | 20 | 87,054 | 9,622 | 20 | 64,290 | 7,660 | 20 |
| Jan-30 | 73,032 | 8,571 | 21 | 86,472 | 9,823 | 21 | 64,072 | 7,736 | 21 |
| Feb-30 | 72,919 | 8,582 | 21 | 86,291 | 9,841 | 21 | 64,004 | 7,742 | 21 |
| Mar-30 | 73,111 | 8,501 | 21 | 86,598 | 9,712 | 21 | 64,119 | 7,694 | 21 |
| Apr-30 | 73,134 | 8,528 | 21 | 86,635 | 9,755 | 21 | 64,133 | 7,710 | 21 |
| May-30 | 73,335 | 8,521 | 24 | 86,957 | 9,744 | 24 | 64,254 | 7,706 | 24 |
| Jun-30 | 73,352 | 8,515 | 21 | 86,985 | 9,734 | 21 | 64,264 | 7,702 | 21 |
| Jul-30 | 73,244 | 8,508 | 21 | 86,811 | 9,722 | 21 | 64,199 | 7,698 | 21 |
| Aug-30 | 73,377 | 8,505 | 21 | 87,023 | 9,718 | 21 | 64,279 | 7,696 | 21 |
| Sep-30 | 73,285 | 8,518 | 21 | 86,877 | 9,738 | 21 | 64,224 | 7,704 | 21 |
| Oct-30 | 73,694 | 8,532 | 21 | 87,532 | 9,761 | 21 | 64,469 | 7,712 | 21 |
| Nov-30 | 74,065 | 8,549 | 21 | 88,124 | 9,789 | 21 | 64,692 | 7,723 | 21 |
| Dec-30 | 74,569 | 8,554 | 21 | 88,931 | 9,797 | 21 | 64,994 | 7,726 | 21 |
| Jan-31 | 74,168 | 8,679 | 21 | 88,290 | 9,997 | 21 | 64,754 | 7,801 | 21 |
| Feb-31 | 74,054 | 8,691 | 21 | 88,106 | 10,015 | 21 | 64,685 | 7,808 | 21 |
| Mar-31 | 74,248 | 8,609 | 21 | 88,418 | 9,884 | 21 | 64,802 | 7,759 | 21 |
| Apr-31 | 74,272 | 8,636 | 21 | 88,455 | 9,927 | 21 | 64,816 | 7,775 | 21 |
| May-31 | 74,476 | 8,629 | 24 | 88,782 | 9,917 | 24 | 64,938 | 7,771 | 24 |
| Jun-31 | 74,494 | 8,623 | 21 | 88,811 | 9,907 | 21 | 64,949 | 7,767 | 21 |
| Jul-31 | 74,383 | 8,615 | 21 | 88,634 | 9,895 | 21 | 64,883 | 7,762 | 21 |
| Aug-31 | 74,518 | 8,613 | 21 | 88,850 | 9,891 | 21 | 64,964 | 7,761 | 21 |
| Sep-31 | 74,425 | 8,626 | 21 | 88,702 | 9,911 | 21 | 64,908 | 7,769 | 21 |
| Oct-31 | 74,841 | 8,640 | 21 | 89,366 | 9,934 | 21 | 65,157 | 7,777 | 21 |
| Nov-31 | 75,217 | 8,657 | 21 | 89,968 | 9,962 | 21 | 65,383 | 7,788 | 21 |
| Dec-31 | 75,729 | 8,663 | 21 | 90,788 | 9,970 | 21 | 65,690 | 7,791 | 21 |
| Jan-32 | 75,277 | 8,785 | 21 | 90,064 | 10,166 | 21 | 65,419 | 7,864 | 21 |
| Feb-32 | 75,161 | 8,797 | 21 | 89,878 | 10,185 | 21 | 65,349 | 7,871 | 21 |
| Mar-32 | 75,359 | 8,714 | 21 | 90,194 | 10,053 | 21 | 65,468 | 7,822 | 21 |
| Apr-32 | 75,382 | 8,741 | 21 | 90,232 | 10,096 | 21 | 65,482 | 7,838 | 21 |
| May-32 | 75,589 | 8,735 | 24 | 90,564 | 10,086 | 24 | 65,606 | 7,834 | 24 |

# APPENDIX 3.2 ⏸ CUSTOMER FORECASTS BY REGION
# MEDFORD

| | Oregon - Expected Growth | | | Oregon - High Growth | | | Oregon - Low Growth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Residential Medford Customers | Commercial Medford Customers | Industrial Medford Customers | Residential Medford Customers | Commercial Medford Customers | Industrial Medford Customers | Residential Medford Customers | Commercia l Medford Customers | Industrial Medford Customers |
| Jun-32 | 75,607 | 8,728 | 21 | 90,593 | 10,075 | 21 | 65,617 | 7,830 | 21 |
| Jul-32 | 75,495 | 8,721 | 21 | 90,414 | 10,063 | 21 | 65,550 | 7,826 | 21 |
| Aug-32 | 75,632 | 8,718 | 21 | 90,633 | 10,059 | 21 | 65,632 | 7,824 | 21 |
| Sep-32 | 75,538 | 8,731 | 21 | 90,482 | 10,080 | 21 | 65,576 | 7,832 | 21 |
| Oct-32 | 75,960 | 8,745 | 21 | 91,157 | 10,102 | 21 | 65,829 | 7,840 | 21 |
| Nov-32 | 76,342 | 8,763 | 21 | 91,768 | 10,131 | 21 | 66,058 | 7,851 | 21 |
| Dec-32 | 76,862 | 8,768 | 21 | 92,599 | 10,140 | 21 | 66,370 | 7,854 | 21 |
| Jan-33 | 76,373 | 8,890 | 21 | 91,818 | 10,334 | 21 | 66,077 | 7,927 | 21 |
| Feb-33 | 76,255 | 8,902 | 21 | 91,630 | 10,353 | 21 | 66,006 | 7,934 | 21 |
| Mar-33 | 76,456 | 8,818 | 21 | 91,951 | 10,219 | 21 | 66,126 | 7,884 | 21 |
| Apr-33 | 76,480 | 8,845 | 21 | 91,989 | 10,263 | 21 | 66,141 | 7,900 | 21 |
| May-33 | 76,690 | 8,839 | 24 | 92,325 | 10,252 | 24 | 66,267 | 7,897 | 24 |
| Jun-33 | 76,709 | 8,832 | 21 | 92,355 | 10,242 | 21 | 66,278 | 7,893 | 21 |
| Jul-33 | 76,595 | 8,824 | 21 | 92,173 | 10,229 | 21 | 66,210 | 7,888 | 21 |
| Aug-33 | 76,734 | 8,822 | 21 | 92,395 | 10,225 | 21 | 66,293 | 7,886 | 21 |
| Sep-33 | 76,638 | 8,835 | 21 | 92,242 | 10,246 | 21 | 66,236 | 7,894 | 21 |
| Oct-33 | 77,066 | 8,849 | 21 | 92,927 | 10,269 | 21 | 66,493 | 7,903 | 21 |
| Nov-33 | 77,454 | 8,868 | 21 | 93,547 | 10,298 | 21 | 66,725 | 7,914 | 21 |
| Dec-33 | 77,981 | 8,873 | 21 | 94,391 | 10,307 | 21 | 67,041 | 7,917 | 21 |
| Jan-34 | 77,475 | 8,995 | 21 | 93,580 | 10,502 | 21 | 66,738 | 7,990 | 21 |
| Feb-34 | 77,355 | 9,007 | 21 | 93,389 | 10,522 | 21 | 66,666 | 7,997 | 21 |
| Mar-34 | 77,559 | 8,922 | 21 | 93,715 | 10,386 | 21 | 66,788 | 7,947 | 21 |
| Apr-34 | 77,583 | 8,950 | 21 | 93,753 | 10,430 | 21 | 66,802 | 7,963 | 21 |
| May-34 | 77,796 | 8,944 | 24 | 94,095 | 10,420 | 24 | 66,931 | 7,959 | 24 |
| Jun-34 | 77,815 | 8,937 | 21 | 94,124 | 10,409 | 21 | 66,942 | 7,955 | 21 |
| Jul-34 | 77,700 | 8,929 | 21 | 93,940 | 10,397 | 21 | 66,873 | 7,951 | 21 |
| Aug-34 | 77,840 | 8,926 | 21 | 94,165 | 10,392 | 21 | 66,957 | 7,949 | 21 |
| Sep-34 | 77,744 | 8,940 | 21 | 94,011 | 10,413 | 21 | 66,899 | 7,957 | 21 |
| Oct-34 | 78,178 | 8,954 | 21 | 94,705 | 10,437 | 21 | 67,159 | 7,966 | 21 |
| Nov-34 | 78,570 | 8,973 | 21 | 95,334 | 10,466 | 21 | 67,395 | 7,977 | 21 |
| Dec-34 | 79,106 | 8,978 | 21 | 96,190 | 10,475 | 21 | 67,716 | 7,980 | 21 |
| Jan-35 | 78,583 | 9,101 | 21 | 95,354 | 10,672 | 21 | 67,403 | 8,054 | 21 |
| Feb-35 | 78,462 | 9,113 | 21 | 95,160 | 10,691 | 21 | 67,330 | 8,061 | 21 |
| Mar-35 | 78,668 | 9,027 | 21 | 95,490 | 10,554 | 21 | 67,454 | 8,010 | 21 |
| Apr-35 | 78,693 | 9,056 | 21 | 95,529 | 10,599 | 21 | 67,468 | 8,027 | 21 |
| May-35 | 78,909 | 9,049 | 24 | 95,875 | 10,588 | 24 | 67,598 | 8,022 | 24 |
| Jun-35 | 78,928 | 9,042 | 21 | 95,906 | 10,578 | 21 | 67,610 | 8,018 | 21 |
| Jul-35 | 78,811 | 9,034 | 21 | 95,718 | 10,565 | 21 | 67,539 | 8,014 | 21 |
| Aug-35 | 78,954 | 9,031 | 21 | 95,947 | 10,560 | 21 | 67,625 | 8,012 | 21 |
| Sep-35 | 78,856 | 9,045 | 21 | 95,790 | 10,582 | 21 | 67,566 | 8,020 | 21 |
| Oct-35 | 79,296 | 9,060 | 21 | 96,494 | 10,605 | 21 | 67,830 | 8,029 | 21 |
| Nov-35 | 79,694 | 9,078 | 21 | 97,132 | 10,635 | 21 | 68,069 | 8,040 | 21 |
| Dec-35 | 80,237 | 9,084 | 21 | 98,000 | 10,644 | 21 | 68,395 | 8,043 | 21 |

## APPENDIX 3.2 ׀׀ CUSTOMER FORECASTS BY REGION
## ROSEBURG

| | Oregon - Expected Growth | | | Oregon - High Growth | | | Oregon - Low Growth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Residential Roseburg Customers | Commercial Roseburg Customers | Industrial Roseburg Customers | Residential Roseburg Customers | Commercial Roseburg Customers | Industrial Roseburg Customers | Residential Roseburg Customers | Commercial Roseburg Customers | Industrial Roseburg Customers |
| Jan-12 | 13,266 | 2,150 | 3 | 13,405 | 2,161 | 3 | 13,173 | 2,143 | 3 |
| Feb-12 | 13,303 | 2,148 | 3 | 13,464 | 2,158 | 3 | 13,195 | 2,142 | 3 |
| Mar-12 | 13,294 | 2,158 | 3 | 13,450 | 2,174 | 3 | 13,190 | 2,148 | 3 |
| Apr-12 | 13,284 | 2,140 | 3 | 13,434 | 2,145 | 3 | 13,184 | 2,137 | 3 |
| May-12 | 13,258 | 2,141 | 3 | 13,392 | 2,146 | 3 | 13,168 | 2,137 | 3 |
| Jun-12 | 13,235 | 2,142 | 3 | 13,356 | 2,148 | 3 | 13,155 | 2,138 | 3 |
| Jul-12 | 13,176 | 2,145 | 3 | 13,261 | 2,153 | 3 | 13,119 | 2,140 | 3 |
| Aug-12 | 13,170 | 2,147 | 3 | 13,252 | 2,156 | 3 | 13,116 | 2,141 | 3 |
| Sep-12 | 13,155 | 2,151 | 3 | 13,228 | 2,162 | 3 | 13,107 | 2,143 | 3 |
| Oct-12 | 13,184 | 2,152 | 3 | 13,274 | 2,164 | 3 | 13,124 | 2,144 | 3 |
| Nov-12 | 13,291 | 2,152 | 3 | 13,445 | 2,164 | 3 | 13,188 | 2,144 | 3 |
| Dec-12 | 13,382 | 2,159 | 3 | 13,591 | 2,175 | 3 | 13,243 | 2,148 | 3 |
| Jan-13 | 13,416 | 2,175 | 3 | 13,645 | 2,201 | 3 | 13,263 | 2,158 | 3 |
| Feb-13 | 13,453 | 2,173 | 3 | 13,704 | 2,198 | 3 | 13,285 | 2,157 | 3 |
| Mar-13 | 13,469 | 2,183 | 3 | 13,730 | 2,214 | 3 | 13,295 | 2,163 | 3 |
| Apr-13 | 13,459 | 2,165 | 3 | 13,714 | 2,185 | 3 | 13,289 | 2,152 | 3 |
| May-13 | 13,458 | 2,166 | 3 | 13,712 | 2,186 | 3 | 13,288 | 2,152 | 3 |
| Jun-13 | 13,485 | 2,167 | 3 | 13,756 | 2,188 | 3 | 13,305 | 2,153 | 3 |
| Jul-13 | 13,426 | 2,170 | 3 | 13,661 | 2,193 | 3 | 13,269 | 2,155 | 3 |
| Aug-13 | 13,420 | 2,172 | 3 | 13,652 | 2,196 | 3 | 13,266 | 2,156 | 3 |
| Sep-13 | 13,430 | 2,176 | 3 | 13,668 | 2,202 | 3 | 13,272 | 2,158 | 3 |
| Oct-13 | 13,459 | 2,177 | 3 | 13,714 | 2,204 | 3 | 13,289 | 2,159 | 3 |
| Nov-13 | 13,566 | 2,177 | 3 | 13,885 | 2,204 | 3 | 13,353 | 2,159 | 3 |
| Dec-13 | 13,657 | 2,184 | 3 | 14,031 | 2,215 | 3 | 13,408 | 2,163 | 3 |
| Jan-14 | 13,716 | 2,205 | 3 | 14,125 | 2,249 | 3 | 13,443 | 2,176 | 3 |
| Feb-14 | 13,753 | 2,203 | 3 | 14,184 | 2,246 | 3 | 13,465 | 2,175 | 3 |
| Mar-14 | 13,769 | 2,213 | 3 | 14,210 | 2,262 | 3 | 13,475 | 2,181 | 3 |
| Apr-14 | 13,759 | 2,195 | 3 | 14,194 | 2,233 | 3 | 13,469 | 2,170 | 3 |
| May-14 | 13,758 | 2,196 | 3 | 14,192 | 2,234 | 3 | 13,468 | 2,170 | 3 |
| Jun-14 | 13,785 | 2,197 | 3 | 14,236 | 2,236 | 3 | 13,485 | 2,171 | 3 |
| Jul-14 | 13,726 | 2,200 | 3 | 14,141 | 2,241 | 3 | 13,449 | 2,173 | 3 |
| Aug-14 | 13,720 | 2,202 | 3 | 14,132 | 2,244 | 3 | 13,446 | 2,174 | 3 |
| Sep-14 | 13,730 | 2,206 | 3 | 14,148 | 2,250 | 3 | 13,452 | 2,176 | 3 |
| Oct-14 | 13,759 | 2,207 | 3 | 14,194 | 2,252 | 3 | 13,469 | 2,177 | 3 |
| Nov-14 | 13,866 | 2,207 | 3 | 14,365 | 2,252 | 3 | 13,533 | 2,177 | 3 |
| Dec-14 | 13,957 | 2,214 | 3 | 14,511 | 2,263 | 3 | 13,588 | 2,181 | 3 |
| Jan-15 | 14,041 | 2,235 | 3 | 14,645 | 2,297 | 3 | 13,638 | 2,194 | 3 |
| Feb-15 | 14,078 | 2,233 | 3 | 14,704 | 2,294 | 3 | 13,660 | 2,193 | 3 |
| Mar-15 | 14,094 | 2,243 | 3 | 14,730 | 2,310 | 3 | 13,670 | 2,199 | 3 |
| Apr-15 | 14,084 | 2,225 | 3 | 14,714 | 2,281 | 3 | 13,664 | 2,188 | 3 |
| May-15 | 14,083 | 2,226 | 3 | 14,712 | 2,282 | 3 | 13,663 | 2,188 | 3 |
| Jun-15 | 14,110 | 2,227 | 3 | 14,756 | 2,284 | 3 | 13,680 | 2,189 | 3 |
| Jul-15 | 14,051 | 2,230 | 3 | 14,661 | 2,289 | 3 | 13,644 | 2,191 | 3 |
| Aug-15 | 14,045 | 2,232 | 3 | 14,652 | 2,292 | 3 | 13,641 | 2,192 | 3 |
| Sep-15 | 14,055 | 2,236 | 3 | 14,668 | 2,298 | 3 | 13,647 | 2,194 | 3 |
| Oct-15 | 14,084 | 2,237 | 3 | 14,714 | 2,300 | 3 | 13,664 | 2,195 | 3 |
| Nov-15 | 14,191 | 2,237 | 3 | 14,885 | 2,300 | 3 | 13,728 | 2,195 | 3 |
| Dec-15 | 14,282 | 2,244 | 3 | 15,031 | 2,311 | 3 | 13,783 | 2,199 | 3 |
| Jan-16 | 14,373 | 2,260 | 3 | 15,177 | 2,336 | 3 | 13,838 | 2,209 | 3 |

# APPENDIX 3.2 ‖ CUSTOMER FORECASTS BY REGION
# ROSEBURG

| | Oregon - Expected Growth | | | Oregon - High Growth | | | Oregon - Low Growth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Roseburg | Roseburg | Roseburg | Roseburg | Roseburg | Roseburg | Roseburg | Roseburg | Roseburg |
| Feb-16 | 14,411 | 2,258 | 3 | 15,238 | 2,333 | 3 | 13,860 | 2,207 | 3 |
| Mar-16 | 14,428 | 2,268 | 3 | 15,264 | 2,349 | 3 | 13,870 | 2,213 | 3 |
| Apr-16 | 14,417 | 2,250 | 3 | 15,247 | 2,320 | 3 | 13,864 | 2,203 | 3 |
| May-16 | 14,416 | 2,251 | 3 | 15,246 | 2,322 | 3 | 13,863 | 2,203 | 3 |
| Jun-16 | 14,444 | 2,252 | 3 | 15,290 | 2,323 | 3 | 13,880 | 2,204 | 3 |
| Jul-16 | 14,384 | 2,255 | 3 | 15,193 | 2,328 | 3 | 13,844 | 2,206 | 3 |
| Aug-16 | 14,377 | 2,257 | 3 | 15,183 | 2,331 | 3 | 13,840 | 2,207 | 3 |
| Sep-16 | 14,388 | 2,261 | 3 | 15,200 | 2,338 | 3 | 13,846 | 2,209 | 3 |
| Oct-16 | 14,417 | 2,262 | 3 | 15,247 | 2,340 | 3 | 13,864 | 2,210 | 3 |
| Nov-16 | 14,527 | 2,262 | 3 | 15,423 | 2,340 | 3 | 13,930 | 2,210 | 3 |
| Dec-16 | 14,620 | 2,269 | 3 | 15,572 | 2,351 | 3 | 13,986 | 2,214 | 3 |
| Jan-17 | 14,683 | 2,283 | 3 | 15,673 | 2,373 | 3 | 14,023 | 2,222 | 3 |
| Feb-17 | 14,722 | 2,281 | 3 | 15,735 | 2,370 | 3 | 14,047 | 2,221 | 3 |
| Mar-17 | 14,739 | 2,291 | 3 | 15,761 | 2,386 | 3 | 14,057 | 2,227 | 3 |
| Apr-17 | 14,728 | 2,273 | 3 | 15,745 | 2,357 | 3 | 14,050 | 2,216 | 3 |
| May-17 | 14,727 | 2,274 | 3 | 15,743 | 2,358 | 3 | 14,050 | 2,217 | 3 |
| Jun-17 | 14,755 | 2,275 | 3 | 15,788 | 2,360 | 3 | 14,067 | 2,218 | 3 |
| Jul-17 | 14,694 | 2,278 | 3 | 15,689 | 2,365 | 3 | 14,030 | 2,219 | 3 |
| Aug-17 | 14,687 | 2,280 | 3 | 15,679 | 2,368 | 3 | 14,026 | 2,221 | 3 |
| Sep-17 | 14,698 | 2,284 | 3 | 15,696 | 2,375 | 3 | 14,032 | 2,223 | 3 |
| Oct-17 | 14,728 | 2,285 | 3 | 15,745 | 2,376 | 3 | 14,050 | 2,224 | 3 |
| Nov-17 | 14,840 | 2,285 | 3 | 15,924 | 2,376 | 3 | 14,118 | 2,224 | 3 |
| Dec-17 | 14,935 | 2,292 | 3 | 16,076 | 2,388 | 3 | 14,175 | 2,228 | 3 |
| Jan-18 | 14,971 | 2,304 | 3 | 16,133 | 2,407 | 3 | 14,196 | 2,235 | 3 |
| Feb-18 | 15,010 | 2,302 | 3 | 16,196 | 2,404 | 3 | 14,220 | 2,234 | 3 |
| Mar-18 | 15,027 | 2,312 | 3 | 16,224 | 2,421 | 3 | 14,230 | 2,240 | 3 |
| Apr-18 | 15,017 | 2,294 | 3 | 16,206 | 2,391 | 3 | 14,224 | 2,229 | 3 |
| May-18 | 15,016 | 2,295 | 3 | 16,205 | 2,393 | 3 | 14,223 | 2,230 | 3 |
| Jun-18 | 15,045 | 2,296 | 3 | 16,251 | 2,394 | 3 | 14,240 | 2,230 | 3 |
| Jul-18 | 14,982 | 2,299 | 3 | 16,150 | 2,399 | 3 | 14,203 | 2,232 | 3 |
| Aug-18 | 14,975 | 2,301 | 3 | 16,140 | 2,402 | 3 | 14,199 | 2,233 | 3 |
| Sep-18 | 14,986 | 2,305 | 3 | 16,157 | 2,409 | 3 | 14,205 | 2,236 | 3 |
| Oct-18 | 15,017 | 2,306 | 3 | 16,206 | 2,411 | 3 | 14,224 | 2,237 | 3 |
| Nov-18 | 15,131 | 2,306 | 3 | 16,389 | 2,411 | 3 | 14,292 | 2,237 | 3 |
| Dec-18 | 15,228 | 2,313 | 3 | 16,544 | 2,422 | 3 | 14,350 | 2,241 | 3 |
| Jan-19 | 15,259 | 2,326 | 3 | 16,594 | 2,442 | 3 | 14,369 | 2,248 | 3 |
| Feb-19 | 15,299 | 2,323 | 3 | 16,658 | 2,438 | 3 | 14,393 | 2,247 | 3 |
| Mar-19 | 15,317 | 2,334 | 3 | 16,686 | 2,455 | 3 | 14,404 | 2,253 | 3 |
| Apr-19 | 15,306 | 2,315 | 3 | 16,669 | 2,425 | 3 | 14,397 | 2,242 | 3 |
| May-19 | 15,305 | 2,316 | 3 | 16,667 | 2,427 | 3 | 14,396 | 2,243 | 3 |
| Jun-19 | 15,334 | 2,317 | 3 | 16,714 | 2,428 | 3 | 14,414 | 2,243 | 3 |
| Jul-19 | 15,270 | 2,320 | 3 | 16,611 | 2,433 | 3 | 14,376 | 2,245 | 3 |
| Aug-19 | 15,263 | 2,322 | 3 | 16,601 | 2,437 | 3 | 14,372 | 2,246 | 3 |
| Sep-19 | 15,274 | 2,327 | 3 | 16,618 | 2,443 | 3 | 14,378 | 2,249 | 3 |
| Oct-19 | 15,306 | 2,328 | 3 | 16,669 | 2,445 | 3 | 14,397 | 2,249 | 3 |
| Nov-19 | 15,422 | 2,328 | 3 | 16,855 | 2,445 | 3 | 14,467 | 2,249 | 3 |
| Dec-19 | 15,521 | 2,335 | 3 | 17,013 | 2,457 | 3 | 14,526 | 2,254 | 3 |
| Jan-20 | 15,549 | 2,347 | 3 | 17,058 | 2,476 | 3 | 14,543 | 2,261 | 3 |
| Feb-20 | 15,590 | 2,345 | 3 | 17,124 | 2,473 | 3 | 14,568 | 2,260 | 3 |
| Mar-20 | 15,608 | 2,356 | 3 | 17,152 | 2,490 | 3 | 14,578 | 2,266 | 3 |

# APPENDIX 3.2 II CUSTOMER FORECASTS BY REGION
# ROSEBURG

| | Oregon - Expected Growth | | | Oregon - High Growth | | | Oregon - Low Growth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Residential Roseburg Customers | Commercial Roseburg Customers | Industrial Roseburg Customers | Residential Roseburg Customers | Commercial Roseburg Customers | Industrial Roseburg Customers | Residential Roseburg Customers | Commercial Roseburg Customers | Industrial Roseburg Customers |
| Apr-20 | 15,597 | 2,337 | 3 | 17,134 | 2,459 | 3 | 14,572 | 2,255 | 3 |
| May-20 | 15,596 | 2,338 | 3 | 17,133 | 2,461 | 3 | 14,571 | 2,255 | 3 |
| Jun-20 | 15,626 | 2,339 | 3 | 17,181 | 2,463 | 3 | 14,589 | 2,256 | 3 |
| Jul-20 | 15,560 | 2,342 | 3 | 17,076 | 2,468 | 3 | 14,550 | 2,258 | 3 |
| Aug-20 | 15,554 | 2,344 | 3 | 17,065 | 2,471 | 3 | 14,546 | 2,259 | 3 |
| Sep-20 | 15,565 | 2,348 | 3 | 17,083 | 2,478 | 3 | 14,552 | 2,262 | 3 |
| Oct-20 | 15,597 | 2,349 | 3 | 17,134 | 2,480 | 3 | 14,572 | 2,262 | 3 |
| Nov-20 | 15,715 | 2,349 | 3 | 17,324 | 2,480 | 3 | 14,643 | 2,262 | 3 |
| Dec-20 | 15,816 | 2,357 | 3 | 17,485 | 2,491 | 3 | 14,703 | 2,267 | 3 |
| Jan-21 | 15,836 | 2,368 | 4 | 17,517 | 2,510 | 4 | 14,715 | 2,274 | 4 |
| Feb-21 | 15,878 | 2,366 | 4 | 17,584 | 2,507 | 4 | 14,740 | 2,273 | 4 |
| Mar-21 | 15,896 | 2,377 | 4 | 17,613 | 2,524 | 4 | 14,751 | 2,279 | 4 |
| Apr-21 | 15,884 | 2,358 | 4 | 17,595 | 2,493 | 4 | 14,744 | 2,268 | 4 |
| May-21 | 15,883 | 2,359 | 4 | 17,593 | 2,495 | 4 | 14,744 | 2,268 | 4 |
| Jun-21 | 15,914 | 2,360 | 4 | 17,642 | 2,497 | 4 | 14,762 | 2,269 | 4 |
| Jul-21 | 15,847 | 2,363 | 4 | 17,535 | 2,502 | 4 | 14,722 | 2,271 | 4 |
| Aug-21 | 15,840 | 2,365 | 4 | 17,524 | 2,505 | 4 | 14,718 | 2,272 | 4 |
| Sep-21 | 15,852 | 2,369 | 4 | 17,542 | 2,512 | 4 | 14,725 | 2,274 | 4 |
| Oct-21 | 15,884 | 2,371 | 4 | 17,595 | 2,514 | 4 | 14,744 | 2,275 | 4 |
| Nov-21 | 16,005 | 2,371 | 4 | 17,788 | 2,514 | 4 | 14,817 | 2,275 | 4 |
| Dec-21 | 16,108 | 2,378 | 4 | 17,952 | 2,526 | 4 | 14,878 | 2,280 | 4 |
| Jan-22 | 16,121 | 2,390 | 4 | 17,974 | 2,544 | 4 | 14,886 | 2,287 | 4 |
| Feb-22 | 16,164 | 2,388 | 4 | 18,042 | 2,541 | 4 | 14,912 | 2,285 | 4 |
| Mar-22 | 16,182 | 2,398 | 4 | 18,071 | 2,558 | 4 | 14,923 | 2,292 | 4 |
| Apr-22 | 16,171 | 2,379 | 4 | 18,053 | 2,527 | 4 | 14,916 | 2,280 | 4 |
| May-22 | 16,170 | 2,380 | 4 | 18,051 | 2,529 | 4 | 14,915 | 2,281 | 4 |
| Jun-22 | 16,201 | 2,381 | 4 | 18,101 | 2,531 | 4 | 14,934 | 2,281 | 4 |
| Jul-22 | 16,133 | 2,384 | 4 | 17,992 | 2,536 | 4 | 14,893 | 2,283 | 4 |
| Aug-22 | 16,126 | 2,386 | 4 | 17,981 | 2,539 | 4 | 14,889 | 2,285 | 4 |
| Sep-22 | 16,137 | 2,391 | 4 | 18,000 | 2,546 | 4 | 14,896 | 2,287 | 4 |
| Oct-22 | 16,171 | 2,392 | 4 | 18,053 | 2,548 | 4 | 14,916 | 2,288 | 4 |
| Nov-22 | 16,294 | 2,392 | 4 | 18,249 | 2,548 | 4 | 14,990 | 2,288 | 4 |
| Dec-22 | 16,398 | 2,399 | 4 | 18,417 | 2,560 | 4 | 15,052 | 2,292 | 4 |
| Jan-23 | 16,409 | 2,411 | 4 | 18,434 | 2,578 | 4 | 15,059 | 2,299 | 4 |
| Feb-23 | 16,452 | 2,409 | 4 | 18,503 | 2,575 | 4 | 15,085 | 2,298 | 4 |
| Mar-23 | 16,471 | 2,420 | 4 | 18,533 | 2,592 | 4 | 15,096 | 2,305 | 4 |
| Apr-23 | 16,459 | 2,400 | 4 | 18,514 | 2,561 | 4 | 15,089 | 2,293 | 4 |
| May-23 | 16,458 | 2,401 | 4 | 18,512 | 2,563 | 4 | 15,088 | 2,294 | 4 |
| Jun-23 | 16,490 | 2,402 | 4 | 18,563 | 2,565 | 4 | 15,107 | 2,294 | 4 |
| Jul-23 | 16,421 | 2,406 | 4 | 18,453 | 2,570 | 4 | 15,066 | 2,296 | 4 |
| Aug-23 | 16,414 | 2,408 | 4 | 18,441 | 2,573 | 4 | 15,062 | 2,297 | 4 |
| Sep-23 | 16,425 | 2,412 | 4 | 18,460 | 2,580 | 4 | 15,069 | 2,300 | 4 |
| Oct-23 | 16,459 | 2,413 | 4 | 18,514 | 2,582 | 4 | 15,089 | 2,301 | 4 |
| Nov-23 | 16,584 | 2,413 | 4 | 18,714 | 2,582 | 4 | 15,164 | 2,301 | 4 |
| Dec-23 | 16,691 | 2,421 | 4 | 18,885 | 2,594 | 4 | 15,228 | 2,305 | 4 |
| Jan-24 | 16,701 | 2,433 | 4 | 18,902 | 2,613 | 4 | 15,234 | 2,312 | 4 |
| Feb-24 | 16,745 | 2,431 | 4 | 18,972 | 2,610 | 4 | 15,261 | 2,311 | 4 |
| Mar-24 | 16,764 | 2,441 | 4 | 19,002 | 2,627 | 4 | 15,272 | 2,318 | 4 |
| Apr-24 | 16,752 | 2,422 | 4 | 18,983 | 2,596 | 4 | 15,265 | 2,306 | 4 |
| May-24 | 16,751 | 2,423 | 4 | 18,982 | 2,598 | 4 | 15,264 | 2,307 | 4 |

# APPENDIX 3.2 II CUSTOMER FORECASTS BY REGION
# ROSEBURG

| | Oregon - Expected Growth | | | Oregon - High Growth | | | Oregon - Low Growth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Residential Roseburg Customers | Commercial Roseburg Customers | Industrial Roseburg Customers | Residential Roseburg Customers | Commercial Roseburg Customers | Industrial Roseburg Customers | Residential Roseburg Customers | Commercial Roseburg Customers | Industrial Roseburg Customers |
| Jun-24 | 16,783 | 2,424 | 4 | 19,033 | 2,599 | 4 | 15,284 | 2,307 | 4 |
| Jul-24 | 16,713 | 2,427 | 4 | 18,921 | 2,605 | 4 | 15,241 | 2,309 | 4 |
| Aug-24 | 16,706 | 2,429 | 4 | 18,909 | 2,608 | 4 | 15,237 | 2,310 | 4 |
| Sep-24 | 16,718 | 2,434 | 4 | 18,928 | 2,615 | 4 | 15,244 | 2,313 | 4 |
| Oct-24 | 16,752 | 2,435 | 4 | 18,983 | 2,617 | 4 | 15,265 | 2,314 | 4 |
| Nov-24 | 16,880 | 2,435 | 4 | 19,187 | 2,617 | 4 | 15,341 | 2,314 | 4 |
| Dec-24 | 16,988 | 2,443 | 4 | 19,360 | 2,629 | 4 | 15,406 | 2,318 | 4 |
| Jan-25 | 16,996 | 2,455 | 4 | 19,374 | 2,648 | 4 | 15,411 | 2,326 | 4 |
| Feb-25 | 17,041 | 2,453 | 4 | 19,445 | 2,645 | 4 | 15,438 | 2,324 | 4 |
| Mar-25 | 17,061 | 2,463 | 4 | 19,476 | 2,662 | 4 | 15,450 | 2,331 | 4 |
| Apr-25 | 17,048 | 2,444 | 4 | 19,457 | 2,631 | 4 | 15,443 | 2,319 | 4 |
| May-25 | 17,047 | 2,445 | 4 | 19,455 | 2,633 | 4 | 15,442 | 2,320 | 4 |
| Jun-25 | 17,080 | 2,446 | 4 | 19,507 | 2,634 | 4 | 15,462 | 2,320 | 4 |
| Jul-25 | 17,008 | 2,449 | 4 | 19,393 | 2,640 | 4 | 15,419 | 2,322 | 4 |
| Aug-25 | 17,001 | 2,451 | 4 | 19,382 | 2,643 | 4 | 15,414 | 2,324 | 4 |
| Sep-25 | 17,013 | 2,456 | 4 | 19,401 | 2,650 | 4 | 15,422 | 2,326 | 4 |
| Oct-25 | 17,048 | 2,457 | 4 | 19,457 | 2,652 | 4 | 15,443 | 2,327 | 4 |
| Nov-25 | 17,178 | 2,457 | 4 | 19,664 | 2,652 | 4 | 15,520 | 2,327 | 4 |
| Dec-25 | 17,288 | 2,465 | 4 | 19,841 | 2,664 | 4 | 15,586 | 2,332 | 4 |
| Jan-26 | 17,296 | 2,477 | 4 | 19,853 | 2,684 | 4 | 15,591 | 2,339 | 4 |
| Feb-26 | 17,341 | 2,475 | 4 | 19,926 | 2,680 | 4 | 15,618 | 2,338 | 4 |
| Mar-26 | 17,361 | 2,486 | 4 | 19,957 | 2,698 | 4 | 15,630 | 2,344 | 4 |
| Apr-26 | 17,349 | 2,466 | 4 | 19,938 | 2,666 | 4 | 15,623 | 2,332 | 4 |
| May-26 | 17,347 | 2,467 | 4 | 19,936 | 2,668 | 4 | 15,622 | 2,333 | 4 |
| Jun-26 | 17,381 | 2,468 | 4 | 19,989 | 2,670 | 4 | 15,642 | 2,334 | 4 |
| Jul-26 | 17,308 | 2,471 | 4 | 19,872 | 2,675 | 4 | 15,598 | 2,336 | 4 |
| Aug-26 | 17,301 | 2,474 | 4 | 19,861 | 2,679 | 4 | 15,594 | 2,337 | 4 |
| Sep-26 | 17,313 | 2,478 | 4 | 19,880 | 2,686 | 4 | 15,601 | 2,340 | 4 |
| Oct-26 | 17,349 | 2,479 | 4 | 19,938 | 2,687 | 4 | 15,623 | 2,340 | 4 |
| Nov-26 | 17,480 | 2,479 | 4 | 20,148 | 2,687 | 4 | 15,702 | 2,340 | 4 |
| Dec-26 | 17,593 | 2,487 | 4 | 20,328 | 2,700 | 4 | 15,769 | 2,345 | 4 |
| Jan-27 | 17,602 | 2,500 | 4 | 20,342 | 2,720 | 4 | 15,775 | 2,353 | 4 |
| Feb-27 | 17,648 | 2,497 | 4 | 20,416 | 2,717 | 4 | 15,802 | 2,351 | 4 |
| Mar-27 | 17,668 | 2,509 | 4 | 20,448 | 2,735 | 4 | 15,814 | 2,358 | 4 |
| Apr-27 | 17,656 | 2,489 | 4 | 20,428 | 2,702 | 4 | 15,807 | 2,346 | 4 |
| May-27 | 17,654 | 2,490 | 4 | 20,426 | 2,704 | 4 | 15,806 | 2,347 | 4 |
| Jun-27 | 17,688 | 2,491 | 4 | 20,481 | 2,706 | 4 | 15,826 | 2,347 | 4 |
| Jul-27 | 17,614 | 2,494 | 4 | 20,362 | 2,711 | 4 | 15,782 | 2,349 | 4 |
| Aug-27 | 17,607 | 2,496 | 4 | 20,350 | 2,715 | 4 | 15,778 | 2,351 | 4 |
| Sep-27 | 17,619 | 2,501 | 4 | 20,370 | 2,722 | 4 | 15,785 | 2,353 | 4 |
| Oct-27 | 17,656 | 2,502 | 4 | 20,428 | 2,724 | 4 | 15,807 | 2,354 | 4 |
| Nov-27 | 17,790 | 2,502 | 4 | 20,643 | 2,724 | 4 | 15,887 | 2,354 | 4 |
| Dec-27 | 17,904 | 2,510 | 4 | 20,826 | 2,736 | 4 | 15,956 | 2,359 | 4 |
| Jan-28 | 17,832 | 2,517 | 4 | 20,710 | 2,748 | 4 | 15,913 | 2,363 | 4 |
| Feb-28 | 17,879 | 2,515 | 4 | 20,785 | 2,744 | 4 | 15,941 | 2,362 | 4 |
| Mar-28 | 17,899 | 2,526 | 4 | 20,818 | 2,762 | 4 | 15,953 | 2,368 | 4 |
| Apr-28 | 17,886 | 2,506 | 4 | 20,797 | 2,730 | 4 | 15,945 | 2,356 | 4 |
| May-28 | 17,885 | 2,507 | 4 | 20,795 | 2,731 | 4 | 15,945 | 2,357 | 4 |
| Jun-28 | 17,919 | 2,508 | 4 | 20,850 | 2,733 | 4 | 15,965 | 2,357 | 4 |
| Jul-28 | 17,844 | 2,511 | 4 | 20,730 | 2,739 | 4 | 15,920 | 2,359 | 4 |

# APPENDIX 3.2 ‖ CUSTOMER FORECASTS BY REGION
# ROSEBURG

| | Oregon - Expected Growth | | | Oregon - High Growth | | | Oregon - Low Growth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Residential Roseburg Customers | Commercial Roseburg Customers | Industrial Roseburg Customers | Residential Roseburg Customers | Commercial Roseburg Customers | Industrial Roseburg Customers | Residential Roseburg Customers | Commercial Roseburg Customers | Industrial Roseburg Customers |
| Aug-28 | 17,837 | 2,513 | 4 | 20,718 | 2,742 | 4 | 15,916 | 2,361 | 4 |
| Sep-28 | 17,849 | 2,518 | 4 | 20,739 | 2,749 | 4 | 15,923 | 2,364 | 4 |
| Oct-28 | 17,886 | 2,519 | 4 | 20,797 | 2,751 | 4 | 15,945 | 2,364 | 4 |
| Nov-28 | 18,022 | 2,519 | 4 | 21,015 | 2,751 | 4 | 16,027 | 2,364 | 4 |
| Dec-28 | 18,138 | 2,527 | 4 | 21,200 | 2,764 | 4 | 16,096 | 2,369 | 4 |
| Jan-29 | 18,058 | 2,534 | 4 | 21,072 | 2,775 | 4 | 16,048 | 2,373 | 4 |
| Feb-29 | 18,105 | 2,531 | 4 | 21,148 | 2,771 | 4 | 16,077 | 2,372 | 4 |
| Mar-29 | 18,126 | 2,543 | 4 | 21,181 | 2,789 | 4 | 16,089 | 2,378 | 4 |
| Apr-29 | 18,113 | 2,522 | 4 | 21,160 | 2,756 | 4 | 16,081 | 2,366 | 4 |
| May-29 | 18,112 | 2,523 | 4 | 21,158 | 2,758 | 4 | 16,081 | 2,367 | 4 |
| Jun-29 | 18,146 | 2,525 | 4 | 21,214 | 2,760 | 4 | 16,101 | 2,368 | 4 |
| Jul-29 | 18,070 | 2,528 | 4 | 21,092 | 2,765 | 4 | 16,056 | 2,370 | 4 |
| Aug-29 | 18,063 | 2,530 | 4 | 21,080 | 2,769 | 4 | 16,051 | 2,371 | 4 |
| Sep-29 | 18,076 | 2,535 | 4 | 21,101 | 2,776 | 4 | 16,059 | 2,374 | 4 |
| Oct-29 | 18,113 | 2,536 | 4 | 21,160 | 2,778 | 4 | 16,081 | 2,374 | 4 |
| Nov-29 | 18,250 | 2,536 | 4 | 21,380 | 2,778 | 4 | 16,164 | 2,374 | 4 |
| Dec-29 | 18,368 | 2,544 | 4 | 21,568 | 2,791 | 4 | 16,234 | 2,379 | 4 |
| Jan-30 | 18,285 | 2,550 | 5 | 21,435 | 2,802 | 5 | 16,184 | 2,383 | 5 |
| Feb-30 | 18,333 | 2,548 | 5 | 21,512 | 2,798 | 5 | 16,213 | 2,382 | 5 |
| Mar-30 | 18,354 | 2,560 | 5 | 21,545 | 2,816 | 5 | 16,226 | 2,389 | 5 |
| Apr-30 | 18,341 | 2,539 | 5 | 21,525 | 2,783 | 5 | 16,218 | 2,376 | 5 |
| May-30 | 18,339 | 2,540 | 5 | 21,523 | 2,785 | 5 | 16,217 | 2,377 | 5 |
| Jun-30 | 18,375 | 2,541 | 5 | 21,579 | 2,787 | 5 | 16,238 | 2,378 | 5 |
| Jul-30 | 18,298 | 2,545 | 5 | 21,456 | 2,792 | 5 | 16,192 | 2,380 | 5 |
| Aug-30 | 18,290 | 2,547 | 5 | 21,443 | 2,796 | 5 | 16,188 | 2,381 | 5 |
| Sep-30 | 18,303 | 2,552 | 5 | 21,464 | 2,803 | 5 | 16,195 | 2,384 | 5 |
| Oct-30 | 18,341 | 2,553 | 5 | 21,525 | 2,805 | 5 | 16,218 | 2,384 | 5 |
| Nov-30 | 18,480 | 2,553 | 5 | 21,748 | 2,805 | 5 | 16,302 | 2,384 | 5 |
| Dec-30 | 18,599 | 2,561 | 5 | 21,937 | 2,818 | 5 | 16,373 | 2,389 | 5 |
| Jan-31 | 18,512 | 2,567 | 5 | 21,799 | 2,829 | 5 | 16,321 | 2,393 | 5 |
| Feb-31 | 18,561 | 2,565 | 5 | 21,877 | 2,825 | 5 | 16,350 | 2,392 | 5 |
| Mar-31 | 18,582 | 2,577 | 5 | 21,911 | 2,843 | 5 | 16,363 | 2,399 | 5 |
| Apr-31 | 18,569 | 2,556 | 5 | 21,890 | 2,810 | 5 | 16,355 | 2,386 | 5 |
| May-31 | 18,567 | 2,557 | 5 | 21,887 | 2,812 | 5 | 16,354 | 2,387 | 5 |
| Jun-31 | 18,603 | 2,558 | 5 | 21,944 | 2,814 | 5 | 16,375 | 2,388 | 5 |
| Jul-31 | 18,525 | 2,562 | 5 | 21,820 | 2,819 | 5 | 16,329 | 2,390 | 5 |
| Aug-31 | 18,517 | 2,564 | 5 | 21,807 | 2,823 | 5 | 16,324 | 2,391 | 5 |
| Sep-31 | 18,530 | 2,569 | 5 | 21,828 | 2,830 | 5 | 16,332 | 2,394 | 5 |
| Oct-31 | 18,569 | 2,570 | 5 | 21,890 | 2,832 | 5 | 16,355 | 2,395 | 5 |
| Nov-31 | 18,710 | 2,570 | 5 | 22,115 | 2,832 | 5 | 16,439 | 2,395 | 5 |
| Dec-31 | 18,830 | 2,578 | 5 | 22,307 | 2,845 | 5 | 16,511 | 2,399 | 5 |
| Jan-32 | 18,735 | 2,584 | 5 | 22,156 | 2,855 | 5 | 16,455 | 2,403 | 5 |
| Feb-32 | 18,785 | 2,582 | 5 | 22,235 | 2,851 | 5 | 16,484 | 2,402 | 5 |
| Mar-32 | 18,806 | 2,593 | 5 | 22,269 | 2,870 | 5 | 16,497 | 2,409 | 5 |
| Apr-32 | 18,793 | 2,572 | 5 | 22,248 | 2,837 | 5 | 16,489 | 2,396 | 5 |
| May-32 | 18,791 | 2,574 | 5 | 22,246 | 2,838 | 5 | 16,488 | 2,397 | 5 |
| Jun-32 | 18,827 | 2,575 | 5 | 22,303 | 2,840 | 5 | 16,510 | 2,398 | 5 |
| Jul-32 | 18,749 | 2,578 | 5 | 22,177 | 2,846 | 5 | 16,463 | 2,400 | 5 |
| Aug-32 | 18,740 | 2,580 | 5 | 22,164 | 2,850 | 5 | 16,458 | 2,401 | 5 |
| Sep-32 | 18,754 | 2,585 | 5 | 22,186 | 2,857 | 5 | 16,466 | 2,404 | 5 |

# APPENDIX 3.2 ‖ CUSTOMER FORECASTS BY REGION
# ROSEBURG

| | Oregon - Expected Growth | | | Oregon - High Growth | | | Oregon - Low Growth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Residential Roseburg Customers | Commercial Roseburg Customers | Industrial Roseburg Customers | Residential Roseburg Customers | Commercial Roseburg Customers | Industrial Roseburg Customers | Residential Roseburg Customers | Commercial Roseburg Customers | Industrial Roseburg Customers |
| Oct-32 | 18,793 | 2,586 | 5 | 22,248 | 2,859 | 5 | 16,489 | 2,405 | 5 |
| Nov-32 | 18,935 | 2,586 | 5 | 22,476 | 2,859 | 5 | 16,575 | 2,405 | 5 |
| Dec-32 | 19,057 | 2,594 | 5 | 22,670 | 2,872 | 5 | 16,648 | 2,409 | 5 |
| Jan-33 | 18,963 | 2,601 | 5 | 22,520 | 2,882 | 5 | 16,591 | 2,413 | 5 |
| Feb-33 | 19,013 | 2,599 | 5 | 22,600 | 2,878 | 5 | 16,621 | 2,412 | 5 |
| Mar-33 | 19,034 | 2,610 | 5 | 22,635 | 2,897 | 5 | 16,634 | 2,419 | 5 |
| Apr-33 | 19,021 | 2,589 | 5 | 22,613 | 2,864 | 5 | 16,626 | 2,406 | 5 |
| May-33 | 19,019 | 2,590 | 5 | 22,611 | 2,865 | 5 | 16,625 | 2,407 | 5 |
| Jun-33 | 19,056 | 2,592 | 5 | 22,669 | 2,867 | 5 | 16,647 | 2,408 | 5 |
| Jul-33 | 18,976 | 2,595 | 5 | 22,542 | 2,873 | 5 | 16,599 | 2,410 | 5 |
| Aug-33 | 18,968 | 2,597 | 5 | 22,529 | 2,877 | 5 | 16,594 | 2,411 | 5 |
| Sep-33 | 18,982 | 2,602 | 5 | 22,550 | 2,884 | 5 | 16,603 | 2,414 | 5 |
| Oct-33 | 19,021 | 2,603 | 5 | 22,613 | 2,886 | 5 | 16,626 | 2,415 | 5 |
| Nov-33 | 19,165 | 2,603 | 5 | 22,844 | 2,886 | 5 | 16,713 | 2,415 | 5 |
| Dec-33 | 19,288 | 2,611 | 5 | 23,041 | 2,899 | 5 | 16,787 | 2,420 | 5 |
| Jan-34 | 19,191 | 2,618 | 5 | 22,885 | 2,909 | 5 | 16,728 | 2,424 | 5 |
| Feb-34 | 19,242 | 2,616 | 5 | 22,966 | 2,906 | 5 | 16,759 | 2,422 | 5 |
| Mar-34 | 19,264 | 2,627 | 5 | 23,001 | 2,924 | 5 | 16,772 | 2,429 | 5 |
| Apr-34 | 19,250 | 2,606 | 5 | 22,979 | 2,891 | 5 | 16,764 | 2,416 | 5 |
| May-34 | 19,249 | 2,607 | 5 | 22,977 | 2,893 | 5 | 16,763 | 2,417 | 5 |
| Jun-34 | 19,285 | 2,608 | 5 | 23,036 | 2,894 | 5 | 16,785 | 2,418 | 5 |
| Jul-34 | 19,205 | 2,612 | 5 | 22,907 | 2,900 | 5 | 16,736 | 2,420 | 5 |
| Aug-34 | 19,197 | 2,614 | 5 | 22,894 | 2,904 | 5 | 16,732 | 2,421 | 5 |
| Sep-34 | 19,210 | 2,619 | 5 | 22,916 | 2,911 | 5 | 16,740 | 2,424 | 5 |
| Oct-34 | 19,250 | 2,620 | 5 | 22,979 | 2,913 | 5 | 16,764 | 2,425 | 5 |
| Nov-34 | 19,396 | 2,620 | 5 | 23,213 | 2,913 | 5 | 16,851 | 2,425 | 5 |
| Dec-34 | 19,521 | 2,628 | 5 | 23,412 | 2,926 | 5 | 16,926 | 2,430 | 5 |
| Jan-35 | 19,418 | 2,635 | 5 | 23,249 | 2,936 | 5 | 16,865 | 2,434 | 5 |
| Feb-35 | 19,469 | 2,632 | 5 | 23,331 | 2,933 | 5 | 16,895 | 2,432 | 5 |
| Mar-35 | 19,492 | 2,644 | 5 | 23,366 | 2,951 | 5 | 16,909 | 2,439 | 5 |
| Apr-35 | 19,478 | 2,623 | 5 | 23,344 | 2,918 | 5 | 16,900 | 2,427 | 5 |
| May-35 | 19,476 | 2,624 | 5 | 23,342 | 2,919 | 5 | 16,899 | 2,427 | 5 |
| Jun-35 | 19,514 | 2,625 | 5 | 23,401 | 2,921 | 5 | 16,922 | 2,428 | 5 |
| Jul-35 | 19,432 | 2,629 | 5 | 23,271 | 2,927 | 5 | 16,873 | 2,430 | 5 |
| Aug-35 | 19,424 | 2,631 | 5 | 23,258 | 2,931 | 5 | 16,868 | 2,432 | 5 |
| Sep-35 | 19,438 | 2,636 | 5 | 23,280 | 2,938 | 5 | 16,876 | 2,434 | 5 |
| Oct-35 | 19,478 | 2,637 | 5 | 23,344 | 2,940 | 5 | 16,900 | 2,435 | 5 |
| Nov-35 | 19,626 | 2,637 | 5 | 23,581 | 2,940 | 5 | 16,989 | 2,435 | 5 |
| Dec-35 | 19,752 | 2,645 | 5 | 23,782 | 2,953 | 5 | 17,065 | 2,440 | 5 |

## APPENDIX 3.2 II CUSTOMER FORECASTS BY REGION
## KLAMATH FALLS

| | Oregon - Expected Growth | | | Oregon - High Growth | | | Oregon - Low Growth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Residential Klamath Falls Customers | Commercial Klamath Falls Customers | Industrial Klamath Falls Customers | Residential Klamath Falls Customers | Commercial Klamath Falls Customers | Industrial Klamath Falls Customers | Residential Klamath Falls Customers | Commercial Klamath Falls Customers | Industrial Klamath Falls Customers |
| Jan-12 | 14,147 | 1,668 | 7 | 14,317 | 1,678 | 7 | 14,034 | 1,662 | 7 |
| Feb-12 | 14,137 | 1,675 | 8 | 14,301 | 1,689 | 8 | 14,028 | 1,666 | 8 |
| Mar-12 | 14,169 | 1,666 | 6 | 14,352 | 1,674 | 6 | 14,047 | 1,660 | 6 |
| Apr-12 | 14,126 | 1,671 | 7 | 14,283 | 1,682 | 7 | 14,021 | 1,663 | 7 |
| May-12 | 14,139 | 1,669 | 7 | 14,304 | 1,679 | 7 | 14,029 | 1,662 | 7 |
| Jun-12 | 14,054 | 1,663 | 7 | 14,168 | 1,670 | 7 | 13,978 | 1,659 | 7 |
| Jul-12 | 14,008 | 1,663 | 7 | 14,094 | 1,670 | 7 | 13,950 | 1,659 | 7 |
| Aug-12 | 13,904 | 1,665 | 7 | 13,928 | 1,673 | 7 | 13,888 | 1,660 | 7 |
| Sep-12 | 13,910 | 1,671 | 7 | 13,938 | 1,682 | 7 | 13,892 | 1,663 | 7 |
| Oct-12 | 14,014 | 1,672 | 7 | 14,104 | 1,684 | 7 | 13,954 | 1,664 | 7 |
| Nov-12 | 14,179 | 1,675 | 7 | 14,368 | 1,689 | 7 | 14,053 | 1,666 | 7 |
| Dec-12 | 14,296 | 1,679 | 7 | 14,555 | 1,695 | 7 | 14,123 | 1,668 | 7 |
| Jan-13 | 14,297 | 1,693 | 7 | 14,557 | 1,718 | 7 | 14,124 | 1,677 | 7 |
| Feb-13 | 14,287 | 1,700 | 8 | 14,541 | 1,729 | 8 | 14,118 | 1,681 | 8 |
| Mar-13 | 14,319 | 1,691 | 6 | 14,592 | 1,714 | 6 | 14,137 | 1,675 | 6 |
| Apr-13 | 14,276 | 1,696 | 7 | 14,523 | 1,722 | 7 | 14,111 | 1,678 | 7 |
| May-13 | 14,289 | 1,694 | 7 | 14,544 | 1,719 | 7 | 14,119 | 1,677 | 7 |
| Jun-13 | 14,229 | 1,688 | 7 | 14,448 | 1,710 | 7 | 14,083 | 1,674 | 7 |
| Jul-13 | 14,183 | 1,688 | 7 | 14,374 | 1,710 | 7 | 14,055 | 1,674 | 7 |
| Aug-13 | 14,079 | 1,690 | 7 | 14,208 | 1,713 | 7 | 13,993 | 1,675 | 7 |
| Sep-13 | 14,085 | 1,696 | 7 | 14,218 | 1,722 | 7 | 13,997 | 1,678 | 7 |
| Oct-13 | 14,214 | 1,697 | 7 | 14,424 | 1,724 | 7 | 14,074 | 1,679 | 7 |
| Nov-13 | 14,404 | 1,700 | 7 | 14,728 | 1,729 | 7 | 14,188 | 1,681 | 7 |
| Dec-13 | 14,521 | 1,704 | 7 | 14,915 | 1,735 | 7 | 14,258 | 1,683 | 7 |
| Jan-14 | 14,547 | 1,723 | 7 | 14,957 | 1,766 | 7 | 14,274 | 1,695 | 7 |
| Feb-14 | 14,537 | 1,730 | 8 | 14,941 | 1,777 | 8 | 14,268 | 1,699 | 8 |
| Mar-14 | 14,569 | 1,721 | 6 | 14,992 | 1,762 | 6 | 14,287 | 1,693 | 6 |
| Apr-14 | 14,526 | 1,726 | 7 | 14,923 | 1,770 | 7 | 14,261 | 1,696 | 7 |
| May-14 | 14,539 | 1,724 | 7 | 14,944 | 1,767 | 7 | 14,269 | 1,695 | 7 |
| Jun-14 | 14,479 | 1,718 | 7 | 14,848 | 1,758 | 7 | 14,233 | 1,692 | 7 |
| Jul-14 | 14,433 | 1,718 | 7 | 14,774 | 1,758 | 7 | 14,205 | 1,692 | 7 |
| Aug-14 | 14,329 | 1,720 | 7 | 14,608 | 1,761 | 7 | 14,143 | 1,693 | 7 |
| Sep-14 | 14,335 | 1,726 | 7 | 14,618 | 1,770 | 7 | 14,147 | 1,696 | 7 |
| Oct-14 | 14,464 | 1,727 | 7 | 14,824 | 1,772 | 7 | 14,224 | 1,697 | 7 |
| Nov-14 | 14,654 | 1,730 | 7 | 15,128 | 1,777 | 7 | 14,338 | 1,699 | 7 |
| Dec-14 | 14,771 | 1,734 | 7 | 15,315 | 1,783 | 7 | 14,408 | 1,701 | 7 |
| Jan-15 | 14,822 | 1,753 | 7 | 15,397 | 1,814 | 7 | 14,439 | 1,713 | 7 |
| Feb-15 | 14,812 | 1,760 | 8 | 15,381 | 1,825 | 8 | 14,433 | 1,717 | 8 |
| Mar-15 | 14,844 | 1,751 | 6 | 15,432 | 1,810 | 6 | 14,452 | 1,711 | 6 |
| Apr-15 | 14,801 | 1,756 | 7 | 15,363 | 1,818 | 7 | 14,426 | 1,714 | 7 |
| May-15 | 14,814 | 1,754 | 7 | 15,384 | 1,815 | 7 | 14,434 | 1,713 | 7 |
| Jun-15 | 14,754 | 1,748 | 7 | 15,288 | 1,806 | 7 | 14,398 | 1,710 | 7 |
| Jul-15 | 14,708 | 1,748 | 7 | 15,214 | 1,806 | 7 | 14,370 | 1,710 | 7 |
| Aug-15 | 14,604 | 1,750 | 7 | 15,048 | 1,809 | 7 | 14,308 | 1,711 | 7 |
| Sep-15 | 14,610 | 1,756 | 7 | 15,058 | 1,818 | 7 | 14,312 | 1,714 | 7 |
| Oct-15 | 14,739 | 1,757 | 7 | 15,264 | 1,820 | 7 | 14,389 | 1,715 | 7 |
| Nov-15 | 14,929 | 1,760 | 7 | 15,568 | 1,825 | 7 | 14,503 | 1,717 | 7 |
| Dec-15 | 15,046 | 1,764 | 7 | 15,755 | 1,831 | 7 | 14,573 | 1,719 | 7 |

# APPENDIX 3.2 II CUSTOMER FORECASTS BY REGION
# KLAMATH FALLS

| | Oregon - Expected Growth | | | Oregon - High Growth | | | Oregon - Low Growth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Residential Klamath Falls Customers | Commercial Klamath Falls Customers | Industrial Klamath Falls Customers | Residential Klamath Falls Customers | Commercial Klamath Falls Customers | Industrial Klamath Falls Customers | Residential Klamath Falls Customers | Commercial Klamath Falls Customers | Industrial Klamath Falls Customers |
| Jan-16 | 15,091 | 1,778 | 7 | 15,827 | 1,854 | 7 | 14,600 | 1,728 | 7 |
| Feb-16 | 15,081 | 1,785 | 8 | 15,811 | 1,865 | 8 | 14,594 | 1,732 | 8 |
| Mar-16 | 15,113 | 1,776 | 6 | 15,863 | 1,851 | 6 | 14,614 | 1,727 | 6 |
| Apr-16 | 15,070 | 1,781 | 7 | 15,793 | 1,859 | 7 | 14,587 | 1,730 | 7 |
| May-16 | 15,083 | 1,779 | 7 | 15,814 | 1,856 | 7 | 14,595 | 1,728 | 7 |
| Jun-16 | 15,022 | 1,773 | 7 | 15,716 | 1,846 | 7 | 14,559 | 1,725 | 7 |
| Jul-16 | 14,975 | 1,773 | 7 | 15,641 | 1,846 | 7 | 14,531 | 1,725 | 7 |
| Aug-16 | 14,869 | 1,775 | 7 | 15,472 | 1,849 | 7 | 14,467 | 1,726 | 7 |
| Sep-16 | 14,875 | 1,781 | 7 | 15,482 | 1,859 | 7 | 14,471 | 1,730 | 7 |
| Oct-16 | 15,006 | 1,782 | 7 | 15,692 | 1,861 | 7 | 14,549 | 1,730 | 7 |
| Nov-16 | 15,200 | 1,785 | 7 | 16,001 | 1,865 | 7 | 14,666 | 1,732 | 7 |
| Dec-16 | 15,319 | 1,789 | 7 | 16,192 | 1,872 | 7 | 14,737 | 1,734 | 7 |
| Jan-17 | 15,345 | 1,802 | 7 | 16,234 | 1,892 | 7 | 14,753 | 1,742 | 7 |
| Feb-17 | 15,335 | 1,809 | 8 | 16,217 | 1,904 | 8 | 14,746 | 1,746 | 8 |
| Mar-17 | 15,368 | 1,800 | 6 | 16,270 | 1,889 | 6 | 14,766 | 1,741 | 6 |
| Apr-17 | 15,323 | 1,805 | 7 | 16,199 | 1,897 | 7 | 14,740 | 1,744 | 7 |
| May-17 | 15,337 | 1,803 | 7 | 16,220 | 1,894 | 7 | 14,748 | 1,743 | 7 |
| Jun-17 | 15,275 | 1,797 | 7 | 16,121 | 1,884 | 7 | 14,710 | 1,739 | 7 |
| Jul-17 | 15,227 | 1,797 | 7 | 16,045 | 1,884 | 7 | 14,682 | 1,739 | 7 |
| Aug-17 | 15,119 | 1,799 | 7 | 15,873 | 1,887 | 7 | 14,617 | 1,740 | 7 |
| Sep-17 | 15,126 | 1,805 | 7 | 15,882 | 1,897 | 7 | 14,621 | 1,744 | 7 |
| Oct-17 | 15,259 | 1,806 | 7 | 16,096 | 1,899 | 7 | 14,701 | 1,745 | 7 |
| Nov-17 | 15,456 | 1,809 | 7 | 16,411 | 1,904 | 7 | 14,819 | 1,746 | 7 |
| Dec-17 | 15,577 | 1,813 | 7 | 16,605 | 1,910 | 7 | 14,892 | 1,749 | 7 |
| Jan-18 | 15,587 | 1,825 | 7 | 16,620 | 1,929 | 7 | 14,898 | 1,756 | 7 |
| Feb-18 | 15,576 | 1,832 | 8 | 16,604 | 1,940 | 8 | 14,891 | 1,760 | 8 |
| Mar-18 | 15,610 | 1,823 | 6 | 16,657 | 1,925 | 6 | 14,912 | 1,754 | 6 |
| Apr-18 | 15,565 | 1,828 | 7 | 16,585 | 1,934 | 7 | 14,884 | 1,758 | 7 |
| May-18 | 15,578 | 1,826 | 7 | 16,607 | 1,930 | 7 | 14,893 | 1,756 | 7 |
| Jun-18 | 15,515 | 1,820 | 7 | 16,506 | 1,920 | 7 | 14,855 | 1,753 | 7 |
| Jul-18 | 15,467 | 1,820 | 7 | 16,429 | 1,920 | 7 | 14,826 | 1,753 | 7 |
| Aug-18 | 15,358 | 1,822 | 7 | 16,254 | 1,924 | 7 | 14,760 | 1,754 | 7 |
| Sep-18 | 15,364 | 1,828 | 7 | 16,264 | 1,934 | 7 | 14,764 | 1,758 | 7 |
| Oct-18 | 15,499 | 1,829 | 7 | 16,481 | 1,935 | 7 | 14,845 | 1,758 | 7 |
| Nov-18 | 15,699 | 1,832 | 7 | 16,800 | 1,940 | 7 | 14,965 | 1,760 | 7 |
| Dec-18 | 15,822 | 1,836 | 7 | 16,997 | 1,947 | 7 | 15,039 | 1,763 | 7 |
| Jan-19 | 15,828 | 1,847 | 7 | 17,006 | 1,965 | 7 | 15,042 | 1,769 | 7 |
| Feb-19 | 15,817 | 1,855 | 8 | 16,989 | 1,977 | 8 | 15,036 | 1,774 | 8 |
| Mar-19 | 15,851 | 1,845 | 6 | 17,044 | 1,961 | 6 | 15,056 | 1,768 | 6 |
| Apr-19 | 15,806 | 1,851 | 7 | 16,970 | 1,970 | 7 | 15,029 | 1,771 | 7 |
| May-19 | 15,819 | 1,849 | 7 | 16,993 | 1,966 | 7 | 15,037 | 1,770 | 7 |
| Jun-19 | 15,755 | 1,842 | 7 | 16,890 | 1,956 | 7 | 14,999 | 1,766 | 7 |
| Jul-19 | 15,706 | 1,842 | 7 | 16,812 | 1,956 | 7 | 14,969 | 1,766 | 7 |
| Aug-19 | 15,595 | 1,844 | 7 | 16,634 | 1,960 | 7 | 14,903 | 1,767 | 7 |
| Sep-19 | 15,602 | 1,851 | 7 | 16,644 | 1,970 | 7 | 14,907 | 1,771 | 7 |
| Oct-19 | 15,739 | 1,852 | 7 | 16,865 | 1,972 | 7 | 14,989 | 1,772 | 7 |
| Nov-19 | 15,942 | 1,855 | 7 | 17,189 | 1,977 | 7 | 15,111 | 1,774 | 7 |
| Dec-19 | 16,067 | 1,859 | 7 | 17,389 | 1,983 | 7 | 15,186 | 1,776 | 7 |

# APPENDIX 3.2 II CUSTOMER FORECASTS BY REGION
# KLAMATH FALLS

| | Oregon - Expected Growth | | | Oregon - High Growth | | | Oregon - Low Growth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Residential Klamath Falls Customers | Commercial Klamath Falls Customers | Industrial Klamath Falls Customers | Residential Klamath Falls Customers | Commercial Klamath Falls Customers | Industrial Klamath Falls Customers | Residential Klamath Falls Customers | Commercial Klamath Falls Customers | Industrial Klamath Falls Customers |
| Jan-20 | 16,068 | 1,870 | 7 | 17,391 | 2,001 | 7 | 15,186 | 1,783 | 7 |
| Feb-20 | 16,057 | 1,878 | 8 | 17,373 | 2,013 | 8 | 15,180 | 1,787 | 8 |
| Mar-20 | 16,092 | 1,868 | 6 | 17,429 | 1,997 | 6 | 15,201 | 1,782 | 6 |
| Apr-20 | 16,045 | 1,873 | 7 | 17,354 | 2,006 | 7 | 15,173 | 1,785 | 7 |
| May-20 | 16,059 | 1,871 | 7 | 17,377 | 2,003 | 7 | 15,181 | 1,783 | 7 |
| Jun-20 | 15,994 | 1,865 | 7 | 17,273 | 1,992 | 7 | 15,142 | 1,780 | 7 |
| Jul-20 | 15,945 | 1,865 | 7 | 17,193 | 1,992 | 7 | 15,112 | 1,780 | 7 |
| Aug-20 | 15,832 | 1,867 | 7 | 17,012 | 1,996 | 7 | 15,045 | 1,781 | 7 |
| Sep-20 | 15,838 | 1,873 | 7 | 17,023 | 2,006 | 7 | 15,049 | 1,785 | 7 |
| Oct-20 | 15,978 | 1,874 | 7 | 17,247 | 2,008 | 7 | 15,132 | 1,785 | 7 |
| Nov-20 | 16,184 | 1,878 | 7 | 17,576 | 2,013 | 7 | 15,256 | 1,787 | 7 |
| Dec-20 | 16,311 | 1,882 | 7 | 17,779 | 2,020 | 7 | 15,332 | 1,790 | 7 |
| Jan-21 | 16,306 | 1,892 | 7 | 17,771 | 2,037 | 7 | 15,329 | 1,796 | 7 |
| Feb-21 | 16,295 | 1,900 | 8 | 17,753 | 2,049 | 8 | 15,323 | 1,801 | 8 |
| Mar-21 | 16,330 | 1,890 | 6 | 17,810 | 2,033 | 6 | 15,344 | 1,795 | 6 |
| Apr-21 | 16,283 | 1,896 | 7 | 17,734 | 2,042 | 7 | 15,315 | 1,798 | 7 |
| May-21 | 16,297 | 1,893 | 7 | 17,757 | 2,038 | 7 | 15,324 | 1,797 | 7 |
| Jun-21 | 16,231 | 1,887 | 7 | 17,651 | 2,028 | 7 | 15,284 | 1,793 | 7 |
| Jul-21 | 16,180 | 1,887 | 7 | 17,570 | 2,028 | 7 | 15,254 | 1,793 | 7 |
| Aug-21 | 16,066 | 1,889 | 7 | 17,387 | 2,031 | 7 | 15,185 | 1,794 | 7 |
| Sep-21 | 16,073 | 1,896 | 7 | 17,398 | 2,042 | 7 | 15,189 | 1,798 | 7 |
| Oct-21 | 16,215 | 1,897 | 7 | 17,625 | 2,044 | 7 | 15,274 | 1,799 | 7 |
| Nov-21 | 16,424 | 1,900 | 7 | 17,959 | 2,049 | 7 | 15,400 | 1,801 | 7 |
| Dec-21 | 16,552 | 1,904 | 7 | 18,165 | 2,056 | 7 | 15,477 | 1,803 | 7 |
| Jan-22 | 16,542 | 1,915 | 7 | 18,148 | 2,072 | 7 | 15,471 | 1,810 | 7 |
| Feb-22 | 16,530 | 1,922 | 8 | 18,130 | 2,084 | 8 | 15,464 | 1,814 | 8 |
| Mar-22 | 16,566 | 1,912 | 6 | 18,187 | 2,069 | 6 | 15,485 | 1,808 | 6 |
| Apr-22 | 16,518 | 1,918 | 7 | 18,111 | 2,077 | 7 | 15,456 | 1,811 | 7 |
| May-22 | 16,533 | 1,916 | 7 | 18,134 | 2,074 | 7 | 15,465 | 1,810 | 7 |
| Jun-22 | 16,466 | 1,909 | 7 | 18,027 | 2,063 | 7 | 15,425 | 1,806 | 7 |
| Jul-22 | 16,414 | 1,909 | 7 | 17,945 | 2,063 | 7 | 15,394 | 1,806 | 7 |
| Aug-22 | 16,298 | 1,911 | 7 | 17,759 | 2,067 | 7 | 15,325 | 1,808 | 7 |
| Sep-22 | 16,305 | 1,918 | 7 | 17,770 | 2,077 | 7 | 15,329 | 1,811 | 7 |
| Oct-22 | 16,449 | 1,919 | 7 | 18,000 | 2,079 | 7 | 15,415 | 1,812 | 7 |
| Nov-22 | 16,661 | 1,922 | 7 | 18,339 | 2,084 | 7 | 15,542 | 1,814 | 7 |
| Dec-22 | 16,792 | 1,927 | 7 | 18,548 | 2,091 | 7 | 15,621 | 1,817 | 7 |
| Jan-23 | 16,777 | 1,937 | 7 | 18,525 | 2,107 | 7 | 15,612 | 1,823 | 7 |
| Feb-23 | 16,766 | 1,944 | 8 | 18,507 | 2,120 | 8 | 15,605 | 1,827 | 8 |
| Mar-23 | 16,802 | 1,934 | 6 | 18,565 | 2,104 | 6 | 15,627 | 1,821 | 6 |
| Apr-23 | 16,753 | 1,940 | 7 | 18,487 | 2,113 | 7 | 15,598 | 1,825 | 7 |
| May-23 | 16,768 | 1,938 | 7 | 18,510 | 2,109 | 7 | 15,606 | 1,823 | 7 |
| Jun-23 | 16,700 | 1,931 | 7 | 18,402 | 2,099 | 7 | 15,566 | 1,819 | 7 |
| Jul-23 | 16,648 | 1,931 | 7 | 18,318 | 2,099 | 7 | 15,534 | 1,819 | 7 |
| Aug-23 | 16,530 | 1,933 | 7 | 18,130 | 2,102 | 7 | 15,464 | 1,821 | 7 |
| Sep-23 | 16,537 | 1,940 | 7 | 18,141 | 2,113 | 7 | 15,468 | 1,825 | 7 |
| Oct-23 | 16,683 | 1,941 | 7 | 18,375 | 2,115 | 7 | 15,555 | 1,825 | 7 |
| Nov-23 | 16,898 | 1,944 | 7 | 18,719 | 2,120 | 7 | 15,684 | 1,827 | 7 |
| Dec-23 | 17,031 | 1,949 | 7 | 18,931 | 2,127 | 7 | 15,764 | 1,830 | 7 |

# APPENDIX 3.2 II CUSTOMER FORECASTS BY REGION
## KLAMATH FALLS

| | Oregon - Expected Growth | | | Oregon - High Growth | | | Oregon - Low Growth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Residential Klamath Falls Customers | Commercial Klamath Falls Customers | Industrial Klamath Falls Customers | Residential Klamath Falls Customers | Commercial Klamath Falls Customers | Industrial Klamath Falls Customers | Residential Klamath Falls Customers | Commercial Klamath Falls Customers | Industrial Klamath Falls Customers |
| Jan-24 | 17,014 | 1,959 | 7 | 18,904 | 2,143 | 7 | 15,754 | 1,836 | 7 |
| Feb-24 | 17,002 | 1,967 | 8 | 18,885 | 2,156 | 8 | 15,747 | 1,841 | 8 |
| Mar-24 | 17,039 | 1,957 | 6 | 18,944 | 2,139 | 6 | 15,769 | 1,835 | 6 |
| Apr-24 | 16,990 | 1,962 | 7 | 18,865 | 2,148 | 7 | 15,739 | 1,838 | 7 |
| May-24 | 17,005 | 1,960 | 7 | 18,889 | 2,145 | 7 | 15,748 | 1,837 | 7 |
| Jun-24 | 16,936 | 1,953 | 7 | 18,779 | 2,134 | 7 | 15,707 | 1,833 | 7 |
| Jul-24 | 16,883 | 1,953 | 7 | 18,694 | 2,134 | 7 | 15,675 | 1,833 | 7 |
| Aug-24 | 16,764 | 1,956 | 7 | 18,503 | 2,138 | 7 | 15,604 | 1,834 | 7 |
| Sep-24 | 16,770 | 1,962 | 7 | 18,514 | 2,148 | 7 | 15,608 | 1,838 | 7 |
| Oct-24 | 16,918 | 1,963 | 7 | 18,751 | 2,150 | 7 | 15,697 | 1,839 | 7 |
| Nov-24 | 17,137 | 1,967 | 7 | 19,100 | 2,156 | 7 | 15,828 | 1,841 | 7 |
| Dec-24 | 17,271 | 1,971 | 7 | 19,315 | 2,163 | 7 | 15,908 | 1,844 | 7 |
| Jan-25 | 17,251 | 1,981 | 7 | 19,284 | 2,179 | 7 | 15,896 | 1,850 | 7 |
| Feb-25 | 17,240 | 1,989 | 8 | 19,265 | 2,191 | 8 | 15,889 | 1,854 | 8 |
| Mar-25 | 17,277 | 1,979 | 6 | 19,325 | 2,175 | 6 | 15,912 | 1,848 | 6 |
| Apr-25 | 17,227 | 1,985 | 7 | 19,245 | 2,184 | 7 | 15,882 | 1,852 | 7 |
| May-25 | 17,242 | 1,982 | 7 | 19,269 | 2,181 | 7 | 15,891 | 1,850 | 7 |
| Jun-25 | 17,172 | 1,976 | 7 | 19,157 | 2,170 | 7 | 15,849 | 1,846 | 7 |
| Jul-25 | 17,119 | 1,976 | 7 | 19,071 | 2,170 | 7 | 15,817 | 1,846 | 7 |
| Aug-25 | 16,998 | 1,978 | 7 | 18,878 | 2,173 | 7 | 15,744 | 1,847 | 7 |
| Sep-25 | 17,005 | 1,985 | 7 | 18,889 | 2,184 | 7 | 15,748 | 1,852 | 7 |
| Oct-25 | 17,155 | 1,986 | 7 | 19,129 | 2,186 | 7 | 15,838 | 1,852 | 7 |
| Nov-25 | 17,376 | 1,989 | 7 | 19,483 | 2,191 | 7 | 15,971 | 1,854 | 7 |
| Dec-25 | 17,512 | 1,994 | 7 | 19,701 | 2,199 | 7 | 16,053 | 1,857 | 7 |
| Jan-26 | 17,489 | 2,004 | 7 | 19,664 | 2,214 | 7 | 16,039 | 1,863 | 7 |
| Feb-26 | 17,477 | 2,012 | 8 | 19,645 | 2,227 | 8 | 16,032 | 1,868 | 8 |
| Mar-26 | 17,515 | 2,001 | 6 | 19,706 | 2,211 | 6 | 16,055 | 1,862 | 6 |
| Apr-26 | 17,464 | 2,007 | 7 | 19,624 | 2,220 | 7 | 16,024 | 1,865 | 7 |
| May-26 | 17,480 | 2,005 | 7 | 19,649 | 2,216 | 7 | 16,033 | 1,864 | 7 |
| Jun-26 | 17,409 | 1,998 | 7 | 19,536 | 2,205 | 7 | 15,991 | 1,859 | 7 |
| Jul-26 | 17,355 | 1,998 | 7 | 19,449 | 2,205 | 7 | 15,958 | 1,859 | 7 |
| Aug-26 | 17,232 | 2,000 | 7 | 19,253 | 2,209 | 7 | 15,885 | 1,861 | 7 |
| Sep-26 | 17,239 | 2,007 | 7 | 19,264 | 2,220 | 7 | 15,889 | 1,865 | 7 |
| Oct-26 | 17,391 | 2,008 | 7 | 19,507 | 2,222 | 7 | 15,980 | 1,866 | 7 |
| Nov-26 | 17,615 | 2,012 | 7 | 19,866 | 2,227 | 7 | 16,115 | 1,868 | 7 |
| Dec-26 | 17,753 | 2,016 | 7 | 20,087 | 2,235 | 7 | 16,198 | 1,870 | 7 |
| Jan-27 | 17,725 | 2,026 | 7 | 20,042 | 2,250 | 7 | 16,181 | 1,876 | 7 |
| Feb-27 | 17,713 | 2,034 | 8 | 20,023 | 2,263 | 8 | 16,174 | 1,881 | 8 |
| Mar-27 | 17,752 | 2,023 | 6 | 20,084 | 2,246 | 6 | 16,197 | 1,875 | 6 |
| Apr-27 | 17,700 | 2,029 | 7 | 20,002 | 2,256 | 7 | 16,166 | 1,878 | 7 |
| May-27 | 17,716 | 2,027 | 7 | 20,027 | 2,252 | 7 | 16,175 | 1,877 | 7 |
| Jun-27 | 17,644 | 2,020 | 7 | 19,912 | 2,241 | 7 | 16,132 | 1,873 | 7 |
| Jul-27 | 17,589 | 2,020 | 7 | 19,824 | 2,241 | 7 | 16,099 | 1,873 | 7 |
| Aug-27 | 17,465 | 2,022 | 7 | 19,625 | 2,244 | 7 | 16,024 | 1,874 | 7 |
| Sep-27 | 17,472 | 2,029 | 7 | 19,636 | 2,256 | 7 | 16,029 | 1,878 | 7 |
| Oct-27 | 17,626 | 2,030 | 7 | 19,883 | 2,257 | 7 | 16,121 | 1,879 | 7 |
| Nov-27 | 17,853 | 2,034 | 7 | 20,247 | 2,263 | 7 | 16,258 | 1,881 | 7 |
| Dec-27 | 17,993 | 2,038 | 7 | 20,471 | 2,270 | 7 | 16,342 | 1,884 | 7 |

# APPENDIX 3.2 ‖ CUSTOMER FORECASTS BY REGION
# KLAMATH FALLS

| | Oregon - Expected Growth | | | Oregon - High Growth | | | Oregon - Low Growth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Residential Klamath Falls Customers | Commercial Klamath Falls Customers | Industrial Klamath Falls Customers | Residential Klamath Falls Customers | Commercial Klamath Falls Customers | Industrial Klamath Falls Customers | Residential Klamath Falls Customers | Commercial Klamath Falls Customers | Industrial Klamath Falls Customers |
| Jan-28 | 17,958 | 2,048 | 7 | 20,414 | 2,285 | 7 | 16,320 | 1,889 | 7 |
| Feb-28 | 17,945 | 2,056 | 8 | 20,394 | 2,298 | 8 | 16,313 | 1,894 | 8 |
| Mar-28 | 17,984 | 2,045 | 6 | 20,456 | 2,281 | 6 | 16,336 | 1,888 | 6 |
| Apr-28 | 17,932 | 2,051 | 7 | 20,373 | 2,290 | 7 | 16,305 | 1,891 | 7 |
| May-28 | 17,948 | 2,049 | 7 | 20,398 | 2,287 | 7 | 16,314 | 1,890 | 7 |
| Jun-28 | 17,875 | 2,042 | 7 | 20,282 | 2,276 | 7 | 16,271 | 1,886 | 7 |
| Jul-28 | 17,819 | 2,042 | 7 | 20,193 | 2,276 | 7 | 16,237 | 1,886 | 7 |
| Aug-28 | 17,693 | 2,044 | 7 | 19,991 | 2,279 | 7 | 16,162 | 1,887 | 7 |
| Sep-28 | 17,701 | 2,051 | 7 | 20,003 | 2,290 | 7 | 16,166 | 1,891 | 7 |
| Oct-28 | 17,857 | 2,052 | 7 | 20,253 | 2,292 | 7 | 16,260 | 1,892 | 7 |
| Nov-28 | 18,087 | 2,056 | 7 | 20,621 | 2,298 | 7 | 16,398 | 1,894 | 7 |
| Dec-28 | 18,229 | 2,060 | 7 | 20,848 | 2,305 | 7 | 16,483 | 1,897 | 7 |
| Jan-29 | 18,186 | 2,069 | 7 | 20,780 | 2,319 | 7 | 16,457 | 1,902 | 7 |
| Feb-29 | 18,174 | 2,077 | 8 | 20,760 | 2,332 | 8 | 16,450 | 1,907 | 8 |
| Mar-29 | 18,213 | 2,067 | 6 | 20,823 | 2,315 | 6 | 16,474 | 1,901 | 6 |
| Apr-29 | 18,160 | 2,073 | 7 | 20,738 | 2,325 | 7 | 16,442 | 1,904 | 7 |
| May-29 | 18,176 | 2,070 | 7 | 20,764 | 2,321 | 7 | 16,451 | 1,903 | 7 |
| Jun-29 | 18,103 | 2,063 | 7 | 20,646 | 2,310 | 7 | 16,407 | 1,899 | 7 |
| Jul-29 | 18,046 | 2,063 | 7 | 20,556 | 2,310 | 7 | 16,373 | 1,899 | 7 |
| Aug-29 | 17,919 | 2,065 | 7 | 20,352 | 2,314 | 7 | 16,297 | 1,900 | 7 |
| Sep-29 | 17,926 | 2,073 | 7 | 20,363 | 2,325 | 7 | 16,301 | 1,904 | 7 |
| Oct-29 | 18,084 | 2,074 | 7 | 20,617 | 2,327 | 7 | 16,396 | 1,905 | 7 |
| Nov-29 | 18,317 | 2,077 | 7 | 20,990 | 2,332 | 7 | 16,536 | 1,907 | 7 |
| Dec-29 | 18,461 | 2,082 | 7 | 21,219 | 2,340 | 7 | 16,622 | 1,910 | 7 |
| Jan-30 | 18,414 | 2,090 | 7 | 21,144 | 2,353 | 7 | 16,594 | 1,915 | 7 |
| Feb-30 | 18,402 | 2,099 | 8 | 21,124 | 2,367 | 8 | 16,587 | 1,920 | 8 |
| Mar-30 | 18,441 | 2,088 | 6 | 21,188 | 2,350 | 6 | 16,610 | 1,914 | 6 |
| Apr-30 | 18,388 | 2,094 | 7 | 21,102 | 2,359 | 7 | 16,578 | 1,917 | 7 |
| May-30 | 18,404 | 2,092 | 7 | 21,128 | 2,355 | 7 | 16,588 | 1,916 | 7 |
| Jun-30 | 18,330 | 2,084 | 7 | 21,009 | 2,344 | 7 | 16,543 | 1,911 | 7 |
| Jul-30 | 18,272 | 2,084 | 7 | 20,917 | 2,344 | 7 | 16,509 | 1,911 | 7 |
| Aug-30 | 18,143 | 2,087 | 7 | 20,711 | 2,348 | 7 | 16,432 | 1,913 | 7 |
| Sep-30 | 18,151 | 2,094 | 7 | 20,723 | 2,359 | 7 | 16,436 | 1,917 | 7 |
| Oct-30 | 18,311 | 2,095 | 7 | 20,979 | 2,361 | 7 | 16,532 | 1,918 | 7 |
| Nov-30 | 18,547 | 2,099 | 7 | 21,357 | 2,367 | 7 | 16,674 | 1,920 | 7 |
| Dec-30 | 18,692 | 2,104 | 7 | 21,589 | 2,374 | 7 | 16,761 | 1,923 | 7 |
| Jan-31 | 18,642 | 2,112 | 7 | 21,509 | 2,388 | 7 | 16,731 | 1,928 | 7 |
| Feb-31 | 18,630 | 2,120 | 8 | 21,489 | 2,401 | 8 | 16,723 | 1,933 | 8 |
| Mar-31 | 18,670 | 2,109 | 6 | 21,554 | 2,384 | 6 | 16,748 | 1,926 | 6 |
| Apr-31 | 18,616 | 2,115 | 7 | 21,467 | 2,394 | 7 | 16,715 | 1,930 | 7 |
| May-31 | 18,632 | 2,113 | 7 | 21,493 | 2,390 | 7 | 16,725 | 1,929 | 7 |
| Jun-31 | 18,557 | 2,106 | 7 | 21,373 | 2,378 | 7 | 16,680 | 1,924 | 7 |
| Jul-31 | 18,499 | 2,106 | 7 | 21,280 | 2,378 | 7 | 16,645 | 1,924 | 7 |
| Aug-31 | 18,368 | 2,108 | 7 | 21,071 | 2,382 | 7 | 16,567 | 1,926 | 7 |
| Sep-31 | 18,376 | 2,115 | 7 | 21,083 | 2,394 | 7 | 16,571 | 1,930 | 7 |
| Oct-31 | 18,538 | 2,117 | 7 | 21,342 | 2,396 | 7 | 16,668 | 1,931 | 7 |
| Nov-31 | 18,777 | 2,120 | 7 | 21,725 | 2,401 | 7 | 16,812 | 1,933 | 7 |
| Dec-31 | 18,924 | 2,125 | 7 | 21,960 | 2,409 | 7 | 16,900 | 1,936 | 7 |

# APPENDIX 3.2 II CUSTOMER FORECASTS BY REGION
## KLAMATH FALLS

| | Oregon - Expected Growth | | | Oregon - High Growth | | | Oregon - Low Growth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Residential Klamath Falls Customers | Commercial Klamath Falls Customers | Industrial Klamath Falls Customers | Residential Klamath Falls Customers | Commercial Klamath Falls Customers | Industrial Klamath Falls Customers | Residential Klamath Falls Customers | Commercial Klamath Falls Customers | Industrial Klamath Falls Customers |
| Jan-32 | 18,868 | 2,133 | 7 | 21,871 | 2,422 | 7 | 16,867 | 1,941 | 7 |
| Feb-32 | 18,856 | 2,142 | 8 | 21,851 | 2,435 | 8 | 16,859 | 1,946 | 8 |
| Mar-32 | 18,896 | 2,131 | 6 | 21,916 | 2,418 | 6 | 16,883 | 1,939 | 6 |
| Apr-32 | 18,842 | 2,137 | 7 | 21,828 | 2,428 | 7 | 16,851 | 1,943 | 7 |
| May-32 | 18,858 | 2,134 | 7 | 21,855 | 2,424 | 7 | 16,861 | 1,941 | 7 |
| Jun-32 | 18,782 | 2,127 | 7 | 21,732 | 2,412 | 7 | 16,815 | 1,937 | 7 |
| Jul-32 | 18,723 | 2,127 | 7 | 21,639 | 2,412 | 7 | 16,780 | 1,937 | 7 |
| Aug-32 | 18,591 | 2,129 | 7 | 21,427 | 2,416 | 7 | 16,700 | 1,938 | 7 |
| Sep-32 | 18,598 | 2,137 | 7 | 21,439 | 2,428 | 7 | 16,705 | 1,943 | 7 |
| Oct-32 | 18,763 | 2,138 | 7 | 21,702 | 2,430 | 7 | 16,803 | 1,944 | 7 |
| Nov-32 | 19,005 | 2,142 | 7 | 22,089 | 2,435 | 7 | 16,948 | 1,946 | 7 |
| Dec-32 | 19,154 | 2,146 | 7 | 22,327 | 2,443 | 7 | 17,038 | 1,949 | 7 |
| Jan-33 | 19,097 | 2,155 | 7 | 22,237 | 2,456 | 7 | 17,004 | 1,954 | 7 |
| Feb-33 | 19,084 | 2,163 | 8 | 22,216 | 2,470 | 8 | 16,996 | 1,959 | 8 |
| Mar-33 | 19,125 | 2,152 | 6 | 22,282 | 2,452 | 6 | 17,021 | 1,952 | 6 |
| Apr-33 | 19,070 | 2,158 | 7 | 22,193 | 2,462 | 7 | 16,988 | 1,956 | 7 |
| May-33 | 19,087 | 2,156 | 7 | 22,220 | 2,458 | 7 | 16,998 | 1,954 | 7 |
| Jun-33 | 19,009 | 2,148 | 7 | 22,097 | 2,446 | 7 | 16,951 | 1,950 | 7 |
| Jul-33 | 18,950 | 2,148 | 7 | 22,002 | 2,446 | 7 | 16,916 | 1,950 | 7 |
| Aug-33 | 18,816 | 2,151 | 7 | 21,787 | 2,450 | 7 | 16,835 | 1,951 | 7 |
| Sep-33 | 18,824 | 2,158 | 7 | 21,800 | 2,462 | 7 | 16,840 | 1,956 | 7 |
| Oct-33 | 18,990 | 2,159 | 7 | 22,066 | 2,464 | 7 | 16,940 | 1,956 | 7 |
| Nov-33 | 19,235 | 2,163 | 7 | 22,457 | 2,470 | 7 | 17,087 | 1,959 | 7 |
| Dec-33 | 19,386 | 2,168 | 7 | 22,699 | 2,478 | 7 | 17,177 | 1,962 | 7 |
| Jan-34 | 19,326 | 2,176 | 7 | 22,604 | 2,491 | 7 | 17,141 | 1,966 | 7 |
| Feb-34 | 19,313 | 2,185 | 8 | 22,583 | 2,505 | 8 | 17,134 | 1,972 | 8 |
| Mar-34 | 19,355 | 2,174 | 6 | 22,650 | 2,487 | 6 | 17,159 | 1,965 | 6 |
| Apr-34 | 19,299 | 2,180 | 7 | 22,560 | 2,497 | 7 | 17,125 | 1,969 | 7 |
| May-34 | 19,316 | 2,177 | 7 | 22,587 | 2,493 | 7 | 17,135 | 1,967 | 7 |
| Jun-34 | 19,238 | 2,170 | 7 | 22,462 | 2,481 | 7 | 17,088 | 1,963 | 7 |
| Jul-34 | 19,178 | 2,170 | 7 | 22,366 | 2,481 | 7 | 17,052 | 1,963 | 7 |
| Aug-34 | 19,042 | 2,172 | 7 | 22,149 | 2,485 | 7 | 16,971 | 1,964 | 7 |
| Sep-34 | 19,050 | 2,180 | 7 | 22,162 | 2,497 | 7 | 16,976 | 1,969 | 7 |
| Oct-34 | 19,218 | 2,181 | 7 | 22,431 | 2,499 | 7 | 17,076 | 1,969 | 7 |
| Nov-34 | 19,466 | 2,185 | 7 | 22,827 | 2,505 | 7 | 17,225 | 1,972 | 7 |
| Dec-34 | 19,618 | 2,190 | 7 | 23,071 | 2,512 | 7 | 17,317 | 1,975 | 7 |
| Jan-35 | 19,555 | 2,198 | 7 | 22,970 | 2,525 | 7 | 17,279 | 1,979 | 7 |
| Feb-35 | 19,542 | 2,206 | 8 | 22,948 | 2,539 | 8 | 17,271 | 1,985 | 8 |
| Mar-35 | 19,584 | 2,195 | 6 | 23,016 | 2,521 | 6 | 17,296 | 1,978 | 6 |
| Apr-35 | 19,527 | 2,201 | 7 | 22,925 | 2,531 | 7 | 17,262 | 1,982 | 7 |
| May-35 | 19,544 | 2,199 | 7 | 22,953 | 2,527 | 7 | 17,272 | 1,980 | 7 |
| Jun-35 | 19,465 | 2,191 | 7 | 22,826 | 2,515 | 7 | 17,225 | 1,976 | 7 |
| Jul-35 | 19,405 | 2,191 | 7 | 22,729 | 2,515 | 7 | 17,188 | 1,976 | 7 |
| Aug-35 | 19,267 | 2,194 | 7 | 22,509 | 2,519 | 7 | 17,106 | 1,977 | 7 |
| Sep-35 | 19,275 | 2,201 | 7 | 22,522 | 2,531 | 7 | 17,111 | 1,982 | 7 |
| Oct-35 | 19,445 | 2,203 | 7 | 22,794 | 2,533 | 7 | 17,213 | 1,982 | 7 |
| Nov-35 | 19,696 | 2,206 | 7 | 23,195 | 2,539 | 7 | 17,363 | 1,985 | 7 |
| Dec-35 | 19,851 | 2,211 | 7 | 23,442 | 2,547 | 7 | 17,456 | 1,988 | 7 |

# APPENDIX 3.2 ‖ CUSTOMER FORECASTS BY REGION
# LA GRANDE

| | Oregon - Expected Growth | | | Oregon - High Growth | | | Oregon - Low Growth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Residential La Grande Customers | Commercial La Grande Customers | Industrial La Grande Customers | Residential La Grande Customers | Commercial La Grande Customers | Industrial La Grande Customers | Residential La Grande Customers | Commercial La Grande Customers | Industrial La Grande Customers |
| Jan-12 | 6,568 | 903 | 0 | 6,627 | 911 | 0 | 6,529 | 898 | 0 |
| Feb-12 | 6,580 | 911 | 0 | 6,646 | 924 | 0 | 6,536 | 903 | 0 |
| Mar-12 | 6,541 | 892 | 0 | 6,584 | 893 | 0 | 6,513 | 891 | 0 |
| Apr-12 | 6,537 | 897 | 0 | 6,577 | 901 | 0 | 6,510 | 894 | 0 |
| May-12 | 6,531 | 887 | 0 | 6,568 | 885 | 0 | 6,507 | 888 | 0 |
| Jun-12 | 6,505 | 888 | 0 | 6,526 | 887 | 0 | 6,491 | 889 | 0 |
| Jul-12 | 6,473 | 884 | 0 | 6,475 | 880 | 0 | 6,472 | 886 | 0 |
| Aug-12 | 6,456 | 885 | 0 | 6,448 | 882 | 0 | 6,462 | 887 | 0 |
| Sep-12 | 6,452 | 887 | 5 | 6,441 | 885 | 5 | 6,459 | 888 | 5 |
| Oct-12 | 6,520 | 900 | 5 | 6,550 | 906 | 5 | 6,500 | 896 | 5 |
| Nov-12 | 6,566 | 900 | 0 | 6,624 | 906 | 0 | 6,528 | 896 | 0 |
| Dec-12 | 6,609 | 906 | 0 | 6,692 | 916 | 0 | 6,553 | 900 | 0 |
| Jan-13 | 6,618 | 918 | 0 | 6,707 | 935 | 0 | 6,559 | 907 | 0 |
| Feb-13 | 6,630 | 926 | 0 | 6,726 | 948 | 0 | 6,566 | 912 | 0 |
| Mar-13 | 6,591 | 907 | 0 | 6,664 | 917 | 0 | 6,543 | 900 | 0 |
| Apr-13 | 6,587 | 912 | 0 | 6,657 | 925 | 0 | 6,540 | 903 | 0 |
| May-13 | 6,581 | 902 | 0 | 6,648 | 909 | 0 | 6,537 | 897 | 0 |
| Jun-13 | 6,555 | 903 | 0 | 6,606 | 911 | 0 | 6,521 | 898 | 0 |
| Jul-13 | 6,523 | 899 | 0 | 6,555 | 904 | 0 | 6,502 | 895 | 0 |
| Aug-13 | 6,506 | 900 | 0 | 6,528 | 906 | 0 | 6,492 | 896 | 0 |
| Sep-13 | 6,502 | 902 | 5 | 6,521 | 909 | 5 | 6,489 | 897 | 5 |
| Oct-13 | 6,570 | 915 | 5 | 6,630 | 930 | 5 | 6,530 | 905 | 5 |
| Nov-13 | 6,616 | 915 | 0 | 6,704 | 930 | 0 | 6,558 | 905 | 0 |
| Dec-13 | 6,659 | 921 | 0 | 6,772 | 940 | 0 | 6,583 | 909 | 0 |
| Jan-14 | 6,668 | 933 | 0 | 6,787 | 959 | 0 | 6,589 | 916 | 0 |
| Feb-14 | 6,680 | 941 | 0 | 6,806 | 972 | 0 | 6,596 | 921 | 0 |
| Mar-14 | 6,641 | 922 | 0 | 6,744 | 941 | 0 | 6,573 | 909 | 0 |
| Apr-14 | 6,637 | 927 | 0 | 6,737 | 949 | 0 | 6,570 | 912 | 0 |
| May-14 | 6,631 | 917 | 0 | 6,728 | 933 | 0 | 6,567 | 906 | 0 |
| Jun-14 | 6,605 | 918 | 0 | 6,686 | 935 | 0 | 6,551 | 907 | 0 |
| Jul-14 | 6,573 | 914 | 0 | 6,635 | 928 | 0 | 6,532 | 904 | 0 |
| Aug-14 | 6,556 | 915 | 0 | 6,608 | 930 | 0 | 6,522 | 905 | 0 |
| Sep-14 | 6,552 | 917 | 5 | 6,601 | 933 | 5 | 6,519 | 906 | 5 |
| Oct-14 | 6,620 | 930 | 5 | 6,710 | 954 | 5 | 6,560 | 914 | 5 |
| Nov-14 | 6,666 | 930 | 0 | 6,784 | 954 | 0 | 6,588 | 914 | 0 |
| Dec-14 | 6,709 | 936 | 0 | 6,852 | 964 | 0 | 6,613 | 918 | 0 |
| Jan-15 | 6,718 | 953 | 0 | 6,867 | 991 | 0 | 6,619 | 928 | 0 |
| Feb-15 | 6,730 | 961 | 0 | 6,886 | 1,004 | 0 | 6,626 | 933 | 0 |
| Mar-15 | 6,691 | 942 | 0 | 6,824 | 973 | 0 | 6,603 | 921 | 0 |
| Apr-15 | 6,687 | 947 | 0 | 6,817 | 981 | 0 | 6,600 | 924 | 0 |
| May-15 | 6,681 | 937 | 0 | 6,808 | 965 | 0 | 6,597 | 918 | 0 |
| Jun-15 | 6,655 | 938 | 0 | 6,766 | 967 | 0 | 6,581 | 919 | 0 |
| Jul-15 | 6,623 | 934 | 0 | 6,715 | 960 | 0 | 6,562 | 916 | 0 |
| Aug-15 | 6,606 | 935 | 0 | 6,688 | 962 | 0 | 6,552 | 917 | 0 |
| Sep-15 | 6,602 | 937 | 5 | 6,681 | 965 | 5 | 6,549 | 918 | 5 |
| Oct-15 | 6,670 | 950 | 5 | 6,790 | 986 | 5 | 6,590 | 926 | 5 |
| Nov-15 | 6,716 | 950 | 0 | 6,864 | 986 | 0 | 6,618 | 926 | 0 |
| Dec-15 | 6,759 | 956 | 0 | 6,932 | 996 | 0 | 6,643 | 930 | 0 |
| Jan-16 | 6,777 | 966 | 0 | 6,962 | 1,012 | 0 | 6,654 | 936 | 0 |

# APPENDIX 3.2 II CUSTOMER FORECASTS BY REGION
# LA GRANDE

| | Oregon - Expected Growth | | | Oregon - High Growth | | | Oregon - Low Growth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Residential La Grande Customers | Commercial La Grande Customers | Industrial La Grande Customers | Residential La Grande Customers | Commercial La Grande Customers | Industrial La Grande Customers | Residential La Grande Customers | Commercial La Grande Customers | Industrial La Grande Customers |
| Feb-16 | 6,789 | 974 | 0 | 6,981 | 1,025 | 0 | 6,662 | 940 | 0 |
| Mar-16 | 6,750 | 955 | 0 | 6,918 | 994 | 0 | 6,638 | 929 | 0 |
| Apr-16 | 6,746 | 960 | 0 | 6,912 | 1,002 | 0 | 6,636 | 932 | 0 |
| May-16 | 6,740 | 950 | 0 | 6,902 | 986 | 0 | 6,632 | 926 | 0 |
| Jun-16 | 6,714 | 951 | 0 | 6,860 | 987 | 0 | 6,616 | 926 | 0 |
| Jul-16 | 6,681 | 947 | 0 | 6,808 | 981 | 0 | 6,597 | 924 | 0 |
| Aug-16 | 6,664 | 948 | 0 | 6,781 | 982 | 0 | 6,587 | 925 | 0 |
| Sep-16 | 6,660 | 950 | 5 | 6,775 | 986 | 5 | 6,584 | 926 | 5 |
| Oct-16 | 6,729 | 963 | 5 | 6,884 | 1,007 | 5 | 6,625 | 934 | 5 |
| Nov-16 | 6,775 | 963 | 0 | 6,959 | 1,007 | 0 | 6,653 | 934 | 0 |
| Dec-16 | 6,819 | 969 | 0 | 7,028 | 1,017 | 0 | 6,679 | 937 | 0 |
| Jan-17 | 6,832 | 978 | 0 | 7,049 | 1,031 | 0 | 6,687 | 943 | 0 |
| Feb-17 | 6,844 | 986 | 0 | 7,069 | 1,044 | 0 | 6,694 | 948 | 0 |
| Mar-17 | 6,804 | 967 | 0 | 7,005 | 1,013 | 0 | 6,671 | 936 | 0 |
| Apr-17 | 6,800 | 972 | 0 | 6,999 | 1,021 | 0 | 6,668 | 939 | 0 |
| May-17 | 6,794 | 962 | 0 | 6,989 | 1,005 | 0 | 6,665 | 933 | 0 |
| Jun-17 | 6,768 | 963 | 0 | 6,946 | 1,006 | 0 | 6,649 | 934 | 0 |
| Jul-17 | 6,735 | 959 | 0 | 6,894 | 1,000 | 0 | 6,629 | 931 | 0 |
| Aug-17 | 6,718 | 960 | 0 | 6,867 | 1,001 | 0 | 6,619 | 932 | 0 |
| Sep-17 | 6,714 | 962 | 5 | 6,860 | 1,005 | 5 | 6,616 | 933 | 5 |
| Oct-17 | 6,783 | 975 | 5 | 6,971 | 1,026 | 5 | 6,658 | 941 | 5 |
| Nov-17 | 6,830 | 975 | 0 | 7,046 | 1,026 | 0 | 6,686 | 941 | 0 |
| Dec-17 | 6,874 | 981 | 0 | 7,116 | 1,036 | 0 | 6,712 | 945 | 0 |
| Jan-18 | 6,883 | 989 | 0 | 7,130 | 1,049 | 0 | 6,718 | 950 | 0 |
| Feb-18 | 6,895 | 997 | 0 | 7,150 | 1,062 | 0 | 6,725 | 954 | 0 |
| Mar-18 | 6,855 | 978 | 0 | 7,086 | 1,030 | 0 | 6,701 | 943 | 0 |
| Apr-18 | 6,851 | 983 | 0 | 7,080 | 1,039 | 0 | 6,699 | 946 | 0 |
| May-18 | 6,845 | 973 | 0 | 7,070 | 1,022 | 0 | 6,695 | 940 | 0 |
| Jun-18 | 6,818 | 974 | 0 | 7,027 | 1,024 | 0 | 6,679 | 940 | 0 |
| Jul-18 | 6,785 | 969 | 0 | 6,975 | 1,017 | 0 | 6,659 | 938 | 0 |
| Aug-18 | 6,768 | 970 | 0 | 6,947 | 1,019 | 0 | 6,649 | 938 | 0 |
| Sep-18 | 6,764 | 973 | 5 | 6,940 | 1,022 | 5 | 6,646 | 940 | 5 |
| Oct-18 | 6,834 | 986 | 5 | 7,052 | 1,044 | 5 | 6,688 | 948 | 5 |
| Nov-18 | 6,881 | 986 | 0 | 7,127 | 1,044 | 0 | 6,716 | 948 | 0 |
| Dec-18 | 6,925 | 992 | 0 | 7,198 | 1,054 | 0 | 6,743 | 951 | 0 |
| Jan-19 | 6,932 | 1,000 | 0 | 7,210 | 1,066 | 0 | 6,747 | 956 | 0 |
| Feb-19 | 6,945 | 1,008 | 0 | 7,230 | 1,080 | 0 | 6,755 | 961 | 0 |
| Mar-19 | 6,905 | 989 | 0 | 7,165 | 1,048 | 0 | 6,731 | 949 | 0 |
| Apr-19 | 6,900 | 994 | 0 | 7,159 | 1,056 | 0 | 6,728 | 952 | 0 |
| May-19 | 6,894 | 983 | 0 | 7,149 | 1,039 | 0 | 6,725 | 946 | 0 |
| Jun-19 | 6,867 | 984 | 0 | 7,106 | 1,041 | 0 | 6,708 | 947 | 0 |
| Jul-19 | 6,834 | 980 | 0 | 7,053 | 1,034 | 0 | 6,689 | 944 | 0 |
| Aug-19 | 6,817 | 981 | 0 | 7,025 | 1,036 | 0 | 6,678 | 945 | 0 |
| Sep-19 | 6,813 | 983 | 5 | 7,018 | 1,039 | 5 | 6,676 | 946 | 5 |
| Oct-19 | 6,883 | 997 | 5 | 7,131 | 1,061 | 5 | 6,718 | 954 | 5 |
| Nov-19 | 6,930 | 997 | 0 | 7,207 | 1,061 | 0 | 6,746 | 954 | 0 |
| Dec-19 | 6,975 | 1,003 | 0 | 7,278 | 1,071 | 0 | 6,773 | 958 | 0 |
| Jan-20 | 6,982 | 1,011 | 0 | 7,289 | 1,083 | 0 | 6,777 | 963 | 0 |
| Feb-20 | 6,994 | 1,019 | 0 | 7,309 | 1,097 | 0 | 6,785 | 968 | 0 |

# APPENDIX 3.2 II CUSTOMER FORECASTS BY REGION
# LA GRANDE

| | Oregon - Expected Growth | | | Oregon - High Growth | | | Oregon - Low Growth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Residential La Grande Customers | Commercial La Grande Customers | Industrial La Grande Customers | Residential La Grande Customers | Commercial La Grande Customers | Industrial La Grande Customers | Residential La Grande Customers | Commercial La Grande Customers | Industrial La Grande Customers |
| Mar-20 | 6,954 | 999 | 0 | 7,244 | 1,065 | 0 | 6,760 | 956 | 0 |
| Apr-20 | 6,950 | 1,005 | 0 | 7,237 | 1,073 | 0 | 6,758 | 959 | 0 |
| May-20 | 6,943 | 994 | 0 | 7,227 | 1,056 | 0 | 6,754 | 952 | 0 |
| Jun-20 | 6,916 | 995 | 0 | 7,184 | 1,058 | 0 | 6,738 | 953 | 0 |
| Jul-20 | 6,883 | 991 | 0 | 7,131 | 1,051 | 0 | 6,718 | 950 | 0 |
| Aug-20 | 6,865 | 992 | 0 | 7,103 | 1,053 | 0 | 6,707 | 951 | 0 |
| Sep-20 | 6,861 | 994 | 5 | 7,096 | 1,056 | 5 | 6,705 | 952 | 5 |
| Oct-20 | 6,932 | 1,008 | 5 | 7,209 | 1,078 | 5 | 6,747 | 961 | 5 |
| Nov-20 | 6,980 | 1,008 | 0 | 7,285 | 1,078 | 0 | 6,776 | 961 | 0 |
| Dec-20 | 7,024 | 1,014 | 0 | 7,357 | 1,089 | 0 | 6,803 | 964 | 0 |
| Jan-21 | 7,030 | 1,022 | 0 | 7,366 | 1,100 | 0 | 6,806 | 969 | 0 |
| Feb-21 | 7,043 | 1,030 | 0 | 7,386 | 1,114 | 0 | 6,814 | 974 | 0 |
| Mar-21 | 7,002 | 1,010 | 0 | 7,321 | 1,082 | 0 | 6,789 | 962 | 0 |
| Apr-21 | 6,998 | 1,015 | 0 | 7,314 | 1,090 | 0 | 6,787 | 965 | 0 |
| May-21 | 6,991 | 1,004 | 0 | 7,304 | 1,073 | 0 | 6,783 | 959 | 0 |
| Jun-21 | 6,964 | 1,005 | 0 | 7,261 | 1,075 | 0 | 6,767 | 959 | 0 |
| Jul-21 | 6,931 | 1,001 | 0 | 7,207 | 1,068 | 0 | 6,746 | 957 | 0 |
| Aug-21 | 6,913 | 1,002 | 0 | 7,179 | 1,070 | 0 | 6,736 | 957 | 0 |
| Sep-21 | 6,909 | 1,004 | 5 | 7,172 | 1,073 | 5 | 6,733 | 959 | 5 |
| Oct-21 | 6,980 | 1,018 | 5 | 7,286 | 1,095 | 5 | 6,776 | 967 | 5 |
| Nov-21 | 7,028 | 1,018 | 0 | 7,363 | 1,095 | 0 | 6,805 | 967 | 0 |
| Dec-21 | 7,073 | 1,025 | 0 | 7,435 | 1,106 | 0 | 6,832 | 971 | 0 |
| Jan-22 | 7,078 | 1,032 | 0 | 7,443 | 1,117 | 0 | 6,835 | 975 | 0 |
| Feb-22 | 7,091 | 1,041 | 0 | 7,463 | 1,131 | 0 | 6,842 | 980 | 0 |
| Mar-22 | 7,049 | 1,020 | 0 | 7,397 | 1,098 | 0 | 6,818 | 968 | 0 |
| Apr-22 | 7,045 | 1,026 | 0 | 7,390 | 1,107 | 0 | 6,815 | 971 | 0 |
| May-22 | 7,039 | 1,015 | 0 | 7,380 | 1,090 | 0 | 6,811 | 965 | 0 |
| Jun-22 | 7,012 | 1,016 | 0 | 7,336 | 1,091 | 0 | 6,795 | 965 | 0 |
| Jul-22 | 6,978 | 1,011 | 0 | 7,283 | 1,084 | 0 | 6,775 | 963 | 0 |
| Aug-22 | 6,960 | 1,013 | 0 | 7,254 | 1,086 | 0 | 6,764 | 964 | 0 |
| Sep-22 | 6,956 | 1,015 | 5 | 7,247 | 1,090 | 5 | 6,761 | 965 | 5 |
| Oct-22 | 7,027 | 1,029 | 5 | 7,362 | 1,112 | 5 | 6,804 | 973 | 5 |
| Nov-22 | 7,076 | 1,029 | 0 | 7,439 | 1,112 | 0 | 6,833 | 973 | 0 |
| Dec-22 | 7,121 | 1,035 | 0 | 7,512 | 1,122 | 0 | 6,861 | 977 | 0 |
| Jan-23 | 7,125 | 1,042 | 0 | 7,518 | 1,134 | 0 | 6,863 | 981 | 0 |
| Feb-23 | 7,138 | 1,051 | 0 | 7,539 | 1,148 | 0 | 6,871 | 987 | 0 |
| Mar-23 | 7,097 | 1,030 | 0 | 7,473 | 1,115 | 0 | 6,846 | 974 | 0 |
| Apr-23 | 7,092 | 1,036 | 0 | 7,466 | 1,123 | 0 | 6,843 | 978 | 0 |
| May-23 | 7,086 | 1,025 | 0 | 7,456 | 1,106 | 0 | 6,840 | 971 | 0 |
| Jun-23 | 7,058 | 1,026 | 0 | 7,411 | 1,108 | 0 | 6,823 | 972 | 0 |
| Jul-23 | 7,024 | 1,022 | 0 | 7,357 | 1,101 | 0 | 6,803 | 969 | 0 |
| Aug-23 | 7,006 | 1,023 | 0 | 7,328 | 1,102 | 0 | 6,792 | 970 | 0 |
| Sep-23 | 7,002 | 1,025 | 5 | 7,322 | 1,106 | 5 | 6,789 | 971 | 5 |
| Oct-23 | 7,074 | 1,039 | 5 | 7,437 | 1,129 | 5 | 6,833 | 979 | 5 |
| Nov-23 | 7,123 | 1,039 | 0 | 7,515 | 1,129 | 0 | 6,862 | 979 | 0 |
| Dec-23 | 7,169 | 1,046 | 0 | 7,588 | 1,139 | 0 | 6,889 | 983 | 0 |
| Jan-24 | 7,172 | 1,053 | 0 | 7,594 | 1,150 | 0 | 6,891 | 988 | 0 |
| Feb-24 | 7,185 | 1,062 | 0 | 7,614 | 1,165 | 0 | 6,899 | 993 | 0 |
| Mar-24 | 7,143 | 1,041 | 0 | 7,548 | 1,131 | 0 | 6,874 | 980 | 0 |

# APPENDIX 3.2 ▌▌ CUSTOMER FORECASTS BY REGION
# LA GRANDE

| | Oregon - Expected Growth | | | Oregon - High Growth | | | Oregon - Low Growth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Residential La Grande Customers | Commercial La Grande Customers | Industrial La Grande Customers | Residential La Grande Customers | Commercial La Grande Customers | Industrial La Grande Customers | Residential La Grande Customers | Commercial La Grande Customers | Industrial La Grande Customers |
| Apr-24 | 7,139 | 1,046 | 0 | 7,541 | 1,140 | 0 | 6,872 | 984 | 0 |
| May-24 | 7,133 | 1,035 | 0 | 7,530 | 1,122 | 0 | 6,868 | 977 | 0 |
| Jun-24 | 7,105 | 1,036 | 0 | 7,486 | 1,124 | 0 | 6,851 | 978 | 0 |
| Jul-24 | 7,071 | 1,032 | 0 | 7,431 | 1,117 | 0 | 6,831 | 975 | 0 |
| Aug-24 | 7,053 | 1,033 | 0 | 7,402 | 1,119 | 0 | 6,820 | 976 | 0 |
| Sep-24 | 7,048 | 1,035 | 5 | 7,395 | 1,122 | 5 | 6,817 | 977 | 5 |
| Oct-24 | 7,121 | 1,049 | 5 | 7,512 | 1,145 | 5 | 6,861 | 986 | 5 |
| Nov-24 | 7,170 | 1,049 | 0 | 7,590 | 1,145 | 0 | 6,890 | 986 | 0 |
| Dec-24 | 7,216 | 1,056 | 0 | 7,664 | 1,156 | 0 | 6,918 | 990 | 0 |
| Jan-25 | 7,219 | 1,063 | 0 | 7,669 | 1,167 | 0 | 6,919 | 994 | 0 |
| Feb-25 | 7,232 | 1,072 | 0 | 7,689 | 1,181 | 0 | 6,927 | 999 | 0 |
| Mar-25 | 7,190 | 1,051 | 0 | 7,622 | 1,147 | 0 | 6,902 | 986 | 0 |
| Apr-25 | 7,186 | 1,056 | 0 | 7,615 | 1,156 | 0 | 6,900 | 990 | 0 |
| May-25 | 7,179 | 1,045 | 0 | 7,605 | 1,138 | 0 | 6,896 | 983 | 0 |
| Jun-25 | 7,151 | 1,046 | 0 | 7,560 | 1,140 | 0 | 6,879 | 984 | 0 |
| Jul-25 | 7,117 | 1,042 | 0 | 7,505 | 1,133 | 0 | 6,858 | 981 | 0 |
| Aug-25 | 7,099 | 1,043 | 0 | 7,476 | 1,135 | 0 | 6,847 | 982 | 0 |
| Sep-25 | 7,095 | 1,045 | 5 | 7,469 | 1,138 | 5 | 6,845 | 983 | 5 |
| Oct-25 | 7,168 | 1,060 | 5 | 7,586 | 1,162 | 5 | 6,889 | 992 | 5 |
| Nov-25 | 7,217 | 1,060 | 0 | 7,665 | 1,162 | 0 | 6,918 | 992 | 0 |
| Dec-25 | 7,263 | 1,066 | 0 | 7,739 | 1,172 | 0 | 6,946 | 996 | 0 |
| Jan-26 | 7,266 | 1,073 | 0 | 7,743 | 1,183 | 0 | 6,947 | 1,000 | 0 |
| Feb-26 | 7,279 | 1,082 | 0 | 7,764 | 1,198 | 0 | 6,955 | 1,005 | 0 |
| Mar-26 | 7,237 | 1,061 | 0 | 7,697 | 1,163 | 0 | 6,930 | 993 | 0 |
| Apr-26 | 7,232 | 1,067 | 0 | 7,690 | 1,172 | 0 | 6,927 | 996 | 0 |
| May-26 | 7,226 | 1,055 | 0 | 7,679 | 1,154 | 0 | 6,923 | 989 | 0 |
| Jun-26 | 7,198 | 1,056 | 0 | 7,634 | 1,156 | 0 | 6,907 | 990 | 0 |
| Jul-26 | 7,163 | 1,052 | 0 | 7,579 | 1,149 | 0 | 6,886 | 987 | 0 |
| Aug-26 | 7,145 | 1,053 | 0 | 7,549 | 1,151 | 0 | 6,875 | 988 | 0 |
| Sep-26 | 7,140 | 1,055 | 5 | 7,542 | 1,154 | 5 | 6,872 | 989 | 5 |
| Oct-26 | 7,214 | 1,070 | 5 | 7,660 | 1,178 | 5 | 6,916 | 998 | 5 |
| Nov-26 | 7,264 | 1,070 | 0 | 7,740 | 1,178 | 0 | 6,946 | 998 | 0 |
| Dec-26 | 7,310 | 1,077 | 0 | 7,814 | 1,189 | 0 | 6,974 | 1,002 | 0 |
| Jan-27 | 7,314 | 1,084 | 0 | 7,820 | 1,200 | 0 | 6,976 | 1,006 | 0 |
| Feb-27 | 7,327 | 1,093 | 0 | 7,841 | 1,215 | 0 | 6,984 | 1,012 | 0 |
| Mar-27 | 7,285 | 1,071 | 0 | 7,773 | 1,180 | 0 | 6,959 | 999 | 0 |
| Apr-27 | 7,280 | 1,077 | 0 | 7,766 | 1,189 | 0 | 6,956 | 1,002 | 0 |
| May-27 | 7,274 | 1,066 | 0 | 7,756 | 1,171 | 0 | 6,952 | 995 | 0 |
| Jun-27 | 7,245 | 1,067 | 0 | 7,711 | 1,173 | 0 | 6,935 | 996 | 0 |
| Jul-27 | 7,211 | 1,062 | 0 | 7,655 | 1,166 | 0 | 6,914 | 993 | 0 |
| Aug-27 | 7,192 | 1,063 | 0 | 7,625 | 1,167 | 0 | 6,903 | 994 | 0 |
| Sep-27 | 7,188 | 1,066 | 5 | 7,618 | 1,171 | 5 | 6,901 | 995 | 5 |
| Oct-27 | 7,262 | 1,080 | 5 | 7,737 | 1,195 | 5 | 6,945 | 1,004 | 5 |
| Nov-27 | 7,312 | 1,080 | 0 | 7,817 | 1,195 | 0 | 6,975 | 1,004 | 0 |
| Dec-27 | 7,359 | 1,087 | 0 | 7,892 | 1,206 | 0 | 7,003 | 1,008 | 0 |
| Jan-28 | 7,365 | 1,095 | 0 | 7,901 | 1,218 | 0 | 7,007 | 1,013 | 0 |
| Feb-28 | 7,378 | 1,104 | 0 | 7,922 | 1,233 | 0 | 7,015 | 1,019 | 0 |
| Mar-28 | 7,335 | 1,082 | 0 | 7,854 | 1,198 | 0 | 6,989 | 1,005 | 0 |
| Apr-28 | 7,331 | 1,088 | 0 | 7,847 | 1,207 | 0 | 6,986 | 1,009 | 0 |

# APPENDIX 3.2 II CUSTOMER FORECASTS BY REGION
# LA GRANDE

| | Oregon - Expected Growth | | | Oregon - High Growth | | | Oregon - Low Growth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Residential La Grande Customers | Commercial La Grande Customers | Industrial La Grande Customers | Residential La Grande Customers | Commercial La Grande Customers | Industrial La Grande Customers | Residential La Grande Customers | Commercial La Grande Customers | Industrial La Grande Customers |
| May-28 | 7,324 | 1,077 | 0 | 7,837 | 1,189 | 0 | 6,982 | 1,002 | 0 |
| Jun-28 | 7,296 | 1,078 | 0 | 7,791 | 1,190 | 0 | 6,965 | 1,003 | 0 |
| Jul-28 | 7,260 | 1,073 | 0 | 7,735 | 1,183 | 0 | 6,944 | 1,000 | 0 |
| Aug-28 | 7,242 | 1,074 | 0 | 7,705 | 1,185 | 0 | 6,933 | 1,001 | 0 |
| Sep-28 | 7,237 | 1,077 | 5 | 7,698 | 1,189 | 5 | 6,930 | 1,002 | 5 |
| Oct-28 | 7,312 | 1,092 | 5 | 7,817 | 1,212 | 5 | 6,975 | 1,011 | 5 |
| Nov-28 | 7,362 | 1,092 | 0 | 7,898 | 1,212 | 0 | 7,005 | 1,011 | 0 |
| Dec-28 | 7,410 | 1,098 | 0 | 7,973 | 1,224 | 0 | 7,034 | 1,015 | 0 |
| Jan-29 | 7,416 | 1,106 | 0 | 7,984 | 1,236 | 0 | 7,038 | 1,020 | 0 |
| Feb-29 | 7,430 | 1,116 | 0 | 8,006 | 1,251 | 0 | 7,046 | 1,025 | 0 |
| Mar-29 | 7,387 | 1,094 | 0 | 7,937 | 1,216 | 0 | 7,020 | 1,012 | 0 |
| Apr-29 | 7,382 | 1,099 | 0 | 7,930 | 1,225 | 0 | 7,017 | 1,016 | 0 |
| May-29 | 7,376 | 1,088 | 0 | 7,919 | 1,207 | 0 | 7,013 | 1,009 | 0 |
| Jun-29 | 7,347 | 1,089 | 0 | 7,873 | 1,208 | 0 | 6,996 | 1,009 | 0 |
| Jul-29 | 7,312 | 1,084 | 0 | 7,817 | 1,201 | 0 | 6,975 | 1,007 | 0 |
| Aug-29 | 7,293 | 1,085 | 0 | 7,787 | 1,203 | 0 | 6,964 | 1,007 | 0 |
| Sep-29 | 7,288 | 1,088 | 5 | 7,779 | 1,207 | 5 | 6,961 | 1,009 | 5 |
| Oct-29 | 7,363 | 1,103 | 5 | 7,900 | 1,231 | 5 | 7,006 | 1,018 | 5 |
| Nov-29 | 7,414 | 1,103 | 0 | 7,981 | 1,231 | 0 | 7,037 | 1,018 | 0 |
| Dec-29 | 7,462 | 1,110 | 0 | 8,057 | 1,242 | 0 | 7,065 | 1,022 | 0 |
| Jan-30 | 7,468 | 1,118 | 0 | 8,067 | 1,254 | 0 | 7,069 | 1,027 | 0 |
| Feb-30 | 7,481 | 1,127 | 0 | 8,088 | 1,269 | 0 | 7,077 | 1,032 | 0 |
| Mar-30 | 7,438 | 1,105 | 0 | 8,019 | 1,234 | 0 | 7,051 | 1,019 | 0 |
| Apr-30 | 7,433 | 1,111 | 0 | 8,011 | 1,243 | 0 | 7,048 | 1,022 | 0 |
| May-30 | 7,427 | 1,099 | 0 | 8,001 | 1,224 | 0 | 7,044 | 1,015 | 0 |
| Jun-30 | 7,398 | 1,100 | 0 | 7,955 | 1,226 | 0 | 7,027 | 1,016 | 0 |
| Jul-30 | 7,362 | 1,095 | 0 | 7,898 | 1,219 | 0 | 7,005 | 1,013 | 0 |
| Aug-30 | 7,343 | 1,097 | 0 | 7,867 | 1,221 | 0 | 6,994 | 1,014 | 0 |
| Sep-30 | 7,339 | 1,099 | 5 | 7,860 | 1,224 | 5 | 6,991 | 1,015 | 5 |
| Oct-30 | 7,415 | 1,114 | 5 | 7,981 | 1,249 | 5 | 7,037 | 1,024 | 5 |
| Nov-30 | 7,466 | 1,114 | 0 | 8,063 | 1,249 | 0 | 7,067 | 1,024 | 0 |
| Dec-30 | 7,513 | 1,121 | 0 | 8,140 | 1,260 | 0 | 7,096 | 1,029 | 0 |
| Jan-31 | 7,519 | 1,129 | 0 | 8,149 | 1,272 | 0 | 7,100 | 1,033 | 0 |
| Feb-31 | 7,533 | 1,138 | 0 | 8,170 | 1,287 | 0 | 7,108 | 1,039 | 0 |
| Mar-31 | 7,489 | 1,116 | 0 | 8,100 | 1,251 | 0 | 7,081 | 1,026 | 0 |
| Apr-31 | 7,484 | 1,122 | 0 | 8,093 | 1,261 | 0 | 7,079 | 1,029 | 0 |
| May-31 | 7,478 | 1,110 | 0 | 8,082 | 1,242 | 0 | 7,075 | 1,022 | 0 |
| Jun-31 | 7,449 | 1,111 | 0 | 8,036 | 1,244 | 0 | 7,057 | 1,023 | 0 |
| Jul-31 | 7,413 | 1,106 | 0 | 7,979 | 1,236 | 0 | 7,036 | 1,020 | 0 |
| Aug-31 | 7,394 | 1,108 | 0 | 7,948 | 1,238 | 0 | 7,024 | 1,021 | 0 |
| Sep-31 | 7,389 | 1,110 | 5 | 7,941 | 1,242 | 5 | 7,022 | 1,022 | 5 |
| Oct-31 | 7,465 | 1,125 | 5 | 8,063 | 1,267 | 5 | 7,067 | 1,031 | 5 |
| Nov-31 | 7,517 | 1,125 | 0 | 8,145 | 1,267 | 0 | 7,098 | 1,031 | 0 |
| Dec-31 | 7,565 | 1,132 | 0 | 8,222 | 1,278 | 0 | 7,127 | 1,035 | 0 |
| Jan-32 | 7,570 | 1,140 | 0 | 8,230 | 1,290 | 0 | 7,130 | 1,040 | 0 |
| Feb-32 | 7,584 | 1,150 | 0 | 8,252 | 1,305 | 0 | 7,138 | 1,046 | 0 |
| Mar-32 | 7,540 | 1,127 | 0 | 8,181 | 1,269 | 0 | 7,112 | 1,032 | 0 |
| Apr-32 | 7,535 | 1,133 | 0 | 8,174 | 1,279 | 0 | 7,109 | 1,036 | 0 |
| May-32 | 7,528 | 1,121 | 0 | 8,163 | 1,260 | 0 | 7,105 | 1,029 | 0 |

# APPENDIX 3.2 ⅠⅠ CUSTOMER FORECASTS BY REGION
# LA GRANDE

| | Oregon - Expected Growth | | | Oregon - High Growth | | | Oregon - Low Growth | | |
|---|---|---|---|---|---|---|---|---|---|
| | Residential La Grande Customers | Commercial La Grande Customers | Industrial La Grande Customers | Residential La Grande Customers | Commercial La Grande Customers | Industrial La Grande Customers | Residential La Grande Customers | Commercial La Grande Customers | Industrial La Grande Customers |
| Jun-32 | 7,499 | 1,122 | 0 | 8,116 | 1,261 | 0 | 7,087 | 1,029 | 0 |
| Jul-32 | 7,463 | 1,117 | 0 | 8,059 | 1,254 | 0 | 7,066 | 1,026 | 0 |
| Aug-32 | 7,444 | 1,119 | 0 | 8,028 | 1,256 | 0 | 7,054 | 1,027 | 0 |
| Sep-32 | 7,439 | 1,121 | 5 | 8,021 | 1,260 | 5 | 7,052 | 1,029 | 5 |
| Oct-32 | 7,516 | 1,137 | 5 | 8,143 | 1,284 | 5 | 7,098 | 1,038 | 5 |
| Nov-32 | 7,568 | 1,137 | 0 | 8,226 | 1,284 | 0 | 7,129 | 1,038 | 0 |
| Dec-32 | 7,616 | 1,144 | 0 | 8,304 | 1,296 | 0 | 7,158 | 1,042 | 0 |
| Jan-33 | 7,621 | 1,151 | 0 | 8,312 | 1,308 | 0 | 7,161 | 1,047 | 0 |
| Feb-33 | 7,635 | 1,161 | 0 | 8,334 | 1,324 | 0 | 7,169 | 1,053 | 0 |
| Mar-33 | 7,591 | 1,138 | 0 | 8,263 | 1,287 | 0 | 7,142 | 1,039 | 0 |
| Apr-33 | 7,586 | 1,144 | 0 | 8,256 | 1,297 | 0 | 7,140 | 1,042 | 0 |
| May-33 | 7,579 | 1,132 | 0 | 8,245 | 1,277 | 0 | 7,136 | 1,035 | 0 |
| Jun-33 | 7,550 | 1,133 | 0 | 8,198 | 1,279 | 0 | 7,118 | 1,036 | 0 |
| Jul-33 | 7,514 | 1,128 | 0 | 8,140 | 1,271 | 0 | 7,096 | 1,033 | 0 |
| Aug-33 | 7,494 | 1,130 | 0 | 8,109 | 1,273 | 0 | 7,085 | 1,034 | 0 |
| Sep-33 | 7,490 | 1,132 | 5 | 8,102 | 1,277 | 5 | 7,082 | 1,035 | 5 |
| Oct-33 | 7,567 | 1,148 | 5 | 8,225 | 1,302 | 5 | 7,128 | 1,045 | 5 |
| Nov-33 | 7,619 | 1,148 | 0 | 8,308 | 1,302 | 0 | 7,159 | 1,045 | 0 |
| Dec-33 | 7,668 | 1,155 | 0 | 8,387 | 1,314 | 0 | 7,189 | 1,049 | 0 |
| Jan-34 | 7,673 | 1,163 | 0 | 8,394 | 1,326 | 0 | 7,192 | 1,054 | 0 |
| Feb-34 | 7,686 | 1,172 | 0 | 8,416 | 1,342 | 0 | 7,200 | 1,059 | 0 |
| Mar-34 | 7,642 | 1,149 | 0 | 8,345 | 1,305 | 0 | 7,173 | 1,046 | 0 |
| Apr-34 | 7,637 | 1,155 | 0 | 8,337 | 1,314 | 0 | 7,170 | 1,049 | 0 |
| May-34 | 7,630 | 1,143 | 0 | 8,327 | 1,295 | 0 | 7,166 | 1,042 | 0 |
| Jun-34 | 7,601 | 1,144 | 0 | 8,279 | 1,297 | 0 | 7,148 | 1,043 | 0 |
| Jul-34 | 7,564 | 1,139 | 0 | 8,221 | 1,289 | 0 | 7,126 | 1,040 | 0 |
| Aug-34 | 7,545 | 1,141 | 0 | 8,189 | 1,291 | 0 | 7,115 | 1,040 | 0 |
| Sep-34 | 7,540 | 1,143 | 5 | 8,182 | 1,295 | 5 | 7,112 | 1,042 | 5 |
| Oct-34 | 7,618 | 1,159 | 5 | 8,306 | 1,320 | 5 | 7,159 | 1,051 | 5 |
| Nov-34 | 7,670 | 1,159 | 0 | 8,390 | 1,320 | 0 | 7,190 | 1,051 | 0 |
| Dec-34 | 7,719 | 1,166 | 0 | 8,469 | 1,332 | 0 | 7,220 | 1,056 | 0 |
| Jan-35 | 7,724 | 1,174 | 0 | 8,476 | 1,344 | 0 | 7,222 | 1,060 | 0 |
| Feb-35 | 7,738 | 1,184 | 0 | 8,498 | 1,360 | 0 | 7,231 | 1,066 | 0 |
| Mar-35 | 7,693 | 1,160 | 0 | 8,426 | 1,322 | 0 | 7,204 | 1,052 | 0 |
| Apr-35 | 7,688 | 1,166 | 0 | 8,419 | 1,332 | 0 | 7,201 | 1,056 | 0 |
| May-35 | 7,681 | 1,154 | 0 | 8,408 | 1,313 | 0 | 7,197 | 1,048 | 0 |
| Jun-35 | 7,651 | 1,155 | 0 | 8,360 | 1,315 | 0 | 7,179 | 1,049 | 0 |
| Jul-35 | 7,614 | 1,150 | 0 | 8,301 | 1,307 | 0 | 7,157 | 1,046 | 0 |
| Aug-35 | 7,595 | 1,152 | 0 | 8,270 | 1,309 | 0 | 7,145 | 1,047 | 0 |
| Sep-35 | 7,590 | 1,154 | 5 | 8,263 | 1,313 | 5 | 7,142 | 1,048 | 5 |
| Oct-35 | 7,669 | 1,170 | 5 | 8,388 | 1,338 | 5 | 7,189 | 1,058 | 5 |
| Nov-35 | 7,721 | 1,170 | 0 | 8,472 | 1,338 | 0 | 7,221 | 1,058 | 0 |
| Dec-35 | 7,771 | 1,178 | 0 | 8,551 | 1,350 | 0 | 7,251 | 1,063 | 0 |

## APPENDIX 3.3 ‖ DEMAND COEFFICIENTS

| | January | February | March | April | May | June | July | August | September | October | November | December |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **HEAT COEFFICIENTS** | | | | | | | | | | | | |
| WA/ID Res | 0.009844 | 0.008976 | 0.008870 | 0.008029 | 0.005690 | 0.003686 | 0.001174 | 0.000826 | 0.002388 | 0.006412 | 0.008695 | 0.009962 |
| WA/ID Com | 0.049978 | 0.045349 | 0.043363 | 0.037282 | 0.024076 | 0.016817 | 0.004930 | 0.007713 | 0.019781 | 0.036017 | 0.042431 | 0.050435 |
| WA/ID Ind | 0.129009 | 0.115248 | 0.094806 | 0.084501 | 0.041487 | 0.055783 | 0.044625 | 0.132057 | 0.198661 | 0.283820 | 0.164946 | 0.170180 |
| Rose Res | 0.010208 | 0.010184 | 0.009517 | 0.008514 | 0.006722 | 0.005038 | 0.000615 | 0.000049 | 0.001527 | 0.004756 | 0.008477 | 0.010124 |
| Rose Com | 0.041388 | 0.039173 | 0.037762 | 0.031763 | 0.022073 | 0.010826 | 0.003070 | 0.002933 | 0.020028 | 0.027221 | 0.036871 | 0.044178 |
| Rose Ind | 0.560088 | 0.639565 | 0.609582 | 1.794676 | 0.050434 | 0.307867 | 3.765089 | 4.759543 | 4.064708 | 1.476627 | 1.166407 | 0.839549 |
| Medford Res | 0.0103873 | 0.0100818 | 0.0100326 | 0.0089329 | 0.0066631 | 0.0046337 | 0.0021118 | 0.0009412 | 0.0029039 | 0.0064739 | 0.0090313 | 0.0105071 |
| Medford Com | 0.0404618 | 0.0406224 | 0.0364242 | 0.0292521 | 0.0221656 | 0.0144695 | 0.0106799 | 0.0095883 | 0.0213454 | 0.0383247 | 0.0390795 | 0.0420363 |
| Medford Ind | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| LaGrande Res | 0.0087736 | 0.0081353 | 0.0080601 | 0.0074661 | 0.0054241 | 0.0033964 | 0.0004897 | 0.0105253 | 0.0007420 | 0.0030466 | 0.0077767 | 0.0089209 |
| LaGrande Com | 0.0424449 | 0.0405465 | 0.0370305 | 0.0313249 | 0.0210792 | 0.0124668 | 0.0094054 | 0.0766325 | 0.0081499 | 0.0183217 | 0.0346280 | 0.0402809 |
| LaGrande Ind | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Klamath Res | 0.008035 | 0.007601 | 0.007340 | 0.006312 | 0.004454 | 0.002573 | 0.000170 | 0.000560 | 0.001306 | 0.004338 | 0.006839 | 0.007861 |
| Klamath Com | 0.031883 | 0.030028 | 0.027044 | 0.021792 | 0.013740 | 0.004544 | 0.000226 | 0.006202 | 0.008292 | 0.023551 | 0.028058 | 0.031165 |
| Klamath Ind | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| **BASE COEFFICIENTS** | | | | | | | | | | | | |
| WA/ID Res | 0.055491 | 0.055491 | 0.055491 | 0.055491 | 0.055491 | 0.055491 | 0.055491 | 0.055491 | 0.055491 | 0.055491 | 0.055491 | 0.055491 |
| WA/ID Com | 0.346420 | 0.346420 | 0.346420 | 0.346420 | 0.346420 | 0.346420 | 0.346420 | 0.346420 | 0.346420 | 0.346420 | 0.346420 | 0.346420 |
| WA/ID Ind | 3.651386 | 3.651386 | 3.651386 | 3.651386 | 3.651386 | 3.651386 | 3.651386 | 3.651386 | 3.651386 | 3.651386 | 3.651386 | 3.651386 |
| Rose Res | 0.045476 | 0.045476 | 0.045476 | 0.045476 | 0.045476 | 0.045476 | 0.045476 | 0.045476 | 0.045476 | 0.045476 | 0.045476 | 0.045476 |
| Rose Com | 0.327449 | 0.327449 | 0.327449 | 0.327449 | 0.327449 | 0.327449 | 0.327449 | 0.327449 | 0.327449 | 0.327449 | 0.327449 | 0.327449 |
| Rose Ind | 19.923195 | 19.923195 | 19.923195 | 19.923195 | 19.923195 | 19.923195 | 19.923195 | 19.923195 | 19.923195 | 19.923195 | 19.923195 | 19.923195 |
| Medford Res | 0.047121 | 0.047121 | 0.047121 | 0.047121 | 0.047121 | 0.047121 | 0.047121 | 0.047121 | 0.047121 | 0.047121 | 0.047121 | 0.047121 |
| Medford Com | 0.333897 | 0.333897 | 0.333897 | 0.333897 | 0.333897 | 0.333897 | 0.333897 | 0.333897 | 0.333897 | 0.333897 | 0.333897 | 0.333897 |
| Medford Ind | 3.762345 | 3.762345 | 3.762345 | 3.762345 | 3.762345 | 3.762345 | 3.762345 | 3.762345 | 3.762345 | 3.762345 | 3.762345 | 3.762345 |
| LaGrande Res | 0.053749 | 0.053749 | 0.053749 | 0.053749 | 0.053749 | 0.053749 | 0.053749 | 0.053749 | 0.053749 | 0.053749 | 0.053749 | 0.053749 |
| LaGrande Com | 0.252881 | 0.252881 | 0.252881 | 0.252881 | 0.252881 | 0.252881 | 0.252881 | 0.252881 | 0.252881 | 0.252881 | 0.252881 | 0.252881 |
| LaGrande Ind | 8.968306 | 8.968306 | 8.968306 | 8.968306 | 8.968306 | 8.968306 | 8.968306 | 8.968306 | 8.968306 | 8.968306 | 8.968306 | 8.968306 |
| Klamath Res | 0.041313 | 0.041313 | 0.041313 | 0.041313 | 0.041313 | 0.041313 | 0.041313 | 0.041313 | 0.041313 | 0.041313 | 0.041313 | 0.041313 |
| Klamath Com | 0.319781 | 0.319781 | 0.319781 | 0.319781 | 0.319781 | 0.319781 | 0.319781 | 0.319781 | 0.319781 | 0.319781 | 0.319781 | 0.319781 |
| Klamath Ind | 2.131761 | 2.131761 | 2.131761 | 2.131761 | 2.131761 | 2.131761 | 2.131761 | 2.131761 | 2.131761 | 2.131761 | 2.131761 | 2.131761 |
| **SUPER PEAK 1/** | | | | | | | | | | | | |
| WA/ID Res | 0.009594 | 0.009594 | | | | | | | | | | 0.009594 |
| WA/ID Com | 0.048587 | 0.048587 | | | | | | | | | | 0.048587 |
| WA/ID Ind | 0.138145 | 0.138145 | | | | | | | | | | 0.138145 |
| Rose Res | 0.010172 | 0.010172 | | | | | | | | | | 0.010172 |
| Rose Com | 0.041580 | 0.041580 | | | | | | | | | | 0.041580 |
| Rose Ind | 0.679734 | 0.679734 | | | | | | | | | | 0.679734 |
| Medford Res | 0.010325 | 0.010325 | | | | | | | | | | 0.010325 |
| Medford Com | 0.041040 | 0.041040 | | | | | | | | | | 0.041040 |
| Medford Ind | - | - | | | | | | | | | | - |
| LaGrande Res | 0.008610 | 0.008610 | | | | | | | | | | 0.008610 |
| LaGrande Com | 0.041091 | 0.041091 | | | | | | | | | | 0.041091 |
| LaGrande Ind | - | - | | | | | | | | | | - |
| Klamath Res | 0.007832 | 0.007832 | | | | | | | | | | 0.007832 |
| Klamath Com | 0.031025 | 0.031025 | | | | | | | | | | 0.031025 |
| Klamath Ind | - | - | | | | | | | | | | - |

1/ Average of DEC JAN FEB heat coefficients

| | January | February | March | April | May | June | July | August | September | October | November | December |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **HEAT COEFFICIENTS** | | | | | | | | | | | | |
| WA/ID Res | 0.009844 | 0.008976 | 0.008870 | 0.008029 | 0.005690 | 0.003686 | 0.001174 | 0.000826 | 0.002388 | 0.006412 | 0.008695 | 0.009962 |
| WA/ID Com | 0.049978 | 0.045349 | 0.043363 | 0.037282 | 0.024076 | 0.016817 | 0.004930 | 0.007713 | 0.019781 | 0.036017 | 0.042431 | 0.050435 |
| WA/ID Ind | 0.129009 | 0.115248 | 0.094806 | 0.084501 | 0.041487 | 0.055783 | 0.044625 | 0.132057 | 0.198661 | 0.283820 | 0.164946 | 0.170180 |
| Rose Res | 0.010208 | 0.010184 | 0.009517 | 0.008514 | 0.006722 | 0.005038 | 0.000615 | 0.000049 | 0.001527 | 0.004756 | 0.008477 | 0.010124 |
| Rose Com | 0.041388 | 0.039173 | 0.037762 | 0.031763 | 0.022073 | 0.010826 | 0.003070 | 0.002933 | 0.020028 | 0.027221 | 0.036871 | 0.044178 |
| Rose Ind | 0.560088 | 0.639565 | 0.609582 | 1.794676 | 0.050434 | 0.307867 | 3.765089 | 4.759543 | 4.064708 | 1.476627 | 1.166407 | 0.839549 |
| Medford Res | 0.0103873 | 0.0100818 | 0.0100326 | 0.0089329 | 0.0066631 | 0.0046337 | 0.0021118 | 0.0009412 | 0.0029039 | 0.0064739 | 0.0090313 | 0.0105071 |
| Medford Com | 0.0404618 | 0.0406224 | 0.0364242 | 0.0292521 | 0.0221656 | 0.0144695 | 0.0106799 | 0.0095883 | 0.0213454 | 0.0383247 | 0.0390795 | 0.0420363 |
| Medford Ind | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| LaGrande Res | 0.0087736 | 0.0081353 | 0.0080601 | 0.0074661 | 0.0054241 | 0.0033964 | 0.0004897 | 0.0105253 | 0.0007420 | 0.0030466 | 0.0077767 | 0.0089209 |
| LaGrande Com | 0.0424449 | 0.0405465 | 0.0370305 | 0.0313249 | 0.0210792 | 0.0124668 | 0.0094054 | 0.0766325 | 0.0081499 | 0.0183217 | 0.0346280 | 0.0402809 |
| LaGrande Ind | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| Klamath Res | 0.008035 | 0.007601 | 0.007340 | 0.006312 | 0.004454 | 0.002573 | 0.000170 | 0.000560 | 0.001306 | 0.004338 | 0.006839 | 0.007861 |
| Klamath Com | 0.031883 | 0.030028 | 0.027044 | 0.021792 | 0.013740 | 0.004544 | 0.000226 | 0.006202 | 0.008292 | 0.023551 | 0.028058 | 0.031165 |
| Klamath Ind | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 | 0.0000000 |
| **BASE COEFFICIENTS** | | | | | | | | | | | | |
| WA/ID Res | 0.055491 | 0.055491 | 0.055491 | 0.055491 | 0.055491 | 0.055491 | 0.055491 | 0.055491 | 0.055491 | 0.055491 | 0.055491 | 0.055491 |
| WA/ID Com | 0.346420 | 0.346420 | 0.346420 | 0.346420 | 0.346420 | 0.346420 | 0.346420 | 0.346420 | 0.346420 | 0.346420 | 0.346420 | 0.346420 |
| WA/ID Ind | 3.651386 | 3.651386 | 3.651386 | 3.651386 | 3.651386 | 3.651386 | 3.651386 | 3.651386 | 3.651386 | 3.651386 | 3.651386 | 3.651386 |
| Rose Res | 0.045476 | 0.045476 | 0.045476 | 0.045476 | 0.045476 | 0.045476 | 0.045476 | 0.045476 | 0.045476 | 0.045476 | 0.045476 | 0.045476 |
| Rose Com | 0.327449 | 0.327449 | 0.327449 | 0.327449 | 0.327449 | 0.327449 | 0.327449 | 0.327449 | 0.327449 | 0.327449 | 0.327449 | 0.327449 |
| Rose Ind | 19.923195 | 19.923195 | 19.923195 | 19.923195 | 19.923195 | 19.923195 | 19.923195 | 19.923195 | 19.923195 | 19.923195 | 19.923195 | 19.923195 |
| Medford Res | 0.047121 | 0.047121 | 0.047121 | 0.047121 | 0.047121 | 0.047121 | 0.047121 | 0.047121 | 0.047121 | 0.047121 | 0.047121 | 0.047121 |
| Medford Com | 0.333897 | 0.333897 | 0.333897 | 0.333897 | 0.333897 | 0.333897 | 0.333897 | 0.333897 | 0.333897 | 0.333897 | 0.333897 | 0.333897 |
| Medford Ind | 3.762345 | 3.762345 | 3.762345 | 3.762345 | 3.762345 | 3.762345 | 3.762345 | 3.762345 | 3.762345 | 3.762345 | 3.762345 | 3.762345 |
| LaGrande Res | 0.053749 | 0.053749 | 0.053749 | 0.053749 | 0.053749 | 0.053749 | 0.053749 | 0.053749 | 0.053749 | 0.053749 | 0.053749 | 0.053749 |
| LaGrande Com | 0.252881 | 0.252881 | 0.252881 | 0.252881 | 0.252881 | 0.252881 | 0.252881 | 0.252881 | 0.252881 | 0.252881 | 0.252881 | 0.252881 |
| LaGrande Ind | 8.968306 | 8.968306 | 8.968306 | 8.968306 | 8.968306 | 8.968306 | 8.968306 | 8.968306 | 8.968306 | 8.968306 | 8.968306 | 8.968306 |
| Klamath Res | 0.041313 | 0.041313 | 0.041313 | 0.041313 | 0.041313 | 0.041313 | 0.041313 | 0.041313 | 0.041313 | 0.041313 | 0.041313 | 0.041313 |
| Klamath Com | 0.319781 | 0.319781 | 0.319781 | 0.319781 | 0.319781 | 0.319781 | 0.319781 | 0.319781 | 0.319781 | 0.319781 | 0.319781 | 0.319781 |
| Klamath Ind | 2.131761 | 2.131761 | 2.131761 | 2.131761 | 2.131761 | 2.131761 | 2.131761 | 2.131761 | 2.131761 | 2.131761 | 2.131761 | 2.131761 |
| **SUPER PEAK 1/** | | | | | | | | | | | | |
| WA/ID Res | 0.009594 | 0.009594 | | | | | | | | | | 0.009594 |
| WA/ID Com | 0.048587 | 0.048587 | | | | | | | | | | 0.048587 |
| WA/ID Ind | 0.138145 | 0.138145 | | | | | | | | | | 0.138145 |
| Rose Res | 0.010172 | 0.010172 | | | | | | | | | | 0.010172 |
| Rose Com | 0.041580 | 0.041580 | | | | | | | | | | 0.041580 |
| Rose Ind | 0.679734 | 0.679734 | | | | | | | | | | 0.679734 |
| Medford Res | 0.010325 | 0.010325 | | | | | | | | | | 0.010325 |
| Medford Com | 0.041040 | 0.041040 | | | | | | | | | | 0.041040 |
| Medford Ind | - | - | | | | | | | | | | - |
| LaGrande Res | 0.008610 | 0.008610 | | | | | | | | | | 0.008610 |
| LaGrande Com | 0.041091 | 0.041091 | | | | | | | | | | 0.041091 |
| LaGrande Ind | - | - | | | | | | | | | | - |
| Klamath Res | 0.007832 | 0.007832 | | | | | | | | | | 0.007832 |
| Klamath Com | 0.031025 | 0.031025 | | | | | | | | | | 0.031025 |
| Klamath Ind | - | - | | | | | | | | | | - |

1/ Average of DEC JAN FEB heat coefficients

# APPENDIX 3.3 ǁ WA/ID BASE COEFFICIENT CALCULATION

## Average Actual Demand by Class

| | | Month | | |
|---|---|---|---|---|
| Year | Data | 7 | 8 | Grand Total |
| 2005 | Average of Res Demand | 11,098 | 10,607 | 10,852 |
| | Average of Com Demand | 7,729 | 8,406 | 8,067 |
| | Average of Ind Demand | 991 | 1,001 | 996 |
| 2006 | Average of Res Demand | 9,988 | 10,513 | 10,250 |
| | Average of Com Demand | 6,956 | 8,331 | 7,643 |
| | Average of Ind Demand | 892 | 992 | 942 |
| 2007 | Average of Res Demand | 10,032 | 10,433 | 10,232 |
| | Average of Com Demand | 6,987 | 8,267 | 7,627 |
| | Average of Ind Demand | 896 | 984 | 940 |
| 2008 | Average of Res Demand | 10,684 | 10,495 | 10,590 |
| | Average of Com Demand | 7,441 | 8,317 | 7,879 |
| | Average of Ind Demand | 954 | 990 | 972 |
| 2009 | Average of Res Demand | 10,346 | 10,516 | 10,431 |
| | Average of Com Demand | 7,466 | 7,810 | 7,638 |
| | Average of Ind Demand | 756 | 797 | 777 |
| 2010 | Average of Res Demand | 11,208 | 10,733 | 10,971 |
| | Average of Com Demand | 8,030 | 8,435 | 8,232 |
| | Average of Ind Demand | 814 | 1,174 | 994 |
| Total Average of Res Demand | | 10,559 | 10,549 | 10,554 |
| Total Average of Com Demand | | 7,435 | 8,261 | 7,848 |
| Total Average of Ind Demand | | 884 | 990 | 937 |

## Average Actual Customer Count by Class

| | | Month | | |
|---|---|---|---|---|
| Year | Data | 7 | 8 | Grand Total |
| 2005 | Average of Res Cust | 179,140 | 179,447 | 179,294 |
| | Average of Com Cust | 20,450 | 20,427 | 20,439 |
| | Average of Ind Cust | 263 | 260 | 262 |
| 2006 | Average of Res Cust | 185,182 | 185,455 | 185,319 |
| | Average of Com Cust | 20,748 | 20,856 | 20,802 |
| | Average of Ind Cust | 246 | 242 | 244 |
| 2007 | Average of Res Cust | 189,577 | 190,087 | 189,832 |
| | Average of Com Cust | 21,291 | 21,336 | 21,314 |
| | Average of Ind Cust | 244 | 241 | 243 |
| 2008 | Average of Res Cust | 193,667 | 193,643 | 193,655 |
| | Average of Com Cust | 21,847 | 21,815 | 21,831 |
| | Average of Ind Cust | 239 | 240 | 240 |
| 2009 | Average of Res Cust | 196,121 | 196,276 | 196,199 |
| | Average of Com Cust | 22,087 | 21,928 | 22,008 |
| | Average of Ind Cust | 233 | 234 | 234 |
| 2010 | Average of Res Cust | 198,059 | 198,572 | 198,316 |
| | Average of Com Cust | 22,344 | 22,320 | 22,332 |
| | Average of Ind Cust | 227 | 229 | 228 |
| Total Average of Res Cust | | 190,291 | 190,580 | 190,436 |
| Total Average of Com Cust | | 21,461 | 21,447 | 21,454 |
| Total Average of Ind Cust | | 242 | 241 | 242 |

**Base Coefficients**

*(Actual Average Demand/Customer Count)*

| | |
|---|---|
| 0.055491 | Res Base Usage |
| 0.346420 | Com Base Usage |
| 3.651386 | Ind Base Usage |

# APPENDIX 3.3 ‖ WA/ID REGRESSION STATS

**WA/ID Residential**

| | January | February | March | April | May | June | July | August | September | October | November | December |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Regression Statistics* | | | | | | | | | | | | |
| Multiple R | 0.997654206 | 0.997358913 | 0.99495305 | 0.981505937 | 0.978167166 | 0.971495302 | 0.9512495 | 0.820421448 | 0.905297943 | 0.980838934 | 0.996347984 | 0.998826781 |
| R Square | 0.995313916 | 0.994724801 | 0.989931572 | 0.963353905 | 0.956811005 | 0.943803121 | 0.904875612 | 0.673091352 | 0.819564366 | 0.962045014 | 0.992709306 | 0.997654938 |
| Adjusted R Square | 0.961980582 | 0.957687764 | 0.956598239 | 0.928871147 | 0.923477671 | 0.909320362 | 0.871542278 | 0.639758019 | 0.785081607 | 0.92871168 | 0.958226547 | 0.964321605 |
| Standard Error | 0.025319723 | 0.026597125 | 0.023849048 | 0.032003003 | 0.019326085 | 0.008778728 | 0.001506231 | 0.002405292 | 0.007547259 | 0.020314017 | 0.026682708 | 0.016880022 |
| Observations | 93 | 85 | 93 | 90 | 93 | 90 | 93 | 93 | 90 | 93 | 90 | 93 |
| *Coefficients* | | | | | | | | | | | | |
| Intercept | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| X Variable 1 | 0.009844497 | 0.008975558 | 0.008869664 | 0.008028585 | 0.005689813 | 0.003686459 | 0.001173698 | 0.000826461 | 0.00238834 | 0.006412228 | 0.008695213 | 0.009962245 |
| **Super Peak** | 0.009594 | | | | | | | | | | | |

**WA/ID Commercial**

| | January | February | March | April | May | June | July | August | September | October | November | December |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Regression Statistics* | | | | | | | | | | | | |
| Multiple R | 0.997535461 | 0.997292266 | 0.994399095 | 0.973845966 | 0.961984203 | 0.948589598 | 0.939986639 | 0.910976062 | 0.915358718 | 0.977449556 | 0.994645052 | 0.998846897 |
| R Square | 0.995076996 | 0.994591864 | 0.988829561 | 0.948375966 | 0.925413607 | 0.899822226 | 0.883574882 | 0.829877386 | 0.837881582 | 0.955407635 | 0.989318779 | 0.997695123 |
| Adjusted R Square | 0.961743663 | 0.957554827 | 0.955496228 | 0.913893207 | 0.892080274 | 0.865339467 | 0.850241548 | 0.796544053 | 0.803398823 | 0.922074302 | 0.954836021 | 0.96436179 |
| Standard Error | 0.132669245 | 0.14116655 | 0.126255346 | 0.17113869 | 0.110750203 | 0.049490372 | 0.008170014 | 0.015327701 | 0.058953352 | 0.129636092 | 0.162257455 | 0.085502566 |
| Observations | 93 | 85 | 93 | 90 | 93 | 90 | 93 | 93 | 90 | 93 | 90 | 93 |
| *Coefficients* | | | | | | | | | | | | |
| Intercept | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| X Variable 1 | 0.049978045 | 0.045348934 | 0.043362661 | 0.037282468 | 0.024075694 | 0.016816525 | 0.004929633 | 0.007712715 | 0.01978081 | 0.036017179 | 0.042430755 | 0.050434673 |
| **Super Peak** | 0.048587 | | | | | | | | | | | |

**WA/ID Industrial**

| | January | February | March | April | May | June | July | August | September | October | November | December |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Regression Statistics* | | | | | | | | | | | | |
| Multiple R | 0.976837619 | 0.985912283 | 0.965121396 | 0.812877595 | 0.747131231 | 0.713029296 | 0.866878204 | 0.97252247 | 0.917942089 | 0.963351152 | 0.979214675 | 0.991637888 |
| R Square | 0.954211734 | 0.972023031 | 0.93145931 | 0.660769984 | 0.558205076 | 0.508410777 | 0.751477821 | 0.945799954 | 0.842617678 | 0.928045441 | 0.958861379 | 0.983345701 |
| Adjusted R Square | 0.9208784 | 0.934985994 | 0.898125976 | 0.626287226 | 0.524871743 | 0.473928018 | 0.718144488 | 0.912466621 | 0.808134919 | 0.894712108 | 0.924378621 | 0.950012368 |
| Standard Error | 0.878794521 | 0.827132425 | 0.649592069 | 0.8391273 | 0.715597581 | 0.361846573 | 0.072274178 | 0.230399915 | 0.689125252 | 1.269881938 | 1.528875182 | 0.561757012 |
| Observations | 93 | 85 | 93 | 90 | 93 | 90 | 93 | 93 | 90 | 93 | 90 | 93 |
| *Coefficients* | | | | | | | | | | | | |
| Intercept | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| X Variable 1 | 0.129008542 | 0.115247756 | 0.0948062 | 0.084500696 | 0.041487475 | 0.055783015 | 0.044625063 | 0.132057167 | 0.198660758 | 0.283820092 | 0.164946307 | 0.170179963 |
| **Super Peak** | 0.138145 | | | | | | | | | | | |

# APPENDIX 3.3 II MEDFORD BASE COEFFICIENT CALCULATION

## Average Actual Demand by Class

| | | Month | | |
|---|---|---|---|---|
| Year | Data | 7 | 8 | Grand Total |
| 2005 | Average of Res Demand | 2,420 | 2,389 | 2,404 |
| | Average of Com Demand | 2,146 | 2,205 | 2,176 |
| | Sum of Ind Demand | - | - | - |
| 2006 | Average of Res Demand | 2,243 | 2,328 | 2,285 |
| | Average of Com Demand | 1,989 | 2,148 | 2,069 |
| | Sum of Ind Demand | - | - | - |
| 2007 | Average of Res Demand | 2,319 | 2,285 | 2,302 |
| | Average of Com Demand | 2,044 | 2,142 | 2,093 |
| | Sum of Ind Demand | 251 | 212 | 463 |
| 2008 | Average of Res Demand | 2,300 | 2,688 | 2,494 |
| | Average of Com Demand | 2,027 | 2,520 | 2,274 |
| | Sum of Ind Demand | 249 | 249 | 498 |
| 2009 | Average of Res Demand | 2,303 | 2,230 | 2,266 |
| | Average of Com Demand | 2,011 | 2,045 | 2,028 |
| | Sum of Ind Demand | 953 | 1,093 | 2,046 |
| 2010 | Average of Res Demand | 2,276 | 2,103 | 2,190 |
| | Average of Com Demand | 1,979 | 2,003 | 1,991 |
| | Sum of Ind Demand | 2,924 | 4,449 | 7,373 |
| Total Average of Res Demand | | 2,310 | 2,337 | 2,324 |
| Total Average of Com Demand | | 2,033 | 2,177 | 2,105 |
| Total Sum of Ind Demand | | 4,377 | 6,003 | 10,380 |

## Average Actual Customer Count by Class

| | | Month | | |
|---|---|---|---|---|
| Year | Data | 7 | 8 | Grand Total |
| 2005 | Average of Res Customer | 47,286 | 47,191 | 47,239 |
| | Average of Com Customer | 6,085 | 6,094 | 6,090 |
| | Average of Ind Customer | - | - | - |
| 2006 | Average of Res Customer | 48,666 | 48,531 | 48,599 |
| | Average of Com Customer | 6,225 | 6,229 | 6,227 |
| | Average of Ind Customer | - | - | - |
| 2007 | Average of Res Customer | 49,448 | 49,391 | 49,420 |
| | Average of Com Customer | 6,356 | 6,352 | 6,354 |
| | Average of Ind Customer | 9 | 9 | 9 |
| 2008 | Average of Res Customer | 49,930 | 49,734 | 49,832 |
| | Average of Com Customer | 6,395 | 6,391 | 6,393 |
| | Average of Ind Customer | 10 | 10 | 10 |
| 2009 | Average of Res Customer | 50,019 | 49,868 | 49,944 |
| | Average of Com Customer | 6,327 | 6,301 | 6,314 |
| | Average of Ind Customer | 12 | 13 | 13 |
| 2010 | Average of Res Customer | 50,824 | 50,824 | 50,824 |
| | Average of Com Customer | 6,449 | 6,449 | 6,449 |
| | Average of Ind Customer | 13 | 13 | 13 |
| Total Average of Res Customer | | 49,362 | 49,257 | 49,309 |
| Total Average of Com Customer | | 6,306 | 6,303 | 6,304 |
| Total Average of Ind Customer | | 7 | 8 | 7 |

**Base Coefficients**

*(Actual Average Demand/Customer Count)*

| | |
|---|---|
| 0.047121 | Res Base Usage |
| 0.333897 | Com Base Usage |
| 3.762345 | Ind Base Usage |

# APPENDIX 3.3 II MEDFORD REGRESSION STATS

**Medford Residential**

| | January | February | March | April | May | June | July | August | September | October | November | December |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Regression Statistics* | | | | | | | | | | | | |
| Multiple R | 0.997413882 | 0.997067778 | 0.995768593 | 0.992944333 | 0.991228607 | 0.920024236 | 0.734018374 | 0.597421004 | 0.913447475 | 0.97528302 | 0.993329289 | 0.995999631 |
| R Square | 0.994834451 | 0.994144154 | 0.991555091 | 0.985938449 | 0.982534151 | 0.846444594 | 0.538782974 | 0.356911856 | 0.834386289 | 0.951176968 | 0.986703075 | 0.992015265 |
| Adjusted R S | 0.961501118 | 0.957107117 | 0.958221758 | 0.95145569 | 0.949200818 | 0.811961836 | 0.505449641 | 0.323578522 | 0.799903531 | 0.917843635 | 0.952220317 | 0.958681931 |
| Standard Err | 0.02023568 | 0.01853198 | 0.01794617 | 0.019456396 | 0.010919646 | 0.008271836 | 0.000992949 | 0.001098302 | 0.00217479 | 0.013342662 | 0.023446397 | 0.020861739 |
| Observations | 93 | 85 | 93 | 90 | 93 | 90 | 93 | 93 | 90 | 93 | 90 | 93 |
| ***Coefficients*** | | | | | | | | | | | | |
| Intercept | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| X Variable 1 | 0.010387258 | 0.010081776 | 0.010032583 | 0.008932892 | 0.006663115 | 0.004633661 | 0.002111771 | 0.000941211 | 0.002903862 | 0.006473882 | 0.009031279 | 0.010507109 |
| **Super Peak** | 0.010325 | | | | | | | | | | | |

**Medford Commercial**

| | January | February | March | April | May | June | July | August | September | October | November | December |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Regression Statistics* | | | | | | | | | | | | |
| Multiple R | 0.995602736 | 0.996276736 | 0.994485657 | 0.974882075 | 0.981370235 | 0.898112402 | 0.712055129 | 0.716686937 | 0.936128746 | 0.971201378 | 0.989751777 | 0.994448238 |
| R Square | 0.991224808 | 0.992567336 | 0.989001722 | 0.95039506 | 0.963087539 | 0.806605886 | 0.507022507 | 0.513640165 | 0.87633703 | 0.943232116 | 0.97960858 | 0.988927299 |
| Adjusted R S | 0.957891475 | 0.955530299 | 0.955668389 | 0.915912301 | 0.929754206 | 0.772123128 | 0.473689174 | 0.480306832 | 0.841854271 | 0.909898783 | 0.945125821 | 0.955593966 |
| Standard Err | 0.10577674 | 0.098869555 | 0.07011104 | 0.093987061 | 0.058149805 | 0.022611663 | 0.005041153 | 0.01034255 | 0.017218831 | 0.089004979 | 0.132496693 | 0.101527957 |
| Observations | 93 | 85 | 93 | 90 | 93 | 90 | 93 | 93 | 90 | 93 | 90 | 93 |
| ***Coefficients*** | | | | | | | | | | | | |
| Intercept | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| X Variable 1 | 0.040461844 | 0.040622406 | 0.036424152 | 0.029252135 | 0.022165633 | 0.014469459 | 0.010679854 | 0.009588349 | 0.021345382 | 0.038324684 | 0.039079527 | 0.04203632 |
| **Super Peak** | 0.041040 | | | | | | | | | | | |

# APPENDIX 3.3 II ROSEBURG BASE COEFFICIENT CALCULATION

### Average Actual Demand by Class

| | | Month | | |
|---|---|---|---|---|
| Year | Data | 7 | 8 | Grand Total |
| 2005 | Average of Res Demand | 859 | 849 | 854 |
| | Average of Com Demand | 910 | 1,040 | 975 |
| | Average of Ind Demand | 32 | 46 | 39 |
| 2006 | Average of Res Demand | 702 | 611 | 657 |
| | Average of Com Demand | 744 | 748 | 746 |
| | Average of Ind Demand | 26 | 33 | 29 |
| 2007 | Average of Res Demand | 634 | 619 | 627 |
| | Average of Com Demand | 672 | 757 | 715 |
| | Average of Ind Demand | 24 | 33 | 28 |
| 2008 | Average of Res Demand | 632 | 585 | 609 |
| | Average of Com Demand | 670 | 716 | 693 |
| | Average of Ind Demand | 23 | 31 | 27 |
| 2009 | Average of Res Demand | 568 | 519 | 543 |
| | Average of Com Demand | 659 | 658 | 659 |
| | Average of Ind Demand | 21 | 31 | 26 |
| 2010 | Average of Res Demand | 497 | 488 | 492 |
| | Average of Com Demand | 631 | 688 | 659 |
| | Average of Ind Demand | 119 | 116 | 118 |
| Total Average of Res Demand | | 649 | 612 | 630 |
| Total Average of Com Demand | | 714 | 768 | 741 |
| Total Average of Ind Demand | | 41 | 48 | 45 |

### Average Actual Customer Count by Class

| | | Month | | |
|---|---|---|---|---|
| Year | Data | 7 | 8 | Grand Total |
| 2005 | Average of Res Customer | 12,311 | 12,257 | 12,284 |
| | Average of Com Customer | 2,093 | 2,093 | 2,093 |
| | Average of Ind Customer | 2 | 2 | 2 |
| 2006 | Average of Res Customer | 12,570 | 12,511 | 12,541 |
| | Average of Com Customer | 2,128 | 2,112 | 2,120 |
| | Average of Ind Customer | 3 | 4 | 4 |
| 2007 | Average of Res Customer | 12,900 | 12,777 | 12,839 |
| | Average of Com Customer | 2,126 | 2,105 | 2,116 |
| | Average of Ind Customer | 2 | 1 | 2 |
| 2008 | Average of Res Customer | 12,942 | 12,885 | 12,914 |
| | Average of Com Customer | 2,116 | 2,106 | 2,111 |
| | Average of Ind Customer | 2 | 2 | 2 |
| 2009 | Average of Res Customer | 12,920 | 12,874 | 12,897 |
| | Average of Com Customer | 2,123 | 2,120 | 2,122 |
| | Average of Ind Customer | 2 | 1 | 2 |
| 2010 | Average of Res Customer | 13,183 | 13,183 | 13,183 |
| | Average of Com Customer | 2,132 | 2,132 | 2,132 |
| | Average of Ind Customer | 3 | 3 | 3 |
| Total Average of Res Customer | | 12,804 | 12,748 | 12,776 |
| Total Average of Com Customer | | 2,120 | 2,111 | 2,116 |
| Total Average of Ind Customer | | 2 | 2 | 2 |

**Base Coefficients**

*(Actual Average Demand/Customer Count)*

| | |
|---|---|
| 0.045476 | Res Base Usage |
| 0.327449 | Com Base Usage |
| 19.92319 | Ind Base Usage |

# APPENDIX 3.3 II ROSEBRURG REGRESSION STATS

| Roseburg Residential | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | January | February | March | April | May | June | July | August | September | October | November | December |
| *Regression Statistics* | | | | | | | | | | | | |
| Multiple R | 0.995703207 | 0.996289735 | 0.995591731 | 0.990373703 | 0.989672191 | 0.961768478 | 1 | 1 | 0.337099931 | 0.76178275 | 0.981277194 | 0.995726522 |
| R Square | 0.991424876 | 0.992593235 | 0.991202896 | 0.980840072 | 0.979451046 | 0.924998606 | 1 | 1 | 0.113636364 | 0.580312959 | 0.962904931 | 0.991471306 |
| Adjusted R S | 0.958091542 | 0.955556198 | 0.957869562 | 0.946357313 | 0.946117713 | 0.890515847 | 0.966666667 | 0.966666667 | 0.079153605 | 0.546979626 | 0.928422173 | 0.958137973 |
| Standard Err | 0.020189471 | 0.020546436 | 0.015516028 | 0.019450184 | 0.012207209 | 0.007791278 | 0 | 0 | 7.63152E-05 | 0.012083008 | 0.030766909 | 0.018667824 |
| Observations | 93 | 85 | 93 | 90 | 93 | 90 | 93 | 93 | 90 | 93 | 90 | 93 |
| *Coefficients* | | | | | | | | | | | | |
| Intercept | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| X Variable 1 | 0.010207961 | 0.01018421 | 0.00951694 | 0.008513573 | 0.006722065 | 0.00503812 | 0.000614775 | 4.93693E-05 | 0.001527313 | 0.004755629 | 0.00847663 | 0.010124057 |
| **Super Peak** | 0.010172 | | | | | | | | | | | |

| Roseburg Commercial | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | January | February | March | April | May | June | July | August | September | October | November | December |
| *Regression Statistics* | | | | | | | | | | | | |
| Multiple R | 0.994259965 | 0.995327341 | 0.994711326 | 0.982448921 | 0.966029275 | 0.888034969 | 0.760421488 | 0.707524379 | 0.855176459 | 0.788678508 | 0.97623698 | 0.995508486 |
| R Square | 0.988552879 | 0.990676515 | 0.989450621 | 0.965205882 | 0.933212559 | 0.788606107 | 0.578240839 | 0.500590747 | 0.731326775 | 0.622013789 | 0.953038641 | 0.991037146 |
| Adjusted R S | 0.955219545 | 0.953639478 | 0.956117288 | 0.930723123 | 0.899879226 | 0.754123348 | 0.544907506 | 0.467257413 | 0.696844017 | 0.588680456 | 0.918555882 | 0.957703813 |
| Standard Err | 0.101619442 | 0.103566587 | 0.074606905 | 0.097003717 | 0.071132553 | 0.033976264 | 0.002411562 | 0.008759553 | 0.018320633 | 0.094215258 | 0.180655819 | 0.088740539 |
| Observations | 93 | 85 | 93 | 90 | 93 | 90 | 93 | 93 | 90 | 93 | 90 | 93 |
| *Coefficients* | | | | | | | | | | | | |
| Intercept | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| X Variable 1 | 0.041387999 | 0.039173031 | 0.037761981 | 0.031762565 | 0.022073058 | 0.010826 | 0.003070018 | 0.002933236 | 0.020028191 | 0.027221003 | 0.036871328 | 0.044178165 |
| **Super Peak** | 0.041580 | | | | | | | | | | | |

| Roseburg Industrial | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | January | February | March | April | May | June | July | August | September | October | November | December |
| *Regression Statistics* | | | | | | | | | | | | |
| Multiple R | 0.994038131 | 0.994751225 | 0.994750448 | 0.608177383 | 0.532904171 | 1 | 0.909561529 | 0.946941185 | 0.935096746 | 0.911034319 | 0.984317571 | 0.995636562 |
| R Square | 0.988111805 | 0.989529999 | 0.989528454 | 0.369879729 | 0.283986856 | 1 | 0.827302176 | 0.896697608 | 0.874405925 | 0.82998353 | 0.968881081 | 0.991292163 |
| Adjusted R S | 0.954778472 | 0.952492962 | 0.956195121 | 0.335396971 | 0.250653523 | 0.965517241 | 0.793968843 | 0.863364275 | 0.839923166 | 0.796650197 | 0.934398322 | 0.95795883 |
| Standard Err | 3.965396109 | 3.82574582 | 2.993997033 | 0.986325539 | 0.535778415 | 0 | 4.895861812 | 3.485419118 | 8.945791539 | 12.11315329 | 10.57405988 | 3.838946443 |
| Observations | 93 | 85 | 93 | 90 | 93 | 90 | 93 | 93 | 90 | 93 | 90 | 93 |
| *Coefficients* | | | | | | | | | | | | |
| Intercept | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| X Variable 1 | 0.560088307 | 0.639564834 | 0.609581699 | 1.794675998 | 0.050433553 | 0.307866797 | 3.765089394 | 4.759542558 | 4.064707745 | 1.47662742 | 1.166406843 | 0.839548803 |
| **Super Peak** | 0.679734 | | | | | | | | | | | |

# APPENDIX 3.3 II KLAMATH FALLS BASE COEFFICIENT CALCULATION

## Average Actual Demand by Class

| | | Month | | |
|---|---|---|---|---|
| Year | Data | 7 | 8 | Grand Total |
| 2005 | Average of Res Demand | 752 | 684 | 718 |
| | Average of Com Demand | 641 | 684 | 662 |
| | Average of Ind Demand | - | - | - |
| 2006 | Average of Res Demand | 552 | 541 | 546 |
| | Average of Com Demand | 451 | 541 | 496 |
| | Average of Ind Demand | - | - | - |
| 2007 | Average of Res Demand | 576 | 540 | 558 |
| | Average of Com Demand | 484 | 547 | 515 |
| | Average of Ind Demand | 7 | 10 | 8 |
| 2008 | Average of Res Demand | 494 | 508 | 501 |
| | Average of Com Demand | 416 | 514 | 465 |
| | Average of Ind Demand | 6 | 9 | 8 |
| 2009 | Average of Res Demand | 459 | 499 | 479 |
| | Average of Com Demand | 428 | 464 | 446 |
| | Average of Ind Demand | 12 | 16 | 14 |
| 2010 | Average of Res Demand | 547 | 521 | 534 |
| | Average of Com Demand | 437 | 521 | 479 |
| | Average of Ind Demand | 16 | 22 | 19 |
| Total Average of Res Demand | | 563 | 549 | 556 |
| Total Average of Com Demand | | 476 | 545 | 511 |
| Total Average of Ind Demand | | 7 | 10 | 8 |

## Average Actual Customer Count by Class

| | | Month | | |
|---|---|---|---|---|
| Year | Data | 7 | 8 | Grand Total |
| 2005 | Average of Res Customer | 12,977 | 12,855 | 12,916 |
| | Average of Com Customer | 1,576 | 1,566 | 1,571 |
| | Average of Ind Customer | - | - | - |
| 2006 | Average of Res Customer | 13,240 | 13,135 | 13,188 |
| | Average of Com Customer | 1,582 | 1,576 | 1,579 |
| | Average of Ind Customer | - | - | - |
| 2007 | Average of Res Customer | 13,675 | 13,610 | 13,643 |
| | Average of Com Customer | 1,605 | 1,598 | 1,602 |
| | Average of Ind Customer | 5 | 5 | 5 |
| 2008 | Average of Res Customer | 13,703 | 13,576 | 13,640 |
| | Average of Com Customer | 1,603 | 1,590 | 1,597 |
| | Average of Ind Customer | 5 | 5 | 5 |
| 2009 | Average of Res Customer | 13,683 | 13,604 | 13,644 |
| | Average of Com Customer | 1,624 | 1,615 | 1,620 |
| | Average of Ind Customer | 6 | 6 | 6 |
| 2010 | Average of Res Customer | 13,783 | 13,679 | 13,731 |
| | Average of Com Customer | 1,620 | 1,610 | 1,615 |
| | Average of Ind Customer | 7 | 7 | 7 |
| Total Average of Res Customer | | 13,510 | 13,410 | 13,460 |
| Total Average of Com Customer | | 1,602 | 1,593 | 1,597 |
| Total Average of Ind Customer | | 4 | 4 | 4 |

**Base Coefficients**

*(Actual Average Demand/Customer Count)*

| | |
|---|---|
| 0.041313 | Res Base Usage |
| 0.319781 | Com Base Usage |
| 2.131761 | Ind Base Usage |

# APPENDIX 3.3 ll KLAMATH FALLS REGRESSION STATS

**Klamath Falls Residential**

| | January | February | March | April | May | June | July | August | September | October | November | December |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | *Regression Statistics* | | | | | | |
| Multiple R | 0.99829776 | 0.994544536 | 0.992991253 | 0.983717594 | 0.966196571 | 0.950403906 | 0.868069678 | 0.791953474 | 0.811217624 | 0.957083956 | 0.993829215 | 0.996354859 |
| R Square | 0.996598417 | 0.989118833 | 0.986031629 | 0.967700304 | 0.933535813 | 0.903267585 | 0.753544966 | 0.627190306 | 0.658074033 | 0.916009699 | 0.987696508 | 0.992723005 |
| Adjusted R S | 0.963265084 | 0.952081796 | 0.952698296 | 0.933217545 | 0.90020248 | 0.868784827 | 0.720211632 | 0.593856972 | 0.623591274 | 0.882676366 | 0.95321375 | 0.959389671 |
| Standard Erro | 0.017001108 | 0.028351681 | 0.027273526 | 0.031901251 | 0.02817435 | 0.009303672 | 0.000969873 | 0.003637699 | 0.004936244 | 0.020286287 | 0.027067469 | 0.023112268 |
| Observations | 93 | 85 | 93 | 90 | 93 | 90 | 93 | 93 | 90 | 93 | 90 | 93 |
| | | | | | | ***Coefficients*** | | | | | | |
| Intercept | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| X Variable 1 | 0.008035196 | 0.007601401 | 0.007340407 | 0.006311879 | 0.004454224 | 0.002572739 | 0.000169675 | 0.000560013 | 0.001305856 | 0.004338331 | 0.0068389 | 0.007860587 |
| **Super Peak** | 0.007832 | | | | | | | | | | | |

**Klamath Falls Commercial**

| | January | February | March | April | May | June | July | August | September | October | November | December |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | *Regression Statistics* | | | | | | |
| Multiple R | 0.997340356 | 0.993757996 | 0.989350597 | 0.966712005 | 0.925120201 | 0.603458962 | 0.602796287 | 0.834498042 | 0.793298581 | 0.935681771 | 0.990550238 | 0.995614497 |
| R Square | 0.994687786 | 0.987554955 | 0.978814603 | 0.934532101 | 0.855847385 | 0.364162718 | 0.363363363 | 0.696386983 | 0.629322638 | 0.875500377 | 0.981189773 | 0.991248227 |
| Adjusted R S | 0.961354452 | 0.950517917 | 0.94548127 | 0.900049343 | 0.822514052 | 0.32967996 | 0.33003003 | 0.663053649 | 0.594839879 | 0.842167044 | 0.946707014 | 0.957914893 |
| Standard Erro | 0.085213132 | 0.127752985 | 0.127404523 | 0.157638569 | 0.148601948 | 0.034214729 | 0.002984935 | 0.033287639 | 0.035625876 | 0.144022096 | 0.144170705 | 0.097840115 |
| Observations | 93 | 85 | 93 | 90 | 93 | 90 | 93 | 93 | 90 | 93 | 90 | 93 |
| | | | | | | ***Coefficients*** | | | | | | |
| Intercept | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| X Variable 1 | 0.031882962 | 0.030028158 | 0.027044273 | 0.021792485 | 0.013739514 | 0.004543931 | 0.00022562 | 0.006201806 | 0.008292339 | 0.023550893 | 0.028057996 | 0.031164693 |
| **Super Peak** | 0.031025 | | | | | | | | | | | |

## APPENDIX 3.3 || LA GRANDE BASE COEFFICIENT CALCULATION

### Average Actual Demand by Class

| Year | Data | Month 7 | Grand Total |
|---|---|---|---|
| 2005 | Average of Res Demand | 368 | 368 |
| | Average of Com Demand | 224 | 224 |
| | Average of Ind Demand | 17 | 17 |
| 2006 | Average of Res Demand | 360 | 360 |
| | Average of Com Demand | 219 | 219 |
| | Average of Ind Demand | 17 | 17 |
| 2007 | Average of Res Demand | 360 | 360 |
| | Average of Com Demand | 219 | 219 |
| | Average of Ind Demand | 17 | 17 |
| 2008 | Average of Res Demand | 365 | 365 |
| | Average of Com Demand | 222 | 222 |
| | Average of Ind Demand | 17 | 17 |
| 2009 | Average of Res Demand | 292 | 292 |
| | Average of Com Demand | 235 | 235 |
| | Average of Ind Demand | 3 | 3 |
| 2010 | Average of Res Demand | 300 | 300 |
| | Average of Com Demand | 235 | 235 |
| | Average of Ind Demand | 11 | 11 |
| Total Average of Res Demand | | 341 | 341 |
| Total Average of Com Demand | | 226 | 226 |
| Total Average of Ind Demand | | 13 | 13 |

### Average Actual Customer Count by Class

| Year | Data | Month 7 | Grand Total |
|---|---|---|---|
| 2005 | Average of Res Customers | 6,475 | 6,475 |
| | Average of Com Customers | 949 | 949 |
| | Average of Ind Customers | 3 | 3 |
| 2006 | Average of Res Customers | 6,163 | 6,163 |
| | Average of Com Customers | 873 | 873 |
| | Average of Ind Customers | 2 | 2 |
| 2007 | Average of Res Customers | 6,259 | 6,259 |
| | Average of Com Customers | 868 | 868 |
| | Average of Ind Customers | 1 | 1 |
| 2008 | Average of Res Customers | 6,351 | 6,351 |
| | Average of Com Customers | 880 | 880 |
| | Average of Ind Customers | 1 | 1 |
| 2009 | Average of Res Customers | 6,386 | 6,386 |
| | Average of Com Customers | 891 | 891 |
| | Average of Ind Customers | 1 | 1 |
| 2010 | Average of Res Customers | 6,418 | 6,418 |
| | Average of Com Customers | 894 | 894 |
| | Average of Ind Customers | 1 | 1 |
| Total Average of Res Customers | | 6,342 | 6,342 |
| Total Average of Com Customers | | 893 | 893 |
| Total Average of Ind Customers | | 2 | 2 |

### Base Coefficients

*(Actual Average Demand/Customer Count)*

| | |
|---|---|
| 0.0537493 | Res Base Usage |
| 0.252881 | Com Base Usage |
| 8.9683057 | Ind Base Usage |

# APPENDIX 3.3 II LA GRANDE REGRESSION STATS

| LaGrande Residential | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | January | February | March | April | May | June | July | August | September | October | November | December |
| **Regression Statistics** | | | | | | | | | | | | |
| Multiple R | 0.996309419 | 0.99434025 | 0.994633514 | 0.981080712 | 0.950464084 | 0.928564142 | 0.594217046 | 0.973312551 | 0.353317 | 0.858301035 | 0.98932765 | 0.994761114 |
| R Square | 0.992632458 | 0.988712533 | 0.989295827 | 0.962519364 | 0.903381976 | 0.862231366 | 0.353093898 | 0.947337323 | 0.124832902 | 0.736680666 | 0.978769199 | 0.989549674 |
| Adjusted R S | 0.959299125 | 0.951675496 | 0.955962493 | 0.928036605 | 0.870048642 | 0.827748608 | 0.319760565 | 0.914003989 | 0.090350144 | 0.703347333 | 0.94428644 | 0.95621634 |
| Standard Errc | 0.025333762 | 0.028628557 | 0.022196244 | 0.02942289 | 0.0336419 | 0.011221729 | 0.001585687 | 0.01199327 | 0.002838372 | 0.015412471 | 0.036545557 | 0.027245655 |
| Observations | 93 | 85 | 93 | 90 | 93 | 90 | 93 | 93 | 90 | 93 | 90 | 93 |
| **Coefficients** | | | | | | | | | | | | |
| Intercept | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| X Variable 1 | 0.008773593 | 0.008135275 | 0.00806009 | 0.007466051 | 0.005424053 | 0.003396429 | 0.000489695 | 0.010525255 | 0.000742044 | 0.003046619 | 0.007776698 | 0.008920865 |
| **Super Peak** | 0.008610 | | | | | | | | | | | |

| LaGrande Commercial | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | January | February | March | April | May | June | July | August | September | October | November | December |
| Regression Statistics | | | | | | | | | | | | |
| Multiple R | 0.996207943 | 0.994427495 | 0.994652101 | 0.980673611 | 0.946830837 | 0.905913752 | 0.94890968 | 0.975588253 | 0.646135991 | 0.913700332 | 0.990307403 | 0.994680868 |
| R Square | 0.992430266 | 0.988886043 | 0.989332802 | 0.961720731 | 0.896488635 | 0.820679726 | 0.90042958 | 0.951772439 | 0.417491719 | 0.834848297 | 0.980708753 | 0.98939003 |
| Adjusted R S | 0.959096932 | 0.951849006 | 0.955999468 | 0.927237973 | 0.863155301 | 0.786196967 | 0.867096247 | 0.918439106 | 0.383008961 | 0.801514964 | 0.946225994 | 0.956056697 |
| Standard Errc | 0.132998566 | 0.168099669 | 0.099767818 | 0.125404814 | 0.139342004 | 0.04804627 | 0.011825828 | 0.086988832 | 0.062638627 | 0.091299821 | 0.177506477 | 0.140345357 |
| Observations | 93 | 85 | 93 | 90 | 93 | 90 | 93 | 93 | 90 | 93 | 90 | 93 |
| **Coefficients** | | | | | | | | | | | | |
| Intercept | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| X Variable 1 | 0.042444919 | 0.04054651 | 0.03703053 | 0.031324856 | 0.021079166 | 0.012466839 | 0.009405361 | 0.076632518 | 0.008149919 | 0.018321714 | 0.034627962 | 0.040280918 |
| **Super Peak** | 0.041091 | | | | | | | | | | | |

# APPENDIX 3.4 II HEATING DEGREE DAY DATA MONTHLY TABLES

| Temp Pattern | Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 2012 | 1032 | 847 | 780 | 595 | 391 | 181 | 38 | 55 | 184 | 505 | 836 | 1055 | 6499 |
| Klam Falls | 2013 | 1032 | 847 | 780 | 595 | 391 | 181 | 38 | 55 | 184 | 505 | 836 | 1055 | 6499 |
| Klam Falls | 2014 | 1032 | 847 | 780 | 595 | 391 | 181 | 38 | 55 | 184 | 505 | 836 | 1055 | 6499 |
| Klam Falls | 2015 | 1032 | 847 | 780 | 595 | 391 | 181 | 38 | 55 | 184 | 505 | 836 | 1055 | 6499 |
| Klam Falls | 2016 | 1032 | 847 | 780 | 595 | 391 | 181 | 38 | 55 | 184 | 505 | 836 | 1055 | 6499 |
| Klam Falls | 2017 | 1032 | 847 | 780 | 595 | 391 | 181 | 38 | 55 | 184 | 505 | 836 | 1055 | 6499 |
| Klam Falls | 2018 | 1032 | 847 | 780 | 595 | 391 | 181 | 38 | 55 | 184 | 505 | 836 | 1055 | 6499 |
| Klam Falls | 2019 | 1032 | 847 | 780 | 595 | 391 | 181 | 38 | 55 | 184 | 505 | 836 | 1055 | 6499 |
| Klam Falls | 2020 | 1032 | 847 | 780 | 595 | 391 | 181 | 38 | 55 | 184 | 505 | 836 | 1055 | 6499 |
| Klam Falls | 2021 | 1032 | 847 | 780 | 595 | 391 | 181 | 38 | 55 | 184 | 505 | 836 | 1055 | 6499 |
| Klam Falls | 2022 | 1032 | 847 | 780 | 595 | 391 | 181 | 38 | 55 | 184 | 505 | 836 | 1055 | 6499 |
| Klam Falls | 2023 | 1032 | 847 | 780 | 595 | 391 | 181 | 38 | 55 | 184 | 505 | 836 | 1055 | 6499 |
| Klam Falls | 2024 | 1032 | 847 | 780 | 595 | 391 | 181 | 38 | 55 | 184 | 505 | 836 | 1055 | 6499 |
| Klam Falls | 2025 | 1032 | 847 | 780 | 595 | 391 | 181 | 38 | 55 | 184 | 505 | 836 | 1055 | 6499 |
| Klam Falls | 2026 | 1032 | 847 | 780 | 595 | 391 | 181 | 38 | 55 | 184 | 505 | 836 | 1055 | 6499 |
| Klam Falls | 2027 | 1032 | 847 | 780 | 595 | 391 | 181 | 38 | 55 | 184 | 505 | 836 | 1055 | 6499 |
| Klam Falls | 2028 | 1032 | 847 | 780 | 595 | 391 | 181 | 38 | 55 | 184 | 505 | 836 | 1055 | 6499 |
| Klam Falls | 2029 | 1032 | 847 | 780 | 595 | 391 | 181 | 38 | 55 | 184 | 505 | 836 | 1055 | 6499 |
| Klam Falls | 2030 | 1032 | 847 | 780 | 595 | 391 | 181 | 38 | 55 | 184 | 505 | 836 | 1055 | 6499 |
| Klam Falls | 2031 | 1032 | 847 | 780 | 595 | 391 | 181 | 38 | 55 | 184 | 505 | 836 | 1055 | 6499 |
| Klam Falls | 2032 | 1032 | 847 | 780 | 595 | 391 | 181 | 38 | 55 | 184 | 505 | 836 | 1055 | 6499 |

| Temp Pattern | Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LaGrande | 2012 | 1023 | 832 | 717 | 521 | 339 | 148 | 29 | 36 | 187 | 493 | 777 | 1024 | 6126 |
| LaGrande | 2013 | 1016 | 826 | 713 | 520 | 337 | 147 | 27 | 35 | 187 | 491 | 771 | 1021 | 6091 |
| LaGrande | 2014 | 1011 | 824 | 710 | 519 | 337 | 146 | 27 | 35 | 184 | 488 | 769 | 1020 | 6070 |
| LaGrande | 2015 | 1008 | 823 | 709 | 517 | 335 | 145 | 27 | 35 | 184 | 487 | 765 | 1016 | 6051 |
| LaGrande | 2016 | 1001 | 822 | 706 | 516 | 333 | 145 | 27 | 35 | 184 | 483 | 761 | 1015 | 6028 |
| LaGrande | 2017 | 1001 | 821 | 703 | 513 | 332 | 142 | 27 | 35 | 184 | 480 | 761 | 1008 | 6007 |
| LaGrande | 2018 | 997 | 817 | 700 | 512 | 332 | 142 | 27 | 35 | 183 | 477 | 757 | 1005 | 5984 |
| LaGrande | 2019 | 993 | 813 | 699 | 511 | 332 | 142 | 27 | 35 | 181 | 477 | 753 | 1002 | 5965 |
| LaGrande | 2020 | 993 | 812 | 698 | 509 | 331 | 142 | 26 | 35 | 181 | 476 | 753 | 996 | 5952 |
| LaGrande | 2021 | 991 | 806 | 694 | 505 | 331 | 140 | 26 | 35 | 180 | 475 | 751 | 993 | 5927 |
| LaGrande | 2022 | 989 | 804 | 694 | 505 | 330 | 140 | 26 | 35 | 180 | 474 | 750 | 992 | 5919 |
| LaGrande | 2023 | 987 | 802 | 693 | 503 | 330 | 140 | 26 | 35 | 180 | 473 | 749 | 991 | 5909 |
| LaGrande | 2024 | 983 | 801 | 693 | 502 | 329 | 140 | 26 | 35 | 180 | 473 | 749 | 989 | 5900 |
| LaGrande | 2025 | 982 | 801 | 693 | 502 | 329 | 139 | 26 | 35 | 180 | 472 | 747 | 989 | 5895 |
| LaGrande | 2026 | 981 | 801 | 691 | 501 | 329 | 139 | 26 | 35 | 180 | 472 | 746 | 989 | 5890 |
| LaGrande | 2027 | 980 | 800 | 691 | 501 | 329 | 139 | 26 | 35 | 180 | 471 | 746 | 989 | 5887 |
| LaGrande | 2028 | 979 | 800 | 689 | 499 | 328 | 139 | 26 | 35 | 180 | 471 | 745 | 989 | 5880 |
| LaGrande | 2029 | 979 | 798 | 689 | 498 | 328 | 138 | 26 | 35 | 180 | 471 | 745 | 987 | 5874 |
| LaGrande | 2030 | 975 | 797 | 687 | 498 | 327 | 137 | 26 | 35 | 179 | 471 | 744 | 984 | 5860 |
| LaGrande | 2031 | 972 | 797 | 687 | 498 | 326 | 137 | 26 | 35 | 179 | 470 | 744 | 984 | 5855 |
| LaGrande | 2032 | 971 | 796 | 686 | 497 | 325 | 137 | 26 | 35 | 178 | 470 | 743 | 984 | 5848 |

| Temp Pattern | Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medford | 2012 | 788 | 613 | 539 | 377 | 207 | 62 | 3 | 2 | 64 | 309 | 613 | 825 | 4402 |
| Medford | 2013 | 788 | 613 | 539 | 377 | 207 | 62 | 3 | 2 | 64 | 309 | 613 | 825 | 4402 |
| Medford | 2014 | 785 | 610 | 535 | 371 | 205 | 59 | 2 | 2 | 62 | 309 | 611 | 821 | 4372 |
| Medford | 2015 | 781 | 607 | 533 | 370 | 205 | 59 | 2 | 2 | 62 | 308 | 607 | 816 | 4352 |
| Medford | 2016 | 777 | 603 | 530 | 367 | 202 | 59 | 2 | 2 | 62 | 306 | 605 | 814 | 4329 |
| Medford | 2017 | 775 | 601 | 529 | 365 | 201 | 59 | 2 | 2 | 62 | 306 | 603 | 811 | 4316 |
| Medford | 2018 | 768 | 597 | 527 | 364 | 201 | 59 | 2 | 2 | 62 | 305 | 600 | 806 | 4293 |
| Medford | 2019 | 765 | 596 | 525 | 364 | 200 | 59 | 2 | 2 | 62 | 304 | 598 | 803 | 4280 |
| Medford | 2020 | 761 | 595 | 523 | 364 | 198 | 59 | 2 | 2 | 61 | 301 | 589 | 799 | 4254 |
| Medford | 2021 | 759 | 590 | 520 | 362 | 198 | 59 | 2 | 2 | 61 | 300 | 588 | 796 | 4237 |
| Medford | 2022 | 756 | 586 | 520 | 361 | 198 | 59 | 2 | 2 | 61 | 300 | 586 | 791 | 4222 |
| Medford | 2023 | 756 | 586 | 520 | 360 | 198 | 59 | 2 | 2 | 61 | 299 | 586 | 791 | 4220 |
| Medford | 2024 | 755 | 585 | 520 | 358 | 198 | 59 | 2 | 2 | 61 | 297 | 585 | 788 | 4210 |
| Medford | 2025 | 753 | 585 | 517 | 358 | 198 | 59 | 2 | 2 | 61 | 296 | 584 | 787 | 4202 |
| Medford | 2026 | 752 | 584 | 513 | 358 | 198 | 59 | 2 | 2 | 61 | 296 | 583 | 786 | 4194 |
| Medford | 2027 | 750 | 584 | 512 | 357 | 198 | 59 | 2 | 2 | 61 | 296 | 583 | 786 | 4190 |
| Medford | 2028 | 748 | 582 | 510 | 357 | 198 | 59 | 2 | 2 | 61 | 295 | 582 | 784 | 4180 |
| Medford | 2029 | 748 | 582 | 510 | 356 | 198 | 59 | 2 | 2 | 61 | 295 | 581 | 784 | 4178 |
| Medford | 2030 | 746 | 582 | 510 | 355 | 197 | 59 | 2 | 2 | 61 | 295 | 580 | 783 | 4172 |
| Medford | 2031 | 746 | 580 | 508 | 355 | 197 | 59 | 2 | 2 | 61 | 295 | 580 | 779 | 4164 |
| Medford | 2032 | 745 | 578 | 508 | 354 | 196 | 58 | 2 | 2 | 61 | 295 | 580 | 779 | 4158 |

# APPENDIX 3.4 || HEATING DEGREE DAY DATA MONTHLY TABLES

| Temp Pattern | Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Roseburg | 2012 | 677 | 551 | 495 | 361 | 219 | 82 | 9 | 3 | 62 | 274 | 497 | 692 | 3922 |
| Roseburg | 2013 | 677 | 551 | 495 | 361 | 219 | 82 | 9 | 3 | 62 | 274 | 497 | 692 | 3922 |
| Roseburg | 2014 | 672 | 550 | 492 | 359 | 219 | 81 | 9 | 3 | 61 | 272 | 495 | 692 | 3905 |
| Roseburg | 2015 | 666 | 547 | 491 | 358 | 217 | 81 | 9 | 3 | 61 | 271 | 492 | 688 | 3884 |
| Roseburg | 2016 | 664 | 544 | 487 | 357 | 217 | 81 | 9 | 3 | 61 | 270 | 490 | 685 | 3868 |
| Roseburg | 2017 | 657 | 544 | 486 | 356 | 216 | 80 | 9 | 3 | 61 | 270 | 488 | 683 | 3853 |
| Roseburg | 2018 | 655 | 544 | 485 | 355 | 216 | 79 | 9 | 3 | 60 | 269 | 488 | 681 | 3844 |
| Roseburg | 2019 | 653 | 539 | 481 | 353 | 215 | 78 | 9 | 3 | 59 | 269 | 486 | 678 | 3823 |
| Roseburg | 2020 | 652 | 539 | 480 | 351 | 214 | 78 | 9 | 3 | 59 | 268 | 483 | 675 | 3811 |
| Roseburg | 2021 | 652 | 538 | 479 | 350 | 213 | 78 | 9 | 3 | 59 | 268 | 482 | 674 | 3805 |
| Roseburg | 2022 | 651 | 533 | 477 | 349 | 212 | 78 | 9 | 3 | 59 | 267 | 477 | 669 | 3784 |
| Roseburg | 2023 | 651 | 533 | 475 | 349 | 212 | 78 | 9 | 3 | 59 | 267 | 476 | 667 | 3779 |
| Roseburg | 2024 | 650 | 533 | 475 | 349 | 212 | 78 | 9 | 3 | 59 | 267 | 475 | 666 | 3776 |
| Roseburg | 2025 | 649 | 533 | 475 | 349 | 212 | 78 | 9 | 3 | 59 | 267 | 475 | 666 | 3775 |
| Roseburg | 2026 | 648 | 532 | 475 | 347 | 211 | 78 | 9 | 3 | 59 | 267 | 474 | 664 | 3767 |
| Roseburg | 2027 | 648 | 531 | 475 | 347 | 211 | 78 | 9 | 3 | 59 | 267 | 474 | 664 | 3766 |
| Roseburg | 2028 | 647 | 530 | 475 | 347 | 211 | 78 | 9 | 3 | 59 | 267 | 474 | 664 | 3764 |
| Roseburg | 2029 | 646 | 528 | 474 | 346 | 210 | 78 | 9 | 3 | 59 | 267 | 472 | 663 | 3755 |
| Roseburg | 2030 | 646 | 527 | 474 | 346 | 209 | 77 | 9 | 3 | 59 | 267 | 472 | 662 | 3751 |
| Roseburg | 2031 | 646 | 527 | 474 | 346 | 209 | 77 | 9 | 3 | 59 | 266 | 472 | 660 | 3748 |
| Roseburg | 2032 | 641 | 527 | 474 | 346 | 208 | 77 | 9 | 3 | 59 | 264 | 471 | 658 | 3737 |

| Temp Pattern | Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WA/ID | 2012 | 1102 | 931 | 774 | 545 | 325 | 138 | 35 | 35 | 185 | 544 | 887 | 1174 | 6675 |
| WA/ID | 2013 | 1099 | 926 | 768 | 543 | 322 | 137 | 35 | 35 | 183 | 542 | 886 | 1168 | 6644 |
| WA/ID | 2014 | 1092 | 924 | 767 | 541 | 320 | 135 | 35 | 35 | 182 | 540 | 884 | 1165 | 6620 |
| WA/ID | 2015 | 1087 | 920 | 766 | 540 | 320 | 135 | 35 | 35 | 182 | 537 | 879 | 1163 | 6599 |
| WA/ID | 2016 | 1084 | 916 | 765 | 538 | 319 | 135 | 35 | 33 | 182 | 535 | 878 | 1159 | 6579 |
| WA/ID | 2017 | 1081 | 913 | 761 | 535 | 317 | 134 | 35 | 33 | 182 | 532 | 869 | 1153 | 6545 |
| WA/ID | 2018 | 1080 | 910 | 757 | 533 | 316 | 134 | 34 | 33 | 179 | 530 | 866 | 1148 | 6520 |
| WA/ID | 2019 | 1078 | 907 | 755 | 531 | 316 | 134 | 34 | 33 | 176 | 528 | 863 | 1142 | 6497 |
| WA/ID | 2020 | 1071 | 902 | 748 | 529 | 315 | 131 | 34 | 33 | 174 | 526 | 861 | 1138 | 6462 |
| WA/ID | 2021 | 1066 | 901 | 746 | 526 | 314 | 131 | 34 | 33 | 174 | 525 | 860 | 1134 | 6444 |
| WA/ID | 2022 | 1064 | 900 | 745 | 524 | 313 | 131 | 34 | 30 | 173 | 525 | 858 | 1134 | 6431 |
| WA/ID | 2023 | 1060 | 896 | 743 | 523 | 313 | 131 | 34 | 30 | 173 | 524 | 858 | 1132 | 6417 |
| WA/ID | 2024 | 1057 | 894 | 743 | 522 | 313 | 131 | 34 | 30 | 171 | 524 | 855 | 1130 | 6404 |
| WA/ID | 2025 | 1055 | 893 | 741 | 522 | 313 | 131 | 34 | 30 | 171 | 523 | 853 | 1129 | 6395 |
| WA/ID | 2026 | 1054 | 890 | 740 | 521 | 313 | 131 | 34 | 30 | 171 | 522 | 853 | 1128 | 6387 |
| WA/ID | 2027 | 1053 | 888 | 739 | 519 | 312 | 130 | 34 | 30 | 171 | 521 | 852 | 1124 | 6373 |
| WA/ID | 2028 | 1052 | 887 | 737 | 519 | 311 | 129 | 34 | 30 | 171 | 519 | 850 | 1122 | 6361 |
| WA/ID | 2029 | 1050 | 887 | 737 | 519 | 311 | 129 | 33 | 29 | 171 | 518 | 847 | 1120 | 6351 |
| WA/ID | 2030 | 1049 | 885 | 735 | 519 | 310 | 129 | 33 | 29 | 170 | 517 | 844 | 1117 | 6337 |
| WA/ID | 2031 | 1048 | 884 | 735 | 518 | 310 | 129 | 33 | 29 | 169 | 517 | 842 | 1114 | 6328 |
| WA/ID | 2032 | 1048 | 883 | 735 | 518 | 310 | 129 | 33 | 29 | 169 | 515 | 841 | 1109 | 6319 |

# APPENDIX 3.4 || HEATING DEGREE DAILY MONTH BY AREA

| Temp Pattern | Day | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WA/ID | 1 | 39 | 36 | 29 | 22 | 15 | 7 | 3 | 1 | 3 | 12 | 24 | 35 |
| WA/ID | 2 | 39 | 35 | 29 | 22 | 14 | 7 | 3 | 1 | 3 | 12 | 25 | 35 |
| WA/ID | 3 | 39 | 35 | 29 | 21 | 14 | 7 | 2 | 0 | 3 | 12 | 25 | 36 |
| WA/ID | 4 | 39 | 35 | 28 | 21 | 14 | 7 | 2 | 1 | 3 | 13 | 26 | 36 |
| WA/ID | 5 | 39 | 35 | 28 | 21 | 14 | 7 | 2 | 1 | 4 | 13 | 26 | 36 |
| WA/ID | 6 | 39 | 35 | 28 | 21 | 13 | 6 | 2 | 1 | 4 | 14 | 27 | 36 |
| WA/ID | 7 | 39 | 34 | 28 | 21 | 13 | 6 | 2 | 1 | 4 | 14 | 27 | 36 |
| WA/ID | 8 | 39 | 34 | 27 | 20 | 13 | 6 | 2 | 1 | 4 | 15 | 27 | 37 |
| WA/ID | 9 | 38 | 34 | 27 | 20 | 12 | 6 | 2 | 1 | 5 | 15 | 28 | 37 |
| WA/ID | 10 | 38 | 34 | 27 | 20 | 12 | 6 | 2 | 1 | 5 | 15 | 28 | 37 |
| WA/ID | 11 | 38 | 34 | 27 | 20 | 12 | 6 | 2 | 1 | 5 | 16 | 28 | 37 |
| WA/ID | 12 | 38 | 33 | 26 | 19 | 12 | 5 | 1 | 1 | 5 | 16 | 29 | 37 |
| WA/ID | 13 | 38 | 62 | 26 | 19 | 11 | 5 | 1 | 1 | 6 | 17 | 29 | 38 |
| WA/ID | 14 | 38 | 72 | 26 | 19 | 11 | 5 | 1 | 1 | 6 | 17 | 30 | 38 |
| WA/ID | 15 | 38 | 82 | 26 | 19 | 11 | 5 | 1 | 1 | 6 | 17 | 30 | 38 |
| WA/ID | 16 | 38 | 67 | 25 | 19 | 11 | 5 | 1 | 1 | 6 | 18 | 30 | 38 |
| WA/ID | 17 | 38 | 57 | 25 | 18 | 11 | 5 | 1 | 1 | 7 | 18 | 31 | 38 |
| WA/ID | 18 | 38 | 32 | 25 | 18 | 10 | 5 | 1 | 1 | 7 | 19 | 31 | 51 |
| WA/ID | 19 | 38 | 32 | 25 | 18 | 10 | 4 | 1 | 1 | 7 | 19 | 31 | 56 |
| WA/ID | 20 | 37 | 32 | 24 | 18 | 10 | 4 | 1 | 1 | 8 | 20 | 32 | 61 |
| WA/ID | 21 | 37 | 31 | 24 | 17 | 10 | 4 | 1 | 1 | 8 | 20 | 32 | 58 |
| WA/ID | 22 | 37 | 31 | 24 | 17 | 9 | 4 | 1 | 2 | 8 | 20 | 32 | 53 |
| WA/ID | 23 | 37 | 31 | 24 | 17 | 9 | 4 | 1 | 2 | 9 | 21 | 33 | 39 |
| WA/ID | 24 | 37 | 31 | 24 | 17 | 9 | 4 | 1 | 2 | 9 | 21 | 33 | 39 |
| WA/ID | 25 | 37 | 30 | 23 | 16 | 9 | 4 | 1 | 2 | 9 | 22 | 33 | 39 |
| WA/ID | 26 | 37 | 30 | 23 | 16 | 9 | 3 | 1 | 2 | 10 | 22 | 33 | 39 |
| WA/ID | 27 | 36 | 30 | 23 | 16 | 8 | 3 | 1 | 2 | 10 | 22 | 34 | 39 |
| WA/ID | 28 | 36 | 29 | 23 | 15 | 8 | 3 | 1 | 2 | 10 | 23 | 34 | 39 |
| WA/ID | 29 | 36 | | 23 | 15 | 8 | 3 | 1 | 2 | 11 | 23 | 34 | 39 |
| WA/ID | 30 | 36 | | 22 | 15 | 8 | 3 | 1 | 3 | 11 | 24 | 35 | 39 |
| WA/ID | 31 | 36 | | 22 | | 8 | | 1 | 3 | | 24 | | 39 |

| Temp Pattern | Day | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medford | 1 | 27 | 24 | 20 | 16 | 11 | 4 | 1 | 0 | 1 | 5 | 16 | 25 |
| Medford | 2 | 27 | 24 | 20 | 16 | 10 | 4 | 1 | 0 | 1 | 6 | 17 | 25 |
| Medford | 3 | 27 | 23 | 19 | 15 | 10 | 4 | 1 | 0 | 1 | 6 | 17 | 26 |
| Medford | 4 | 27 | 23 | 19 | 15 | 10 | 4 | 1 | 0 | 1 | 6 | 17 | 26 |
| Medford | 5 | 27 | 23 | 19 | 15 | 10 | 4 | 1 | 0 | 1 | 7 | 18 | 26 |
| Medford | 6 | 27 | 23 | 19 | 15 | 10 | 4 | 1 | 0 | 1 | 7 | 18 | 26 |
| Medford | 7 | 27 | 23 | 19 | 15 | 9 | 3 | 1 | 0 | 1 | 7 | 18 | 26 |
| Medford | 8 | 27 | 23 | 19 | 15 | 9 | 3 | 1 | 0 | 1 | 7 | 19 | 26 |
| Medford | 9 | 27 | 23 | 19 | 15 | 9 | 3 | 1 | 0 | 1 | 8 | 19 | 27 |
| Medford | 10 | 27 | 22 | 19 | 14 | 9 | 3 | 1 | 0 | 1 | 8 | 20 | 27 |
| Medford | 11 | 27 | 22 | 18 | 14 | 8 | 3 | 0 | 0 | 1 | 8 | 20 | 27 |
| Medford | 12 | 27 | 22 | 18 | 14 | 8 | 3 | 0 | 0 | 1 | 9 | 20 | 27 |
| Medford | 13 | 26 | 32 | 18 | 14 | 8 | 2 | 0 | 0 | 2 | 9 | 21 | 27 |
| Medford | 14 | 26 | 36 | 18 | 14 | 8 | 2 | 0 | 0 | 2 | 9 | 21 | 27 |
| Medford | 15 | 26 | 38 | 18 | 14 | 8 | 2 | 0 | 0 | 2 | 10 | 21 | 27 |
| Medford | 16 | 26 | 32 | 18 | 13 | 7 | 2 | 0 | 0 | 2 | 10 | 21 | 27 |
| Medford | 17 | 26 | 28 | 18 | 13 | 7 | 2 | 0 | 0 | 2 | 10 | 22 | 27 |
| Medford | 18 | 26 | 21 | 17 | 13 | 7 | 2 | 0 | 0 | 2 | 11 | 22 | 50 |
| Medford | 19 | 26 | 21 | 17 | 13 | 7 | 2 | 0 | 0 | 3 | 11 | 22 | 59 |
| Medford | 20 | 26 | 21 | 17 | 13 | 7 | 2 | 0 | 0 | 3 | 11 | 23 | 61 |
| Medford | 21 | 25 | 21 | 17 | 12 | 6 | 2 | 0 | 0 | 3 | 12 | 23 | 56 |
| Medford | 22 | 25 | 21 | 17 | 12 | 6 | 1 | 0 | 0 | 3 | 12 | 23 | 55 |
| Medford | 23 | 25 | 21 | 17 | 12 | 6 | 1 | 0 | 0 | 3 | 13 | 23 | 28 |
| Medford | 24 | 25 | 20 | 17 | 12 | 6 | 1 | 0 | 0 | 4 | 13 | 24 | 28 |
| Medford | 25 | 25 | 20 | 17 | 12 | 6 | 1 | 0 | 1 | 4 | 13 | 24 | 28 |
| Medford | 26 | 25 | 20 | 16 | 12 | 6 | 1 | 0 | 1 | 4 | 14 | 24 | 28 |
| Medford | 27 | 25 | 20 | 16 | 11 | 5 | 1 | 0 | 1 | 4 | 14 | 24 | 28 |
| Medford | 28 | 25 | 20 | 16 | 11 | 5 | 1 | 0 | 1 | 4 | 14 | 25 | 28 |
| Medford | 29 | 24 | | 16 | 11 | 5 | 1 | 0 | 1 | 5 | 15 | 25 | 28 |
| Medford | 30 | 24 | | 16 | 11 | 5 | 1 | 0 | 1 | 5 | 15 | 25 | 27 |
| Medford | 31 | 24 | | 16 | | 5 | | 0 | 1 | | 16 | | 27 |

# APPENDIX 3.4 II HEATING DEGREE DAILY MONTH BY AREA

| Temp Pattern | Day | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Roseburg | 1 | 24 | 21 | 18 | 14 | 10 | 5 | 1 | 0 | 1 | 5 | 13 | 21 |
| Roseburg | 2 | 24 | 21 | 17 | 14 | 10 | 4 | 1 | 0 | 1 | 5 | 14 | 21 |
| Roseburg | 3 | 24 | 21 | 17 | 14 | 9 | 4 | 1 | 0 | 1 | 5 | 14 | 21 |
| Roseburg | 4 | 23 | 21 | 17 | 14 | 9 | 4 | 1 | 0 | 1 | 6 | 14 | 22 |
| Roseburg | 5 | 23 | 20 | 17 | 14 | 9 | 4 | 1 | 0 | 1 | 6 | 14 | 22 |
| Roseburg | 6 | 23 | 20 | 17 | 14 | 9 | 4 | 1 | 0 | 1 | 6 | 15 | 22 |
| Roseburg | 7 | 23 | 20 | 17 | 14 | 9 | 4 | 1 | 0 | 1 | 6 | 15 | 22 |
| Roseburg | 8 | 23 | 20 | 17 | 14 | 9 | 4 | 1 | 0 | 1 | 7 | 15 | 22 |
| Roseburg | 9 | 23 | 20 | 17 | 13 | 8 | 3 | 1 | 0 | 1 | 7 | 16 | 22 |
| Roseburg | 10 | 23 | 20 | 17 | 13 | 8 | 3 | 1 | 0 | 2 | 7 | 16 | 23 |
| Roseburg | 11 | 23 | 20 | 17 | 13 | 8 | 3 | 1 | 0 | 2 | 7 | 16 | 23 |
| Roseburg | 12 | 23 | 20 | 16 | 13 | 8 | 3 | 1 | 0 | 2 | 7 | 17 | 23 |
| Roseburg | 13 | 23 | 32 | 16 | 13 | 8 | 3 | 1 | 0 | 2 | 8 | 17 | 23 |
| Roseburg | 14 | 23 | 37 | 16 | 13 | 7 | 3 | 1 | 0 | 2 | 8 | 17 | 23 |
| Roseburg | 15 | 23 | 42 | 16 | 13 | 7 | 3 | 1 | 0 | 2 | 8 | 17 | 23 |
| Roseburg | 16 | 23 | 34 | 16 | 13 | 7 | 3 | 1 | 0 | 2 | 9 | 18 | 23 |
| Roseburg | 17 | 23 | 28 | 16 | 12 | 7 | 3 | 1 | 0 | 2 | 9 | 18 | 23 |
| Roseburg | 18 | 23 | 19 | 16 | 12 | 7 | 2 | 1 | 0 | 3 | 9 | 18 | 40 |
| Roseburg | 19 | 22 | 19 | 16 | 12 | 7 | 2 | 1 | 0 | 3 | 9 | 18 | 53 |
| Roseburg | 20 | 22 | 19 | 16 | 12 | 6 | 2 | 0 | 0 | 3 | 10 | 19 | 55 |
| Roseburg | 21 | 22 | 18 | 15 | 12 | 6 | 2 | 0 | 1 | 3 | 10 | 19 | 46 |
| Roseburg | 22 | 22 | 18 | 15 | 12 | 6 | 2 | 0 | 1 | 3 | 10 | 19 | 48 |
| Roseburg | 23 | 22 | 18 | 15 | 11 | 6 | 2 | 0 | 1 | 3 | 10 | 19 | 24 |
| Roseburg | 24 | 22 | 18 | 15 | 11 | 6 | 2 | 0 | 1 | 4 | 11 | 20 | 24 |
| Roseburg | 25 | 22 | 18 | 15 | 11 | 6 | 2 | 0 | 1 | 4 | 11 | 20 | 24 |
| Roseburg | 26 | 22 | 18 | 15 | 11 | 5 | 2 | 0 | 1 | 4 | 11 | 20 | 24 |
| Roseburg | 27 | 22 | 18 | 15 | 11 | 5 | 2 | 0 | 1 | 4 | 12 | 20 | 24 |
| Roseburg | 28 | 21 | 18 | 15 | 10 | 5 | 2 | 0 | 1 | 4 | 12 | 20 | 24 |
| Roseburg | 29 | 21 | | 15 | 10 | 5 | 2 | 0 | 1 | 4 | 12 | 21 | 24 |
| Roseburg | 30 | 21 | | 15 | 10 | 5 | 1 | 0 | 1 | 5 | 13 | 21 | 24 |
| Roseburg | 31 | 21 | | 14 | | 5 | | 0 | 1 | | 13 | | 24 |

| Temp Pattern | Day | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klamath Falls | 1 | 35 | 32 | 27 | 22 | 16 | 8 | 3 | 1 | 3 | 10 | 22 | 32 |
| Klamath Falls | 2 | 35 | 32 | 27 | 22 | 15 | 8 | 3 | 1 | 3 | 10 | 22 | 32 |
| Klamath Falls | 3 | 35 | 31 | 27 | 22 | 15 | 8 | 3 | 1 | 4 | 11 | 23 | 33 |
| Klamath Falls | 4 | 35 | 31 | 27 | 22 | 15 | 7 | 3 | 1 | 4 | 11 | 23 | 33 |
| Klamath Falls | 5 | 35 | 31 | 26 | 21 | 15 | 7 | 2 | 1 | 4 | 11 | 24 | 33 |
| Klamath Falls | 6 | 35 | 31 | 26 | 21 | 14 | 7 | 2 | 1 | 4 | 12 | 24 | 33 |
| Klamath Falls | 7 | 35 | 31 | 26 | 21 | 14 | 7 | 2 | 1 | 4 | 12 | 25 | 33 |
| Klamath Falls | 8 | 35 | 31 | 26 | 21 | 14 | 7 | 2 | 1 | 5 | 12 | 25 | 33 |
| Klamath Falls | 9 | 35 | 30 | 26 | 21 | 13 | 6 | 2 | 1 | 5 | 13 | 25 | 34 |
| Klamath Falls | 10 | 35 | 30 | 26 | 20 | 13 | 6 | 2 | 1 | 5 | 13 | 26 | 34 |
| Klamath Falls | 11 | 35 | 30 | 26 | 20 | 13 | 6 | 2 | 1 | 5 | 13 | 26 | 34 |
| Klamath Falls | 12 | 35 | 30 | 25 | 20 | 13 | 6 | 2 | 1 | 5 | 14 | 26 | 34 |
| Klamath Falls | 13 | 35 | 42 | 25 | 20 | 12 | 6 | 2 | 1 | 6 | 14 | 27 | 34 |
| Klamath Falls | 14 | 35 | 51 | 25 | 20 | 12 | 5 | 2 | 1 | 6 | 14 | 27 | 34 |
| Klamath Falls | 15 | 34 | 54 | 25 | 19 | 12 | 5 | 1 | 1 | 6 | 15 | 28 | 34 |
| Klamath Falls | 16 | 34 | 53 | 25 | 19 | 12 | 5 | 1 | 1 | 6 | 15 | 28 | 34 |
| Klamath Falls | 17 | 34 | 47 | 25 | 19 | 12 | 5 | 1 | 1 | 7 | 15 | 28 | 35 |
| Klamath Falls | 18 | 34 | 29 | 24 | 19 | 11 | 5 | 1 | 1 | 7 | 16 | 29 | 54 |
| Klamath Falls | 19 | 34 | 29 | 24 | 19 | 11 | 5 | 1 | 1 | 7 | 16 | 29 | 66 |
| Klamath Falls | 20 | 34 | 28 | 24 | 18 | 11 | 4 | 1 | 1 | 7 | 17 | 29 | 72 |
| Klamath Falls | 21 | 34 | 28 | 24 | 18 | 11 | 4 | 1 | 2 | 7 | 17 | 30 | 68 |
| Klamath Falls | 22 | 34 | 28 | 24 | 18 | 10 | 4 | 1 | 2 | 8 | 17 | 30 | 58 |
| Klamath Falls | 23 | 34 | 28 | 24 | 18 | 10 | 4 | 1 | 2 | 8 | 18 | 30 | 35 |
| Klamath Falls | 24 | 33 | 28 | 23 | 17 | 10 | 4 | 1 | 2 | 8 | 18 | 30 | 35 |
| Klamath Falls | 25 | 33 | 28 | 23 | 17 | 10 | 4 | 1 | 2 | 9 | 19 | 31 | 35 |
| Klamath Falls | 26 | 33 | 27 | 23 | 17 | 9 | 3 | 1 | 2 | 9 | 19 | 31 | 35 |
| Klamath Falls | 27 | 33 | 27 | 23 | 17 | 9 | 3 | 1 | 2 | 9 | 20 | 31 | 35 |
| Klamath Falls | 28 | 33 | 27 | 23 | 16 | 9 | 3 | 1 | 3 | 9 | 20 | 31 | 35 |
| Klamath Falls | 29 | 32 | | 23 | 16 | 9 | 3 | 1 | 3 | 10 | 20 | 32 | 35 |
| Klamath Falls | 30 | 32 | | 22 | 16 | 8 | 3 | 1 | 3 | 10 | 21 | 32 | 35 |
| Klamath Falls | 31 | 32 | | 22 | | 8 | | 1 | 3 | | 21 | | 35 |

## APPENDIX 3.4 II HEATING DEGREE DAILY MONTH BY AREA

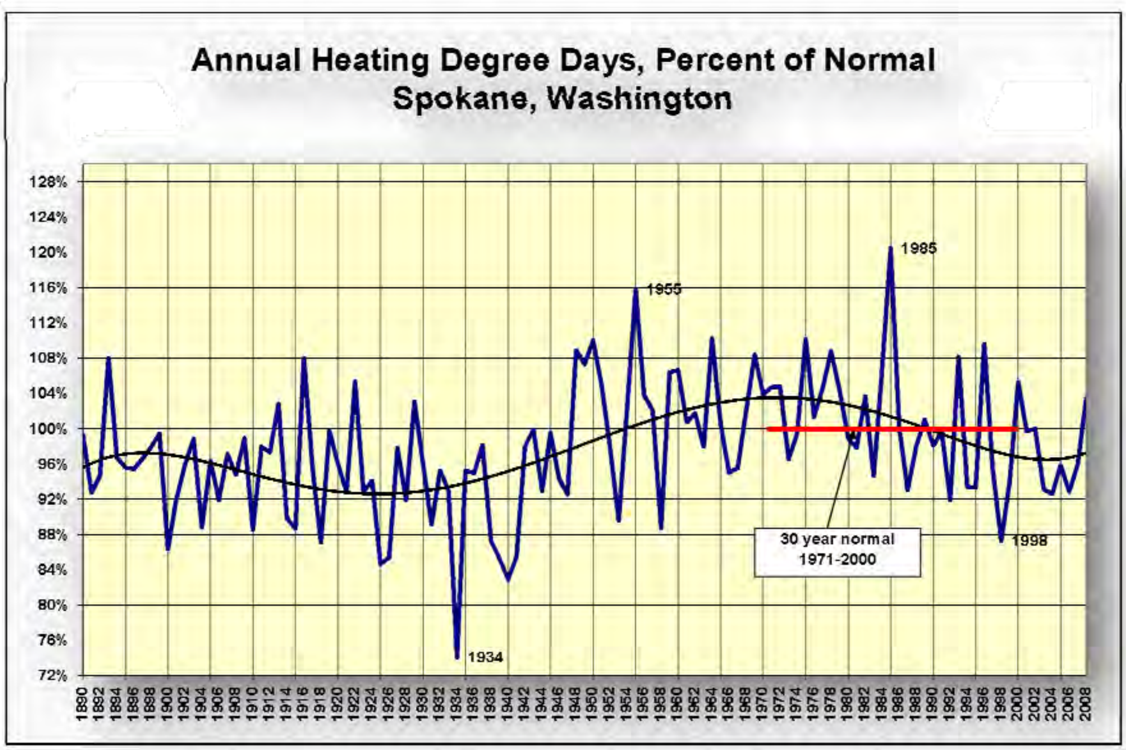
| Temp Pattern | Day | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LaGrande | 1 | 35 | 33 | 28 | 22 | 15 | 8 | 3 | 1 | 4 | 11 | 22 | 32 |
| LaGrande | 2 | 35 | 33 | 27 | 21 | 15 | 7 | 2 | 1 | 4 | 11 | 23 | 32 |
| LaGrande | 3 | 35 | 33 | 27 | 21 | 14 | 7 | 2 | 1 | 4 | 12 | 23 | 32 |
| LaGrande | 4 | 35 | 32 | 27 | 21 | 14 | 7 | 2 | 1 | 4 | 12 | 23 | 32 |
| LaGrande | 5 | 36 | 32 | 27 | 21 | 14 | 7 | 2 | 1 | 5 | 12 | 24 | 32 |
| LaGrande | 6 | 36 | 32 | 26 | 21 | 13 | 7 | 2 | 1 | 5 | 13 | 24 | 33 |
| LaGrande | 7 | 36 | 32 | 26 | 21 | 13 | 6 | 2 | 1 | 5 | 13 | 25 | 33 |
| LaGrande | 8 | 36 | 32 | 26 | 20 | 13 | 6 | 2 | 1 | 5 | 13 | 25 | 33 |
| LaGrande | 9 | 35 | 31 | 26 | 20 | 13 | 6 | 2 | 1 | 6 | 13 | 25 | 33 |
| LaGrande | 10 | 35 | 31 | 26 | 20 | 12 | 6 | 2 | 1 | 6 | 14 | 26 | 33 |
| LaGrande | 11 | 35 | 31 | 26 | 20 | 12 | 6 | 1 | 1 | 6 | 14 | 26 | 33 |
| LaGrande | 12 | 35 | 31 | 25 | 20 | 12 | 5 | 1 | 1 | 6 | 14 | 26 | 34 |
| LaGrande | 13 | 35 | 61 | 25 | 19 | 12 | 5 | 1 | 1 | 6 | 15 | 27 | 34 |
| LaGrande | 14 | 35 | 68 | 25 | 19 | 11 | 5 | 1 | 1 | 7 | 15 | 27 | 34 |
| LaGrande | 15 | 35 | 74 | 25 | 19 | 11 | 5 | 1 | 1 | 7 | 15 | 28 | 34 |
| LaGrande | 16 | 35 | 61 | 25 | 19 | 11 | 5 | 1 | 1 | 7 | 16 | 28 | 34 |
| LaGrande | 17 | 35 | 60 | 24 | 18 | 11 | 5 | 1 | 1 | 7 | 16 | 28 | 34 |
| LaGrande | 18 | 35 | 30 | 24 | 18 | 11 | 4 | 1 | 2 | 8 | 17 | 28 | 51 |
| LaGrande | 19 | 35 | 30 | 24 | 18 | 10 | 4 | 1 | 2 | 8 | 17 | 29 | 58 |
| LaGrande | 20 | 35 | 29 | 24 | 18 | 10 | 4 | 1 | 2 | 8 | 17 | 29 | 64 |
| LaGrande | 21 | 35 | 29 | 24 | 17 | 10 | 4 | 1 | 2 | 8 | 18 | 29 | 58 |
| LaGrande | 22 | 35 | 29 | 23 | 17 | 10 | 4 | 1 | 2 | 9 | 18 | 30 | 51 |
| LaGrande | 23 | 34 | 29 | 23 | 17 | 9 | 4 | 1 | 2 | 9 | 18 | 30 | 35 |
| LaGrande | 24 | 34 | 29 | 23 | 17 | 9 | 4 | 1 | 2 | 9 | 19 | 30 | 35 |
| LaGrande | 25 | 34 | 28 | 23 | 16 | 9 | 3 | 1 | 3 | 9 | 19 | 30 | 35 |
| LaGrande | 26 | 34 | 28 | 23 | 16 | 9 | 3 | 1 | 3 | 10 | 20 | 31 | 35 |
| LaGrande | 27 | 34 | 28 | 22 | 16 | 9 | 3 | 1 | 3 | 10 | 20 | 31 | 35 |
| LaGrande | 28 | 34 | 28 | 22 | 16 | 8 | 3 | 1 | 3 | 10 | 20 | 31 | 35 |
| LaGrande | 29 | 34 | | 22 | 15 | 8 | 3 | 1 | 3 | 10 | 21 | 31 | 35 |
| LaGrande | 30 | 33 | | 22 | 15 | 8 | 3 | 1 | 3 | 11 | 21 | 31 | 35 |
| LaGrande | 31 | 33 | | 22 | | 8 | | 1 | 4 | | 22 | | 35 |

## APPENDIX 3.5 ll GLOBAL WARMING

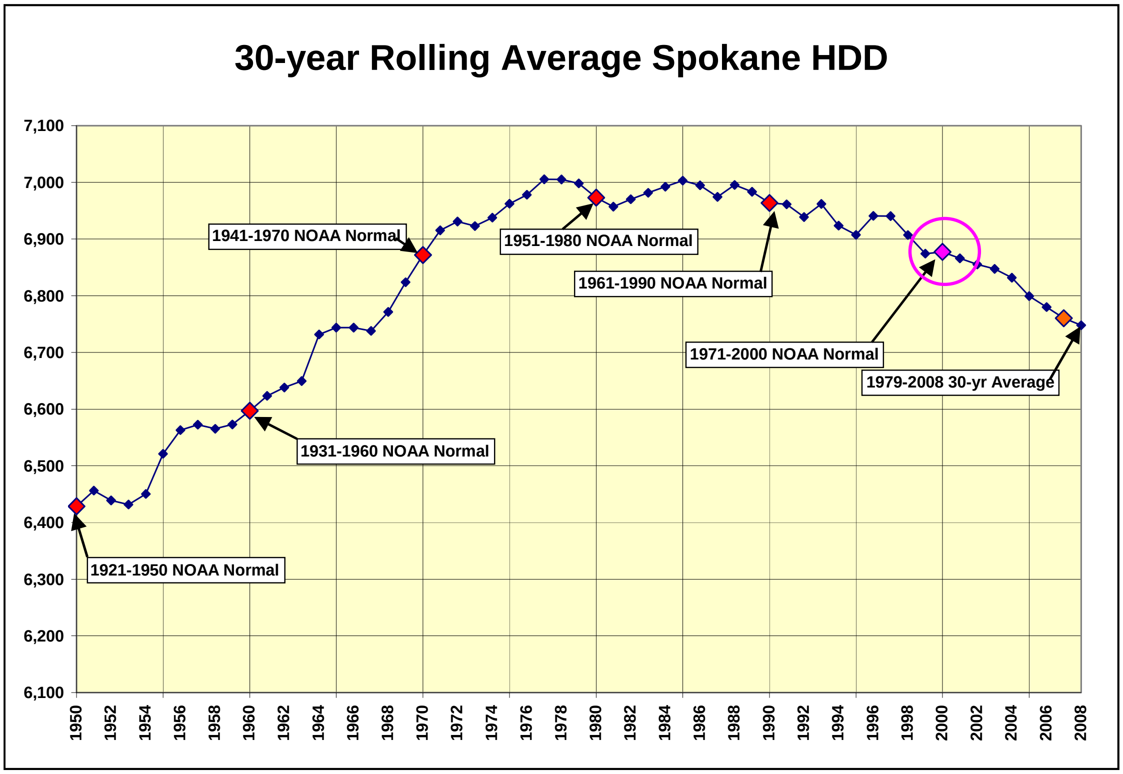
- Peak and trough weather appears more volatile
- Reduce annual consumption over time
- Decrease non peak HDDs over time to reflect warming trend

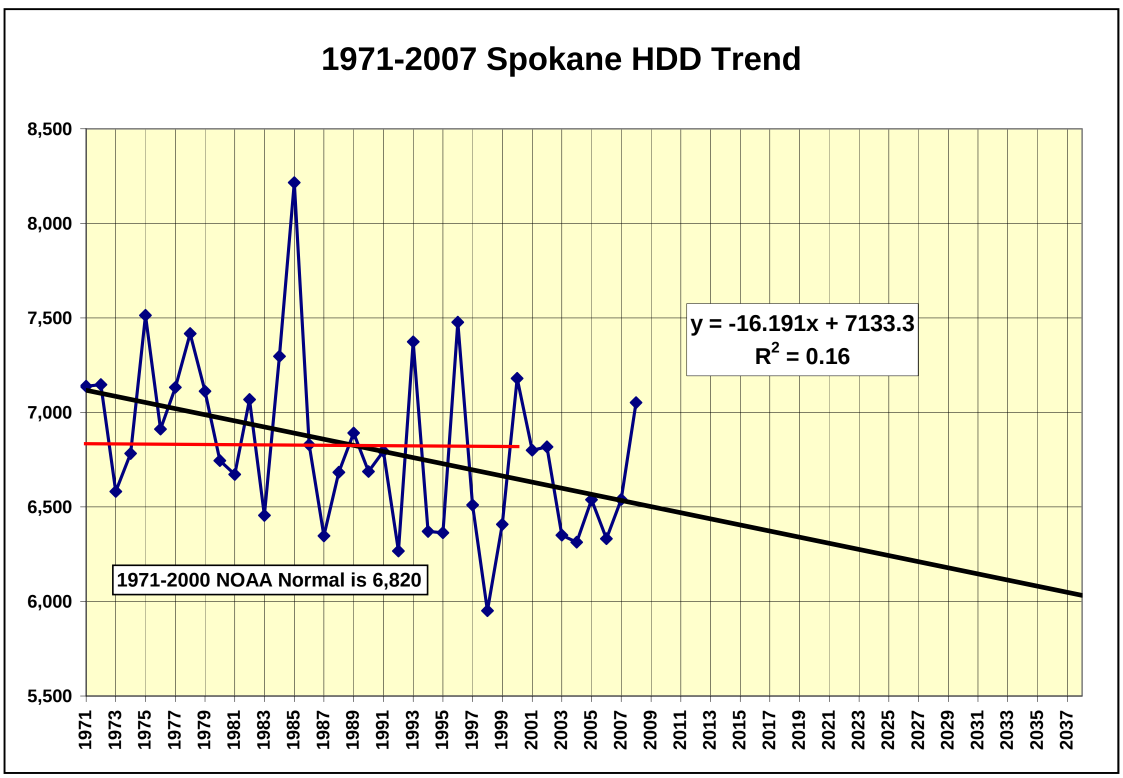
### GLOBAL WARMING ADJUSTMENT

- Heating degree day data is obtained from the National Weather Service (NWS). Avista uses the most recent 30-year period, which goes from 1979-2008. For Oregon, Avista uses four weather stations as the weather basis, corresponding to the areas within which natural gas services are provided, all of which are official National Weather Service stations. Heating degree day weather patterns between these areas are uncorrelated.
- At the April 2009 Technical Advisory Committee meeting, Avista presented some data and information regarding trends in heating degree days for its service area. Avista has adopted a "Global Warming" baseline for forecasting which captures the modest warming trend (i.e. gradually declining heating degree days) expected through the 20 year forecast period.
- By 2030, as compared to the "official" NWS normal figures based on the 1971-2000 period, the number of annual heating degree days as a percentage of the official period are:
  - Spokane 93.9%
  - Medford 88.4%
  - Roseburg 86.8%
  - Klamath Falls 94.9%
  - La Grande 81.6%

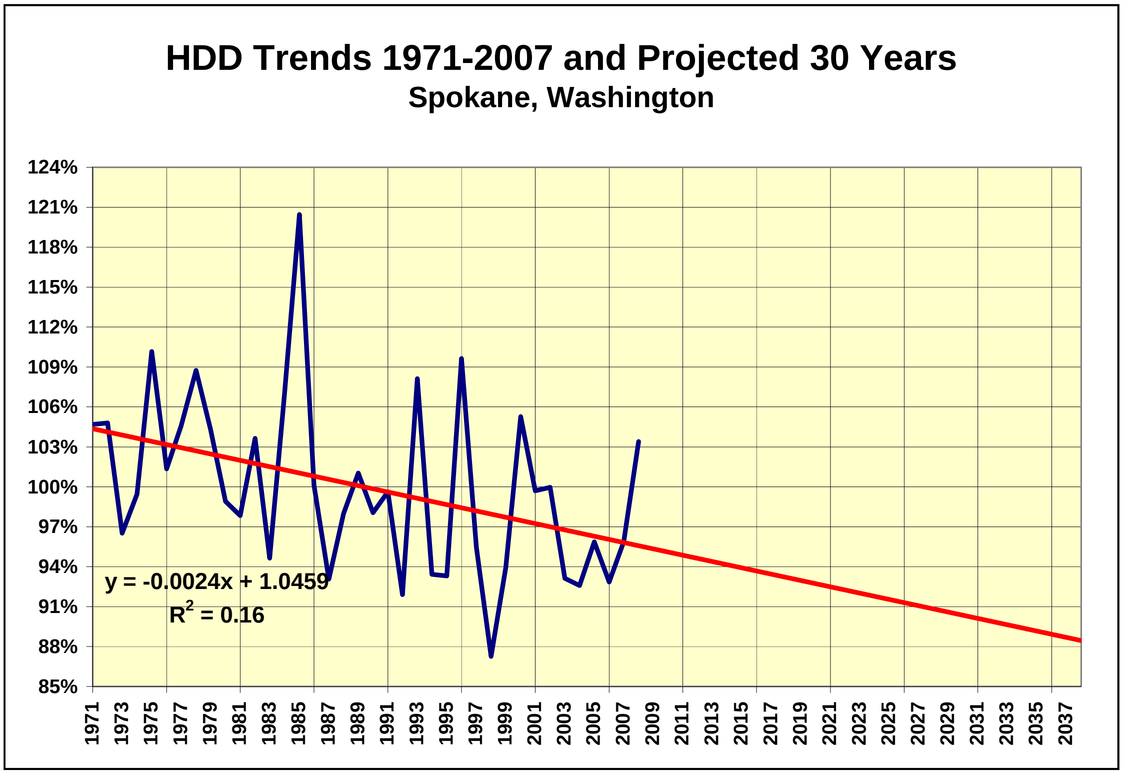


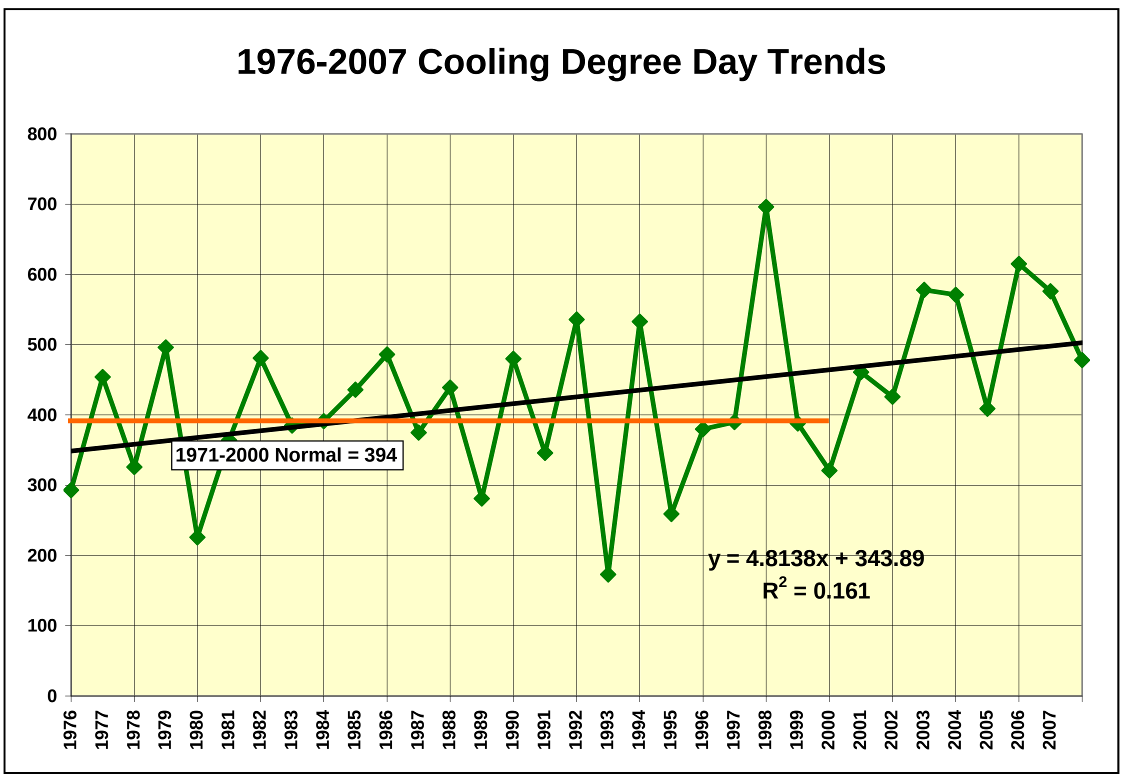
## APPENDIX 3.5 II GLOBAL WARMING



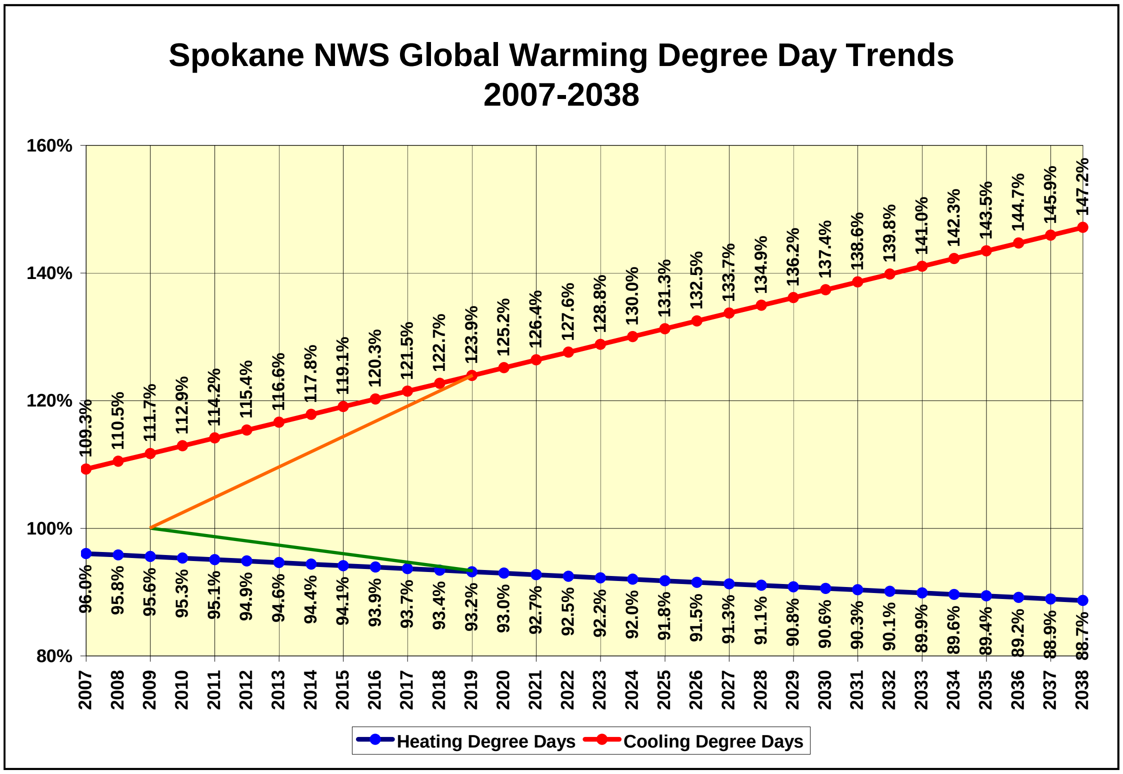



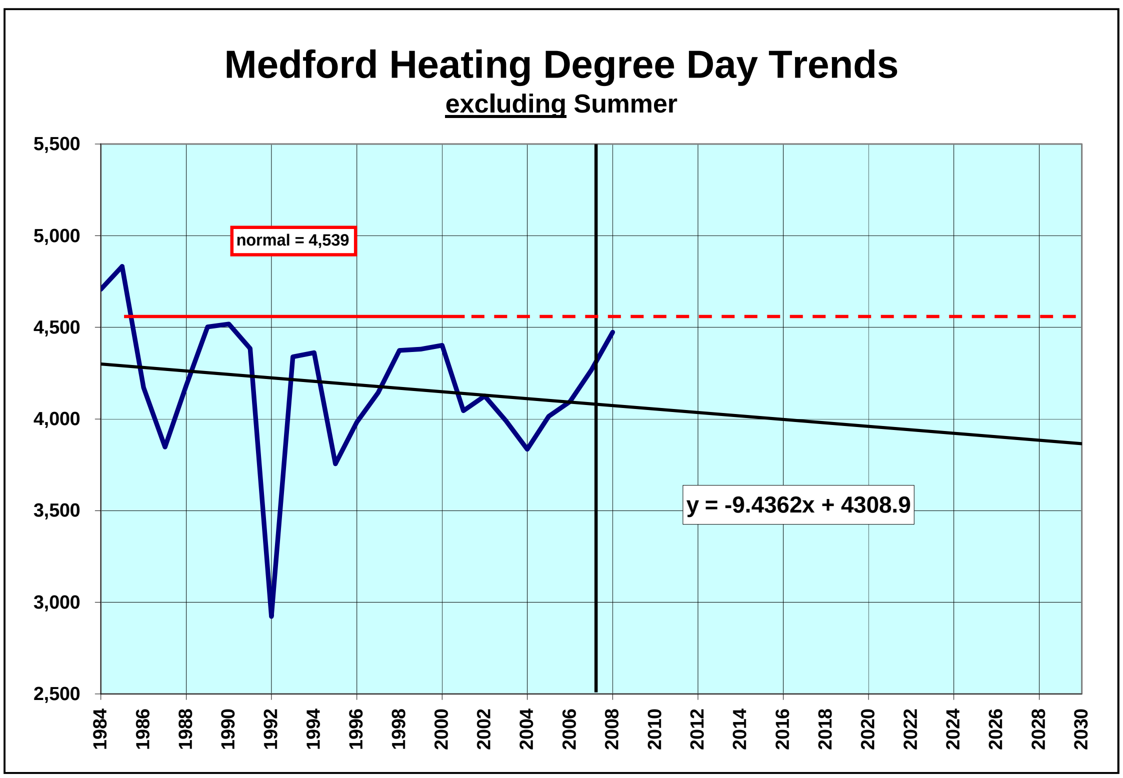
## APPENDIX 3.5 ‖ GLOBAL WARMING



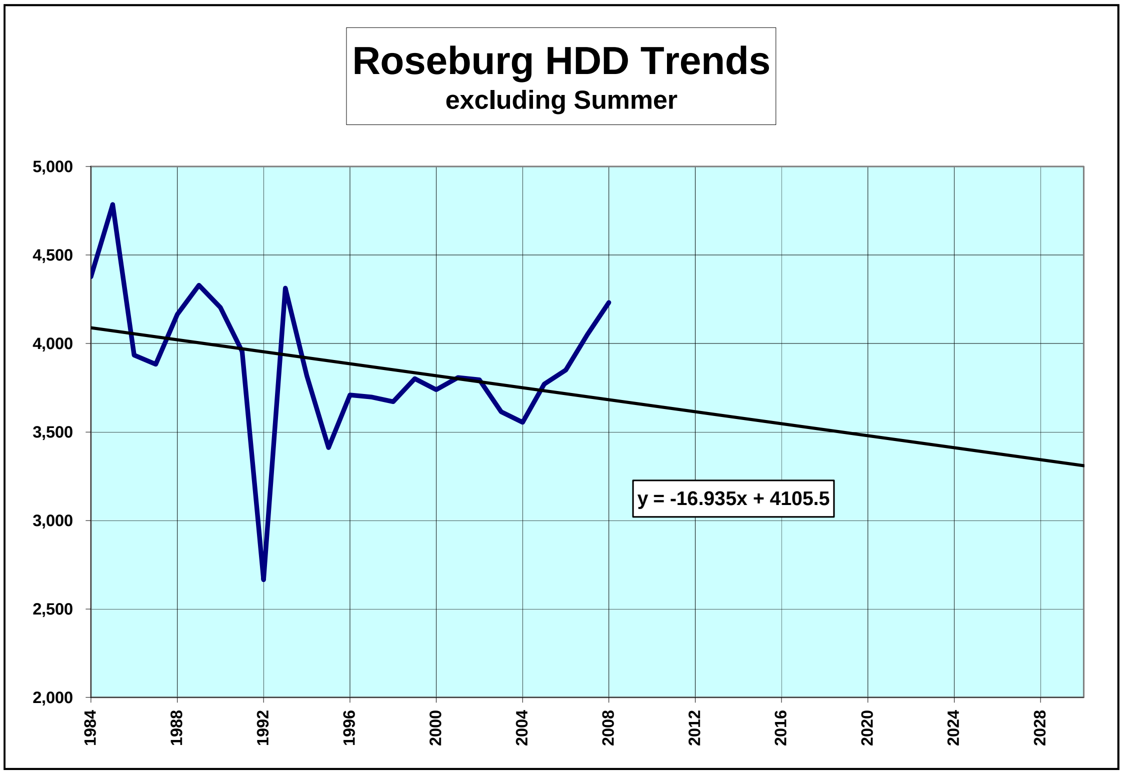



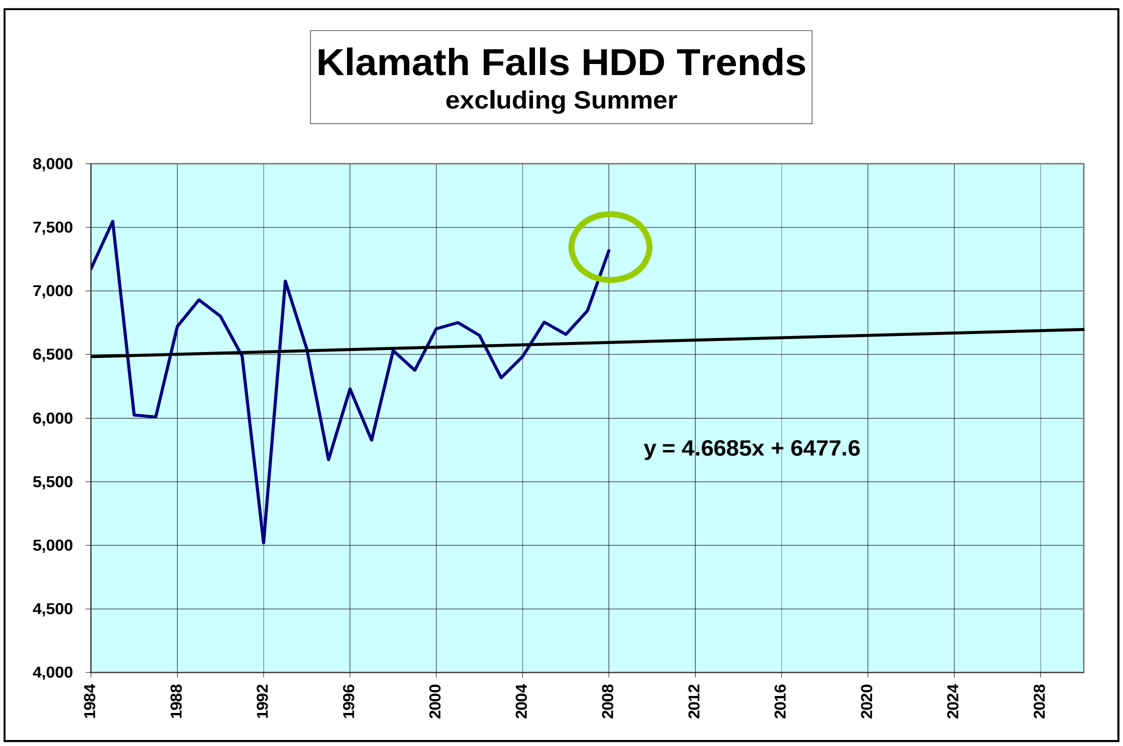
## APPENDIX 3.5 II GLOBAL WARMING



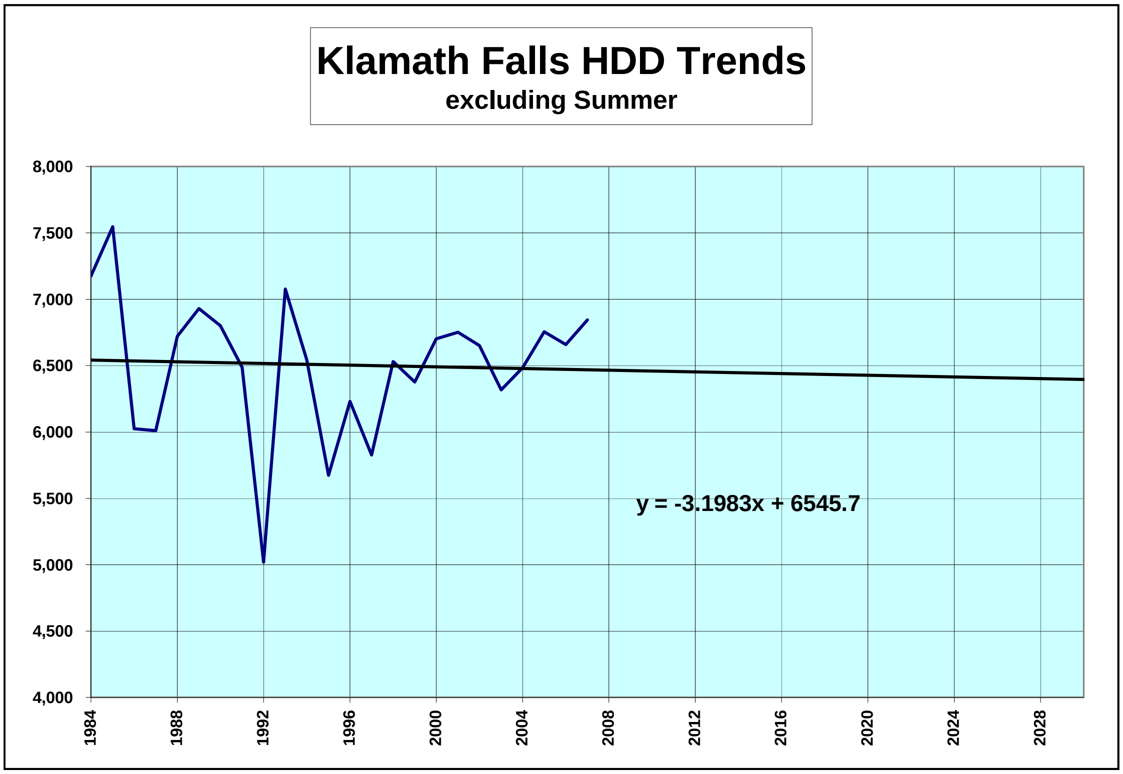



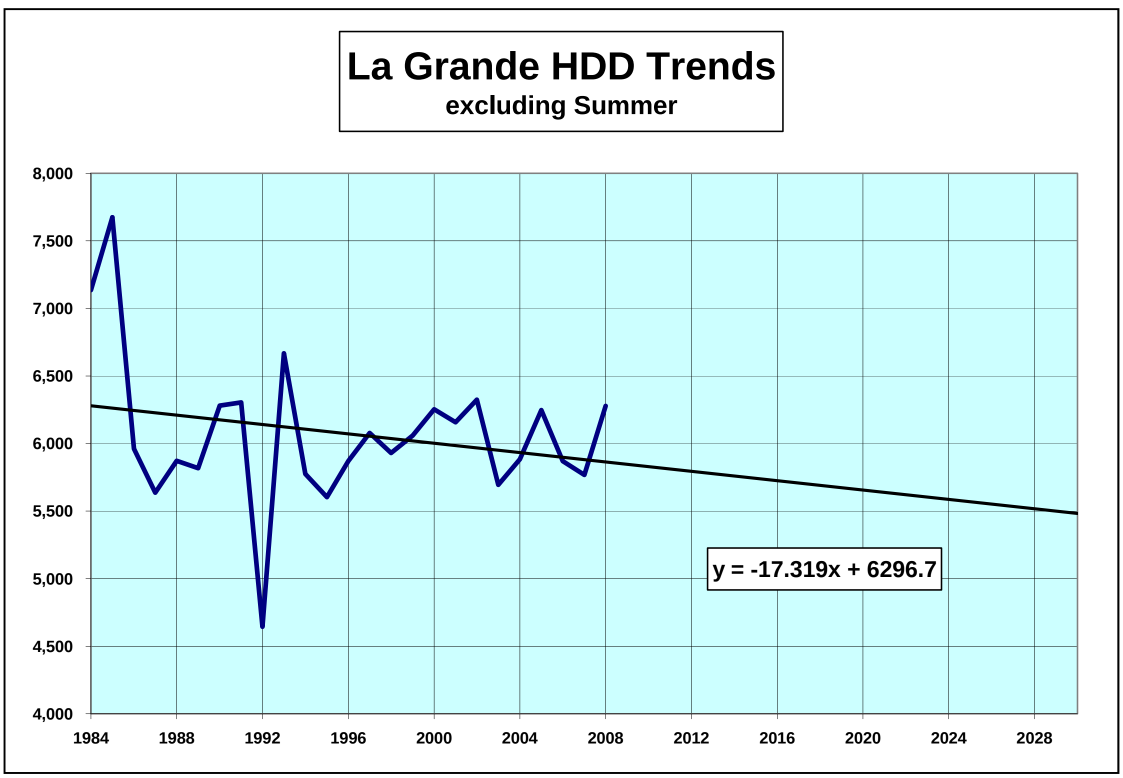
## APPENDIX 3.5 ‖ GLOBAL WARMING



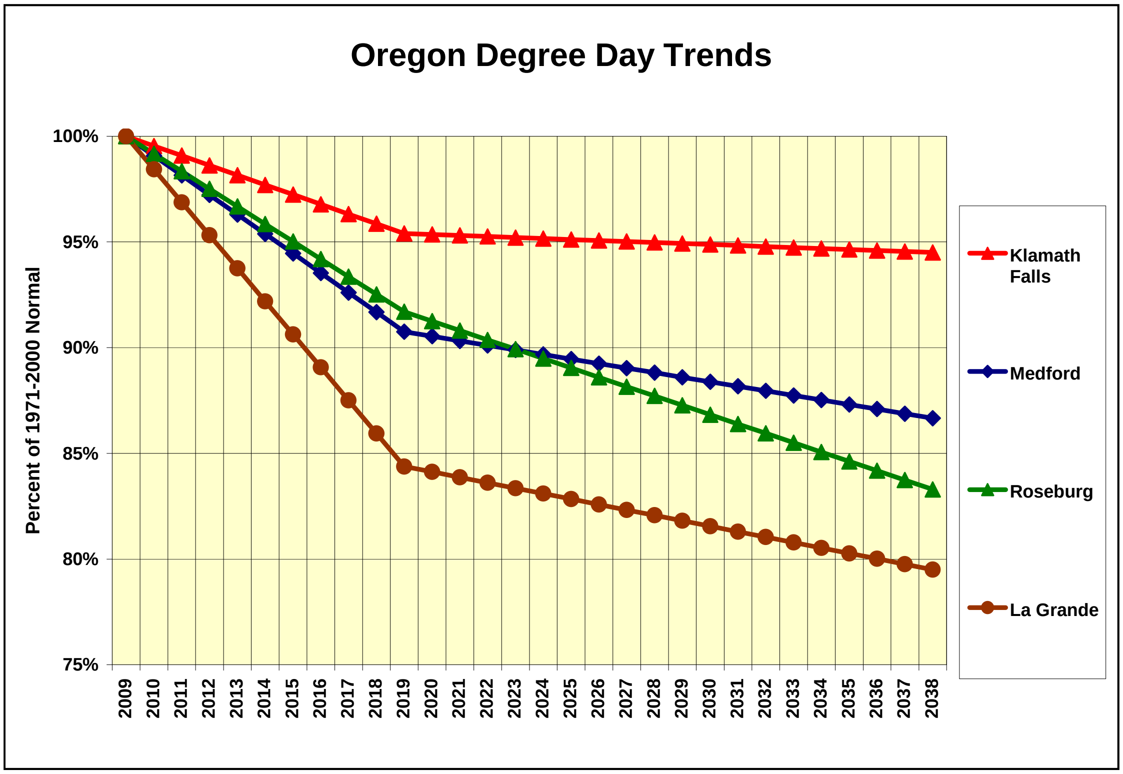



## APPENDIX 3.5 II GLOBAL WARMING



# APPENDIX 3.5 ‖ GLOBAL WARMING



# APPENDIX 3.6 II DEMAND SENSITIVITIES
# SUMMARY OF ASSUMPTIONS – DEMAND SCENARIOS

| | | | DEMAND INFLUENCING - DIRECT | | | | | | | PRICE INFLUENCING - INDIRECT | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| INPUT ASSUMPTIONS | Reference Case | Reference Plus Peak Case | Low Cust Growth | High Cust Growth | CNG/NGV Vehicles | Alternate Weather Std | DSM Case | Peak plus DSM Case | Alterante Historical UPC Case | Expect Elasticity | Low Prices | High Prices | Carbon Legistlation | Exported LNG |
| **Customer Growth Rate** | | | 40% Decrease in Cust Growth Rates | 60% Increase in Cust Growth Rates | | | | | | | | | | |
| Residential WA/ID | | | | | | | | | | | | | | |
| Residential Medford | | | | | | | | | | | | | | |
| Residential Roseburg | | | | | | | | | | | | | | |
| Residential Klamath | | | | | | | | | | | | | | |
| Residential La Grande | | | | | | | | | | | | | | |
| Commercial WA/ID | | | | | | | | | | | | | | |
| Commercial Medford | | | | | | | | | | | | | | |
| Commercial Roseburg | | | | | | | | | | | | | | |
| Commercial Klamath | | | | | | | | | | | | | | |
| Commercial La Grande | | | | | | | | | | | | | | |
| **Use per Customer** | 3 Year Historical | 3 Year Historical | 3 Year Historical | 3 Year Historical | 15% Growth Cumulative | 3 Year Historical | 3 Year Historical | 3 Year Historical | 5 Year Historical | 3 Year Historical | 3 Year Historical | 3 Year Historical | 3 Year Historical | 3 Year Historical |
| **Weather** | | | | | | | | | | | | | | |
| Planning Standard | Normal plus GW Adj | Coldest on Record | Coldest on Record | Coldest on Record | Coldest on Record | Coldest 20yrs | Normal plus GW Adj | Coldest on Record | Coldest on Record | Coldest on Record | Coldest on Record | Coldest on Record | Coldest on Record | Coldest on Record |
| **Demand Side Management** | | | | | | | | | | | | | | |
| Programs Included | No | No | No | No | No | No | Yes | Yes | No | No | No | No | No | No |
| **Prices** | | | | | | | | | | | | | | |
| Price curve | Expected | Expected | Expected | Expected | Expected | Expected | Expected | Expected | Expected | Expected | Low | High | Expected | Expected |
| Price curve adder ($/Dth) | None | None | None | None | None | None | None | None | None | | | | | $.50 Adder After 5yrs |
| Elasticity | None | None | None | None | None | None | None | None | None | Expected | Expected | Expected | Expected | Expected |
| Carbon Adder ($/Ton) | None | None | None | None | None | None | None | None | None | | | | $14-$22 starting in 2022 | |
| **RESULTS** | | | | | | | | | | | | | | |
| **FIRST YEAR UNSERVED** | | | | | | | | | | | | | | |
| WA/ID | N/A | 2023 | N/A | 2020 | 2024 | 2026 | N/A | 2023 | 2023 | 2031 | 2029 | N/A | N/A | N/A |
| Medford | N/A | 2023 | N/A | 2020 | 2023 | N/A | N/A | 2024 | 2023 | 2029 | 2028 | N/A | 2030 | 2030 |
| Roseburg | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Klamath | N/A | 2022 | N/A | 2019 | 2022 | 2023 | N/A | 2023 | 2022 | 2031 | 2028 | N/A | 2031 | 2031 |
| La Grande | N/A | N/A | N/A | 2027 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

# APPENDIX 3.6 II DEMAND SCENARIOS
# PROPOSED SCENARIOS

| INPUT ASSUMPTIONS | Expected Case | High Growth & Low Prices | Low Growth & High Prices | Cold Day 20-yr Weather Std | Average Case |
|---|---|---|---|---|---|
| **Customer Growth Rate** | Reference Case Cust Growth Rates | 60% Increase in Cust Growth Rates | 40% Decrease in Cust Growth Rates | Reference Case Cust Growth Rates | Reference Case Cust Growth Rates |
| **Use per Customer** | 3 yr Flat + Price Elast. | 3 yr Flat + Price Elast. + CNG/NGV | 3 yr Flat + Price Elast. | 3 yr Flat + Price Elast. | 3 yr Flat + Price Elast. |
| **Demand Side Management** | Yes | Yes | Yes | Yes | Yes |
| **Weather Planning Standard** | Coldest Day | Coldest Day | Coldest Day | Alternate Planning Standard | Normal |
| **Prices** | | | | | |
| Price curve | Expected | Low | High | Expected | Expected |
| Elasticity | Expected | None | Expected | Expected | Expected |
| Carbon Adder ($/Ton) | $14-$22 | None | $14-$22 | $14-$22 | $14-$22 |
| **RESULTS** | | | | | |
| **First Gas Year Unserved** | | | | | |
| WA/ID | 2030 | 2020 | N/A | N/A | N/A |
| Medford | 2029 | 2020 | N/A | N/A | N/A |
| Roseburg | N/A | N/A | N/A | N/A | N/A |
| Klamath | 2030 | 2019 | N/A | N/A | N/A |
| La Grande | N/A | N/A | N/A | N/A | N/A |
| **SCENARIO SUMMARY** | | | | | |
| | Most aggressive peak weather planning case utilizing Average Case assumptions as a starting point and layering in coldest weather on record. The liklihood of occurrence is low. | Aggressive growth assumptions in order to evaluate when our earliest resource shortage could occur. Not likely of occuring. | Stagnant growth assumptions in order to evaluate if a shortage does occur. Not likely to occur. | Evaluates adopting an alternate peak weather standard. Helps provide some bounds around our senstivity to weather. | Case most representative of our average (budget, PGA, rate case, procurement) planning criteria. Most likely to occur. |

**RISK ASSESSMENT**

Higher or lower customer growth rates, which are heavily based on economic recovery. Higher or lower growth rates will lead to accelerated or delayed unserved demand. Looking at various growth assumptions off the Expected Case allows us to capture the risk in terms of the change in demand linked to customer growth.

Higher or lower use per customer will also lead to accelerated or delayed unserved demand. Use per customer can differ in many ways. Direct use per customer influencers, such as demand side management, NGV/CNG usage, and derivation of the use per customer starting point (i.e. one year, three year, etc). Again, varying these assumptions under our forecasting methodology allows us to quantify the change each assumption has to our forecast.

Weather volatility and predictability are a key risk. As the most correlated direct demand influencer, varying weather assumptions is key to understanding the weather related risks.

Indirect influencers including elasticity and price are also important assumptions. The two go hand in hand, as price changes it will influence how much customers consume. If forecasted prices remain relatively stable over the planning horizon our current elasticity assumption will not provide much decreased usage. However, price adders or an overall steepening of the price curve will tirgger a greater decline in usage due to the price elastic response. The maginitude of the elasticity adjustment is also important. We are using a long run elasticity factor as calcuated by the AGA. We continue to evaluate this assumption and are looking to update the study as part of our Action Plan.

# APPENDIX 3.7 ▮ DEMAND FORECAST SENSITIVITIES AND SCENARIOS DESCRIPTIONS

## DEFINITIONS

**DYNAMIC DEMAND METHODOLOGY** – Avista's demand forecasting approach wherein we 1) identify key demand drivers behind natural gas consumption, 2) perform sensitivity analysis on each demand driver, and 3) combine demand drivers under various scenarios to develop alternative potential outcomes for forecasted demand.

**DEMAND INFLUENCING FACTORS** – Factors that directly influence the volume of natural gas consumed by our core customers.

**PRICE INFLUENCING FACTORS** – Factors that, through price elasticity response, indirectly influence the volume of natural gas consumed by our core customers.

**REFERENCE CASE** – A baseline point of reference that captures the basic inputs for determining a demand forecast in SENDOUT® which includes number of customers, use per customer, average daily weather temperatures (including an adjustment for global warming) and expected natural gas prices.

**SENSITIVITIES** – Focused analysis of a specific natural gas demand driver and its impact on forecasted demand relative to the Reference Case when underlying input assumptions are modified.

**SCENARIOS** – Combination of natural gas demand drivers that make up a demand forecast.

Avista evaluates each sensitivities impact.

## SENSITIVITIES

The following Sensitivities were performed on identified demand drivers against the reference case for consideration in Scenario development. Note that Sensitivity assumptions reflect incremental adjustments we estimate are not captured in the underlying reference case forecast.

Following are the Demand Influencing (Direct) Sensitivities we evaluated:

**REFERENCE CASE PLUS PEAK** – Same assumptions as in the Reference Case with and adjustment made to normal weather to incorporate peak weather conditions. The peak weather data being the coldest day on record for each weather area.

**LOW & HIGH CUSTOMER GROWTH** – In our low customer growth Sensitivity, annual customer growth rates under perform the reference rate of growth by 40% over our 20 year planning horizon while annual customer growth rates exceed the reference rate by 60% in our high growth Sensitivity.

**NATURAL GAS VEHICLES (NGV) AND/OR COMPRESSED NATURAL GAS (CNG) VEHICLES** – NGV/CNG vehicles assumed to produce a 15% cumulative incremental demand over our 20 year planning horizon. Our assumption utilized market consumption estimates from an independent analysis on NGV/CNG vehicle viability. The analysis indicates significant challenges exist to widespread adoption but did provide a scenario for significant market penetration (10% in 10 years).

**ALTERNATE WEATHER STANDARD (COLDEST DAY 20 YRS)** – Peak Day weather temperature reduced to coldest average daily temperature (HDDs) experienced in the most recent 20 years in each region.

**DSM** – Reference case assumptions including the potential DSM identified by the Conservation Potential Assessment provided by Global Energy Partners. See Appendix 4.1 for full assessment report.

**PEAK PLUS DSM** – Reference plus peak weather assumptions including the potential DSM identified by the Conservation Potential Assessment provided by Global Energy Partners. See Appendix 4.1 for the full assessment report.

**ALTERNATE USE PER CUSTOMER** – Reference case use per customer was based upon 3 years of actual use per customer per heating degree day data. This sensitivity used five years of historical use per customer per heating degree day data.

Following are the Price Influencing (Indirect) Sensitivities we evaluated:

**EXPECTED ELASTICITY** – For our expected elasticity Sensitivity, we incorporate reduced consumption in response to higher natural gas prices utilizing a price elasticity study prepared by the American Gas Association.

**LOW & HIGH PRICES** – To capture a wide band of alternative prices forecasts, we use the Northwest Power and Conservation Council's "very low" and "very high" natural gas price forecast scenarios with first five years modified to include blend of recent market prices (Nymex forward prices) consistent with our Expected price forecast.

**CARBON LEGISLATION**– Utilizes carbon cost adders quantified by independent analysis from Consultant #1. They identify both an adder reflecting carbon allowances as well as an adder to capture the effect of increased natural gas demand as more gas turbines come online to replace coal plants and back up wind generation. The allowance adder escalates from $14/ton in 2022 to $22/ton by 2032.

**EXPORTED LNG** – Beginning in 2017, we apply an estimate of $.50/mmbtu *incremental* adder each year to regional natural gas prices to capture upward price pressure because of exports of LNG to Asian and European counties. There is much uncertainty about the region price impact LNG will have. It is highly dependent on many things including which export facilities get built and the pipeline infrastructure used to serve them. There are several analyses that have been conducted where the price impact can be minimal to $1.00/mmbtu.

## SCENARIOS

After identifying the above demand drivers and analyzing the various Sensitivities, we have developed the following demand forecast Scenarios:

**AVERAGE CASE –** This Scenario we believe represents the most likely average demand forecast modeled. We assume service territory customer growth rates consistent with the reference case, rolling 30 year normal weather in each service territory, our expected natural gas price forecast (Consultant #1), expected price elasticity, and the CO2 cost adders from our **Carbon Legislation** Sensitivity, and DSM. The Scenario does not include incremental cost adders for declining Canadian imports or drilling restrictions beyond what is incorporated in the selected price forecast.

**EXPECTED CASE –** This Scenario represents the peak demand forecast. We assume service territory customer growth rates consistent with the reference case, a weather standard of coldest day on record in each service territory, our middle range natural gas price forecast (Consultant #1), expected price elasticity, and the CO2 cost adders from our **Carbon Legislation** Sensitivity, and DSM.

**HIGH GROWTH, LOW PRICE** – This Scenario models a rapid return to robust growth in part spurred on by low energy prices. We assume customer growth rates 60% higher than the reference case, coldest day on record weather standard, incremental demand from NGV/CNG, our low natural gas price forecast, no price elasticity, DSM, and no CO2 adders.

**LOW GROWTH, HIGH PRICE** – This Scenario models an extended period of slow economic growth in part resulting from high energy prices. We assume customer growth rates 40% lower than the reference case, coldest day on record weather standard, our high natural gas price forecast, expected price elasticity, and CO2 adders from our **Carbon Legislation Sensitivity**.

**ALTERNATE WEATHER STANDARD** – This Scenario models all the same assumptions as the **Expected Case** Scenario except for the change in the weather planning standard from coldest day on record to coldest day in 20 years for each service territory. As noted in the Sensitivity analysis, this change does not affect the Klamath Falls and La Grande service territories which have each experienced their coldest day on record within the last 20 years.

A case incorporating Exported LNG was not included in this IRP's scenario analysis. There is much uncertainty about the location and timing of exported LNG and its potential price impacts. The forecasters we subscribe to have incorporated some level of export LNG into their price forecasts and therefore our expected price curve does include an export LNG assumption. At this time the effects of LNG are minimal given the robust North American supply picture. Avista will closely monitor developments with export LNG for the potential price and infrastructure impacts.

# APPENDIX 3.8 II ANNUAL DEMAND, AVERAGE DAY DEMAND AND PEAK DAY DEMAND (NET OF DSM – CASE AVERAGE

| Case | Gas Year | Annual Demand Klamath (MDth) | Daily Demand Klamath (MDth/day) | Peak Day Klamath (MDth/day) | Annual Demand La Grande (MDth) | Daily Demand La Grande (MDth/day) | Peak Day La Grande (MDth/day) | Annual Demand Medford/Roseburg (MDth) | Daily Demand Medford/Roseburg (MDth/day) | Peak Day Medford/Roseburg (MDth/day) |
|---|---|---|---|---|---|---|---|---|---|---|
| Average | 2012 | 1,277.85 | 3.501 | 12.482 | 719.60 | 1.972 | 7.083 | 6,163.95 | 16.888 | 65.99 |
| Average | 2013 | 1,288.18 | 3.529 | 12.513 | 723.97 | 1.983 | 7.100 | 6,210.64 | 17.015 | 66.04 |
| Average | 2014 | 1,284.04 | 3.518 | 12.817 | 717.67 | 1.966 | 7.224 | 6,205.13 | 17.000 | 67.76 |
| Average | 2015 | 1,298.94 | 3.559 | 13.164 | 721.86 | 1.978 | 7.372 | 6,298.05 | 17.255 | 69.87 |
| Average | 2016 | 1,324.25 | 3.628 | 13.534 | 731.58 | 2.004 | 7.496 | 6,445.07 | 17.658 | 72.18 |
| Average | 2017 | 1,339.27 | 3.669 | 13.884 | 735.37 | 2.015 | 7.610 | 6,547.54 | 17.938 | 74.51 |
| Average | 2018 | 1,358.38 | 3.722 | 14.215 | 741.47 | 2.031 | 7.716 | 6,671.57 | 18.278 | 76.82 |
| Average | 2019 | 1,373.79 | 3.764 | 14.529 | 745.61 | 2.043 | 7.820 | 6,777.80 | 18.569 | 79.08 |
| Average | 2020 | 1,395.83 | 3.824 | 14.843 | 753.35 | 2.064 | 7.923 | 6,915.81 | 18.947 | 81.32 |
| Average | 2021 | 1,408.12 | 3.858 | 15.156 | 755.72 | 2.070 | 8.024 | 7,016.72 | 19.224 | 83.54 |
| Average | 2022 | 1,422.13 | 3.896 | 15.466 | 759.18 | 2.080 | 8.123 | 7,120.21 | 19.507 | 85.72 |
| Average | 2023 | 1,435.69 | 3.933 | 15.772 | 762.30 | 2.089 | 8.222 | 7,218.04 | 19.775 | 87.91 |
| Average | 2024 | 1,456.62 | 3.991 | 16.079 | 769.45 | 2.108 | 8.320 | 7,354.80 | 20.150 | 90.14 |
| Average | 2025 | 1,465.16 | 4.014 | 16.387 | 769.77 | 2.109 | 8.418 | 7,428.59 | 20.352 | 92.38 |
| Average | 2026 | 1,480.81 | 4.057 | 16.696 | 773.92 | 2.120 | 8.515 | 7,537.43 | 20.650 | 94.64 |
| Average | 2027 | 1,493.82 | 4.093 | 17.006 | 776.99 | 2.129 | 8.616 | 7,634.26 | 20.916 | 96.91 |
| Average | 2028 | 1,513.95 | 4.148 | 17.313 | 784.11 | 2.148 | 8.722 | 7,759.19 | 21.258 | 99.13 |
| Average | 2029 | 1,521.43 | 4.168 | 17.616 | 784.99 | 2.151 | 8.830 | 7,815.12 | 21.411 | 101.17 |
| Average | 2030 | 1,534.70 | 4.205 | 17.913 | 789.06 | 2.162 | 8.937 | 7,914.29 | 21.683 | 103.16 |
| Average | 2031 | 1,547.94 | 4.241 | 18.210 | 792.95 | 2.172 | 9.044 | 8,004.53 | 21.930 | 105.15 |

| Case | Gas Year | Annual Demand Oregon (MDth) | Daily Demand Oregon (MDth/day) | Peak Day Demand Oregon (MDth/day) | Annual Demand WA/ID (MDth) | Daily Demand WA/ID (MDth/day) | Peak Day WA/ID (MDth/day) | Annual Demand Total System (MDth) | Daily Demand Total System (MDth/day) | Peak Day Demand Total System (MDth/day) |
|---|---|---|---|---|---|---|---|---|---|---|
| Average | 2012 | 8,161.406 | 22.360 | 85.551 | 25,163.851 | 68.942 | 245.972 | 33,325.258 | 91.302 | 331.523 |
| Average | 2013 | 8,222.780 | 22.528 | 85.654 | 25,480.238 | 69.809 | 248.812 | 33,703.019 | 92.337 | 334.466 |
| Average | 2014 | 8,206.842 | 22.484 | 87.804 | 25,445.489 | 69.714 | 256.521 | 33,652.331 | 92.198 | 344.326 |
| Average | 2015 | 8,318.857 | 22.791 | 90.406 | 25,773.110 | 70.611 | 264.366 | 34,091.967 | 93.403 | 354.772 |
| Average | 2016 | 8,500.904 | 23.290 | 93.208 | 26,327.094 | 72.129 | 272.090 | 34,827.998 | 95.419 | 365.298 |
| Average | 2017 | 8,622.183 | 23.622 | 96.002 | 26,690.777 | 73.125 | 279.693 | 35,312.961 | 96.748 | 375.695 |
| Average | 2018 | 8,771.422 | 24.031 | 98.748 | 27,146.080 | 74.373 | 287.093 | 35,917.502 | 98.404 | 385.840 |
| Average | 2019 | 8,897.202 | 24.376 | 101.434 | 27,527.058 | 75.417 | 294.436 | 36,424.260 | 99.792 | 395.869 |
| Average | 2020 | 9,064.991 | 24.836 | 104.083 | 28,039.888 | 76.822 | 301.744 | 37,104.879 | 101.657 | 405.827 |
| Average | 2021 | 9,180.559 | 25.152 | 106.719 | 28,355.733 | 77.687 | 308.999 | 37,536.292 | 102.839 | 415.718 |
| Average | 2022 | 9,301.523 | 25.484 | 109.314 | 28,706.582 | 78.648 | 316.234 | 38,008.105 | 104.132 | 425.548 |
| Average | 2023 | 9,416.028 | 25.797 | 111.903 | 29,053.598 | 79.599 | 323.594 | 38,469.626 | 105.396 | 435.497 |
| Average | 2024 | 9,580.870 | 26.249 | 114.541 | 29,552.166 | 80.965 | 330.924 | 39,133.036 | 107.214 | 445.465 |
| Average | 2025 | 9,663.522 | 26.475 | 117.181 | 29,797.373 | 81.637 | 338.326 | 39,460.895 | 108.112 | 455.507 |
| Average | 2026 | 9,792.160 | 26.828 | 119.855 | 30,186.012 | 82.701 | 345.687 | 39,978.173 | 109.529 | 465.542 |
| Average | 2027 | 9,905.070 | 27.137 | 122.532 | 30,520.477 | 83.618 | 353.026 | 40,425.547 | 110.755 | 475.558 |
| Average | 2028 | 10,057.255 | 27.554 | 125.162 | 31,004.570 | 84.944 | 360.329 | 41,061.825 | 112.498 | 485.491 |
| Average | 2029 | 10,121.537 | 27.730 | 127.612 | 31,232.440 | 85.568 | 367.636 | 41,353.977 | 113.299 | 495.248 |
| Average | 2030 | 10,238.048 | 28.049 | 130.006 | 31,580.327 | 86.521 | 374.910 | 41,818.376 | 114.571 | 504.916 |
| Average | 2031 | 10,345.422 | 28.344 | 132.406 | 31,928.321 | 87.475 | 382.216 | 42,273.743 | 115.818 | 514.622 |

# APPENDIX 3.8 II ANNUAL DEMAND, AVERAGE DAY DEMAND AND PEAK DAY DEMAND (NET OF DSM) – CASE HIGH

| Case | Gas Year | Annual Demand Klamath (MDth) | Daily Demand Klamath (MDth/day) | Peak Day Klamath (MDth/day) | Annual Demand La Grande (MDth) | Daily Demand La Grande (MDth/day) | Peak Day La Grande (MDth/day) | Annual Demand Medford/Roseburg (MDth) | Daily Demand Medford/Roseburg (MDth/day) | Peak Day Medford/Roseburg (MDth/day) |
|---|---|---|---|---|---|---|---|---|---|---|
| High | 2012 | 1,312.83 | 3.597 | 12.482 | 705.92 | 1.934 | 7.083 | 6,222.40 | 17.048 | 65.99 |
| High | 2013 | 1,318.01 | 3.611 | 12.513 | 706.72 | 1.936 | 7.100 | 6,246.05 | 17.112 | 66.04 |
| High | 2014 | 1,353.14 | 3.707 | 12.817 | 719.05 | 1.970 | 7.224 | 6,421.81 | 17.594 | 67.76 |
| High | 2015 | 1,391.17 | 3.811 | 13.164 | 733.12 | 2.009 | 7.372 | 6,630.94 | 18.167 | 69.87 |
| High | 2016 | 1,433.48 | 3.927 | 13.534 | 749.12 | 2.052 | 7.496 | 6,871.78 | 18.827 | 72.18 |
| High | 2017 | 1,462.55 | 4.007 | 13.884 | 757.66 | 2.076 | 7.610 | 7,058.12 | 19.337 | 74.51 |
| High | 2018 | 1,495.45 | 4.097 | 14.215 | 768.42 | 2.105 | 7.716 | 7,268.03 | 19.912 | 76.82 |
| High | 2019 | 1,527.82 | 4.186 | 14.529 | 778.80 | 2.134 | 7.820 | 7,474.62 | 20.478 | 79.08 |
| High | 2020 | 1,566.17 | 4.291 | 14.843 | 792.26 | 2.171 | 7.923 | 7,709.62 | 21.122 | 81.32 |
| High | 2021 | 1,592.06 | 4.362 | 15.156 | 799.14 | 2.189 | 8.024 | 7,881.95 | 21.594 | 83.54 |
| High | 2022 | 1,623.76 | 4.449 | 15.466 | 809.08 | 2.217 | 8.123 | 8,083.19 | 22.146 | 85.72 |
| High | 2023 | 1,655.36 | 4.535 | 15.772 | 818.92 | 2.244 | 8.222 | 8,287.63 | 22.706 | 87.91 |
| High | 2024 | 1,693.65 | 4.640 | 16.079 | 832.07 | 2.280 | 8.320 | 8,526.67 | 23.361 | 90.14 |
| High | 2025 | 1,718.89 | 4.709 | 16.387 | 838.42 | 2.297 | 8.418 | 8,701.46 | 23.840 | 92.38 |
| High | 2026 | 1,750.78 | 4.797 | 16.696 | 848.10 | 2.324 | 8.515 | 8,910.37 | 24.412 | 94.64 |
| High | 2027 | 1,782.53 | 4.884 | 17.006 | 858.00 | 2.351 | 8.616 | 9,116.08 | 24.976 | 96.91 |
| High | 2028 | 1,820.93 | 4.989 | 17.313 | 871.91 | 2.389 | 8.722 | 9,345.33 | 25.604 | 99.13 |
| High | 2029 | 1,844.66 | 5.054 | 17.616 | 879.05 | 2.408 | 8.830 | 9,493.84 | 26.011 | 101.17 |
| High | 2030 | 1,875.25 | 5.138 | 17.913 | 889.74 | 2.438 | 8.937 | 9,677.82 | 26.515 | 103.16 |
| High | 2031 | 1,905.87 | 5.222 | 18.210 | 900.38 | 2.467 | 9.044 | 9,859.35 | 27.012 | 105.15 |

| Case | Gas Year | Annual Demand Oregon (MDth) | Daily Demand Oregon (MDth/day) | Peak Day Demand Oregon (MDth/day) | Annual Demand WA/ID (MDth) | Daily Demand WA/ID (MDth/day) | Peak Day WA/ID (MDth/day) | Annual Demand Total System (MDth) | Daily Demand Total System (MDth/day) | Peak Day Demand Total System (MDth/day) |
|---|---|---|---|---|---|---|---|---|---|---|
| High | 2012 | 8,241.152 | 22.578 | 85.551 | 26,676.459 | 73.086 | 245.972 | 34,917.611 | 95.665 | 331.523 |
| High | 2013 | 8,270.788 | 22.660 | 85.654 | 26,733.275 | 73.242 | 248.812 | 35,004.063 | 95.902 | 334.466 |
| High | 2014 | 8,494.001 | 23.271 | 87.804 | 27,127.241 | 74.321 | 256.521 | 35,621.241 | 97.592 | 344.326 |
| High | 2015 | 8,755.227 | 23.987 | 90.406 | 27,650.283 | 75.754 | 264.366 | 36,405.510 | 99.741 | 354.772 |
| High | 2016 | 9,054.378 | 24.807 | 93.208 | 28,293.395 | 77.516 | 272.090 | 37,347.773 | 102.323 | 365.298 |
| High | 2017 | 9,278.333 | 25.420 | 96.002 | 28,962.324 | 79.349 | 279.693 | 38,240.657 | 104.769 | 375.695 |
| High | 2018 | 9,531.905 | 26.115 | 98.748 | 29,516.994 | 80.868 | 287.093 | 39,048.899 | 106.983 | 385.840 |
| High | 2019 | 9,781.233 | 26.798 | 101.434 | 30,027.442 | 82.267 | 294.436 | 39,808.675 | 109.065 | 395.869 |
| High | 2020 | 10,068.045 | 27.584 | 104.083 | 30,622.956 | 83.899 | 301.744 | 40,691.001 | 111.482 | 405.827 |
| High | 2021 | 10,273.157 | 28.146 | 106.719 | 31,253.974 | 85.627 | 308.999 | 41,527.131 | 113.773 | 415.718 |
| High | 2022 | 10,516.037 | 28.811 | 109.314 | 31,976.453 | 87.607 | 316.234 | 42,492.490 | 116.418 | 425.548 |
| High | 2023 | 10,761.904 | 29.485 | 111.903 | 32,697.751 | 89.583 | 323.594 | 43,459.655 | 119.068 | 435.497 |
| High | 2024 | 11,052.396 | 30.281 | 114.541 | 33,441.452 | 91.620 | 330.924 | 44,493.848 | 121.901 | 445.465 |
| High | 2025 | 11,258.779 | 30.846 | 117.181 | 34,206.603 | 93.717 | 338.326 | 45,465.382 | 124.563 | 455.507 |
| High | 2026 | 11,509.257 | 31.532 | 119.855 | 35,016.400 | 95.935 | 345.687 | 46,525.656 | 127.468 | 465.542 |
| High | 2027 | 11,756.610 | 32.210 | 122.532 | 35,754.261 | 97.957 | 353.026 | 47,510.871 | 130.167 | 475.558 |
| High | 2028 | 12,038.173 | 32.981 | 125.162 | 36,578.506 | 100.215 | 360.329 | 48,616.679 | 133.196 | 485.491 |
| High | 2029 | 12,217.548 | 33.473 | 127.612 | 37,341.572 | 102.306 | 367.636 | 49,559.119 | 135.778 | 495.248 |
| High | 2030 | 12,442.813 | 34.090 | 130.006 | 38,196.855 | 104.649 | 374.910 | 50,639.668 | 138.739 | 504.916 |
| High | 2031 | 12,665.597 | 34.700 | 132.406 | 38,985.923 | 106.811 | 382.216 | 51,651.519 | 141.511 | 514.622 |

# APPENDIX 3.8 II ANNUAL DEMAND, AVERAGE DAY DEMAND AND PEAK DAY DEMAND (NET OF DSM) – CASE LOW

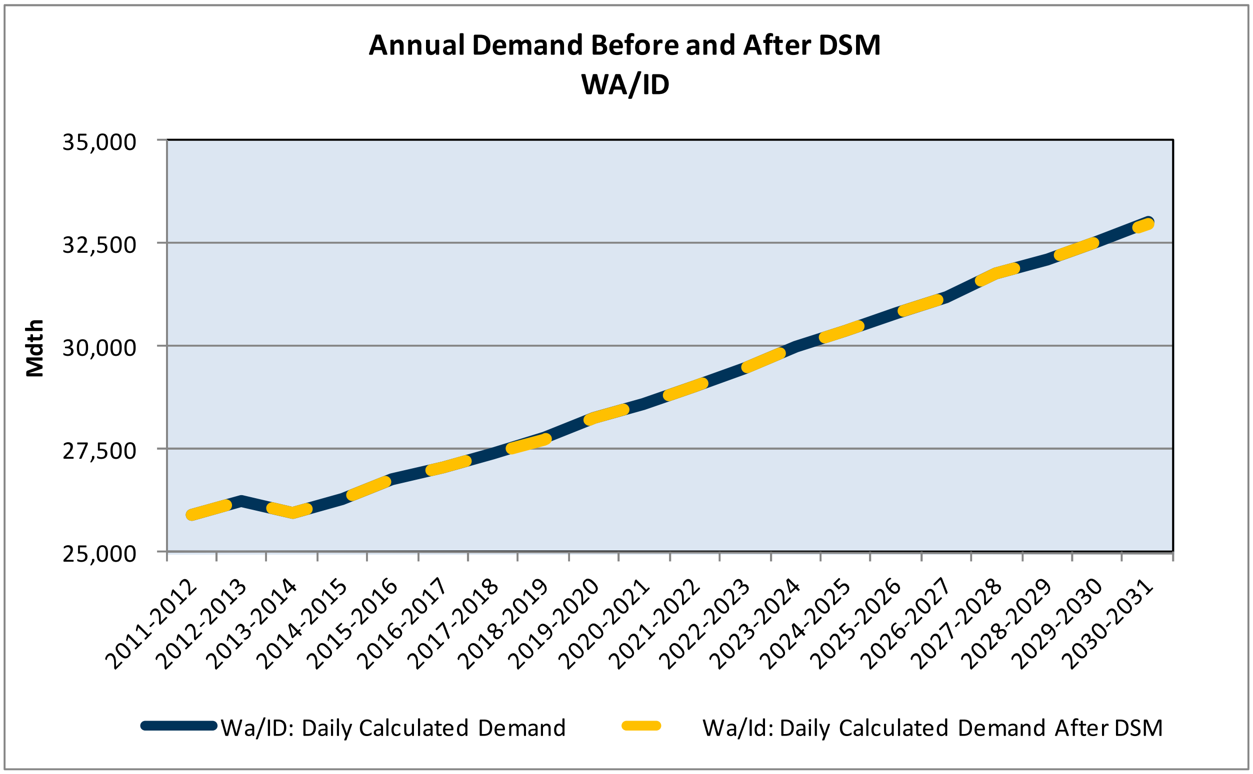
| Case | Gas Year | Annual Demand Klamath (MDth) | Daily Demand Klamath (MDth/day) | Peak Day Klamath (MDth/day) | Annual Demand La Grande (MDth) | Daily Demand La Grande (MDth/day) | Peak Day La Grande (MDth/day) | Annual Demand Medford/Roseburg (MDth) | Daily Demand Medford/Roseburg (MDth/day) | Peak Day Medford/Roseburg (MDth/day) |
|---|---|---|---|---|---|---|---|---|---|---|
| Low | 2012 | 1,330.48 | 3.645 | 12.753 | 718.84 | 1.969 | 7.206 | 6,326.70 | 17.333 | 67.81 |
| Low | 2013 | 1,334.98 | 3.657 | 12.839 | 720.48 | 1.974 | 7.255 | 6,346.10 | 17.387 | 68.22 |
| Low | 2014 | 1,257.67 | 3.446 | 11.804 | 675.45 | 1.851 | 6.647 | 6,004.92 | 16.452 | 62.76 |
| Low | 2015 | 1,242.11 | 3.403 | 11.556 | 664.53 | 1.821 | 6.489 | 5,949.30 | 16.299 | 61.53 |
| Low | 2016 | 1,230.66 | 3.372 | 11.314 | 655.85 | 1.797 | 6.323 | 5,916.94 | 16.211 | 60.36 |
| Low | 2017 | 1,226.09 | 3.359 | 11.282 | 650.84 | 1.783 | 6.277 | 5,915.49 | 16.207 | 60.35 |
| Low | 2018 | 1,226.50 | 3.360 | 11.254 | 648.66 | 1.777 | 6.235 | 5,939.22 | 16.272 | 60.38 |
| Low | 2019 | 1,233.41 | 3.379 | 11.305 | 649.98 | 1.781 | 6.240 | 5,991.97 | 16.416 | 60.85 |
| Low | 2020 | 1,244.69 | 3.410 | 11.352 | 653.68 | 1.791 | 6.243 | 6,065.67 | 16.618 | 61.28 |
| Low | 2021 | 1,248.11 | 3.419 | 11.421 | 653.10 | 1.789 | 6.257 | 6,100.04 | 16.712 | 61.83 |
| Low | 2022 | 1,254.25 | 3.436 | 11.463 | 654.03 | 1.792 | 6.258 | 6,148.25 | 16.845 | 62.23 |
| Low | 2023 | 1,260.27 | 3.453 | 11.504 | 654.90 | 1.794 | 6.258 | 6,197.08 | 16.978 | 62.62 |
| Low | 2024 | 1,272.34 | 3.486 | 11.560 | 658.98 | 1.805 | 6.266 | 6,275.54 | 17.193 | 63.11 |
| Low | 2025 | 1,272.08 | 3.485 | 11.582 | 656.45 | 1.798 | 6.255 | 6,294.48 | 17.245 | 63.41 |
| Low | 2026 | 1,279.11 | 3.504 | 11.635 | 657.80 | 1.802 | 6.262 | 6,348.75 | 17.394 | 63.89 |
| Low | 2027 | 1,278.47 | 3.503 | 11.591 | 655.25 | 1.795 | 6.217 | 6,366.30 | 17.442 | 63.83 |
| Low | 2028 | 1,285.57 | 3.522 | 11.585 | 657.03 | 1.800 | 6.194 | 6,417.67 | 17.583 | 63.96 |
| Low | 2029 | 1,282.12 | 3.513 | 11.570 | 653.45 | 1.790 | 6.169 | 6,414.80 | 17.575 | 63.99 |
| Low | 2030 | 1,283.44 | 3.516 | 11.552 | 652.45 | 1.788 | 6.143 | 6,435.68 | 17.632 | 64.01 |
| Low | 2031 | 1,284.72 | 3.520 | 11.533 | 651.44 | 1.785 | 6.117 | 6,454.48 | 17.684 | 64.01 |

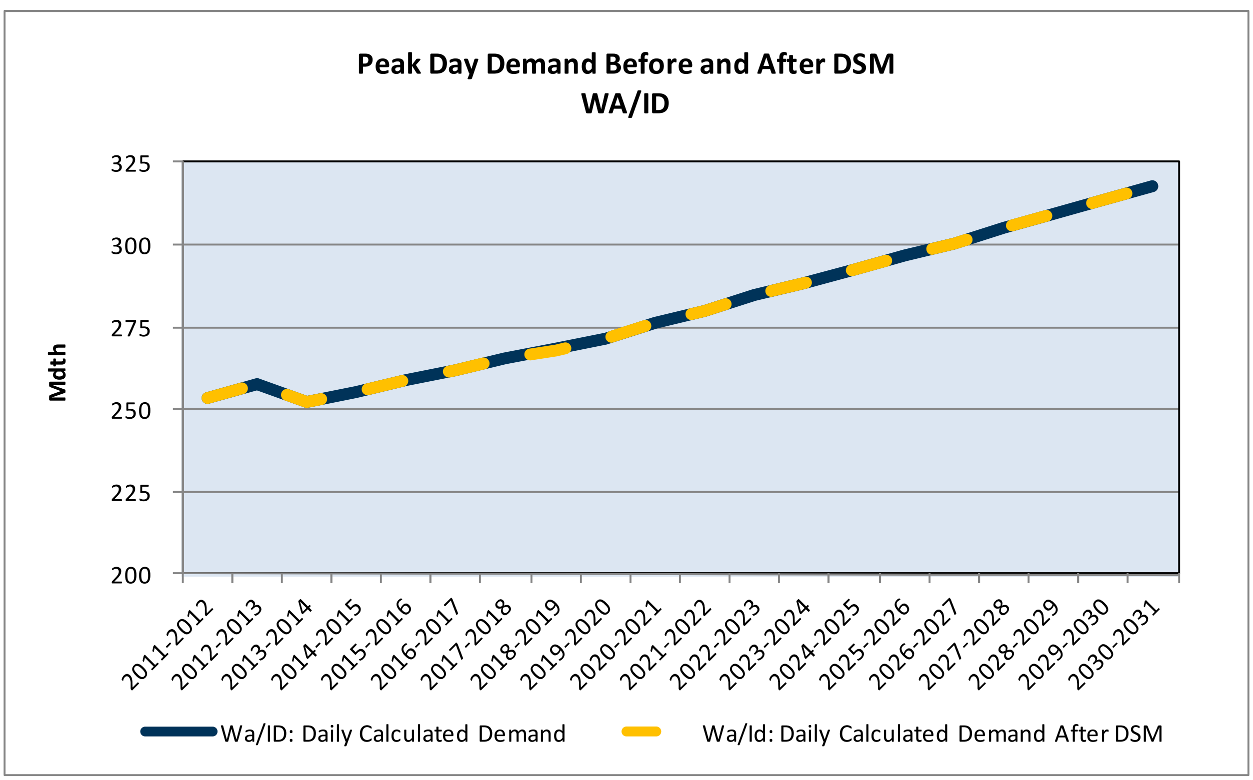
| Case | Gas Year | Annual Demand Oregon (MDth) | Daily Demand Oregon (MDth/day) | Peak Day Demand Oregon (MDth/day) | Annual Demand WA/ID (MDth) | Daily Demand WA/ID (MDth/day) | Peak Day WA/ID (MDth/day) | Annual Demand Total System (MDth) | Daily Demand Total System (MDth/day) | Peak Day Demand Total System (MDth/day) |
|---|---|---|---|---|---|---|---|---|---|---|
| Low | 2012 | 8,376.018 | 22.948 | 87.772 | 25,869.420 | 70.875 | 253.682 | 34,245.438 | 93.823 | 341.454 |
| Low | 2013 | 8,401.559 | 23.018 | 88.316 | 26,027.116 | 71.307 | 256.267 | 34,428.675 | 94.325 | 344.584 |
| Low | 2014 | 7,938.030 | 21.748 | 81.213 | 24,484.249 | 67.080 | 235.970 | 32,422.280 | 88.828 | 317.183 |
| Low | 2015 | 7,855.937 | 21.523 | 79.580 | 24,180.231 | 66.247 | 231.265 | 32,036.167 | 87.770 | 310.845 |
| Low | 2016 | 7,803.438 | 21.379 | 78.001 | 23,963.104 | 65.652 | 226.450 | 31,766.543 | 87.032 | 304.451 |
| Low | 2017 | 7,792.414 | 21.349 | 77.907 | 23,902.034 | 65.485 | 225.981 | 31,694.448 | 86.834 | 303.888 |
| Low | 2018 | 7,814.387 | 21.409 | 77.869 | 23,944.602 | 65.602 | 225.656 | 31,758.990 | 87.011 | 303.525 |
| Low | 2019 | 7,875.358 | 21.576 | 78.394 | 24,119.248 | 66.080 | 227.010 | 31,994.606 | 87.656 | 305.405 |
| Low | 2020 | 7,964.045 | 21.819 | 78.876 | 24,378.702 | 66.791 | 228.263 | 32,342.747 | 88.610 | 307.139 |
| Low | 2021 | 8,001.250 | 21.921 | 79.506 | 24,484.906 | 67.082 | 229.973 | 32,486.156 | 89.003 | 309.479 |
| Low | 2022 | 8,056.527 | 22.073 | 79.950 | 24,642.850 | 67.515 | 231.151 | 32,699.377 | 89.587 | 311.101 |
| Low | 2023 | 8,112.246 | 22.225 | 80.383 | 24,801.674 | 67.950 | 232.338 | 32,913.920 | 90.175 | 312.721 |
| Low | 2024 | 8,206.862 | 22.485 | 80.934 | 25,081.808 | 68.717 | 233.825 | 33,288.670 | 91.202 | 314.759 |
| Low | 2025 | 8,223.010 | 22.529 | 81.247 | 25,116.474 | 68.812 | 234.654 | 33,339.484 | 91.341 | 315.900 |
| Low | 2026 | 8,285.659 | 22.700 | 81.784 | 25,295.164 | 69.302 | 236.060 | 33,580.823 | 92.002 | 317.843 |
| Low | 2027 | 8,300.022 | 22.740 | 81.638 | 25,314.457 | 69.355 | 235.478 | 33,614.479 | 92.094 | 317.116 |
| Low | 2028 | 8,360.274 | 22.905 | 81.742 | 25,492.680 | 69.843 | 235.657 | 33,852.953 | 92.748 | 317.399 |
| Low | 2029 | 8,350.362 | 22.878 | 81.734 | 25,461.533 | 69.758 | 235.688 | 33,811.895 | 92.635 | 317.421 |
| Low | 2030 | 8,371.576 | 22.936 | 81.702 | 25,525.012 | 69.932 | 235.658 | 33,896.588 | 92.867 | 317.359 |
| Low | 2031 | 8,390.650 | 22.988 | 81.666 | 25,589.265 | 70.108 | 235.634 | 33,979.915 | 93.096 | 317.300 |

# APPENDIX 3.8 II ANNUAL DEMAND, AVERAGE DAY DEMAND AND PEAK DAY DEMAND (NET OF DSM) – CASE COLDEST IN 20

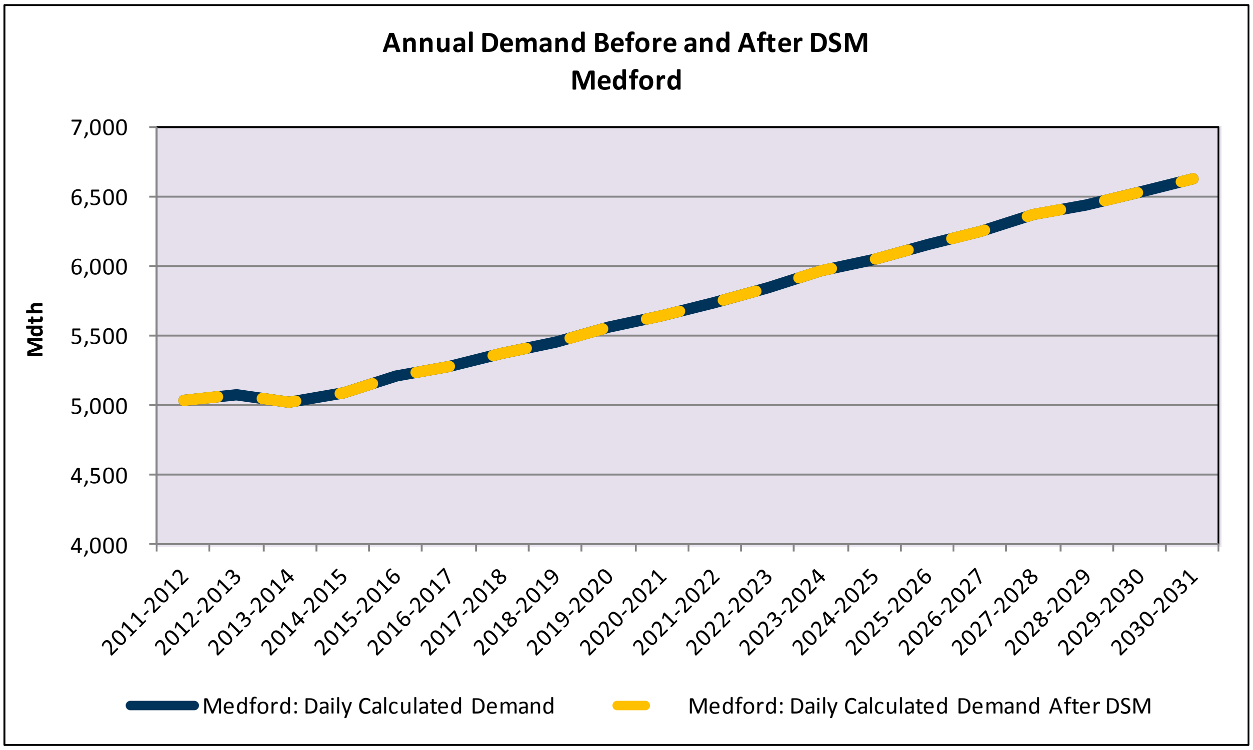
| Case | Gas Year | Annual Demand Klamath (MDth) | Daily Demand Klamath (MDth/day) | Peak Day Klamath (MDth/day) | Annual Demand La Grande (MDth) | Daily Demand La Grande (MDth/day) | Peak Day La Grande (MDth/day) | Annual Demand Medford/Roseburg (MDth) | Daily Demand Medford/Roseburg (MDth/day) | Peak Day Medford/Roseburg (MDth/day) |
|---|---|---|---|---|---|---|---|---|---|---|
| Coldest in 20 | 2012 | 1,310.62 | 3.591 | 11.393 | 745.86 | 2.043 | 7.231 | 6,324.53 | 17.327 | 60.67 |
| Coldest in 20 | 2013 | 1,321.32 | 3.620 | 11.519 | 750.50 | 2.056 | 7.312 | 6,372.93 | 17.460 | 61.28 |
| Coldest in 20 | 2014 | 1,304.32 | 3.573 | 11.251 | 736.89 | 2.019 | 7.108 | 6,309.85 | 17.287 | 59.94 |
| Coldest in 20 | 2015 | 1,318.81 | 3.613 | 11.344 | 740.83 | 2.030 | 7.136 | 6,401.37 | 17.538 | 60.58 |
| Coldest in 20 | 2016 | 1,341.98 | 3.677 | 11.498 | 749.39 | 2.053 | 7.180 | 6,539.28 | 17.916 | 61.60 |
| Coldest in 20 | 2017 | 1,352.20 | 3.705 | 11.626 | 750.61 | 2.056 | 7.210 | 6,620.72 | 18.139 | 62.55 |
| Coldest in 20 | 2018 | 1,366.76 | 3.745 | 11.746 | 754.30 | 2.067 | 7.236 | 6,724.60 | 18.424 | 63.49 |
| Coldest in 20 | 2019 | 1,380.34 | 3.782 | 11.850 | 757.48 | 2.075 | 7.257 | 6,822.92 | 18.693 | 64.36 |
| Coldest in 20 | 2020 | 1,401.25 | 3.839 | 11.976 | 764.64 | 2.095 | 7.292 | 6,956.07 | 19.058 | 65.33 |
| Coldest in 20 | 2021 | 1,415.08 | 3.877 | 12.146 | 767.86 | 2.104 | 7.354 | 7,064.45 | 19.355 | 66.54 |
| Coldest in 20 | 2022 | 1,432.40 | 3.924 | 12.293 | 773.08 | 2.118 | 7.404 | 7,183.63 | 19.681 | 67.71 |
| Coldest in 20 | 2023 | 1,451.40 | 3.976 | 12.461 | 779.03 | 2.134 | 7.463 | 7,307.07 | 20.019 | 68.89 |
| Coldest in 20 | 2024 | 1,473.50 | 4.037 | 12.596 | 786.77 | 2.156 | 7.505 | 7,449.79 | 20.410 | 69.93 |
| Coldest in 20 | 2025 | 1,486.90 | 4.074 | 12.762 | 789.59 | 2.163 | 7.564 | 7,546.85 | 20.676 | 71.15 |
| Coldest in 20 | 2026 | 1,505.28 | 4.124 | 12.922 | 795.12 | 2.178 | 7.617 | 7,669.18 | 21.011 | 72.32 |
| Coldest in 20 | 2027 | 1,520.68 | 4.166 | 13.047 | 799.37 | 2.190 | 7.654 | 7,777.92 | 21.309 | 73.32 |
| Coldest in 20 | 2028 | 1,545.42 | 4.234 | 13.212 | 808.81 | 2.216 | 7.717 | 7,925.26 | 21.713 | 74.52 |
| Coldest in 20 | 2029 | 1,557.37 | 4.267 | 13.370 | 811.94 | 2.224 | 7.781 | 8,002.99 | 21.926 | 75.58 |
| Coldest in 20 | 2030 | 1,575.18 | 4.316 | 13.525 | 818.26 | 2.242 | 7.841 | 8,124.26 | 22.258 | 76.62 |
| Coldest in 20 | 2031 | 1,593.02 | 4.364 | 13.680 | 824.44 | 2.259 | 7.902 | 8,237.08 | 22.567 | 77.76 |
| Case | Gas Year | Annual Demand Oregon (MDth) | Daily Demand Oregon (MDth/day) | Peak Day Demand Oregon (MDth/day) | Annual Demand WA/ID (MDth) | Daily Demand WA/ID (MDth/day) | Peak Day WA/ID (MDth/day) | Annual Demand Total System (MDth) | Daily Demand Total System (MDth/day) | Peak Day Demand Total System (MDth/day) |
| Coldest in 20 | 2012 | 8,381.005 | 22.962 | 79.297 | 25,850.890 | 70.824 | 236.316 | 34,231.896 | 93.786 | 315.614 |
| Coldest in 20 | 2013 | 8,444.741 | 23.136 | 80.115 | 26,178.590 | 71.722 | 240.308 | 34,623.330 | 94.858 | 320.423 |
| Coldest in 20 | 2014 | 8,351.060 | 22.880 | 78.294 | 25,883.372 | 70.913 | 235.606 | 34,234.432 | 93.793 | 313.900 |
| Coldest in 20 | 2015 | 8,461.012 | 23.181 | 79.061 | 26,203.844 | 71.791 | 238.076 | 34,664.856 | 94.972 | 317.137 |
| Coldest in 20 | 2016 | 8,630.650 | 23.646 | 80.280 | 26,714.961 | 73.192 | 241.508 | 35,345.611 | 96.837 | 321.789 |
| Coldest in 20 | 2017 | 8,723.534 | 23.900 | 81.382 | 26,981.594 | 73.922 | 244.543 | 35,705.129 | 97.822 | 325.925 |
| Coldest in 20 | 2018 | 8,845.665 | 24.235 | 82.470 | 27,344.674 | 74.917 | 247.489 | 36,190.340 | 99.152 | 329.959 |
| Coldest in 20 | 2019 | 8,960.745 | 24.550 | 83.468 | 27,688.899 | 75.860 | 250.257 | 36,649.644 | 100.410 | 333.725 |
| Coldest in 20 | 2020 | 9,121.955 | 24.992 | 84.598 | 28,178.988 | 77.203 | 253.448 | 37,300.943 | 102.194 | 338.046 |
| Coldest in 20 | 2021 | 9,247.389 | 25.335 | 86.037 | 28,527.323 | 78.157 | 257.582 | 37,774.712 | 103.492 | 343.619 |
| Coldest in 20 | 2022 | 9,389.109 | 25.724 | 87.407 | 28,946.999 | 79.307 | 261.267 | 38,336.108 | 105.030 | 348.674 |
| Coldest in 20 | 2023 | 9,537.493 | 26.130 | 88.814 | 29,408.147 | 80.570 | 265.451 | 38,945.640 | 106.700 | 354.265 |
| Coldest in 20 | 2024 | 9,710.063 | 26.603 | 90.034 | 29,932.043 | 82.006 | 268.955 | 39,642.107 | 108.609 | 358.988 |
| Coldest in 20 | 2025 | 9,823.340 | 26.913 | 91.473 | 30,280.223 | 82.960 | 273.163 | 40,103.563 | 109.873 | 364.636 |
| Coldest in 20 | 2026 | 9,969.582 | 27.314 | 92.859 | 30,727.329 | 84.184 | 277.147 | 40,696.911 | 111.498 | 370.006 |
| Coldest in 20 | 2027 | 10,097.977 | 27.666 | 94.017 | 31,113.863 | 85.243 | 280.427 | 41,211.840 | 112.909 | 374.444 |
| Coldest in 20 | 2028 | 10,279.493 | 28.163 | 95.444 | 31,696.310 | 86.839 | 284.546 | 41,975.803 | 115.002 | 379.990 |
| Coldest in 20 | 2029 | 10,372.303 | 28.417 | 96.732 | 32,020.073 | 87.726 | 288.556 | 42,392.376 | 116.143 | 385.288 |
| Coldest in 20 | 2030 | 10,517.702 | 28.816 | 97.987 | 32,465.913 | 88.948 | 292.555 | 42,983.616 | 117.763 | 390.542 |
| Coldest in 20 | 2031 | 10,654.532 | 29.190 | 99.340 | 32,913.603 | 90.174 | 296.552 | 43,568.136 | 119.365 | 395.892 |

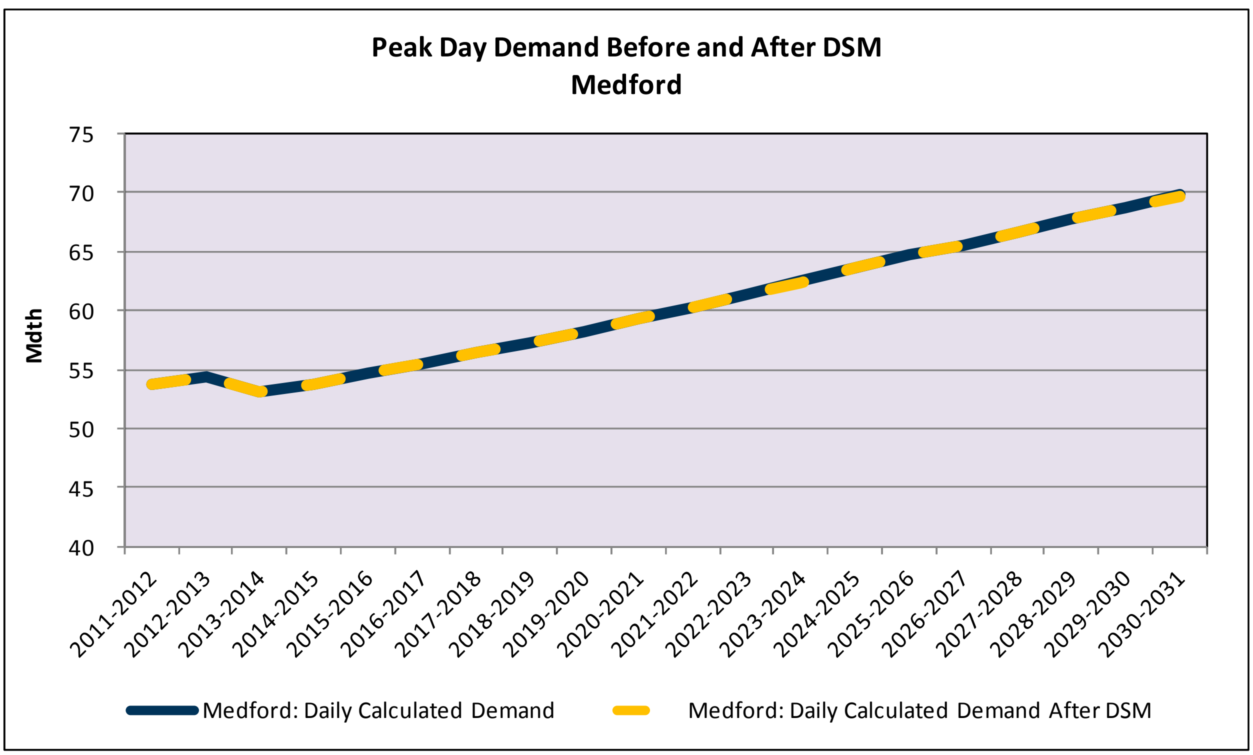
## APPENDIX 3.9 II PEAK DAY DEMAND BEFORE AND AFTER DSM WA/ID



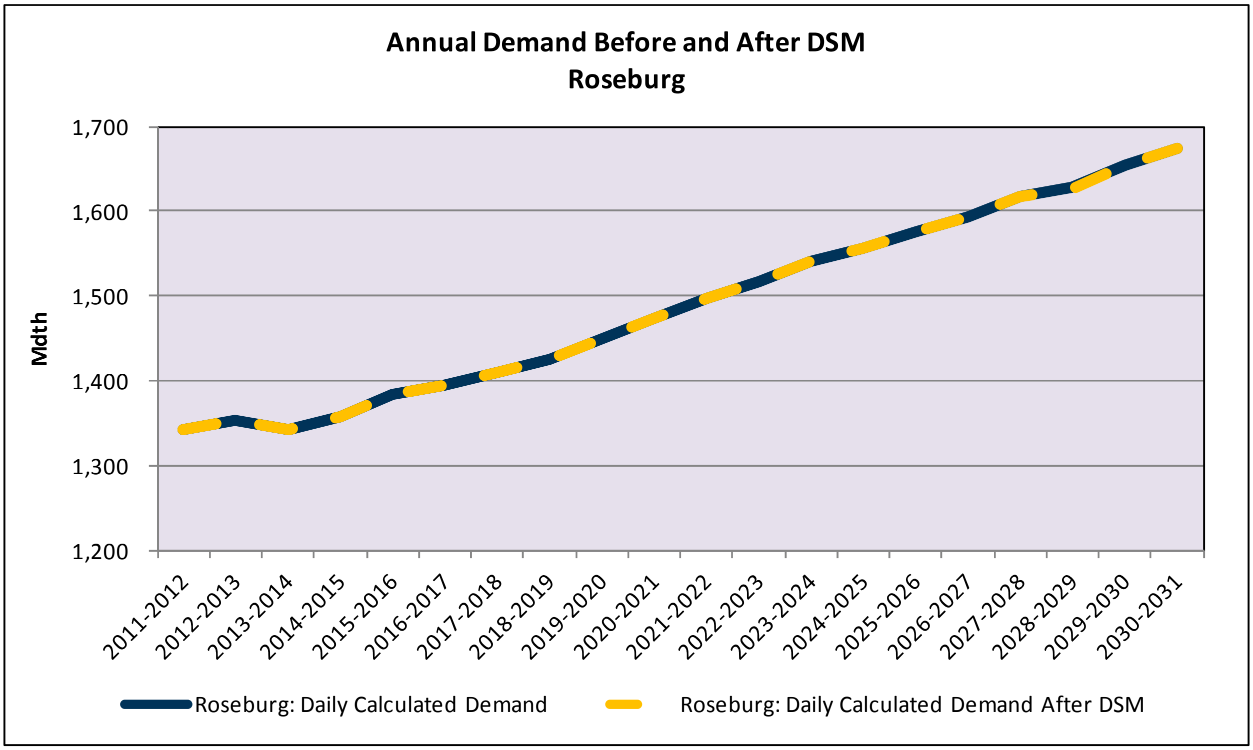



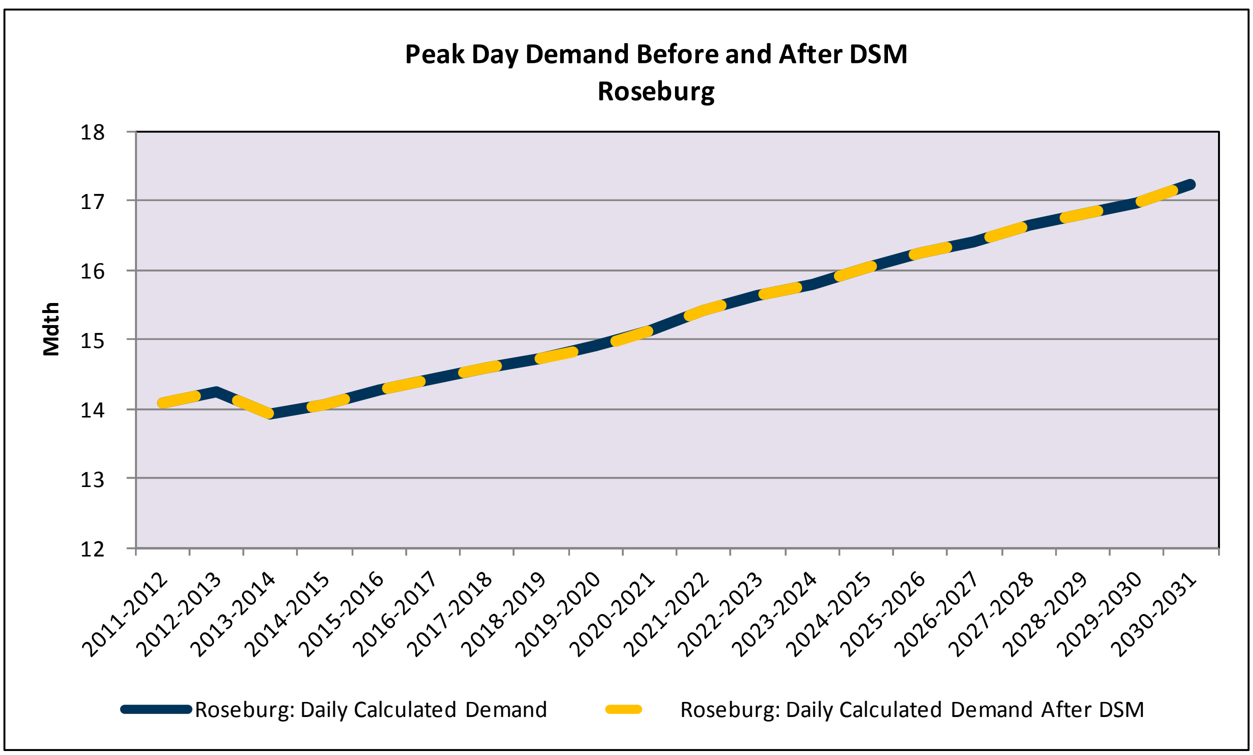
# APPENDIX 3.9 II PEAK DAY DEMAND BEFORE AND AFTER DSM MEDFORD



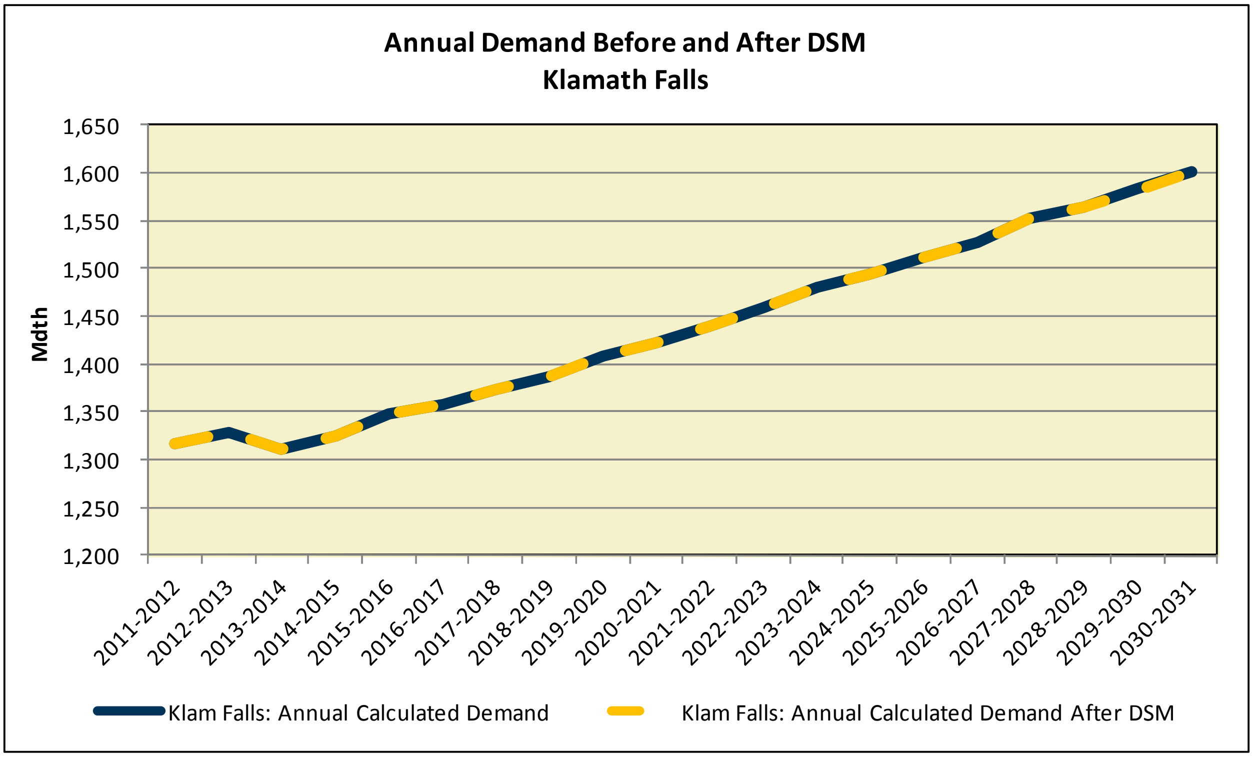



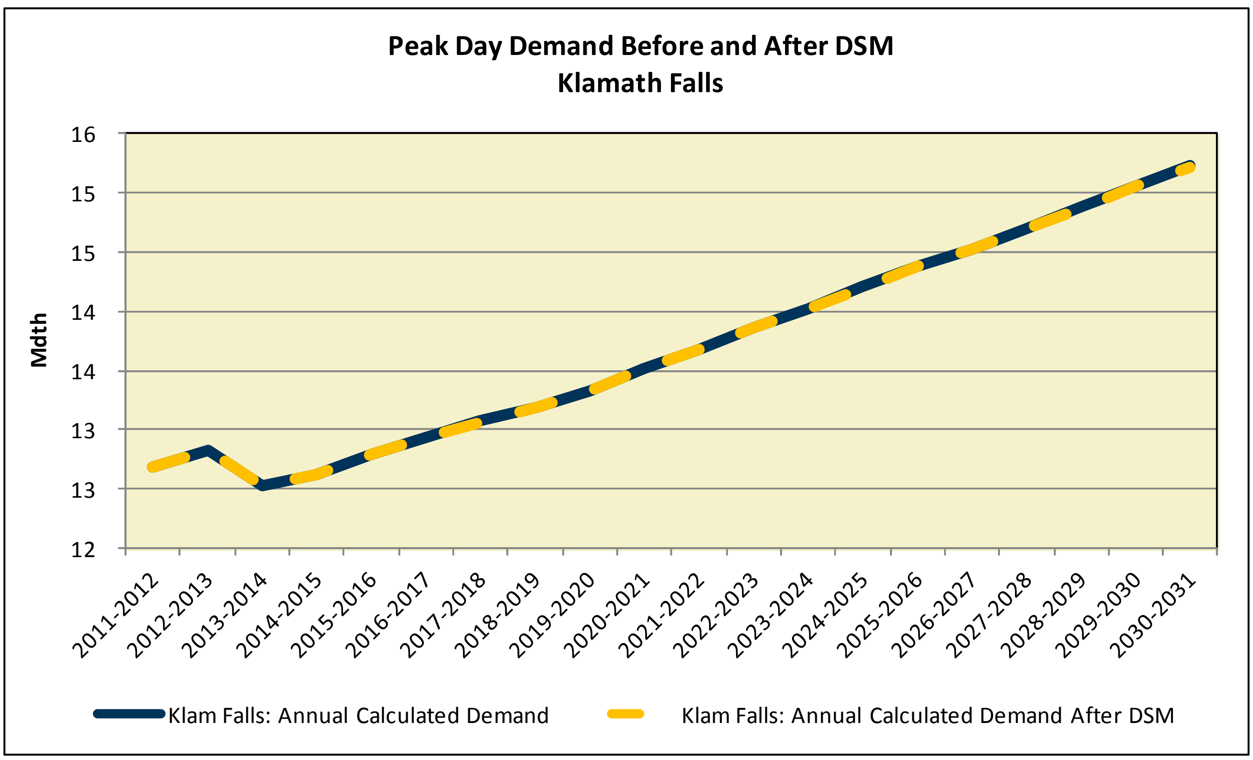
# APPENDIX 3.9 II PEAK DAY DEMAND BEFORE AND AFTER DSM ROSEBURG



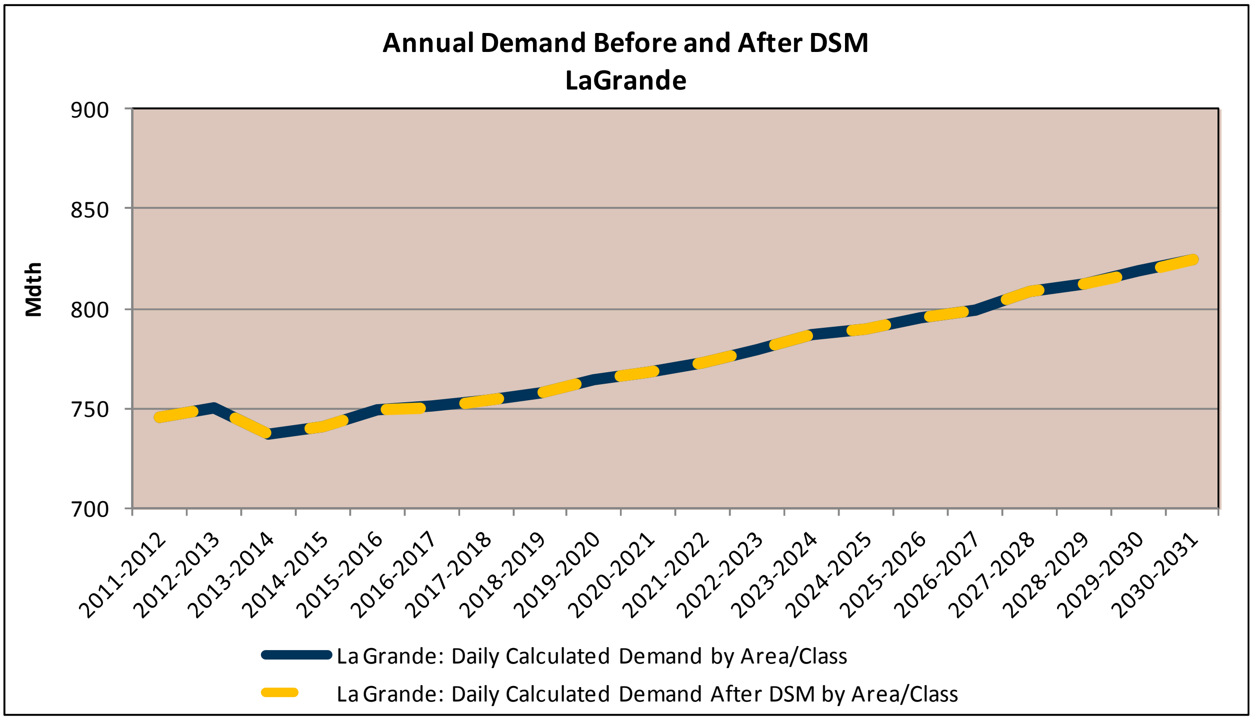



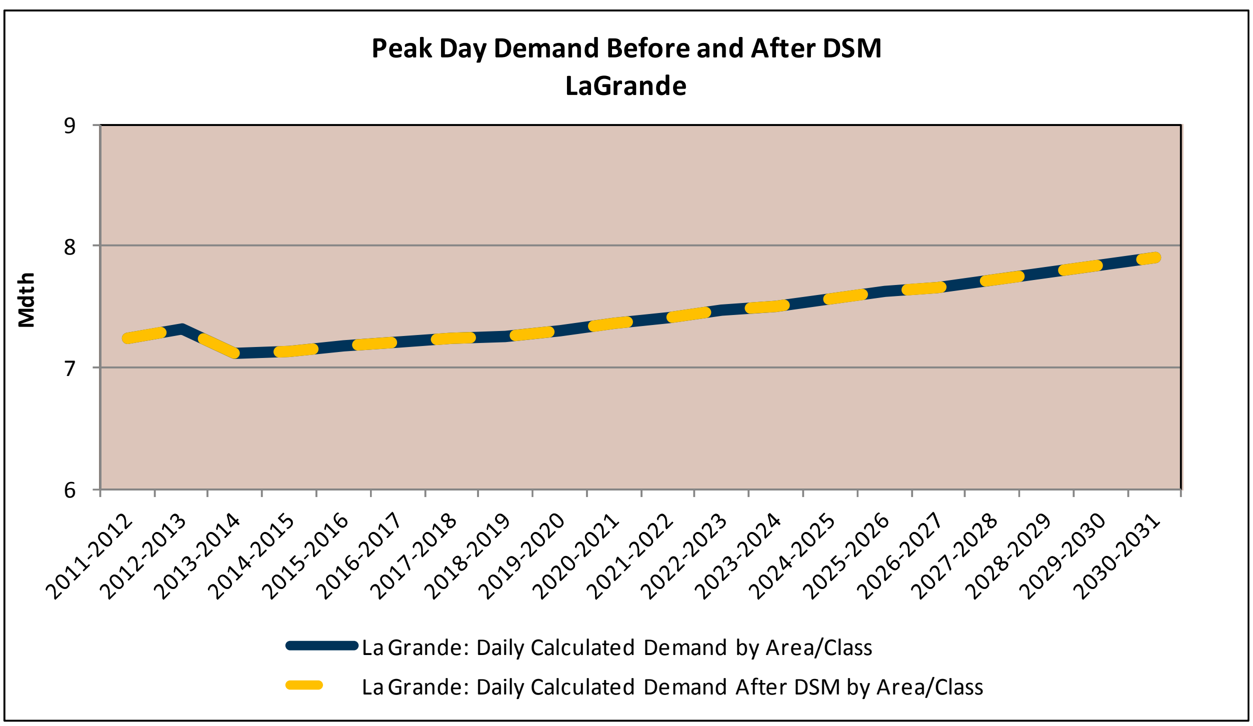
## APPENDIX 3.9 II PEAK DAY DEMAND BEFORE AND AFTER DSM
## KLAMATH FALLS



## APPENDIX 3.9 II PEAK DAY DEMAND BEFORE AND AFTER DSM LA GRANDE



# APPENDIX 3.10 ‖ DETAILED DEMAND DATA
# EXPECTED MIX

| Area | 2012: Residential | 2012: Commercial | 2012: Ind FirmSale | 2012 Total | 2013: Residential | 2013: Commercial | 2013: Ind FirmSale | 2013 Total | 2014: Residential | 2014: Commercial | 2014: Ind FirmSale | 2014 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 832.29 | 479.61 | 5.02 | 1,316.92 | 838.10 | 484.58 | 5.01 | 1,327.69 | 825.31 | 480.20 | 5.01 | 1,310.52 |
| La Grande | 436.90 | 280.81 | 28.15 | 745.86 | 438.49 | 283.86 | 28.15 | 750.50 | 428.75 | 280.00 | 28.15 | 736.89 |
| Medford GTN | 2,122.77 | 1,319.53 | 27.83 | 3,470.13 | 2,144.95 | 1,323.48 | 28.25 | 3,496.68 | 2,127.21 | 1,305.07 | 28.25 | 3,460.54 |
| Medford NWP | 953.71 | 592.83 | 12.50 | 1,559.04 | 963.67 | 594.61 | 12.69 | 1,570.97 | 955.71 | 586.34 | 12.69 | 1,554.74 |
| Roseburg | 711.03 | 582.36 | 49.52 | 1,342.92 | 717.40 | 586.53 | 49.38 | 1,353.30 | 712.04 | 580.41 | 48.91 | 1,341.36 |
| **OR Sub-Total** | **5,056.71** | **3,255.14** | **123.02** | **8,434.86** | **5,102.61** | **3,273.05** | **123.48** | **8,499.15** | **5,049.01** | **3,232.02** | **123.01** | **8,404.04** |
| WA/ID Both | 9,207.42 | 5,521.06 | 306.24 | 15,034.72 | 9,342.29 | 5,576.39 | 306.80 | 15,225.48 | 9,230.37 | 5,518.49 | 304.41 | 15,053.27 |
| WA/ID GTN | 1,269.99 | 761.53 | 42.24 | 2,073.75 | 1,288.59 | 769.16 | 42.32 | 2,100.07 | 1,273.15 | 761.17 | 41.99 | 2,076.32 |
| WA/ID NWP | 5,397.45 | 3,236.49 | 179.52 | 8,813.46 | 5,476.52 | 3,268.93 | 179.85 | 8,925.29 | 5,410.91 | 3,234.99 | 178.45 | 8,824.35 |
| **WA/ID Sub-Total** | **15,874.86** | **9,519.08** | **528.00** | **25,921.94** | **16,107.40** | **9,614.48** | **528.96** | **26,250.84** | **15,914.43** | **9,514.66** | **524.85** | **25,953.94** |
| **Case Total** | **20,931.57** | **12,774.21** | **651.02** | **34,356.80** | **21,210.01** | **12,887.54** | **652.44** | **34,749.99** | **20,963.44** | **12,746.67** | **647.86** | **34,357.98** |

| Area | 2015: Residential | 2015: Commercial | 2015: Ind FirmSale | 2015 Total | 2016: Residential | 2016: Commercial | 2016: Ind FirmSale | 2016 Total | 2017: Residential | 2017: Commercial | 2017: Ind FirmSale | 2017 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 834.34 | 485.71 | 5.01 | 1,325.06 | 849.85 | 493.43 | 5.02 | 1,348.30 | 857.10 | 496.48 | 5.01 | 1,358.59 |
| La Grande | 429.01 | 283.67 | 28.15 | 740.83 | 432.86 | 288.38 | 28.15 | 749.39 | 432.86 | 289.61 | 28.15 | 750.61 |
| Medford GTN | 2,164.16 | 1,318.96 | 29.61 | 3,512.74 | 2,216.60 | 1,344.06 | 30.22 | 3,590.88 | 2,249.64 | 1,358.28 | 31.49 | 3,639.41 |
| Medford NWP | 972.31 | 592.58 | 13.30 | 1,578.19 | 995.86 | 603.85 | 13.58 | 1,613.29 | 1,010.71 | 610.24 | 14.15 | 1,635.10 |
| Roseburg | 723.71 | 585.17 | 48.81 | 1,357.69 | 741.47 | 592.76 | 48.90 | 1,383.13 | 751.56 | 594.69 | 48.69 | 1,394.94 |
| **OR Sub-Total** | **5,123.54** | **3,266.09** | **124.88** | **8,514.50** | **5,236.65** | **3,322.48** | **125.87** | **8,684.99** | **5,301.87** | **3,349.31** | **127.48** | **8,778.65** |
| WA/ID Both | 9,342.69 | 5,589.65 | 307.19 | 15,239.53 | 9,523.97 | 5,701.77 | 310.81 | 15,536.55 | 9,617.59 | 5,762.39 | 311.72 | 15,691.70 |
| WA/ID GTN | 1,288.65 | 770.99 | 42.37 | 2,102.01 | 1,313.65 | 786.45 | 42.87 | 2,142.98 | 1,326.57 | 794.82 | 43.00 | 2,164.38 |
| WA/ID NWP | 5,476.76 | 3,276.71 | 180.08 | 8,933.55 | 5,583.03 | 3,342.44 | 182.20 | 9,107.68 | 5,637.92 | 3,377.98 | 182.73 | 9,198.63 |
| **WA/ID Sub-Total** | **16,108.10** | **9,637.35** | **529.64** | **26,275.09** | **16,420.66** | **9,830.67** | **535.88** | **26,787.21** | **16,582.07** | **9,935.19** | **537.45** | **27,054.71** |
| **Case Total** | **21,231.64** | **12,903.44** | **654.52** | **34,789.59** | **21,657.31** | **13,153.14** | **661.75** | **35,472.20** | **21,883.94** | **13,284.50** | **664.92** | **35,833.36** |

| Area | 2018: Residential | 2018: Commercial | 2018: Ind FirmSale | 2018 Total | 2019: Residential | 2019: Commercial | 2019: Ind FirmSale | 2019 Total | 2020: Residential | 2020: Commercial | 2020: Ind FirmSale | 2020 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 867.06 | 501.15 | 5.01 | 1,373.21 | 876.37 | 505.47 | 5.01 | 1,386.85 | 890.47 | 512.33 | 5.02 | 1,407.82 |
| La Grande | 434.39 | 291.76 | 28.15 | 754.30 | 435.63 | 293.70 | 28.15 | 757.48 | 439.20 | 297.30 | 28.15 | 764.64 |
| Medford GTN | 2,291.24 | 1,377.44 | 32.00 | 3,700.68 | 2,330.95 | 1,395.74 | 32.00 | 3,758.69 | 2,382.58 | 1,420.77 | 32.15 | 3,835.50 |
| Medford NWP | 1,029.40 | 618.85 | 14.38 | 1,662.63 | 1,047.24 | 627.07 | 14.38 | 1,688.69 | 1,070.43 | 638.32 | 14.44 | 1,723.19 |
| Roseburg | 763.68 | 598.42 | 48.63 | 1,410.72 | 775.15 | 601.91 | 48.56 | 1,425.61 | 791.06 | 608.46 | 48.66 | 1,448.18 |
| **OR Sub-Total** | **5,385.77** | **3,387.61** | **128.16** | **8,901.55** | **5,465.34** | **3,423.89** | **128.10** | **9,017.33** | **5,573.75** | **3,477.17** | **128.42** | **9,179.34** |
| WA/ID Both | 9,746.28 | 5,842.88 | 313.60 | 15,902.77 | 9,868.05 | 5,919.40 | 315.42 | 16,102.86 | 10,043.33 | 6,026.84 | 317.48 | 16,387.65 |
| WA/ID GTN | 1,344.32 | 805.92 | 43.26 | 2,193.49 | 1,361.11 | 816.47 | 43.51 | 2,221.09 | 1,385.29 | 831.29 | 43.79 | 2,260.37 |
| WA/ID NWP | 5,713.37 | 3,425.17 | 183.84 | 9,322.37 | 5,784.75 | 3,470.03 | 184.90 | 9,439.69 | 5,887.51 | 3,533.02 | 186.11 | 9,606.64 |
| **WA/ID Sub-Total** | **16,803.97** | **10,073.97** | **540.69** | **27,418.63** | **17,013.92** | **10,205.90** | **543.82** | **27,763.64** | **17,316.12** | **10,391.16** | **547.38** | **28,254.66** |
| **Case Total** | **22,189.74** | **13,461.59** | **668.85** | **36,320.18** | **22,479.26** | **13,629.79** | **671.92** | **36,780.97** | **22,889.87** | **13,868.33** | **675.79** | **37,434.00** |

| Area | 2021: Residential | 2021: Commercial | 2021: Ind FirmSale | 2021 Total | 2022: Residential | 2022: Commercial | 2022: Ind FirmSale | 2022 Total | 2023: Residential | 2023: Commercial | 2023: Ind FirmSale | 2023 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 900.18 | 516.56 | 5.01 | 1,421.75 | 912.06 | 522.08 | 5.01 | 1,439.15 | 925.10 | 528.13 | 5.01 | 1,458.24 |
| La Grande | 440.51 | 299.20 | 28.15 | 767.86 | 442.98 | 301.96 | 28.15 | 773.08 | 445.94 | 304.94 | 28.15 | 779.03 |
| Medford GTN | 2,421.76 | 1,438.08 | 33.36 | 3,893.20 | 2,466.89 | 1,459.16 | 33.88 | 3,959.92 | 2,515.90 | 1,482.06 | 33.92 | 4,031.89 |
| Medford NWP | 1,088.04 | 646.09 | 14.99 | 1,749.12 | 1,108.31 | 655.56 | 15.22 | 1,779.10 | 1,130.33 | 665.85 | 15.24 | 1,811.43 |
| Roseburg | 802.36 | 611.66 | 59.87 | 1,473.89 | 815.95 | 616.61 | 64.67 | 1,497.23 | 830.54 | 622.08 | 64.67 | 1,517.29 |
| **OR Sub-Total** | **5,652.84** | **3,511.60** | **141.37** | **9,305.81** | **5,746.19** | **3,555.36** | **146.92** | **9,448.47** | **5,847.83** | **3,603.06** | **146.98** | **9,597.87** |
| WA/ID Both | 10,168.21 | 6,102.41 | 319.77 | 16,590.39 | 10,319.06 | 6,193.88 | 321.49 | 16,834.43 | 10,485.41 | 6,293.44 | 323.76 | 17,102.61 |
| WA/ID GTN | 1,402.52 | 841.72 | 44.11 | 2,288.34 | 1,423.32 | 854.33 | 44.34 | 2,322.00 | 1,446.27 | 868.07 | 44.66 | 2,358.99 |
| WA/ID NWP | 5,960.72 | 3,577.33 | 187.45 | 9,725.50 | 6,049.15 | 3,630.95 | 188.46 | 9,868.57 | 6,146.67 | 3,689.32 | 189.79 | 10,025.79 |
| **WA/ID Sub-Total** | **17,531.44** | **10,521.46** | **551.32** | **28,604.23** | **17,791.54** | **10,679.16** | **554.29** | **29,024.99** | **18,078.35** | **10,850.83** | **558.21** | **29,487.39** |
| **Case Total** | **23,184.28** | **14,033.06** | **692.70** | **37,910.03** | **23,537.73** | **14,234.53** | **701.21** | **38,473.47** | **23,926.17** | **14,453.89** | **705.20** | **39,085.26** |

# APPENDIX 3.10 II DETAILED DEMAND DATA
# EXPECTED MIX

| Area | 2024: Residential | 2024: Commercial | 2024: Ind FirmSale | 2024 Total | 2025: Residential | 2025: Commercial | 2025: Ind FirmSale | 2025 Total | 2026: Residential | 2026: Commercial | 2026: Ind FirmSale | 2026 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 940.04 | 535.35 | 5.02 | 1,480.41 | 949.44 | 539.46 | 5.01 | 1,493.90 | 962.02 | 545.34 | 5.01 | 1,512.37 |
| La Grande | 449.85 | 308.78 | 28.15 | 786.77 | 451.01 | 310.44 | 28.15 | 789.59 | 453.70 | 313.27 | 28.15 | 795.12 |
| Medford GTN | 2,570.46 | 1,508.48 | 35.35 | 4,114.29 | 2,610.10 | 1,526.07 | 35.75 | 4,171.92 | 2,658.54 | 1,548.71 | 35.80 | 4,243.05 |
| Medford NWP | 1,154.84 | 677.72 | 15.88 | 1,848.45 | 1,172.65 | 685.63 | 16.06 | 1,874.34 | 1,194.42 | 695.80 | 16.08 | 1,906.30 |
| Roseburg | 847.41 | 629.16 | 64.82 | 1,541.40 | 858.76 | 632.47 | 64.63 | 1,555.87 | 873.47 | 637.93 | 64.62 | 1,576.02 |
| **OR Sub-Total** | **5,962.61** | **3,659.49** | **149.22** | **9,771.31** | **6,041.96** | **3,694.06** | **149.60** | **9,885.62** | **6,142.16** | **3,741.06** | **149.65** | **10,032.87** |
| WA/ID Both | 10,674.30 | 6,406.73 | 326.03 | 17,407.06 | 10,799.03 | 6,481.43 | 329.27 | 17,609.73 | 10,960.49 | 6,577.81 | 331.44 | 17,869.73 |
| WA/ID GTN | 1,472.32 | 883.69 | 44.97 | 2,400.99 | 1,489.53 | 894.00 | 45.42 | 2,428.94 | 1,511.80 | 907.29 | 45.72 | 2,464.80 |
| WA/ID NWP | 6,257.41 | 3,755.74 | 191.12 | 10,204.27 | 6,330.53 | 3,799.53 | 193.02 | 10,323.08 | 6,425.18 | 3,856.03 | 194.29 | 10,475.51 |
| **WA/ID Sub-Total** | **18,404.03** | **11,046.16** | **562.13** | **30,012.32** | **18,619.09** | **11,174.95** | **567.71** | **30,361.75** | **18,897.46** | **11,341.14** | **571.44** | **30,810.04** |
| **Case Total** | **24,366.64** | **14,705.65** | **711.34** | **39,783.63** | **24,661.05** | **14,869.01** | **717.31** | **40,247.37** | **25,039.62** | **15,082.19** | **721.09** | **40,842.91** |

| Area | 2027: Residential | 2027: Commercial | 2027: Ind FirmSale | 2027 Total | 2028: Residential | 2028: Commercial | 2028: Ind FirmSale | 2028 Total | 2029: Residential | 2029: Commercial | 2029: Ind FirmSale | 2029 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 972.59 | 550.24 | 5.01 | 1,527.84 | 989.35 | 558.30 | 5.02 | 1,552.67 | 997.76 | 561.94 | 5.01 | 1,564.71 |
| La Grande | 455.60 | 315.63 | 28.15 | 799.37 | 460.54 | 320.12 | 28.15 | 808.81 | 461.78 | 322.02 | 28.15 | 811.94 |
| Medford GTN | 2,700.69 | 1,568.40 | 37.11 | 4,306.20 | 2,758.04 | 1,596.10 | 37.79 | 4,391.93 | 2,791.49 | 1,610.82 | 37.67 | 4,439.98 |
| Medford NWP | 1,213.35 | 704.64 | 16.67 | 1,934.67 | 1,239.12 | 717.09 | 16.98 | 1,973.19 | 1,254.15 | 723.70 | 16.93 | 1,994.77 |
| Roseburg | 886.86 | 642.56 | 64.57 | 1,593.99 | 903.43 | 649.83 | 64.76 | 1,618.02 | 910.82 | 651.55 | 64.57 | 1,626.94 |
| **OR Sub-Total** | **6,229.10** | **3,781.48** | **151.51** | **10,162.08** | **6,350.49** | **3,841.44** | **152.70** | **10,344.62** | **6,416.00** | **3,870.03** | **152.32** | **10,438.34** |
| WA/ID Both | 11,099.67 | 6,661.55 | 333.26 | 18,094.47 | 11,310.26 | 6,786.85 | 335.89 | 18,433.00 | 11,426.73 | 6,856.68 | 338.06 | 18,621.47 |
| WA/ID GTN | 1,530.99 | 918.84 | 45.97 | 2,495.80 | 1,560.04 | 936.12 | 46.33 | 2,542.50 | 1,576.11 | 945.76 | 46.63 | 2,568.49 |
| WA/ID NWP | 6,506.77 | 3,905.13 | 195.36 | 10,607.26 | 6,630.23 | 3,978.58 | 196.90 | 10,805.72 | 6,698.51 | 4,019.52 | 198.18 | 10,916.21 |
| **WA/ID Sub-Total** | **19,137.43** | **11,485.51** | **574.58** | **31,197.53** | **19,500.53** | **11,701.55** | **579.13** | **31,781.21** | **19,701.34** | **11,821.96** | **582.87** | **32,106.17** |
| **Case Total** | **25,366.53** | **15,266.99** | **726.09** | **41,359.61** | **25,851.01** | **15,542.99** | **731.83** | **42,125.83** | **26,117.35** | **15,691.98** | **735.18** | **42,544.51** |

| Area | 2030: Residential | 2030: Commercial | 2030: Ind FirmSale | 2030 Total | 2031: Residential | 2031: Commercial | 2031: Ind FirmSale | 2031 Total |
|---|---|---|---|---|---|---|---|---|
| Klam Falls | 1,009.99 | 567.60 | 5.01 | 1,582.60 | 1,022.21 | 573.31 | 5.01 | 1,600.52 |
| La Grande | 464.85 | 325.27 | 28.15 | 818.26 | 467.90 | 328.39 | 28.15 | 824.44 |
| Medford GTN | 2,835.39 | 1,631.42 | 38.99 | 4,505.80 | 2,878.97 | 1,651.77 | 39.50 | 4,570.25 |
| Medford NWP | 1,273.87 | 732.96 | 17.52 | 2,024.34 | 1,293.45 | 742.10 | 17.75 | 2,053.30 |
| Roseburg | 922.03 | 655.72 | 75.89 | 1,653.64 | 933.25 | 659.94 | 80.69 | 1,673.89 |
| **OR Sub-Total** | **6,506.13** | **3,912.96** | **165.54** | **10,584.64** | **6,595.78** | **3,955.51** | **171.10** | **10,722.39** |
| WA/ID Both | 11,588.62 | 6,952.18 | 339.94 | 18,880.74 | 11,750.46 | 7,047.50 | 343.12 | 19,141.09 |
| WA/ID GTN | 1,598.44 | 958.93 | 46.89 | 2,604.26 | 1,620.76 | 972.08 | 47.33 | 2,640.17 |
| WA/ID NWP | 6,793.42 | 4,075.51 | 199.28 | 11,068.20 | 6,888.30 | 4,131.38 | 201.14 | 11,220.82 |
| **WA/ID Sub-Total** | **19,980.48** | **11,986.62** | **586.10** | **32,553.20** | **20,259.52** | **12,150.96** | **591.60** | **33,002.08** |
| **Case Total** | **26,486.61** | **15,899.58** | **751.65** | **43,137.83** | **26,855.31** | **16,106.47** | **762.69** | **43,724.47** |

# APPENDIX 3.10 ‖ DETAILED DEMAND DATA
# LOW GROWTH HIGH PRICE

| Area | 2012: Residential | 2012: Commercial | 2012: Ind FirmSale | 2012 Total | 2013: Residential | 2013: Commercial | 2013: Ind FirmSale | 2013 Total | 2014: Residential | 2014: Commercial | 2014: Ind FirmSale | 2014 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 830.20 | 479.70 | 5.02 | 1,314.92 | 832.39 | 481.98 | 5.01 | 1,319.37 | 778.93 | 457.96 | 5.01 | 1,241.90 |
| La Grande | 436.78 | 281.08 | 28.15 | 746.01 | 437.05 | 282.46 | 28.15 | 747.65 | 408.85 | 265.63 | 28.15 | 702.63 |
| Medford GTN | 2,122.03 | 1,321.59 | 27.83 | 3,471.45 | 2,132.06 | 1,321.98 | 28.25 | 3,482.30 | 2,010.33 | 1,254.69 | 28.25 | 3,293.27 |
| Medford NWP | 953.38 | 593.76 | 12.50 | 1,559.64 | 957.88 | 593.93 | 12.69 | 1,564.51 | 903.19 | 563.70 | 12.69 | 1,479.58 |
| Roseburg | 709.37 | 582.82 | 49.59 | 1,341.78 | 711.99 | 584.45 | 49.44 | 1,345.89 | 673.31 | 557.11 | 48.35 | 1,278.77 |
| **OR Sub-Total** | **5,051.76** | **3,258.95** | **123.08** | **8,433.79** | **5,071.38** | **3,264.80** | **123.55** | **8,459.72** | **4,774.62** | **3,099.09** | **122.45** | **7,996.16** |
| Wa/Id Both | 9,217.51 | 5,568.18 | 309.22 | 15,094.90 | 9,284.07 | 5,593.04 | 309.79 | 15,186.89 | 8,714.68 | 5,278.14 | 300.26 | 14,293.07 |
| Wa/Id GTN | 1,271.38 | 768.02 | 42.65 | 2,082.06 | 1,280.56 | 771.45 | 42.73 | 2,094.74 | 1,202.02 | 728.02 | 41.41 | 1,971.46 |
| Wa/Id NWP | 5,403.37 | 3,264.11 | 181.27 | 8,848.74 | 5,442.39 | 3,278.68 | 181.60 | 8,902.67 | 5,108.61 | 3,094.09 | 176.01 | 8,378.72 |
| **Wa/Id Sub-Total** | **15,892.25** | **9,600.31** | **533.13** | **26,025.70** | **16,007.02** | **9,643.17** | **534.11** | **26,184.30** | **15,025.31** | **9,100.25** | **517.69** | **24,643.25** |
| **Case Total** | **20,944.01** | **12,859.26** | **656.22** | **34,459.49** | **21,078.39** | **12,907.97** | **657.66** | **34,644.02** | **19,799.93** | **12,199.34** | **640.14** | **32,639.41** |

| Area | 2015: Residential | 2015: Commercial | 2015: Ind FirmSale | 2015 Total | 2016: Residential | 2016: Commercial | 2016: Ind FirmSale | 2016 Total | 2017: Residential | 2017: Commercial | 2017: Ind FirmSale | 2017 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 767.68 | 453.49 | 5.01 | 1,226.18 | 759.37 | 450.10 | 5.02 | 1,214.49 | 756.36 | 448.48 | 5.01 | 1,209.85 |
| La Grande | 401.03 | 262.54 | 28.15 | 691.73 | 395.06 | 259.86 | 28.15 | 683.06 | 391.64 | 258.27 | 28.15 | 678.06 |
| Medford GTN | 1,991.60 | 1,242.65 | 29.61 | 3,263.87 | 1,979.78 | 1,236.56 | 30.59 | 3,246.93 | 1,980.89 | 1,235.66 | 31.00 | 3,247.56 |
| Medford NWP | 894.78 | 558.29 | 13.30 | 1,466.38 | 889.46 | 555.56 | 13.74 | 1,458.76 | 889.97 | 555.15 | 13.93 | 1,459.05 |
| Roseburg | 667.29 | 551.43 | 48.00 | 1,266.72 | 664.25 | 547.20 | 48.76 | 1,260.21 | 664.25 | 544.53 | 49.86 | 1,258.63 |
| **OR Sub-Total** | **4,722.38** | **3,068.41** | **124.07** | **7,914.86** | **4,687.92** | **3,049.28** | **126.26** | **7,863.46** | **4,683.11** | **3,042.09** | **127.94** | **7,853.14** |
| Wa/Id Both | 8,598.84 | 5,218.85 | 300.16 | 14,117.85 | 8,513.98 | 5,179.09 | 300.23 | 13,993.30 | 8,488.77 | 5,169.66 | 300.23 | 13,958.67 |
| Wa/Id GTN | 1,186.05 | 719.84 | 41.40 | 1,947.29 | 1,174.34 | 714.36 | 41.41 | 1,930.11 | 1,170.87 | 713.06 | 41.41 | 1,925.34 |
| Wa/Id NWP | 5,040.71 | 3,059.34 | 175.96 | 8,276.01 | 4,990.97 | 3,036.04 | 176.00 | 8,203.01 | 4,976.20 | 3,030.52 | 176.00 | 8,182.72 |
| **Wa/Id Sub-Total** | **14,825.60** | **8,998.03** | **517.52** | **24,341.16** | **14,679.29** | **8,929.49** | **517.64** | **24,126.42** | **14,635.84** | **8,913.24** | **517.65** | **24,066.72** |
| **Case Total** | **19,547.98** | **12,066.44** | **641.59** | **32,256.02** | **19,367.21** | **11,978.77** | **643.90** | **31,989.88** | **19,318.95** | **11,955.33** | **645.59** | **31,919.87** |

| Area | 2018: Residential | 2018: Commercial | 2018: Ind FirmSale | 2018 Total | 2019: Residential | 2019: Commercial | 2019: Ind FirmSale | 2019 Total | 2020: Residential | 2020: Commercial | 2020: Ind FirmSale | 2020 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 756.51 | 448.60 | 5.01 | 1,210.12 | 761.09 | 450.79 | 5.01 | 1,216.88 | 768.40 | 454.53 | 5.02 | 1,227.95 |
| La Grande | 389.93 | 257.81 | 28.15 | 675.89 | 390.35 | 258.72 | 28.15 | 677.22 | 392.17 | 260.62 | 28.15 | 680.94 |
| Medford GTN | 1,990.85 | 1,239.96 | 31.52 | 3,262.33 | 2,011.48 | 1,249.62 | 32.04 | 3,293.14 | 2,039.06 | 1,263.49 | 32.68 | 3,335.23 |
| Medford NWP | 894.44 | 557.08 | 14.16 | 1,465.68 | 903.71 | 561.42 | 14.40 | 1,479.53 | 916.10 | 567.65 | 14.68 | 1,498.44 |
| Roseburg | 666.82 | 543.97 | 51.15 | 1,261.94 | 672.77 | 545.69 | 52.56 | 1,271.02 | 681.42 | 549.34 | 54.16 | 1,284.93 |
| **OR Sub-Total** | **4,698.54** | **3,047.43** | **129.98** | **7,875.96** | **4,739.40** | **3,066.24** | **132.15** | **7,937.79** | **4,797.16** | **3,095.63** | **134.69** | **8,027.48** |
| Wa/Id Both | 8,501.12 | 5,182.02 | 301.26 | 13,984.40 | 8,562.06 | 5,221.46 | 303.20 | 14,086.72 | 8,653.99 | 5,279.45 | 305.07 | 14,238.50 |
| Wa/Id GTN | 1,172.57 | 714.76 | 41.55 | 1,928.89 | 1,180.98 | 720.20 | 41.82 | 1,943.00 | 1,193.66 | 728.20 | 42.08 | 1,963.94 |
| Wa/Id NWP | 4,983.44 | 3,037.77 | 176.60 | 8,197.81 | 5,019.17 | 3,060.90 | 177.74 | 8,257.81 | 5,073.06 | 3,094.90 | 178.83 | 8,346.80 |
| **Wa/Id Sub-Total** | **14,657.14** | **8,934.55** | **519.41** | **24,111.10** | **14,762.21** | **9,002.56** | **522.77** | **24,287.53** | **14,920.71** | **9,102.55** | **525.98** | **24,549.24** |
| **Case Total** | **19,355.68** | **11,981.98** | **649.39** | **31,987.06** | **19,501.61** | **12,068.80** | **654.92** | **32,225.32** | **19,717.87** | **12,198.18** | **660.68** | **32,576.72** |

| Area | 2021: Residential | 2021: Commercial | 2021: Ind FirmSale | 2021 Total | 2022: Residential | 2022: Commercial | 2022: Ind FirmSale | 2022 Total | 2023: Residential | 2023: Commercial | 2023: Ind FirmSale | 2023 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 770.84 | 455.46 | 5.01 | 1,231.30 | 774.88 | 457.42 | 5.01 | 1,237.30 | 778.84 | 459.34 | 5.01 | 1,243.19 |
| La Grande | 391.49 | 260.72 | 28.15 | 680.35 | 391.70 | 261.45 | 28.15 | 681.29 | 391.87 | 262.15 | 28.15 | 682.17 |
| Medford GTN | 2,053.39 | 1,269.32 | 33.12 | 3,355.83 | 2,072.11 | 1,278.10 | 33.67 | 3,383.88 | 2,091.08 | 1,287.04 | 34.23 | 3,412.35 |
| Medford NWP | 922.54 | 570.27 | 14.88 | 1,507.69 | 930.95 | 574.22 | 15.13 | 1,520.29 | 939.47 | 578.23 | 15.38 | 1,533.08 |
| Roseburg | 685.26 | 549.52 | 55.51 | 1,290.29 | 690.82 | 551.05 | 57.04 | 1,298.91 | 696.37 | 552.57 | 58.61 | 1,307.55 |
| **OR Sub-Total** | **4,823.52** | **3,105.28** | **136.67** | **8,065.47** | **4,860.45** | **3,122.23** | **138.99** | **8,121.67** | **4,897.64** | **3,139.33** | **141.37** | **8,178.34** |
| Wa/Id Both | 8,690.67 | 5,303.22 | 306.94 | 14,300.83 | 8,746.42 | 5,338.85 | 308.17 | 14,393.43 | 8,802.28 | 5,374.55 | 309.73 | 14,486.57 |
| Wa/Id GTN | 1,198.72 | 731.48 | 42.34 | 1,972.54 | 1,206.41 | 736.40 | 42.51 | 1,985.31 | 1,214.11 | 741.32 | 42.72 | 1,998.16 |
| Wa/Id NWP | 5,094.58 | 3,108.84 | 179.93 | 8,383.35 | 5,127.26 | 3,129.73 | 180.65 | 8,437.64 | 5,160.01 | 3,150.66 | 181.57 | 8,492.24 |
| **Wa/Id Sub-Total** | **14,983.96** | **9,143.55** | **529.21** | **24,656.72** | **15,080.09** | **9,204.97** | **531.33** | **24,816.38** | **15,176.40** | **9,266.53** | **534.03** | **24,976.96** |
| **Case Total** | **19,807.48** | **12,248.83** | **665.87** | **32,722.19** | **19,940.54** | **12,327.20** | **670.32** | **32,938.06** | **20,074.04** | **12,405.86** | **675.40** | **33,155.30** |

# APPENDIX 3.10 II DETAILED DEMAND DATA LOW GROWTH HIGH PRICE

| Area | 2024: Residential | 2024: Commercial | 2024: Ind FirmSale | 2024 Total | 2025: Residential | 2025: Commercial | 2025: Ind FirmSale | 2025 Total | 2026: Residential | 2026: Commercial | 2026: Ind FirmSale | 2026 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 786.69 | 463.33 | 5.02 | 1,255.04 | 786.59 | 463.12 | 5.01 | 1,254.72 | 791.24 | 465.37 | 5.01 | 1,261.61 |
| La Grande | 393.95 | 264.17 | 28.15 | 686.27 | 392.13 | 263.47 | 28.15 | 683.74 | 392.60 | 264.35 | 28.15 | 685.10 |
| Medford GTN | 2,120.33 | 1,301.78 | 34.91 | 3,457.02 | 2,128.80 | 1,304.84 | 35.38 | 3,469.02 | 2,149.65 | 1,314.74 | 35.97 | 3,500.36 |
| Medford NWP | 952.61 | 584.86 | 15.69 | 1,553.15 | 956.42 | 586.23 | 15.90 | 1,558.54 | 965.78 | 590.68 | 16.16 | 1,572.63 |
| Roseburg | 705.57 | 556.60 | 60.41 | 1,322.59 | 707.54 | 555.65 | 61.87 | 1,325.06 | 713.83 | 557.63 | 63.59 | 1,335.05 |
| **OR Sub-Total** | **4,959.15** | **3,170.74** | **144.18** | **8,274.06** | **4,971.47** | **3,173.30** | **146.30** | **8,291.07** | **5,013.10** | **3,192.77** | **148.87** | **8,354.75** |
| Wa/Id Both | 8,902.50 | 5,436.10 | 311.75 | 14,650.35 | 8,912.55 | 5,444.59 | 314.06 | 14,671.21 | 8,975.96 | 5,484.18 | 315.71 | 14,775.85 |
| Wa/Id GTN | 1,227.94 | 749.81 | 43.00 | 2,020.75 | 1,229.32 | 750.98 | 43.32 | 2,023.63 | 1,238.07 | 756.44 | 43.55 | 2,038.06 |
| Wa/Id NWP | 5,218.76 | 3,186.75 | 182.75 | 8,588.26 | 5,224.66 | 3,191.73 | 184.11 | 8,600.50 | 5,261.84 | 3,214.94 | 185.07 | 8,661.85 |
| **Wa/Id Sub-Total** | **15,349.20** | **9,372.66** | **537.50** | **25,259.35** | **15,366.53** | **9,387.30** | **541.49** | **25,295.33** | **15,475.87** | **9,455.56** | **544.33** | **25,475.77** |
| **Case Total** | **20,308.34** | **12,543.39** | **681.68** | **33,533.42** | **20,338.00** | **12,560.61** | **687.80** | **33,586.41** | **20,488.97** | **12,648.33** | **693.21** | **33,830.51** |

| Area | 2027: Residential | 2027: Commercial | 2027: Ind FirmSale | 2027 Total | 2028: Residential | 2028: Commercial | 2028: Ind FirmSale | 2028 Total | 2029: Residential | 2029: Commercial | 2029: Ind FirmSale | 2029 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 790.61 | 465.22 | 5.01 | 1,260.84 | 795.02 | 467.67 | 5.02 | 1,267.71 | 792.73 | 466.48 | 5.01 | 1,264.21 |
| La Grande | 390.74 | 263.66 | 28.15 | 682.55 | 391.43 | 264.77 | 28.15 | 684.35 | 388.97 | 263.65 | 28.15 | 680.77 |
| Medford GTN | 2,156.50 | 1,317.88 | 36.57 | 3,510.95 | 2,175.76 | 1,327.87 | 37.30 | 3,540.93 | 2,176.32 | 1,327.25 | 37.80 | 3,541.37 |
| Medford NWP | 968.86 | 592.09 | 16.43 | 1,577.38 | 977.52 | 596.58 | 16.76 | 1,590.85 | 977.77 | 596.30 | 16.98 | 1,591.05 |
| Roseburg | 716.09 | 557.11 | 65.24 | 1,338.43 | 721.49 | 559.09 | 67.18 | 1,347.76 | 719.93 | 556.54 | 68.76 | 1,345.23 |
| **OR Sub-Total** | **5,022.81** | **3,195.96** | **151.40** | **8,370.16** | **5,061.23** | **3,215.98** | **154.40** | **8,431.61** | **5,055.71** | **3,210.22** | **156.70** | **8,422.63** |
| Wa/Id Both | 8,980.67 | 5,491.01 | 316.37 | 14,788.05 | 9,043.48 | 5,531.51 | 317.75 | 14,892.73 | 9,029.91 | 5,526.75 | 318.72 | 14,875.38 |
| Wa/Id GTN | 1,238.72 | 757.39 | 43.64 | 2,039.75 | 1,247.38 | 762.97 | 43.83 | 2,054.18 | 1,245.51 | 762.32 | 43.96 | 2,051.79 |
| Wa/Id NWP | 5,264.61 | 3,218.95 | 185.46 | 8,669.01 | 5,301.43 | 3,242.69 | 186.27 | 8,730.39 | 5,293.48 | 3,239.90 | 186.84 | 8,720.22 |
| **Wa/Id Sub-Total** | **15,484.00** | **9,467.35** | **545.46** | **25,496.81** | **15,592.29** | **9,537.17** | **547.84** | **25,677.31** | **15,568.90** | **9,528.97** | **549.52** | **25,647.39** |
| **Case Total** | **20,506.80** | **12,663.31** | **696.86** | **33,866.97** | **20,653.52** | **12,753.15** | **702.24** | **34,108.92** | **20,624.61** | **12,739.19** | **706.22** | **34,070.02** |

| Area | 2030: Residential | 2030: Commercial | 2030: Ind FirmSale | 2030 Total | 2031: Residential | 2031: Commercial | 2031: Ind FirmSale | 2031 Total |
|---|---|---|---|---|---|---|---|---|
| Klam Falls | 793.43 | 466.96 | 5.01 | 1,265.40 | 794.11 | 467.44 | 5.01 | 1,266.55 |
| La Grande | 388.03 | 263.61 | 28.15 | 679.79 | 387.09 | 263.55 | 28.15 | 678.79 |
| Medford GTN | 2,184.94 | 1,331.38 | 38.43 | 3,554.75 | 2,193.23 | 1,335.38 | 38.61 | 3,567.21 |
| Medford NWP | 981.64 | 598.15 | 17.27 | 1,597.06 | 985.36 | 599.95 | 17.34 | 1,602.66 |
| Roseburg | 721.32 | 556.04 | 70.59 | 1,347.95 | 722.67 | 555.56 | 71.04 | 1,349.27 |
| **OR Sub-Total** | **5,069.36** | **3,216.14** | **159.44** | **8,444.95** | **5,082.46** | **3,221.88** | **160.15** | **8,464.48** |
| Wa/Id Both | 9,051.35 | 5,542.48 | 319.36 | 14,913.18 | 9,072.44 | 5,557.76 | 321.27 | 14,951.47 |
| Wa/Id GTN | 1,248.47 | 764.49 | 44.05 | 2,057.01 | 1,251.38 | 766.60 | 44.31 | 2,062.29 |
| Wa/Id NWP | 5,306.05 | 3,249.13 | 187.21 | 8,742.39 | 5,318.42 | 3,258.09 | 188.33 | 8,764.84 |
| **Wa/Id Sub-Total** | **15,605.87** | **9,556.09** | **550.62** | **25,712.58** | **15,642.23** | **9,582.45** | **553.91** | **25,778.59** |
| **Case Total** | **20,675.23** | **12,772.23** | **710.06** | **34,157.53** | **20,724.69** | **12,804.33** | **714.06** | **34,243.07** |

# APPENDIX 3.10 ‖ DETAILED DEMAND DATA
# HIGH GROWTH LOW PRICE

| Area | 2012: Residential | 2012: Commercial | 2012: Ind FirmSale | 2012 Total | 2013: Residential | 2013: Commercial | 2013: Ind FirmSale | 2013 Total | 2014: Residential | 2014: Commercial | 2014: Ind FirmSale | 2014 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 854.74 | 491.34 | 5.46 | 1,351.53 | 866.16 | 500.53 | 5.44 | 1,372.13 | 889.34 | 513.91 | 5.44 | 1,408.69 |
| La Grande | 440.98 | 283.42 | 2.74 | 727.13 | 444.55 | 289.03 | 2.74 | 736.31 | 449.88 | 296.54 | 2.74 | 749.16 |
| Medford GTN | 2,149.26 | 1,328.84 | 14.34 | 3,492.44 | 2,189.93 | 1,338.15 | 14.45 | 3,542.54 | 2,267.06 | 1,361.28 | 14.45 | 3,642.79 |
| Medford NWP | 965.61 | 597.02 | 6.44 | 1,569.07 | 983.88 | 601.20 | 6.49 | 1,591.57 | 1,018.53 | 611.59 | 6.49 | 1,636.62 |
| Roseburg | 715.91 | 585.11 | 33.12 | 1,334.14 | 727.85 | 593.11 | 33.02 | 1,353.98 | 752.82 | 605.50 | 33.02 | 1,391.35 |
| **OR Sub-Total** | **5,126.49** | **3,285.72** | **62.09** | **8,474.31** | **5,212.37** | **3,322.01** | **62.15** | **8,596.53** | **5,377.63** | **3,388.82** | **62.15** | **8,828.60** |
| WA/ID Both | 9,309.49 | 5,508.24 | 303.40 | 15,121.14 | 9,548.68 | 5,609.43 | 303.96 | 15,462.07 | 9,846.00 | 5,779.62 | 306.90 | 15,932.52 |
| WA/ID GTN | 1,284.07 | 759.76 | 41.85 | 2,085.67 | 1,317.06 | 773.71 | 41.93 | 2,132.70 | 1,358.07 | 797.19 | 42.33 | 2,197.59 |
| WA/ID NWP | 5,457.29 | 3,228.97 | 177.86 | 8,864.12 | 5,597.50 | 3,288.29 | 178.18 | 9,063.98 | 5,771.80 | 3,388.06 | 179.91 | 9,339.77 |
| **WA/ID Sub-Total** | **16,050.85** | **9,496.98** | **523.11** | **26,070.94** | **16,463.24** | **9,671.44** | **524.07** | **26,658.75** | **16,975.87** | **9,964.87** | **529.15** | **27,469.89** |
| **High Case Total** | **21,177.34** | **12,782.70** | **585.20** | **34,545.24** | **21,675.62** | **12,993.44** | **586.22** | **35,255.28** | **22,353.50** | **13,353.69** | **591.29** | **36,298.49** |

| Area | 2015: Residential | 2015: Commercial | 2015: Ind FirmSale | 2015 Total | 2016: Residential | 2016: Commercial | 2016: Ind FirmSale | 2016 Total | 2017: Residential | 2017: Commercial | 2017: Ind FirmSale | 2017 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 914.90 | 527.94 | 5.44 | 1,448.28 | 944.51 | 542.42 | 5.46 | 1,492.39 | 967.90 | 553.94 | 5.49 | 1,527.34 |
| La Grande | 455.21 | 305.86 | 2.74 | 763.81 | 463.09 | 314.68 | 2.74 | 780.50 | 468.56 | 320.41 | 2.76 | 791.72 |
| Medford GTN | 2,353.41 | 1,396.45 | 15.24 | 3,765.10 | 2,448.94 | 1,441.44 | 15.66 | 3,906.04 | 2,532.86 | 1,481.96 | 16.04 | 4,030.85 |
| Medford NWP | 1,057.33 | 627.39 | 6.85 | 1,691.57 | 1,100.25 | 647.60 | 7.04 | 1,754.89 | 1,137.95 | 665.81 | 7.20 | 1,810.96 |
| Roseburg | 779.93 | 618.49 | 33.02 | 1,431.44 | 811.62 | 632.23 | 33.85 | 1,477.70 | 837.87 | 642.83 | 34.95 | 1,515.65 |
| **OR Sub-Total** | **5,560.78** | **3,476.13** | **63.29** | **9,100.20** | **5,768.41** | **3,578.38** | **64.74** | **9,411.52** | **5,945.15** | **3,664.93** | **66.44** | **9,676.52** |
| WA/ID Both | 10,145.89 | 5,958.30 | 310.93 | 16,415.11 | 10,485.18 | 6,162.36 | 315.22 | 16,962.76 | 10,765.03 | 6,334.95 | 318.77 | 17,418.74 |
| WA/ID GTN | 1,399.43 | 821.84 | 42.89 | 2,264.16 | 1,446.23 | 849.98 | 43.48 | 2,339.69 | 1,484.83 | 873.79 | 43.97 | 2,402.59 |
| WA/ID NWP | 5,947.60 | 3,492.81 | 182.27 | 9,622.68 | 6,146.50 | 3,612.44 | 184.79 | 9,943.73 | 6,310.56 | 3,713.62 | 186.86 | 10,211.04 |
| **WA/ID Sub-Total** | **17,492.92** | **10,272.94** | **536.09** | **28,301.95** | **18,077.91** | **10,624.78** | **543.49** | **29,246.18** | **18,560.42** | **10,922.35** | **549.60** | **30,032.37** |
| **High Case Total** | **23,053.70** | **13,749.07** | **599.38** | **37,402.15** | **23,846.32** | **14,203.16** | **608.22** | **38,657.70** | **24,505.57** | **14,587.28** | **616.04** | **39,708.90** |

| Area | 2018: Residential | 2018: Commercial | 2018: Ind FirmSale | 2018 Total | 2019: Residential | 2019: Commercial | 2019: Ind FirmSale | 2019 Total | 2020: Residential | 2020: Commercial | 2020: Ind FirmSale | 2020 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 994.34 | 567.38 | 5.56 | 1,567.28 | 1,021.01 | 581.19 | 5.63 | 1,607.83 | 1,052.51 | 597.83 | 5.73 | 1,656.08 |
| La Grande | 475.70 | 327.22 | 2.79 | 805.72 | 482.95 | 334.05 | 2.83 | 819.83 | 492.45 | 342.52 | 2.87 | 837.84 |
| Medford GTN | 2,627.80 | 1,529.13 | 16.49 | 4,173.42 | 2,723.43 | 1,577.30 | 16.99 | 4,317.72 | 2,831.70 | 1,633.14 | 17.58 | 4,482.41 |
| Medford NWP | 1,180.60 | 687.00 | 7.41 | 1,875.02 | 1,223.57 | 708.64 | 7.63 | 1,939.84 | 1,272.21 | 733.73 | 7.90 | 2,013.84 |
| Roseburg | 866.31 | 655.66 | 36.22 | 1,558.19 | 894.90 | 668.95 | 37.58 | 1,601.44 | 928.44 | 685.66 | 39.16 | 1,653.26 |
| **OR Sub-Total** | **6,144.76** | **3,766.39** | **68.47** | **9,979.63** | **6,345.87** | **3,870.12** | **70.66** | **10,286.66** | **6,577.31** | **3,992.88** | **73.25** | **10,643.44** |
| WA/ID Both | 11,086.65 | 6,531.21 | 323.60 | 17,941.46 | 11,411.79 | 6,730.05 | 328.82 | 18,470.66 | 11,791.41 | 6,961.29 | 334.50 | 19,087.20 |
| WA/ID GTN | 1,529.20 | 900.86 | 44.63 | 2,474.69 | 1,574.04 | 928.29 | 45.36 | 2,547.68 | 1,626.40 | 960.18 | 46.14 | 2,632.72 |
| WA/ID NWP | 6,499.10 | 3,828.68 | 189.70 | 10,517.47 | 6,689.70 | 3,945.24 | 192.76 | 10,827.70 | 6,912.24 | 4,080.81 | 196.09 | 11,189.13 |
| **WA/ID Sub-Total** | **19,114.95** | **11,260.74** | **557.93** | **30,933.63** | **19,675.53** | **11,603.58** | **566.94** | **31,846.05** | **20,330.06** | **12,002.28** | **576.72** | **32,909.06** |
| **High Case Total** | **25,259.71** | **15,027.14** | **626.40** | **40,913.25** | **26,021.40** | **15,473.70** | **637.60** | **42,132.71** | **26,907.36** | **15,995.16** | **649.97** | **43,552.49** |

| Area | 2021: Residential | 2021: Commercial | 2021: Ind FirmSale | 2021 Total | 2022: Residential | 2022: Commercial | 2022: Ind FirmSale | 2022 Total | 2023: Residential | 2023: Commercial | 2023: Ind FirmSale | 2023 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 1,076.35 | 610.66 | 5.82 | 1,692.82 | 1,105.21 | 626.54 | 5.93 | 1,737.68 | 1,135.28 | 643.47 | 6.07 | 1,784.82 |
| La Grande | 498.38 | 348.32 | 2.92 | 849.63 | 506.70 | 355.87 | 2.98 | 865.55 | 515.56 | 363.81 | 3.05 | 882.43 |
| Medford GTN | 2,919.45 | 1,678.34 | 18.14 | 4,615.93 | 3,021.34 | 1,732.25 | 18.81 | 4,772.40 | 3,128.96 | 1,790.21 | 19.57 | 4,938.74 |
| Medford NWP | 1,311.64 | 754.04 | 8.15 | 2,073.82 | 1,357.41 | 778.26 | 8.45 | 2,144.12 | 1,405.76 | 804.30 | 8.79 | 2,218.85 |
| Roseburg | 954.91 | 698.04 | 40.64 | 1,693.59 | 986.39 | 714.04 | 42.37 | 1,742.80 | 1,019.44 | 731.40 | 44.27 | 1,795.11 |
| **OR Sub-Total** | **6,760.73** | **4,089.39** | **75.67** | **10,925.79** | **6,977.05** | **4,206.95** | **78.55** | **11,262.55** | **7,205.00** | **4,333.20** | **81.75** | **11,619.95** |
| WA/ID Both | 12,085.96 | 7,142.67 | 340.40 | 19,569.03 | 12,439.48 | 7,359.29 | 346.59 | 20,145.36 | 12,811.71 | 7,587.77 | 353.91 | 20,753.38 |
| WA/ID GTN | 1,667.03 | 985.20 | 46.95 | 2,699.18 | 1,715.79 | 1,015.08 | 47.81 | 2,778.68 | 1,767.14 | 1,046.59 | 48.81 | 2,862.55 |
| WA/ID NWP | 7,084.91 | 4,187.14 | 199.55 | 11,471.60 | 7,292.16 | 4,314.12 | 203.18 | 11,809.46 | 7,510.36 | 4,448.06 | 207.46 | 12,165.89 |
| **WA/ID Sub-Total** | **20,837.91** | **12,315.01** | **586.90** | **33,739.81** | **21,447.43** | **12,688.49** | **597.57** | **34,733.50** | **22,089.21** | **13,082.43** | **610.18** | **35,781.82** |
| **High Case Total** | **27,598.64** | **16,404.39** | **662.57** | **44,665.60** | **28,424.48** | **16,895.44** | **676.12** | **45,996.04** | **29,294.21** | **17,415.63** | **691.93** | **47,401.76** |

# APPENDIX 3.10 II DETAILED DEMAND DATA HIGH GROWTH LOW PRICE

| Area | 2024: Residential | 2024: Commercial | 2024: Ind FirmSale | 2024 Total | 2025: Residential | 2025: Commercial | 2025: Ind FirmSale | 2025 Total | 2026: Residential | 2026: Commercial | 2026: Ind FirmSale | 2026 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 1,171.60 | 664.24 | 6.25 | 1,842.09 | 1,200.64 | 681.72 | 6.42 | 1,888.79 | 1,236.67 | 703.66 | 6.65 | 1,946.99 |
| La Grande | 527.20 | 373.82 | 3.13 | 904.16 | 535.55 | 381.34 | 3.23 | 920.12 | 547.03 | 391.20 | 3.34 | 941.57 |
| Medford GTN | 3,254.92 | 1,859.37 | 20.48 | 5,134.77 | 3,362.79 | 1,919.99 | 21.40 | 5,304.18 | 3,491.33 | 1,993.71 | 22.52 | 5,507.56 |
| Medford NWP | 1,462.36 | 835.37 | 9.20 | 2,306.93 | 1,510.82 | 862.60 | 9.61 | 2,383.04 | 1,568.57 | 895.73 | 10.12 | 2,474.41 |
| Roseburg | 1,059.09 | 753.31 | 46.49 | 1,858.90 | 1,092.31 | 771.64 | 48.70 | 1,912.64 | 1,133.04 | 795.29 | 51.32 | 1,979.64 |
| **OR Sub-Total** | **7,475.17** | **4,486.12** | **85.56** | **12,046.84** | **7,702.12** | **4,617.30** | **89.36** | **12,408.77** | **7,976.64** | **4,779.59** | **93.94** | **12,850.17** |
| WA/ID Both | 13,255.79 | 7,859.74 | 362.52 | 21,478.05 | 13,618.27 | 8,086.49 | 373.01 | 22,077.77 | 14,061.21 | 8,362.70 | 383.76 | 22,807.67 |
| WA/ID GTN | 1,828.39 | 1,084.11 | 50.00 | 2,962.50 | 1,878.39 | 1,115.38 | 51.45 | 3,045.22 | 1,939.48 | 1,153.48 | 52.93 | 3,145.90 |
| WA/ID NWP | 7,770.70 | 4,607.50 | 212.51 | 12,590.71 | 7,983.19 | 4,740.43 | 218.66 | 12,942.28 | 8,242.85 | 4,902.35 | 224.97 | 13,370.16 |
| **WA/ID Sub-Total** | **22,854.88** | **13,551.34** | **625.03** | **37,031.26** | **23,479.84** | **13,942.30** | **643.12** | **38,065.26** | **24,243.54** | **14,418.53** | **661.67** | **39,323.73** |
| **High Case Total** | **30,330.05** | **18,037.46** | **710.59** | **49,078.10** | **31,181.96** | **18,559.60** | **732.48** | **50,474.03** | **32,220.18** | **19,198.12** | **755.61** | **52,173.91** |

| Area | 2027: Residential | 2027: Commercial | 2027: Ind FirmSale | 2027 Total | 2028: Residential | 2028: Commercial | 2028: Ind FirmSale | 2028 Total | 2029: Residential | 2029: Commercial | 2029: Ind FirmSale | 2029 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 1,275.45 | 727.97 | 6.92 | 2,010.34 | 1,322.58 | 757.88 | 7.26 | 2,087.72 | 1,363.42 | 785.81 | 7.63 | 2,156.85 |
| La Grande | 559.94 | 402.17 | 3.48 | 965.59 | 577.01 | 416.36 | 3.64 | 997.01 | 591.82 | 428.85 | 3.84 | 1,024.50 |
| Medford GTN | 3,627.46 | 2,073.90 | 23.82 | 5,725.17 | 3,786.30 | 2,169.48 | 25.41 | 5,981.19 | 3,928.07 | 2,259.25 | 27.14 | 6,214.47 |
| Medford NWP | 1,629.73 | 931.75 | 10.70 | 2,572.18 | 1,701.09 | 974.70 | 11.42 | 2,687.20 | 1,764.79 | 1,015.03 | 12.20 | 2,792.01 |
| Roseburg | 1,177.64 | 822.07 | 54.29 | 2,054.00 | 1,226.50 | 853.60 | 57.86 | 2,137.96 | 1,267.90 | 882.41 | 61.63 | 2,211.94 |
| **OR Sub-Total** | **8,270.22** | **4,957.86** | **99.21** | **13,327.28** | **8,613.47** | **5,172.02** | **105.59** | **13,891.08** | **8,915.99** | **5,371.34** | **112.44** | **14,399.76** |
| WA/ID Both | 14,537.11 | 8,661.52 | 396.24 | 23,594.87 | 15,112.69 | 9,023.46 | 411.20 | 24,547.34 | 15,622.26 | 9,351.98 | 428.34 | 25,402.58 |
| WA/ID GTN | 2,005.13 | 1,194.70 | 54.65 | 3,254.48 | 2,084.52 | 1,244.62 | 56.72 | 3,385.85 | 2,154.80 | 1,289.94 | 59.08 | 3,503.82 |
| WA/ID NWP | 8,521.83 | 5,077.52 | 232.28 | 13,831.63 | 8,859.24 | 5,289.70 | 241.05 | 14,389.99 | 9,157.96 | 5,482.28 | 251.10 | 14,891.34 |
| **WA/ID Sub-Total** | **25,064.07** | **14,933.75** | **683.17** | **40,680.98** | **26,056.45** | **15,557.78** | **708.96** | **42,323.19** | **26,935.02** | **16,124.20** | **738.52** | **43,797.75** |
| **High Case Total** | **33,334.29** | **19,891.60** | **782.37** | **54,008.27** | **34,669.92** | **20,729.80** | **814.55** | **56,214.27** | **35,851.01** | **21,495.54** | **850.95** | **58,197.51** |

| Area | 2030: Residential | 2030: Commercial | 2030: Ind FirmSale | 2030 Total | 2031: Residential | 2031: Commercial | 2031: Ind FirmSale | 2031 Total |
|---|---|---|---|---|---|---|---|---|
| Klam Falls | 1,414.80 | 821.12 | 8.10 | 2,244.02 | 1,473.29 | 862.45 | 8.67 | 2,344.41 |
| La Grande | 611.46 | 445.01 | 4.07 | 1,060.54 | 634.36 | 463.63 | 4.36 | 1,102.35 |
| Medford GTN | 4,102.52 | 2,371.21 | 29.29 | 6,503.02 | 4,300.14 | 2,501.24 | 31.45 | 6,832.84 |
| Medford NWP | 1,843.16 | 1,065.33 | 13.16 | 2,921.65 | 1,931.95 | 1,123.75 | 14.13 | 3,069.83 |
| Roseburg | 1,320.56 | 919.82 | 66.25 | 2,306.64 | 1,381.23 | 964.23 | 70.15 | 2,415.62 |
| **OR Sub-Total** | **9,292.50** | **5,622.49** | **120.88** | **15,035.87** | **9,720.98** | **5,915.30** | **128.76** | **15,765.04** |
| WA/ID Both | 16,257.92 | 9,759.54 | 448.26 | 26,465.72 | 16,978.99 | 10,225.50 | 474.16 | 27,678.65 |
| WA/ID GTN | 2,242.48 | 1,346.15 | 61.83 | 3,650.46 | 2,341.94 | 1,410.42 | 65.40 | 3,817.76 |
| WA/ID NWP | 9,530.59 | 5,721.20 | 262.78 | 15,514.57 | 9,953.29 | 5,994.35 | 277.96 | 16,225.60 |
| **WA/ID Sub-Total** | **28,030.99** | **16,826.89** | **772.86** | **45,630.75** | **29,274.22** | **17,630.27** | **817.53** | **47,722.01** |
| **High Case Total** | **37,323.49** | **22,449.38** | **893.74** | **60,666.62** | **38,995.20** | **23,545.57** | **946.29** | **63,487.05** |

# APPENDIX 3.10 ▌▌ DETAILED DEMAND DATA AVERAGE MIX

| Area | 2012: Residential | 2012: Commercial | 2012: Ind FirmSale | 2012 Total | 2013: Residential | 2013: Commercial | 2013: Ind FirmSale | 2013 Total | 2014: Residential | 2014: Commercial | 2014: Ind FirmSale | 2014 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 805.65 | 467.19 | 5.02 | 1,277.85 | 811.18 | 471.99 | 5.01 | 1,288.18 | 807.27 | 471.76 | 5.01 | 1,284.04 |
| La Grande | 421.11 | 270.35 | 28.15 | 719.60 | 422.57 | 273.25 | 28.15 | 723.97 | 417.30 | 272.22 | 28.15 | 717.67 |
| Medford GTN | 2,048.56 | 1,281.69 | 27.83 | 3,358.08 | 2,069.78 | 1,285.43 | 28.25 | 3,383.46 | 2,073.41 | 1,278.15 | 28.25 | 3,379.82 |
| Medford NWP | 920.37 | 575.83 | 12.50 | 1,508.70 | 929.90 | 577.51 | 12.69 | 1,520.11 | 931.53 | 574.24 | 12.69 | 1,518.47 |
| Roseburg | 683.94 | 564.17 | 49.06 | 1,297.18 | 690.00 | 568.15 | 48.92 | 1,307.07 | 691.51 | 566.72 | 48.61 | 1,306.84 |
| **OR Sub-Total** | **4,879.63** | **3,159.22** | **122.56** | **8,161.41** | **4,923.43** | **3,176.33** | **123.02** | **8,222.78** | **4,921.04** | **3,163.09** | **122.72** | **8,206.84** |
| Wa/Id Both | 8,928.85 | 5,364.38 | 301.80 | 14,595.03 | 9,058.53 | 5,417.66 | 302.34 | 14,778.53 | 9,043.22 | 5,413.42 | 301.73 | 14,758.37 |
| Wa/Id GTN | 1,231.57 | 739.91 | 41.63 | 2,013.11 | 1,249.45 | 747.26 | 41.70 | 2,038.42 | 1,247.34 | 746.68 | 41.62 | 2,035.64 |
| Wa/Id NWP | 5,234.15 | 3,144.64 | 176.92 | 8,555.71 | 5,310.18 | 3,175.88 | 177.23 | 8,663.29 | 5,301.20 | 3,173.40 | 176.88 | 8,651.48 |
| **Wa/Id Sub-Total** | **15,394.57** | **9,248.93** | **520.35** | **25,163.85** | **15,618.16** | **9,340.81** | **521.27** | **25,480.24** | **15,591.76** | **9,333.50** | **520.23** | **25,445.49** |
| **Avg. Case Total** | **20,274.20** | **12,408.15** | **642.91** | **33,325.26** | **20,541.59** | **12,517.14** | **644.29** | **33,703.02** | **20,512.80** | **12,496.59** | **642.95** | **33,652.33** |

| Area | 2015: Residential | 2015: Commercial | 2015: Ind FirmSale | 2015 Total | 2016: Residential | 2016: Commercial | 2016: Ind FirmSale | 2016 Total | 2017: Residential | 2017: Commercial | 2017: Ind FirmSale | 2017 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 816.55 | 477.38 | 5.01 | 1,298.94 | 833.47 | 485.77 | 5.02 | 1,324.25 | 843.93 | 490.33 | 5.01 | 1,339.27 |
| La Grande | 417.78 | 275.94 | 28.15 | 721.86 | 422.36 | 281.08 | 28.15 | 731.58 | 423.91 | 283.31 | 28.15 | 735.37 |
| Medford GTN | 2,110.51 | 1,292.41 | 29.61 | 3,432.54 | 2,165.94 | 1,319.14 | 30.22 | 3,515.30 | 2,206.45 | 1,337.16 | 31.49 | 3,575.10 |
| Medford NWP | 948.20 | 580.65 | 13.30 | 1,542.15 | 973.10 | 592.66 | 13.58 | 1,579.34 | 991.30 | 600.75 | 14.15 | 1,606.20 |
| Roseburg | 703.22 | 571.62 | 48.52 | 1,323.36 | 721.87 | 579.93 | 48.64 | 1,350.44 | 734.27 | 583.49 | 48.49 | 1,366.25 |
| **OR Sub-Total** | **4,996.26** | **3,198.00** | **124.59** | **8,318.86** | **5,116.74** | **3,258.56** | **125.61** | **8,500.90** | **5,199.87** | **3,295.04** | **127.27** | **8,622.18** |
| Wa/Id Both | 9,157.89 | 5,485.91 | 304.59 | 14,948.39 | 9,354.65 | 5,606.53 | 308.51 | 15,269.69 | 9,483.73 | 5,686.81 | 310.08 | 15,480.62 |
| Wa/Id GTN | 1,263.16 | 756.68 | 42.01 | 2,061.85 | 1,290.30 | 773.32 | 42.55 | 2,106.17 | 1,308.10 | 784.39 | 42.77 | 2,135.26 |
| Wa/Id NWP | 5,368.43 | 3,215.89 | 178.55 | 8,762.88 | 5,483.78 | 3,286.61 | 180.85 | 8,951.24 | 5,559.45 | 3,333.68 | 181.77 | 9,074.90 |
| **Wa/Id Sub-Total** | **15,789.48** | **9,458.48** | **525.15** | **25,773.11** | **16,128.73** | **9,666.45** | **531.91** | **26,327.09** | **16,351.28** | **9,804.88** | **534.62** | **26,690.78** |
| **Avg. Case Total** | **20,785.75** | **12,656.48** | **649.74** | **34,091.97** | **21,245.47** | **12,925.01** | **657.52** | **34,828.00** | **21,551.15** | **13,099.92** | **661.89** | **35,312.96** |

| Area | 2018: Residential | 2018: Commercial | 2018: Ind FirmSale | 2018 Total | 2019: Residential | 2019: Commercial | 2019: Ind FirmSale | 2019 Total | 2020: Residential | 2020: Commercial | 2020: Ind FirmSale | 2020 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 856.95 | 496.43 | 5.01 | 1,358.38 | 867.46 | 501.32 | 5.01 | 1,373.79 | 882.29 | 508.52 | 5.02 | 1,395.83 |
| La Grande | 426.91 | 286.42 | 28.15 | 741.47 | 428.73 | 288.73 | 28.15 | 745.61 | 432.66 | 292.55 | 28.15 | 753.35 |
| Medford GTN | 2,255.22 | 1,359.92 | 32.00 | 3,647.14 | 2,297.58 | 1,379.59 | 32.00 | 3,709.17 | 2,350.69 | 1,405.41 | 32.15 | 3,788.25 |
| Medford NWP | 1,013.22 | 610.98 | 14.38 | 1,638.57 | 1,032.24 | 619.82 | 14.38 | 1,666.44 | 1,056.11 | 631.42 | 14.44 | 1,701.97 |
| Roseburg | 748.63 | 588.74 | 48.48 | 1,385.85 | 760.92 | 592.84 | 48.43 | 1,402.20 | 777.29 | 599.76 | 48.55 | 1,425.59 |
| **OR Sub-Total** | **5,300.93** | **3,342.48** | **128.01** | **8,771.42** | **5,386.94** | **3,382.29** | **127.97** | **8,897.20** | **5,499.02** | **3,437.66** | **128.30** | **9,064.99** |
| Wa/Id Both | 9,646.07 | 5,786.03 | 312.58 | 15,744.69 | 9,781.14 | 5,869.87 | 314.64 | 15,965.65 | 9,964.43 | 5,981.80 | 316.85 | 16,263.08 |
| Wa/Id GTN | 1,330.50 | 798.08 | 43.11 | 2,171.69 | 1,349.12 | 809.64 | 43.40 | 2,202.16 | 1,374.41 | 825.08 | 43.70 | 2,243.19 |
| Wa/Id NWP | 5,654.62 | 3,391.85 | 183.24 | 9,229.71 | 5,733.80 | 3,441.00 | 184.45 | 9,359.25 | 5,841.25 | 3,506.62 | 185.74 | 9,533.62 |
| **Wa/Id Sub-Total** | **16,631.19** | **9,975.96** | **538.93** | **27,146.08** | **16,864.06** | **10,120.51** | **542.49** | **27,527.06** | **17,180.08** | **10,313.50** | **546.30** | **28,039.89** |
| **Avg. Case Total** | **21,932.12** | **13,318.44** | **666.94** | **35,917.50** | **22,251.00** | **13,502.80** | **670.46** | **36,424.26** | **22,679.11** | **13,751.16** | **674.61** | **37,104.88** |

| Area | 2021: Residential | 2021: Commercial | 2021: Ind FirmSale | 2021 Total | 2022: Residential | 2022: Commercial | 2022: Ind FirmSale | 2022 Total | 2023: Residential | 2023: Commercial | 2023: Ind FirmSale | 2023 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 890.86 | 512.25 | 5.01 | 1,408.12 | 900.41 | 516.71 | 5.01 | 1,422.13 | 909.64 | 521.04 | 5.01 | 1,435.69 |
| La Grande | 433.47 | 294.10 | 28.15 | 755.72 | 434.91 | 296.13 | 28.15 | 759.18 | 436.21 | 297.95 | 28.15 | 762.30 |
| Medford GTN | 2,386.67 | 1,421.25 | 33.36 | 3,841.28 | 2,425.54 | 1,439.41 | 33.88 | 3,898.83 | 2,464.49 | 1,457.60 | 33.92 | 3,956.00 |
| Medford NWP | 1,072.27 | 638.53 | 14.99 | 1,725.79 | 1,089.74 | 646.69 | 15.22 | 1,751.65 | 1,107.23 | 654.86 | 15.24 | 1,777.34 |
| Roseburg | 787.50 | 602.39 | 59.76 | 1,449.65 | 799.09 | 606.20 | 64.45 | 1,469.73 | 810.49 | 609.83 | 64.38 | 1,484.70 |
| **OR Sub-Total** | **5,570.78** | **3,468.52** | **141.26** | **9,180.56** | **5,649.69** | **3,505.14** | **146.70** | **9,301.52** | **5,728.05** | **3,541.28** | **146.69** | **9,416.03** |
| Wa/Id Both | 10,076.87 | 6,050.44 | 318.95 | 16,446.27 | 10,202.08 | 6,127.43 | 320.25 | 16,649.75 | 10,325.78 | 6,203.40 | 321.84 | 16,851.02 |
| Wa/Id GTN | 1,389.92 | 834.55 | 43.99 | 2,268.46 | 1,407.19 | 845.17 | 44.17 | 2,296.53 | 1,424.25 | 855.65 | 44.39 | 2,324.29 |
| Wa/Id NWP | 5,907.17 | 3,546.86 | 186.97 | 9,641.01 | 5,980.57 | 3,592.00 | 187.73 | 9,760.30 | 6,053.09 | 3,636.54 | 188.66 | 9,878.29 |
| **Wa/Id Sub-Total** | **17,373.97** | **10,431.85** | **549.92** | **28,355.73** | **17,589.84** | **10,564.59** | **552.15** | **28,706.58** | **17,803.12** | **10,695.58** | **554.89** | **29,053.60** |
| **Avg. Case Total** | **22,944.74** | **13,900.37** | **691.18** | **37,536.29** | **23,239.52** | **14,069.73** | **698.85** | **38,008.11** | **23,531.18** | **14,236.87** | **701.58** | **38,469.63** |

# APPENDIX 3.10 II DETAILED DEMAND DATA AVERAGE MIX

| Area | 2024: Residential | 2024: Commercial | 2024: Ind FirmSale | 2024 Total | 2025: Residential | 2025: Commercial | 2025: Ind FirmSale | 2025 Total | 2026: Residential | 2026: Commercial | 2026: Ind FirmSale | 2026 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 923.71 | 527.89 | 5.02 | 1,456.62 | 929.68 | 530.47 | 5.01 | 1,465.16 | 940.31 | 535.49 | 5.01 | 1,480.81 |
| La Grande | 439.77 | 301.53 | 28.15 | 769.45 | 439.47 | 302.16 | 28.15 | 769.77 | 441.36 | 304.41 | 28.15 | 773.92 |
| Medford GTN | 2,516.41 | 1,482.86 | 35.35 | 4,034.62 | 2,546.80 | 1,496.18 | 35.75 | 4,078.73 | 2,589.67 | 1,516.32 | 35.80 | 4,141.78 |
| Medford NWP | 1,130.56 | 666.21 | 15.88 | 1,812.65 | 1,144.21 | 672.19 | 16.06 | 1,832.47 | 1,163.48 | 681.24 | 16.08 | 1,860.80 |
| Roseburg | 826.51 | 616.51 | 64.52 | 1,507.53 | 834.94 | 618.18 | 64.26 | 1,517.39 | 847.89 | 622.73 | 64.22 | 1,534.84 |
| **OR Sub-Total** | **5,836.96** | **3,595.00** | **148.91** | **9,580.87** | **5,895.10** | **3,619.18** | **149.23** | **9,663.52** | **5,982.71** | **3,660.19** | **149.26** | **9,792.16** |
| Wa/Id Both | 10,504.97 | 6,311.23 | 323.97 | 17,140.18 | 10,591.22 | 6,364.58 | 326.60 | 17,282.39 | 10,730.68 | 6,448.70 | 328.43 | 17,507.80 |
| Wa/Id GTN | 1,448.97 | 870.52 | 44.69 | 2,364.17 | 1,460.86 | 877.88 | 45.05 | 2,383.79 | 1,480.10 | 889.48 | 45.30 | 2,414.88 |
| Wa/Id NWP | 6,158.14 | 3,699.75 | 189.91 | 10,047.81 | 6,208.71 | 3,731.03 | 191.45 | 10,131.19 | 6,290.46 | 3,780.34 | 192.53 | 10,263.33 |
| **Wa/Id Sub-Total** | **18,112.09** | **10,881.51** | **558.57** | **29,552.17** | **18,260.79** | **10,973.49** | **563.10** | **29,797.37** | **18,501.24** | **11,118.52** | **566.26** | **30,186.01** |
| **Avg. Case Total** | **23,949.04** | **14,476.51** | **707.48** | **39,133.04** | **24,155.89** | **14,592.67** | **712.33** | **39,460.90** | **24,483.95** | **14,778.71** | **715.51** | **39,978.17** |

| Area | 2027: Residential | 2027: Commercial | 2027: Ind FirmSale | 2027 Total | 2028: Residential | 2028: Commercial | 2028: Ind FirmSale | 2028 Total | 2029: Residential | 2029: Commercial | 2029: Ind FirmSale | 2029 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 949.16 | 539.65 | 5.01 | 1,493.82 | 962.67 | 546.27 | 5.02 | 1,513.95 | 967.90 | 548.52 | 5.01 | 1,521.43 |
| La Grande | 442.58 | 306.27 | 28.15 | 776.99 | 446.17 | 309.79 | 28.15 | 784.11 | 446.11 | 310.74 | 28.15 | 784.99 |
| Medford GTN | 2,626.91 | 1,533.81 | 37.11 | 4,197.84 | 2,675.27 | 1,557.42 | 37.79 | 4,270.49 | 2,699.94 | 1,568.18 | 37.67 | 4,305.79 |
| Medford NWP | 1,180.21 | 689.10 | 16.67 | 1,885.99 | 1,201.93 | 699.71 | 16.98 | 1,918.63 | 1,213.02 | 704.54 | 16.93 | 1,934.49 |
| Roseburg | 859.71 | 626.58 | 64.15 | 1,550.44 | 873.47 | 632.33 | 64.28 | 1,570.08 | 878.19 | 632.62 | 64.03 | 1,574.84 |
| **OR Sub-Total** | **6,058.58** | **3,695.41** | **151.08** | **9,905.07** | **6,159.51** | **3,745.53** | **152.22** | **10,057.26** | **6,205.16** | **3,764.59** | **151.79** | **10,121.54** |
| Wa/Id Both | 10,850.16 | 6,521.66 | 329.97 | 17,701.78 | 11,023.98 | 6,626.52 | 332.05 | 17,982.55 | 11,104.69 | 6,676.35 | 333.68 | 18,114.71 |
| Wa/Id GTN | 1,496.58 | 899.55 | 45.51 | 2,441.64 | 1,520.56 | 914.01 | 45.80 | 2,480.37 | 1,531.69 | 920.88 | 46.02 | 2,498.60 |
| Wa/Id NWP | 6,360.51 | 3,823.12 | 193.43 | 10,377.06 | 6,462.41 | 3,884.59 | 194.65 | 10,541.65 | 6,509.72 | 3,913.80 | 195.61 | 10,619.13 |
| **Wa/Id Sub-Total** | **18,707.25** | **11,244.32** | **568.91** | **30,520.48** | **19,006.95** | **11,425.12** | **572.51** | **31,004.57** | **19,146.10** | **11,511.04** | **575.31** | **31,232.44** |
| **Avg. Case Total** | **24,765.82** | **14,939.73** | **720.00** | **40,425.55** | **25,166.46** | **15,170.65** | **724.72** | **41,061.83** | **25,351.26** | **15,275.63** | **727.09** | **41,353.98** |

| Area | 2030: Residential | 2030: Commercial | 2030: Ind FirmSale | 2030 Total | 2031: Residential | 2031: Commercial | 2031: Ind FirmSale | 2031 Total |
|---|---|---|---|---|---|---|---|---|
| Klam Falls | 976.92 | 552.77 | 5.01 | 1,534.70 | 985.88 | 557.06 | 5.01 | 1,547.94 |
| La Grande | 447.87 | 313.04 | 28.15 | 789.06 | 449.61 | 315.20 | 28.15 | 792.95 |
| Medford GTN | 2,734.96 | 1,584.77 | 38.99 | 4,358.71 | 2,769.46 | 1,601.05 | 39.50 | 4,410.01 |
| Medford NWP | 1,228.75 | 712.00 | 17.52 | 1,958.26 | 1,244.25 | 719.31 | 17.75 | 1,981.31 |
| Roseburg | 886.70 | 635.36 | 75.26 | 1,597.32 | 895.18 | 638.13 | 79.90 | 1,613.21 |
| **OR Sub-Total** | **6,275.21** | **3,797.93** | **164.91** | **10,238.05** | **6,344.37** | **3,830.75** | **170.30** | **10,345.42** |
| Wa/Id Both | 11,229.90 | 6,751.56 | 335.01 | 18,316.48 | 11,354.47 | 6,826.19 | 337.65 | 18,518.31 |
| Wa/Id GTN | 1,548.96 | 931.26 | 46.21 | 2,526.43 | 1,566.14 | 941.55 | 46.57 | 2,554.27 |
| Wa/Id NWP | 6,583.13 | 3,957.90 | 196.39 | 10,737.42 | 6,656.16 | 4,001.65 | 197.93 | 10,855.74 |
| **Wa/Id Sub-Total** | **19,361.99** | **11,640.72** | **577.61** | **31,580.33** | **19,576.77** | **11,769.39** | **582.16** | **31,928.32** |
| **Avg. Case Total** | **25,637.20** | **15,438.65** | **742.52** | **41,818.38** | **25,921.15** | **15,600.14** | **752.46** | **42,273.74** |

# APPENDIX 3.10 ❚❚ DETAILED DEMAND DATA COLDEST IN 20 YEARS

| Area | 2012: Residential | 2012: Commercial | 2012: Ind FirmSale | 2012 Total | 2013: Residential | 2013: Commercial | 2013: Ind FirmSale | 2013 Total | 2014: Residential | 2014: Commercial | 2014: Ind FirmSale | 2014 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 827.99 | 477.61 | 5.02 | 1,310.62 | 833.75 | 482.56 | 5.01 | 1,321.32 | 821.08 | 478.23 | 5.01 | 1,304.32 |
| La Grande | 436.90 | 280.81 | 28.15 | 745.86 | 438.49 | 283.86 | 28.15 | 750.50 | 428.75 | 280.00 | 28.15 | 736.89 |
| Medford GTN | 2,105.83 | 1,310.93 | 27.83 | 3,444.58 | 2,127.79 | 1,314.84 | 28.25 | 3,470.88 | 2,110.43 | 1,296.73 | 28.25 | 3,435.42 |
| Medford NWP | 946.10 | 588.97 | 12.50 | 1,547.57 | 955.97 | 590.72 | 12.69 | 1,559.38 | 948.16 | 582.59 | 12.69 | 1,543.45 |
| Roseburg | 704.92 | 578.05 | 49.41 | 1,332.38 | 711.22 | 582.18 | 49.26 | 1,342.66 | 706.00 | 576.19 | 48.80 | 1,330.99 |
| **OR Sub-Total** | **5,021.74** | **3,236.36** | **122.90** | **8,381.01** | **5,067.22** | **3,254.16** | **123.37** | **8,444.74** | **5,014.41** | **3,213.74** | **122.90** | **8,351.06** |
| WA/ID Both | 9,181.27 | 5,506.37 | 305.87 | 14,993.51 | 9,315.65 | 5,561.50 | 306.42 | 15,183.57 | 9,204.35 | 5,503.95 | 304.05 | 15,012.34 |
| WA/ID GTN | 1,266.38 | 759.50 | 42.19 | 2,068.07 | 1,284.92 | 767.10 | 42.26 | 2,094.29 | 1,269.57 | 759.17 | 41.94 | 2,070.67 |
| WA/ID NWP | 5,382.13 | 3,227.88 | 179.30 | 8,789.31 | 5,460.90 | 3,260.20 | 179.62 | 8,900.73 | 5,395.66 | 3,226.47 | 178.23 | 8,800.36 |
| **WA/ID Sub-Total** | **15,829.78** | **9,493.75** | **527.36** | **25,850.89** | **16,061.48** | **9,588.81** | **528.31** | **26,178.59** | **15,869.57** | **9,489.58** | **524.22** | **25,883.37** |
| **Alt. Plan Case Total** | **20,851.52** | **12,730.11** | **650.26** | **34,231.90** | **21,128.70** | **12,842.96** | **651.67** | **34,623.33** | **20,883.98** | **12,703.33** | **647.12** | **34,234.43** |

| Area | 2015: Residential | 2015: Commercial | 2015: Ind FirmSale | 2015 Total | 2016: Residential | 2016: Commercial | 2016: Ind FirmSale | 2016 Total | 2017: Residential | 2017: Commercial | 2017: Ind FirmSale | 2017 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 830.08 | 483.73 | 5.01 | 1,318.81 | 845.54 | 491.42 | 5.02 | 1,341.98 | 852.73 | 494.46 | 5.01 | 1,352.20 |
| La Grande | 429.01 | 283.67 | 28.15 | 740.83 | 432.86 | 288.38 | 28.15 | 749.39 | 432.86 | 289.61 | 28.15 | 750.61 |
| Medford GTN | 2,147.14 | 1,310.60 | 29.61 | 3,487.35 | 2,199.25 | 1,335.59 | 30.22 | 3,565.06 | 2,231.99 | 1,349.71 | 31.49 | 3,613.19 |
| Medford NWP | 964.66 | 588.82 | 13.30 | 1,566.78 | 988.07 | 600.05 | 13.58 | 1,601.69 | 1,002.78 | 606.39 | 14.15 | 1,623.32 |
| Roseburg | 717.60 | 580.94 | 48.70 | 1,347.24 | 735.25 | 588.49 | 48.79 | 1,372.53 | 745.23 | 590.41 | 48.58 | 1,384.21 |
| **OR Sub-Total** | **5,088.49** | **3,247.76** | **124.77** | **8,461.01** | **5,200.96** | **3,303.93** | **125.76** | **8,630.65** | **5,265.59** | **3,330.58** | **127.37** | **8,723.53** |
| WA/ID Both | 9,316.43 | 5,574.96 | 306.82 | 15,198.21 | 9,497.34 | 5,686.87 | 310.44 | 15,494.65 | 9,590.64 | 5,747.31 | 311.35 | 15,649.29 |
| WA/ID GTN | 1,285.03 | 768.96 | 42.32 | 2,096.31 | 1,309.98 | 784.40 | 42.82 | 2,137.20 | 1,322.85 | 792.73 | 42.94 | 2,158.53 |
| WA/ID NWP | 5,461.36 | 3,268.10 | 179.86 | 8,909.33 | 5,567.42 | 3,333.71 | 181.98 | 9,083.11 | 5,622.12 | 3,369.14 | 182.52 | 9,173.77 |
| **WA/ID Sub-Total** | **16,062.81** | **9,612.02** | **529.01** | **26,203.84** | **16,374.74** | **9,804.98** | **535.24** | **26,714.96** | **16,535.60** | **9,909.18** | **536.81** | **26,981.59** |
| **Alt. Plan Case Total** | **21,151.30** | **12,859.78** | **653.77** | **34,664.86** | **21,575.70** | **13,108.91** | **661.00** | **35,345.61** | **21,801.19** | **13,239.76** | **664.18** | **35,705.13** |

| Area | 2018: Residential | 2018: Commercial | 2018: Ind FirmSale | 2018 Total | 2019: Residential | 2019: Commercial | 2019: Ind FirmSale | 2019 Total | 2020: Residential | 2020: Commercial | 2020: Ind FirmSale | 2020 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 862.64 | 499.11 | 5.01 | 1,366.76 | 871.92 | 503.42 | 5.01 | 1,380.34 | 885.96 | 510.27 | 5.02 | 1,401.25 |
| La Grande | 434.39 | 291.76 | 28.15 | 754.30 | 435.63 | 293.70 | 28.15 | 757.48 | 439.20 | 297.30 | 28.15 | 764.64 |
| Medford GTN | 2,273.29 | 1,368.77 | 32.00 | 3,674.06 | 2,312.71 | 1,386.97 | 32.00 | 3,731.69 | 2,364.03 | 1,411.90 | 32.15 | 3,808.07 |
| Medford NWP | 1,021.33 | 614.95 | 14.38 | 1,650.67 | 1,039.05 | 623.13 | 14.38 | 1,676.56 | 1,062.10 | 634.33 | 14.44 | 1,710.87 |
| Roseburg | 757.25 | 594.11 | 48.52 | 1,399.88 | 768.63 | 597.59 | 48.46 | 1,414.67 | 784.45 | 604.12 | 48.55 | 1,437.12 |
| **OR Sub-Total** | **5,348.90** | **3,368.70** | **128.06** | **8,845.67** | **5,427.94** | **3,404.82** | **127.99** | **8,960.75** | **5,535.74** | **3,457.91** | **128.31** | **9,121.96** |
| WA/ID Both | 9,719.02 | 5,827.62 | 313.23 | 15,859.87 | 9,840.50 | 5,903.97 | 315.05 | 16,059.51 | 10,015.43 | 6,011.22 | 317.11 | 16,343.76 |
| WA/ID GTN | 1,340.56 | 803.81 | 43.20 | 2,187.57 | 1,357.31 | 814.34 | 43.45 | 2,215.11 | 1,381.44 | 829.14 | 43.74 | 2,254.32 |
| WA/ID NWP | 5,697.38 | 3,416.23 | 183.62 | 9,297.23 | 5,768.60 | 3,460.99 | 184.68 | 9,414.27 | 5,871.15 | 3,523.87 | 185.89 | 9,580.91 |
| **WA/ID Sub-Total** | **16,756.96** | **10,047.66** | **540.05** | **27,344.67** | **16,966.41** | **10,179.30** | **543.18** | **27,688.90** | **17,268.03** | **10,364.22** | **546.73** | **28,178.99** |
| **Alt. Plan Case Total** | **22,105.86** | **13,416.37** | **668.11** | **36,190.34** | **22,394.35** | **13,584.12** | **671.17** | **36,649.64** | **22,803.77** | **13,822.13** | **675.05** | **37,300.94** |

| Area | 2021: Residential | 2021: Commercial | 2021: Ind FirmSale | 2021 Total | 2022: Residential | 2022: Commercial | 2022: Ind FirmSale | 2022 Total | 2023: Residential | 2023: Commercial | 2023: Ind FirmSale | 2023 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 895.60 | 514.47 | 5.01 | 1,415.08 | 907.43 | 519.97 | 5.01 | 1,432.40 | 920.40 | 525.99 | 5.01 | 1,451.40 |
| La Grande | 440.51 | 299.20 | 28.15 | 767.86 | 442.98 | 301.96 | 28.15 | 773.08 | 445.94 | 304.94 | 28.15 | 779.03 |
| Medford GTN | 2,402.81 | 1,429.06 | 33.36 | 3,865.23 | 2,447.60 | 1,450.01 | 33.88 | 3,931.49 | 2,496.23 | 1,472.77 | 33.92 | 4,002.93 |
| Medford NWP | 1,079.52 | 642.04 | 14.99 | 1,736.55 | 1,099.65 | 651.45 | 15.22 | 1,766.32 | 1,121.49 | 661.68 | 15.24 | 1,798.42 |
| Roseburg | 795.62 | 607.28 | 59.76 | 1,462.66 | 809.10 | 612.20 | 64.52 | 1,485.82 | 823.57 | 617.63 | 64.52 | 1,505.73 |
| **OR Sub-Total** | **5,614.07** | **3,492.05** | **141.27** | **9,247.39** | **5,706.75** | **3,535.58** | **146.78** | **9,389.11** | **5,807.64** | **3,583.01** | **146.84** | **9,537.49** |
| WA/ID Both | 10,139.86 | 6,086.54 | 319.39 | 16,545.79 | 10,290.31 | 6,177.78 | 321.11 | 16,789.19 | 10,456.19 | 6,277.08 | 323.38 | 17,056.65 |
| WA/ID GTN | 1,398.60 | 839.53 | 44.05 | 2,282.19 | 1,419.36 | 852.11 | 44.29 | 2,315.76 | 1,442.24 | 865.81 | 44.60 | 2,352.65 |
| WA/ID NWP | 5,944.10 | 3,568.02 | 187.23 | 9,699.35 | 6,032.30 | 3,621.51 | 188.24 | 9,842.05 | 6,129.54 | 3,679.73 | 189.57 | 9,998.84 |
| **WA/ID Sub-Total** | **17,482.56** | **10,494.09** | **550.68** | **28,527.32** | **17,741.96** | **10,651.40** | **553.64** | **28,947.00** | **18,027.97** | **10,822.62** | **557.56** | **29,408.15** |
| **Alt. Plan Case Total** | **23,096.63** | **13,986.14** | **691.94** | **37,774.71** | **23,448.71** | **14,186.98** | **700.41** | **38,336.11** | **23,835.61** | **14,405.63** | **704.40** | **38,945.64** |

# APPENDIX 3.10 II DETAILED DEMAND DATA COLDEST IN 20 YEARS

| Area | 2024: Residential | 2024: Commercial | 2024: Ind FirmSale | 2024 Total | 2025: Residential | 2025: Commercial | 2025: Ind FirmSale | 2025 Total | 2026: Residential | 2026: Commercial | 2026: Ind FirmSale | 2026 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 935.29 | 533.19 | 5.02 | 1,473.50 | 944.61 | 537.27 | 5.01 | 1,486.90 | 957.14 | 543.14 | 5.01 | 1,505.28 |
| La Grande | 449.85 | 308.78 | 28.15 | 786.77 | 451.01 | 310.44 | 28.15 | 789.59 | 453.70 | 313.27 | 28.15 | 795.12 |
| Medford GTN | 2,550.45 | 1,499.07 | 35.35 | 4,084.87 | 2,589.70 | 1,516.51 | 35.75 | 4,141.97 | 2,637.76 | 1,539.02 | 35.80 | 4,212.58 |
| Medford NWP | 1,145.85 | 673.49 | 15.88 | 1,835.23 | 1,163.49 | 681.33 | 16.06 | 1,860.88 | 1,185.08 | 691.44 | 16.08 | 1,892.61 |
| Roseburg | 840.33 | 624.68 | 64.68 | 1,529.70 | 851.56 | 627.95 | 64.49 | 1,544.00 | 866.14 | 633.37 | 64.48 | 1,563.99 |
| **OR Sub-Total** | **5,921.77** | **3,639.22** | **149.07** | **9,710.06** | **6,000.37** | **3,673.51** | **149.46** | **9,823.34** | **6,099.83** | **3,720.24** | **149.51** | **9,969.58** |
| WA/ID Both | 10,644.70 | 6,390.16 | 325.65 | 17,360.51 | 10,768.97 | 6,464.59 | 328.88 | 17,562.44 | 10,929.98 | 6,560.73 | 331.05 | 17,821.76 |
| WA/ID GTN | 1,468.24 | 881.41 | 44.92 | 2,394.56 | 1,485.38 | 891.67 | 45.36 | 2,422.42 | 1,507.59 | 904.94 | 45.66 | 2,458.19 |
| WA/ID NWP | 6,240.05 | 3,746.02 | 190.90 | 10,176.97 | 6,312.91 | 3,789.66 | 192.80 | 10,295.36 | 6,407.30 | 3,846.02 | 194.06 | 10,447.38 |
| **WA/ID Sub-Total** | **18,352.99** | **11,017.58** | **561.47** | **29,932.04** | **18,567.25** | **11,145.93** | **567.04** | **30,280.22** | **18,844.87** | **11,311.69** | **570.77** | **30,727.33** |
| **Alt. Plan Case Total** | **24,274.76** | **14,656.80** | **710.54** | **39,642.11** | **24,567.62** | **14,819.44** | **716.50** | **40,103.56** | **24,944.69** | **15,031.93** | **720.29** | **40,696.91** |

| Area | 2027: Residential | 2027: Commercial | 2027: Ind FirmSale | 2027 Total | 2028: Residential | 2028: Commercial | 2028: Ind FirmSale | 2028 Total | 2029: Residential | 2029: Commercial | 2029: Ind FirmSale | 2029 Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Klam Falls | 967.65 | 548.02 | 5.01 | 1,520.68 | 984.35 | 556.05 | 5.02 | 1,545.42 | 992.70 | 559.67 | 5.01 | 1,557.37 |
| La Grande | 455.60 | 315.63 | 28.15 | 799.37 | 460.54 | 320.12 | 28.15 | 808.81 | 461.78 | 322.02 | 28.15 | 811.94 |
| Medford GTN | 2,679.59 | 1,558.59 | 37.11 | 4,275.29 | 2,736.56 | 1,586.15 | 37.79 | 4,360.50 | 2,769.65 | 1,600.74 | 37.67 | 4,408.07 |
| Medford NWP | 1,203.87 | 700.24 | 16.67 | 1,920.78 | 1,229.47 | 712.62 | 16.98 | 1,959.07 | 1,244.34 | 719.17 | 16.93 | 1,980.44 |
| Roseburg | 879.43 | 637.98 | 64.43 | 1,581.84 | 895.87 | 645.21 | 64.62 | 1,605.70 | 903.17 | 646.89 | 64.43 | 1,614.49 |
| **OR Sub-Total** | **6,186.15** | **3,760.46** | **151.37** | **10,097.98** | **6,306.79** | **3,820.14** | **152.56** | **10,279.49** | **6,371.64** | **3,848.49** | **152.18** | **10,372.30** |
| WA/ID Both | 11,068.80 | 6,644.27 | 332.87 | 18,045.94 | 11,278.93 | 6,769.32 | 335.50 | 18,383.76 | 11,394.96 | 6,838.90 | 337.67 | 18,571.53 |
| WA/ID GTN | 1,526.74 | 916.46 | 45.91 | 2,489.11 | 1,555.72 | 933.71 | 46.28 | 2,535.70 | 1,571.73 | 943.30 | 46.57 | 2,561.61 |
| WA/ID NWP | 6,488.68 | 3,895.00 | 195.13 | 10,578.81 | 6,611.87 | 3,968.31 | 196.68 | 10,776.85 | 6,679.89 | 4,009.10 | 197.94 | 10,886.93 |
| **WA/ID Sub-Total** | **19,084.22** | **11,455.73** | **573.91** | **31,113.86** | **19,446.52** | **11,671.33** | **578.45** | **31,696.31** | **19,646.58** | **11,791.31** | **582.18** | **32,020.07** |
| **Alt. Plan Case Total** | **25,270.37** | **15,216.19** | **725.28** | **41,211.84** | **25,753.32** | **15,491.48** | **731.01** | **41,975.80** | **26,018.22** | **15,639.80** | **734.36** | **42,392.38** |

| Area | 2030: Residential | 2030: Commercial | 2030: Ind FirmSale | 2030 Total | 2031: Residential | 2031: Commercial | 2031: Ind FirmSale | 2031 Total |
|---|---|---|---|---|---|---|---|---|
| Klam Falls | 1,004.86 | 565.31 | 5.01 | 1,575.18 | 1,017.02 | 570.99 | 5.01 | 1,593.02 |
| La Grande | 464.85 | 325.27 | 28.15 | 818.26 | 467.90 | 328.39 | 28.15 | 824.44 |
| Medford GTN | 2,813.22 | 1,621.21 | 38.99 | 4,473.41 | 2,856.45 | 1,641.44 | 39.50 | 4,537.39 |
| Medford NWP | 1,263.91 | 728.37 | 17.52 | 2,009.79 | 1,283.33 | 737.46 | 17.75 | 2,038.54 |
| Roseburg | 914.27 | 651.04 | 75.75 | 1,641.06 | 925.41 | 655.23 | 80.52 | 1,661.15 |
| **OR Sub-Total** | **6,461.11** | **3,891.19** | **165.40** | **10,517.70** | **6,550.11** | **3,933.50** | **170.92** | **10,654.53** |
| WA/ID Both | 11,556.41 | 6,934.16 | 339.54 | 18,830.12 | 11,717.81 | 7,029.24 | 342.72 | 19,089.77 |
| WA/ID GTN | 1,594.00 | 956.44 | 46.83 | 2,597.27 | 1,616.26 | 969.56 | 47.27 | 2,633.09 |
| WA/ID NWP | 6,774.54 | 4,064.94 | 199.04 | 11,038.52 | 6,869.16 | 4,120.68 | 200.91 | 11,190.74 |
| **WA/ID Sub-Total** | **19,924.94** | **11,955.55** | **585.42** | **32,465.91** | **20,203.22** | **12,119.47** | **590.90** | **32,913.60** |
| **Alt. Plan Case Total** | **26,386.05** | **15,846.74** | **750.82** | **42,983.62** | **26,753.33** | **16,052.98** | **761.83** | **43,568.14** |

# APPENDIX 4.1 || AVISTA GAS CPA REPORT 4/30/2012

# AVISTA UTILITIES
# GAS CONSERVATION
# POTENTIAL ASSESSMENT

April 17, 2012
Revised April 30, 2012

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An EnerNOC Company

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# EXECUTIVE SUMMARY

## Background

Avista Utilities (Avista) has contracted with Global Energy Partners (Global) to conduct a conservation potential assessment (CPA) to quantify the amount, the timing, and the cost of natural gas energy conservation resources available within the Avista service territory. The purpose of this study is to establish cost-effective and achievable energy conservation resources for the 2013–2032 period to support development of Avista's 2013 gas Integrated Resource Plan (IRP).

Key objectives for the study include:

- Determine the conservation potential for natural gas for Washington, Idaho, and Oregon, for the period 2013–2032, based on Avista's service territory characteristics.
- Develop energy conservation measure (ECM) data sets for each market sector and each appropriate market segment.
- Categorize the potential by market sector, segment, building type, and ECM.
- Using parameters provided by Avista, calculate the Total Resource Cost (TRC), and measure levelized cost of the ECMs.
- Provide supply curves of achievable potential.

## Definitions of Potential

In this study, the conservation potential estimates represent gross savings[1] developed into three types of potential: technical potential, economic potential, and achievable potential. Technical and economic potential are both theoretical limits to efficiency savings. Achievable potential embodies a set of assumptions about the decisions consumers make regarding the efficiency of the equipment they purchase, the maintenance activities they undertake, the controls they use for energy-consuming equipment, and the elements of building construction. These levels are described below.

***Technical potential*** is defined as the theoretical upper limit of conservation potential. It assumes that customers adopt all feasible measures regardless of cost. At the time of equipment failure, customers replace equipment with the most efficient option available. In new construction, customers and developers also choose the most efficient equipment option. Examples of measures that make up technical potential in the residential sector include:

- High efficiency furnaces and boilers
- High efficiency water heaters
- High efficiency clothes dryers

Technical potential also assumes the adoption of every available non-equipment measure, where applicable. For example, it includes installation of high-efficiency windows in all new construction opportunities and furnace maintenance in all existing buildings with furnace systems. The retrofit measures are phased in over a number of years, which is longer for higher-cost measures.

***Economic potential*** represents the adoption of all ***cost-effective*** conservation measures. In this analysis, the total resources cost (TRC) test, which compares lifetime energy and capacity benefits to the incremental cost of the measure, is applied. Economic potential assumes that

[1] Savings in "gross" terms instead of "net" terms means that the baseline forecast does not include naturally occurring efficiency. In other words, the baseline assumes that energy efficiency levels remain fixed as they are today. This rule holds true except in cases where future codes and standards were on the books before November 2011, e.g. the effects of the upcoming furnace and water heater standards.

customers purchase the most cost-effective option at the time of equipment failure and also adopt every other cost-effective and applicable measure.

***Achievable potential*** takes into account market maturity, customer preferences for energy-efficient technologies, and expected program participation. Achievable potential establishes a realistic target for the conservation savings that a utility can hope to achieve through its programs. It is determined by applying a series of annual factors to the economic potential for each ECM. These factors represent the ramp rates at which technologies will penetrate the market and were based upon the Northwest Power and Conservation Council Sixth Plan (NWPCC) ramp rates. Although Avista is not required to use the Sixth Plan ramp rates for its gas CPA, the project team chose to use those ramp rates for consistency with the Avista 2011 electricity CPA. Also, these ramp rates have been widely vetted and are accepted by regional stakeholders. Details regarding the ramp rate development appear in Appendix E.

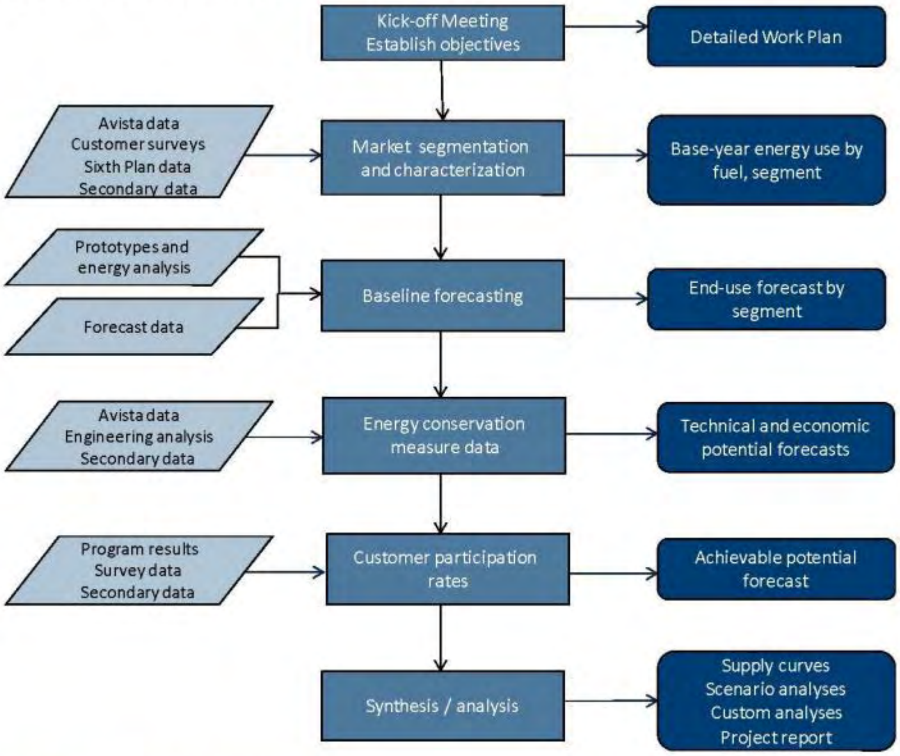
## Analysis Approach

To perform the conservation analysis, Global used a bottom-up analysis approach as shown in Figure ES-1 and outlined below.

1. Met by phone with Avista staff to refine the objectives that were identified in the Avista RFP. This resulted in a work plan for the study.
2. Performed a market characterization to describe sector-level natural gas use for the residential, commercial, and industrial sectors for the base year, 2010. This included using utility data and secondary data from sources such as the American Community Survey (ACS), and the Energy Information Administration (EIA).
3. Utilized secondary sources including Northwest Energy Efficiency Alliance (NEAA) data and market reports to understand how customers in the Avista service territory currently use gas. Combining this information with the market characterization, we developed energy market profiles that describe energy use by sector, segment, and end use for 2010.
4. Developed a baseline gas forecast by sector, segment, and end use for 2013 through 2032.
5. Identified and analyzed energy conservations measures appropriate for the Avista service territory.
6. Estimated three levels of conservation potential, *Technical, Economic,* and *Achievable*.

The results from these steps are summarized below, with details provided in the body of the report.

***Figure ES-1 Overview of Analysis Approach***




## Market Characterization

Avista Utilities, headquartered in Spokane, Washington is an investor-owned utility with annual revenues of more than $1.3 billion. Avista provides electric and natural gas service to about 481,000 customers in a service territory of more than 30,000 square miles. Avista uses a mix of hydro, natural gas, coal and biomass generation delivered over 2,100 miles of transmission line, 17,000 miles of distribution line, and 6,100 miles of natural gas distribution mains. Avista currently operates a portfolio of electric and natural gas conservation programs in Washington, Idaho, and Oregon for residential, low-income, and non-residential customers that is funded by a non-bypassable systems benefits charge.

Total natural gas use in 2010 for the residential, commercial, and industrial rate classes included in this potential assessment was 315,905,627 therms.[2] Table ES-1 shows detail by state and sector, including the rate classes included in each sector, number of meters, sales, and average use per meter. The largest sector is residential, accounting for 59.8% of system sales, followed by large commercial with 22.5% and small commercial with 16.0%. The gas transportation rate classes, which include relatively large commercial and industrial facilities, were excluded from the CPA analysis. Therefore, most of the remaining industrial customers, which represent only 1.6% of sales included in this CPA, are relatively small in terms of their gas usage per meter.

[2] Energy usage as measured "at-the-meter," i.e., does not include pipeline losses.

***Table ES-1 2010 Gas Sales by State and Sector***

| All States Sector | Rate Class | Number of Meters | 2010 Sales (1000 thm) | % of System Sales | Average Use per Meter (thm) |
|---|---|---|---|---|---|
| Residential | N/A | 282,418 | 188,894 | 59.8% | 669 |
| Small Commercial | N/A | 30,317 | 50,693 | 16.0% | 1,672 |
| Large Commercial | N/A | 3,419 | 71,176 | 22.5% | 20,818 |
| Industrial | N/A | 253 | 5,141 | 1.6% | 20,322 |
| **Total** | | **316,407** | **315,906** | **100.0%** | **998** |
| **Washington Sector** | **Rate Class** | **Number of Meters** | **2010 Sales (1000 thm)** | **% of WA Sales** | **Average Use per Meter (thm)** |
| Residential | 101 | 132,657 | 97,372 | 58.3% | 734 |
| Small Commercial | 101 | 11,906 | 16,706 | 10.0% | 1,403 |
| Large Commercial | 111, 112, 121, 122, 132 | 2,292 | 49,808 | 29.8% | 21,731 |
| Industrial | 101, 111, 121, 122 | 132 | 3,135 | 1.9% | 23,752 |
| **Washington total** | | **146,987** | **167,021** | **100.0%** | **1,136** |
| **Idaho Sector** | **Rate Class** | **Number of Meters** | **2010 Sales (1000 thm)** | **% of ID Sales** | **Average Use per Meter (thm)** |
| Residential | 101 | 65,648 | 44,084 | 61.2% | 672 |
| Small Commercial | 101 | 7,398 | 8,432 | 11.7% | 1,140 |
| Large Commercial | 111, 132 | 1,050 | 17,820 | 24.7% | 16,971 |
| Industrial | 101, 111, 112 | 99 | 1,681 | 2.3% | 16,978 |
| **Idaho total** | | **74,195** | **72,017** | **100.0%** | **971** |
| **Oregon Sector** | **Rate Class** | **Number of Meters** | **2010 Sales (1000 thm)** | **% of OR Sales** | **Average Use per Meter (thm)** |
| Residential | 410 | 84,114 | 47,438 | 61.7% | 564 |
| Small Commercial | 420 | 11,013 | 25,556 | 33.2% | 2,320 |
| Large Commercial | 424 | 77 | 3,548 | 4.6% | 46,081 |
| Industrial | 420, 424 | 22 | 325 | 0.4% | 14,787 |
| **Oregon total** | | **95,226** | **76,867** | **100.0%** | **807** |

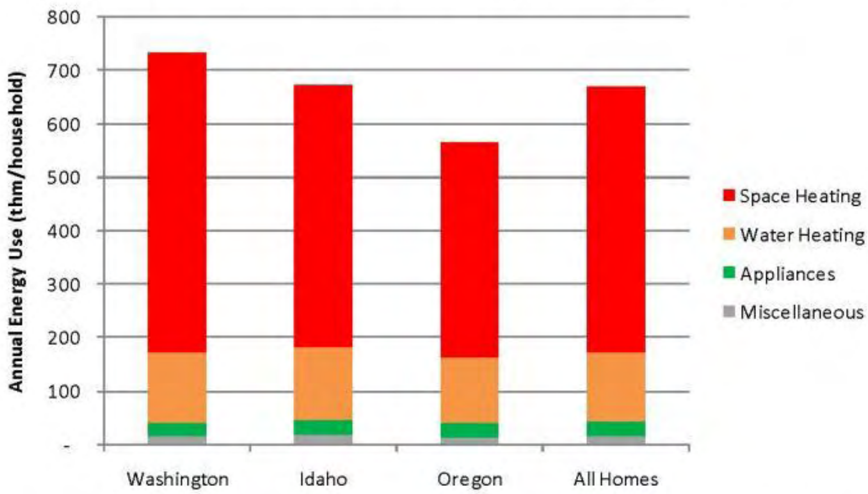
Total residential gas use in 2010 was 188.9 million therms. Customer information for each segment is shown in Table ES-2. System wide, the single-family segment consumed 84% of total residential sector gas in 2010 as a result of having the largest number of customers and the highest intensity.

***Table ES-2 Residential Sector Gas Usage and Intensity by State and Segment Type***

| All States Residential Segment | Number of Meters | 2010 Sales (1000 thm) | % of System Res. Sales | Intensity (thm/HH) |
|---|---|---|---|---|
| Single Family | 222,934 | 157,830 | 84% | 708 |
| Multi Family | 25,755 | 11,615 | 6% | 451 |
| Mobile Home | 33,729 | 19,450 | 10% | 577 |
| **Total** | **282,418** | **188,894** | **100%** | **669** |
| **WA Residential Segment** | **Number of Meters** | **2010 Sales (1000 thm)** | **% of WA Res. Sales** | **Intensity (thm/HH)** |
| Single Family | 107,230 | 83,143 | 85% | 775 |
| Multi Family | 14,318 | 6,994 | 7% | 488 |
| Mobile Home | 11,109 | 7,235 | 7% | 651 |
| **Washington Total** | **132,657** | **97,372** | **100%** | **734** |
| **ID Residential Segment** | **Number of Meters** | **2010 Sales (1000 thm)** | **% of ID Res. Sales** | **Intensity (thm/HH)** |
| Single Family | 51,487 | 36,371 | 83% | 706 |
| Multi Family | 4,648 | 2,068 | 5% | 445 |
| Mobile Home | 9,513 | 5,645 | 13% | 593 |
| **Idaho Total** | **65,648** | **44,084** | **100%** | **672** |
| **OR Residential Segment** | **Number of Meters** | **2010 Sales (1000 thm)** | **% of OR Res. Sales** | **Intensity (thm/HH)** |
| Single Family | 64,217 | 38,317 | 81% | 597 |
| Multi Family | 6,789 | 2,552 | 5% | 376 |
| Mobile Home | 13,107 | 6,570 | 14% | 501 |
| **Oregon Total** | **84,114** | **47,438** | **100%** | **564** |

Figure ES-2 shows the breakdown of annual use by end use for the average home in each state and for the Avista residential sector as a whole. Space heating constitutes 77% of gas usage in Washington, 73% in Idaho, and from 71% in Oregon, reflecting the differences in climate among the states.

***Figure ES-2 Annual Residential Natural Gas Use by End Use and State, 2010***



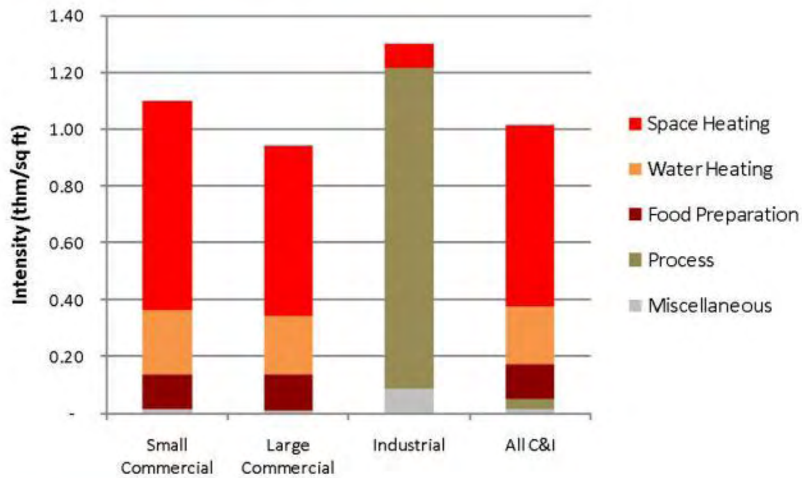

Total natural gas use in the commercial and industrial (C&I) sector in 2010 was 127.0 million therms. Avista rate classes were used to allocate this energy use to three segments per state. Intensity estimates in therms/sq. ft. were developed and then used to infer the segment size in floor space for each segment. Table ES-3 displays the resulting sales, intensity, and segment size. Due to the characteristics of the rate structures, a greater percentage of C&I customers in Oregon are classified as small commercial, as compared with Washington and Idaho.

***Table ES-3 C&I Sector Gas Usage and Intensity by State and Segment, 2010***

| All States C&I | | 2010 Sales (1000 thm) | % of All C&I Sales | Intensity (thm/sq. ft.) | Segment Size (million sq. ft) |
|---|---|---|---|---|---|
| Small Commercial | N/A | 50,693 | 40% | 0.343 | 147.798 |
| Large Commercial | N/A | 71,176 | 56% | 0.649 | 109.666 |
| Industrial | N/A | 5,141 | 4% | 0.776 | 6.621 |
| **All States Total** | | **127,011** | **100%** | **0.481** | **264.085** |
| **Washington Sector** | **Rate Class** | **2010 Sales (1000 thm)** | **% of WA C&I Sales** | **Intensity (thm/sq. ft.)** | **Segment Size (million sq. ft)** |
| Small Commercial | 101 | 16,706 | 24% | 0.363 | 46.021 |
| Large Commercial | 111, 112, 121, 122, 132 | 49,808 | 72% | 0.660 | 75.467 |
| Industrial | 101, 111, 121, 122 | 3,135 | 5% | 0.792 | 3.959 |
| **Washington Total** | | **69,649** | **100%** | **0.555** | **125.447** |
| **Idaho Sector** | **Rate Class** | **2010 Sales (1000 thm)** | **% of ID C&I Sales** | **Intensity (thm/sq. ft.)** | **Segment Size (million sq. ft)** |
| Small Commercial | 101 | 8,432 | 30% | 0.347 | 24.335 |
| Large Commercial | 111, 132 | 17,820 | 64% | 0.630 | 28.285 |
| Industrial | 101, 111, 112 | 1,681 | 6% | 0.759 | 2.215 |
| **Idaho Total** | | **27,933** | **100%** | **0.509** | **54.835** |
| **Oregon Sector** | **Rate Class** | **2010 Sales (1000 thm)** | **% of OR C&I Sales** | **Intensity (thm/sq. ft.)** | **Segment Size (million sq. ft)** |
| Small Commercial | 420 | 25,556 | 87% | 0.330 | 77.441 |
| Large Commercial | 424 | 3,548 | 12% | 0.600 | 5.914 |
| Industrial | 420, 424 | 325 | 1% | 0.726 | 0.448 |
| **Oregon Total** | | **29,429** | **100%** | **0.351** | **83.803** |

Figure ES-3 illustrates the distribution of gas consumption by end use for small commercial, large commercial, industrial, and C&I facilities as a whole. As one would expect, space heating is the predominant use, representing 63% of overall C&I gas consumption. For industrial facilities however, process heating represents the greatest share.

***Figure ES-3 C&I End Use Intensities, 2010***




## Baseline Forecast

Prior to developing estimates of conservation potential, a baseline end-use forecast was developed to quantify how natural gas is used by end use in the base year and what the consumption is likely to be in the future in absence of new utility programs and naturally occurring conservation. The baseline forecast serves as the metric against which conservation potentials are measured.

Referring to Table ES-4, natural gas use across all three sectors is expected to increase by 28% between the base year 2010 and 2032, for an average annual growth rate of 1.1%. Overall, the forecast for the next 20 years grows steadily, dominated by growth in the residential sector.

***Table ES-4 Baseline Forecast Summary (1000 therm)***

| Sector | 2010 | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 | % Change (2010-2032) | Avg. Growth Rate (2010-2032) |
|---|---|---|---|---|---|---|---|---|---|
| Residential | 188,894 | 196,073 | 197,449 | 204,112 | 219,778 | 241,292 | 269,274 | 43% | 1.5% |
| Sm. Commercial | 50,693 | 50,130 | 50,530 | 51,271 | 52,378 | 53,494 | 55,120 | 9% | 0.4% |
| Lg. Commercial | 71,176 | 69,274 | 69,647 | 70,392 | 71,667 | 73,191 | 75,295 | 6% | 0.2% |
| Industrial | 5,141 | 5,026 | 5,067 | 5,156 | 5,274 | 5,409 | 5,560 | 8% | 0.3% |
| Total | 315,906 | 320,503 | 322,693 | 330,932 | 349,097 | 373,385 | 405,250 | 28% | 1.1% |

| State | 2010 | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 | % Change (2010-2032) | Avg. Growth Rate (2010-2032) |
|---|---|---|---|---|---|---|---|---|---|
| Washington | 167,021 | 168,616 | 169,523 | 173,064 | 180,908 | 191,260 | 205,302 | 23% | 0.9% |
| Idaho | 72,017 | 73,767 | 74,426 | 76,910 | 82,427 | 89,742 | 99,277 | 38% | 1.4% |
| Oregon | 76,867 | 78,120 | 78,744 | 80,958 | 85,762 | 92,383 | 100,671 | 31% | 1.2% |
| Total | 315,906 | 320,503 | 322,693 | 330,932 | 349,097 | 373,385 | 405,250 | 28% | 1.1% |

Figure ES-4 and Figure ES-5 present the baseline end-use forecasts for the residential and C&I sectors respectively, while Figure ES-6 displays growth system wide.

***Figure ES-4 Residential Baseline Forecast by End Use***

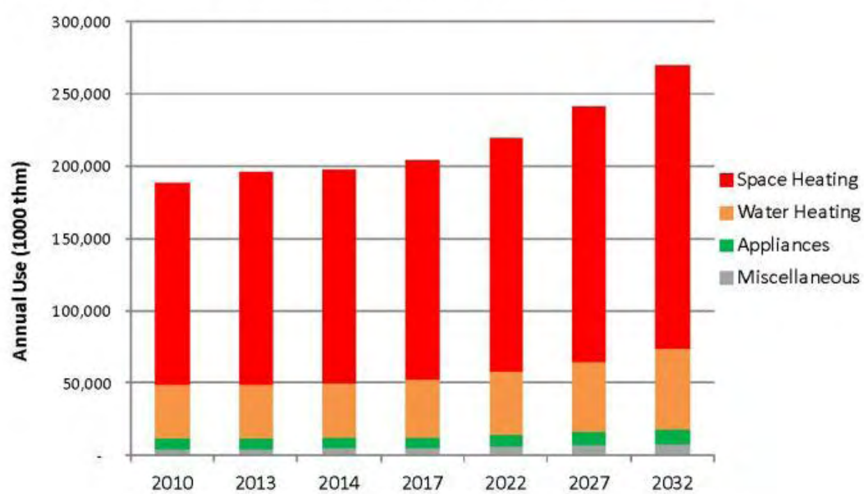


***Figure ES-5 Commercial and Industrial Baseline Forecast by End Use***

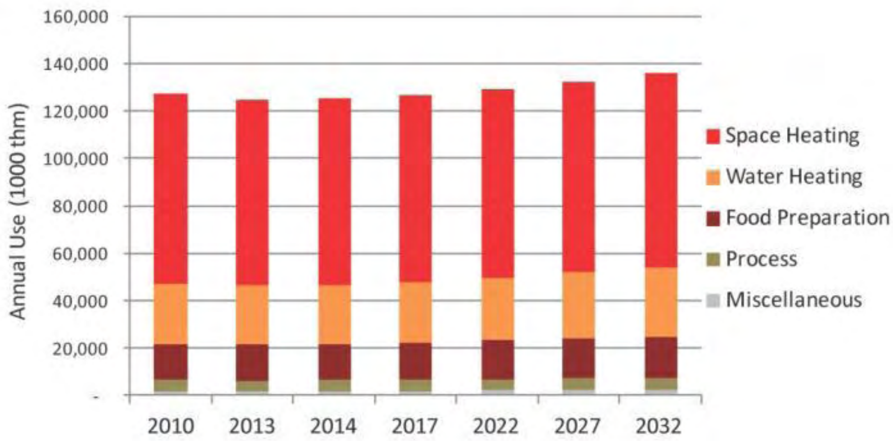
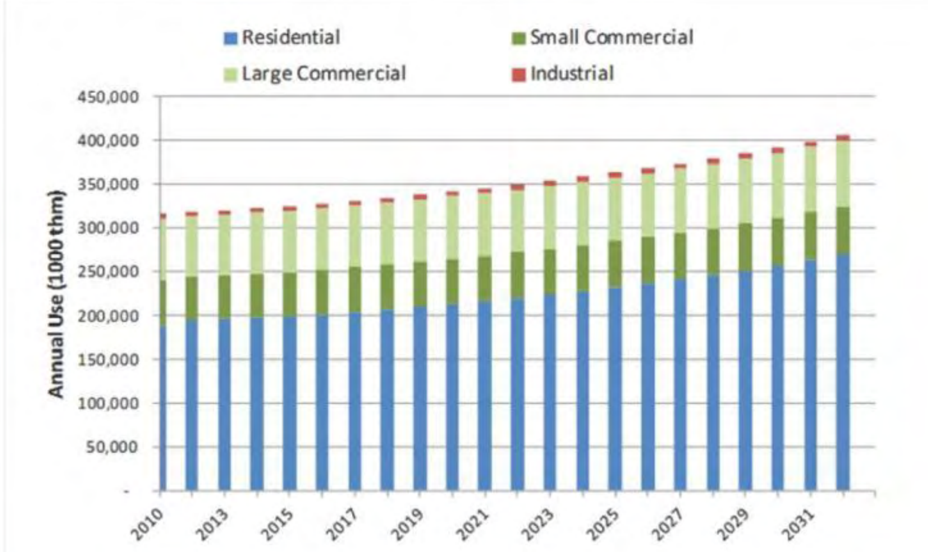



***Figure ES-6 Baseline Forecast Summary (MWh)***




## Energy Conservation Measures

The first step of the energy conservation measure analysis is to identify the list of all relevant conservation measures that should be considered for the Avista CPA. The measures are categorized into two types according to the LoadMAP[3] taxonomy: equipment measures and non-equipment measures:

[3] Global's Load Management Analysis and Planning™ tool, which was used to perform the CPA analysis.

- ***Equipment measures,*** or efficient energy-consuming equipment, save energy by providing the same service with a lower energy requirement. For equipment measures, many efficiency levels are available for a specific technology that range from the baseline unit (often determined by code or standard) up to the most efficient product commercially available. For instance, in the case of residential furnaces, this list begins with the federal standard energy factor (EF) 0.78 unit and spans a broad spectrum of efficiency, with the highest efficiency level represented by an EF 0.96 unit.
- ***Non-equipment measures*** save energy by reducing the need for delivered energy but do not involve replacement or purchase of major end-use equipment (such as a furnace or water heater). An example would be a programmable thermostat that is pre-set to reduce the load on a furnace or boiler when the building is unoccupied. Non-equipment measures fall into one of the following categories:
  - Building shell (windows, insulation, roofing material)
  - Equipment controls (thermostat, occupancy sensors)
  - Equipment maintenance (cleaning filters, changing setpoints)
  - Whole-building design (natural ventilation, ENERGY STAR home)
  - Commissioning and retrocommissioning

## Conservation Potential Results

Table ES-5 summarizes the achievable potential by state and by sector for selected years. As shown in Figure ES-7, initially, the large commercial sector provides a relatively higher percentage of the achievable savings compared with its share of sales, but over time this situation reverses so that the residential sector's share of savings is greatest, mainly due to growth in residential customer count.

***Table ES-5 Cumulative Achievable Conservation Potential by State and by Sector***

| Cumulative Savings (1000 therm) | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 |
|---|---|---|---|---|---|---|
| Washington | 893 | 2,203 | 6,923 | 15,364 | 21,885 | 26,909 |
| Idaho | 364 | 821 | 2,734 | 5,601 | 8,758 | 11,914 |
| Oregon | 289 | 715 | 3,136 | 7,251 | 10,706 | 13,559 |
| **Total** | **1,546** | **3,738** | **12,794** | **28,216** | **41,349** | **52,381** |

| Cumulative Savings (1000 therm) | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 |
|---|---|---|---|---|---|---|
| Residential | 515 | 1,567 | 6,507 | 14,903 | 22,278 | 29,960 |
| Small Comercial | 206 | 469 | 1,588 | 3,557 | 5,709 | 7,018 |
| Large Commercial | 801 | 1,654 | 4,548 | 9,436 | 13,007 | 15,027 |
| Industrial | 25 | 49 | 151 | 319 | 354 | 377 |
| **Total** | **1,546** | **3,738** | **12,794** | **28,216** | **41,349** | **52,381** |

***Figure ES-7 Cumulative Achievable Conservation Potential Savings by Sector***

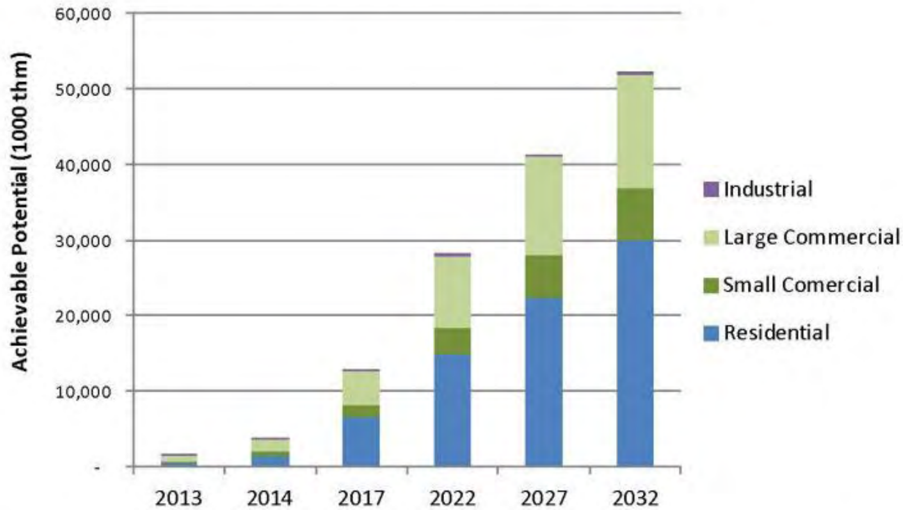



Table ES-6 and Figure ES-8 summarize the conservation savings for the different levels of potential relative to the baseline forecast. Figure ES-9 displays the baseline and potential forecasts.

- ***Achievable potential*** across the residential, commercial, and industrial sectors is 29.6 million therms in 2022 and increases to 53.8 million therms by 2032. These savings represent 8.5% of the baseline forecast in 2022 and 13.3% in 2032.
- ***Economic potential***, which reflects the savings when all cost-effective measures are taken, is 34.6 million therms in 2022. This represents 9.9% of the baseline energy forecast. By 2032, economic potential reaches 61.8 million therms, 15.3% of the baseline energy forecast. [4]
- ***Technical potential***, which reflects the adoption of all conservation measures regardless of cost-effectiveness, is a theoretical upper bound on savings. Technical potential is substantial, because measures such as solar thermal water heating could cut energy use dramatically. In 2022, energy savings are 103.5 million therms, equivalent to 29.7% of the baseline energy forecast. By 2032, technical potential reaches 169.4 million therms, 41.8% of the baseline energy forecast. The relatively wide gap between technical and economic potential reflects the low avoided costs, as well as the fact that Avista's long-running conservation programs have already achieved much of the cost-effective conservation. As a result, additional conservation measures are becoming relatively more costly, and many do not pass the cost-effectiveness screen based on Avista's current avoided costs.

[4] Note that economic and achievable potential for Oregon includes residential weatherization measures that are mandated to be included in utility DSM programs. Many of these measures did not pass the B/C test in the analysis model but were nonetheless included in economic and achievable potential.

***Table ES-6 Summary of Cumulative Achievable, Economic, and Technical Conservation Potential***

| | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 |
|---|---|---|---|---|---|---|
| **Baseline Forecast (1000 thm)** | | | | | | |
| | 320,503 | 322,693 | 330,932 | 349,097 | 373,385 | 405,250 |
| **Cumulative Natural Gas Savings (1000 thm)** | | | | | | |
| Achievable | 1,546 | 3,738 | 12,794 | 28,216 | 41,349 | 52,381 |
| Economic | 1,797 | 4,333 | 14,785 | 31,757 | 45,809 | 58,965 |
| Technical | 7,623 | 15,844 | 46,189 | 91,655 | 131,422 | 157,520 |
| **Cumulative Natural Gas Savings (% of Baseline)** | | | | | | |
| Achievable | 0.5% | 1.2% | 3.9% | 8.1% | 11.1% | 12.9% |
| Economic | 0.6% | 1.3% | 4.5% | 9.1% | 12.3% | 14.6% |
| Technical | 2.4% | 4.9% | 14.0% | 26.3% | 35.2% | 38.9% |

***Figure ES-8 Summary of Cumulative Conservation Potential Savings***

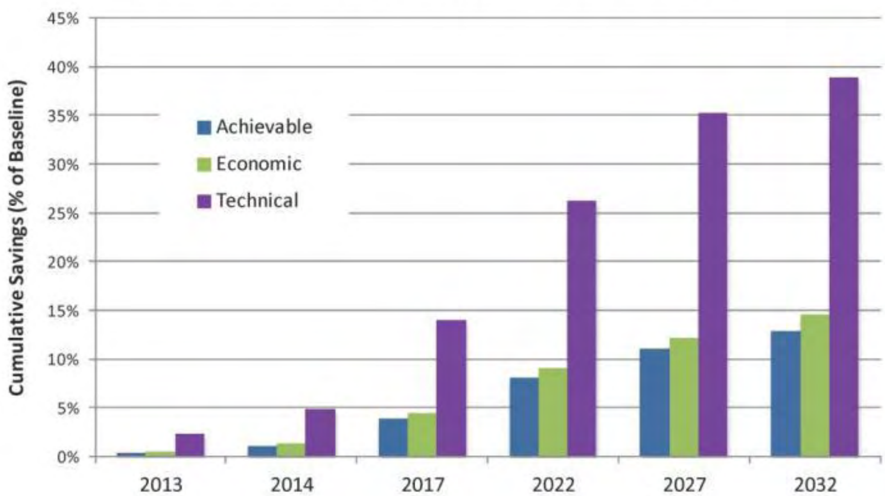
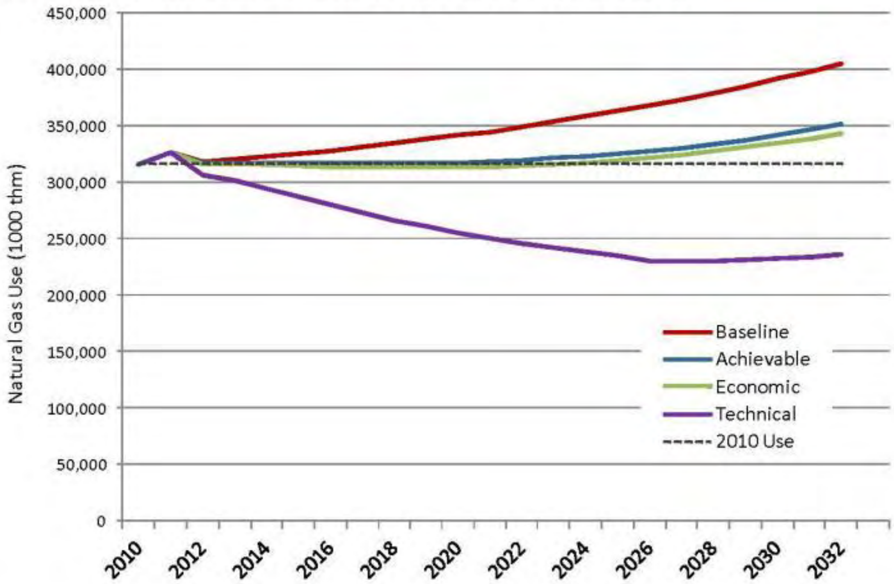


***Figure ES-9 Conservation Potential Energy Forecasts (1000 therm)***




The greatest sources of residential achievable potential in 2022, across all three states, are as follows:

- ***Shell measures and insulation***, which representing 6.4 million therms or 43% of all savings
- ***Thermostats and home energy monitoring systems***, which provide 3.5 million therms or 24% of all savings
- ***Water-saving devices***, including low-flow showerheads and faucet aerators, which combine for 3.2 million therms or 21% of achievable potential
- ***Water heater tank blankets and pipe insulation***, which provide an additional 1.3 million therms or nearly 9% of achievable potential

The primary sources of C&I achievable savings are as follows:

- ***Energy management systems and programmable thermostats***, because they can be readily installed, account for about 27% of achievable potential in 2014. These controls remain significant contributors to cumulative potential, with 2.5 million therms or 19% of potential in 2022.
- ***Boiler operating measures***, including maintenance, hot water reset, and efficient circulation, together can provide 4.3 million therms or about 29% of achievable potential in 2022.
- ***Equipment upgrades for furnaces, boilers, and unit heaters*** equal 2.0 million therms, or 15% of 2022 achievable potential.
- ***Foodservice equipment*** has an achievable potential by 2022 of 1.6 million therms, or 12% of achievable potential.

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CHAPTER | **1**

# INTRODUCTION

## Background

Avista Utilities (Avista) has contracted with Global Energy Partners (Global) to conduct a conservation potential assessment (CPA) to quantify the amount, the timing, and the cost of natural gas energy conservation resources available within the Avista service territory. The purpose of this study is to establish cost-effective and achievable energy conservation resources for the 2013–2032 period to support development of Avista's 2013 gas Integrated Resource Plan (IRP).

Key objectives for the study include:

- Determine the conservation potential for natural gas for Washington, Idaho, and Oregon, for the period 2013–2032, based on Avista's service territory characteristics.
- Develop energy conservation measure (ECM) data sets for each market sector and each appropriate market segment.
- Categorize the potential by market sector, segment, building type, and ECM.
- Using parameters provided by Avista, calculate the Total Resource Cost (TRC), and measure levelized cost of the ECMs.
- Provide supply curves of achievable potential.

## Report Organization

This report contains the following chapters:

1. Introduction
2. Analysis Approach and Data Development
3. Market Assessment and Market Profiles
4. Baseline Forecast
5. Conservation Potential

## Definitions of Potential

In this study, the conservation potential estimates represent gross savings[5] developed into three types of potential: technical potential, economic potential, and achievable potential. Technical and economic potential are both theoretical limits to efficiency savings. Achievable potential embodies a set of assumptions about the decisions consumers make regarding the efficiency of the equipment they purchase, the maintenance activities they undertake, the controls they use for energy-consuming equipment, and the elements of building construction. These levels are described below.

***Technical potential*** is defined as the theoretical upper limit of conservation potential. It assumes that customers adopt all feasible measures regardless of cost. At the time of equipment failure, customers replace equipment with the most efficient option available. In new

[5] Savings in "gross" terms instead of "net" terms means that the baseline forecast does not include naturally occurring efficiency. In other words, the baseline assumes that energy efficiency levels remain fixed as they are today. This rule holds true except in cases where future codes and standards were on the books before November 2011, e.g. the effects of the upcoming furnace and water heater standards.

construction, customers and developers also choose the most efficient equipment option. Examples of measures that make up technical potential in the residential sector include:

- High efficiency furnaces and boilers
- High efficiency water heaters
- High efficiency clothes dryers

Technical potential also assumes the adoption of every available non-equipment measure, where applicable. For example, it includes installation of high-efficiency windows in all new construction opportunities and furnace maintenance in all existing buildings with furnace systems. The retrofit measures are phased in over a number of years, which is longer for higher-cost measures.

***Economic potential*** represents the adoption of all ***cost-effective*** conservation measures. In this analysis, the TRC test, which compares lifetime energy and capacity benefits to the incremental cost of the measure, is applied. Economic potential assumes that customers \urchase the most cost-effective option at the time of equipment failure and also adopt every other cost-effective and applicable measure.

***Achievable potential*** takes into account market maturity, customer preferences for energy-efficient technologies, and expected program participation. Achievable potential establishes a realistic target for the conservation savings that a utility can hope to achieve through its programs. It is determined by applying a series of annual factors to the economic potential for each ECM. These factors represent the ramp rates at which technologies will penetrate the market and were based upon the Northwest Power and Conservation Council Sixth Plan (NWPCC) ramp rates. Although Avista is not required to use the Sixth Plan ramp rates for its gas CPA, the project team chose to use those ramp rates for consistency with the Avista 2011 electricity CPA. Also, these ramp rates have been widely vetted and are accepted by regional stakeholders. Details regarding the ramp rate development appear in Appendix E.

## Abbreviations and Acronyms

Throughout the report we make reference to several abbreviations and acronyms. Table 1-1 shows the abbreviation or acronym, along with what it stands for.

***Table 1-1 Explanation of Abbreviations and Acronyms***

| Acronym | Explanation |
|---|---|
| ACS | American Community Survey |
| AEO | Annual Energy Outlook |
| B/C Ratio | Benefit to Cost Ratio |
| BEST | Global's Building Energy Simulation Tool |
| C&I | Commercial and Industrial |
| CBSA | Northwest Energy Efficiency Alliance Commercial Building Stock Assessment |
| CPA | Conservation Potential Assessment |
| DEEM | Global's Database of Energy Efficiency Measures |
| DEER | Database for Energy-Efficient Resources |
| DSM | Demand side management |
| EE | Energy Efficiency |
| EIA | Energy Information Administration |
| EISA | Energy Efficiency and Security Act of 2007 |
| EPACT | Energy Policy Act of 2005 |
| EPRI | Electric Power Research Institute |
| EUEA | Efficient Use of Energy Act |
| EUI | Energy-use Index (energy use by end use) |
| HH | Household |
| I-937 | Washington Initiative 937 |
| LoadMAP | Global's Load Management Analysis and Planning™ tool |
| MAR | Market Acceptance Rate |
| NEEA | Northwest Energy Efficiency Alliance |
| NWPCC | Northwest Power and Conservation Council |
| RTF | Regional Technical Forum |
| Sq. ft. | Square feet |
| TRC | Total Resource Cost |
| UEC | Unit Energy Consumption |

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CHAPTER | 2

# ANALYSIS APPROACH AND DATA DEVELOPMENT

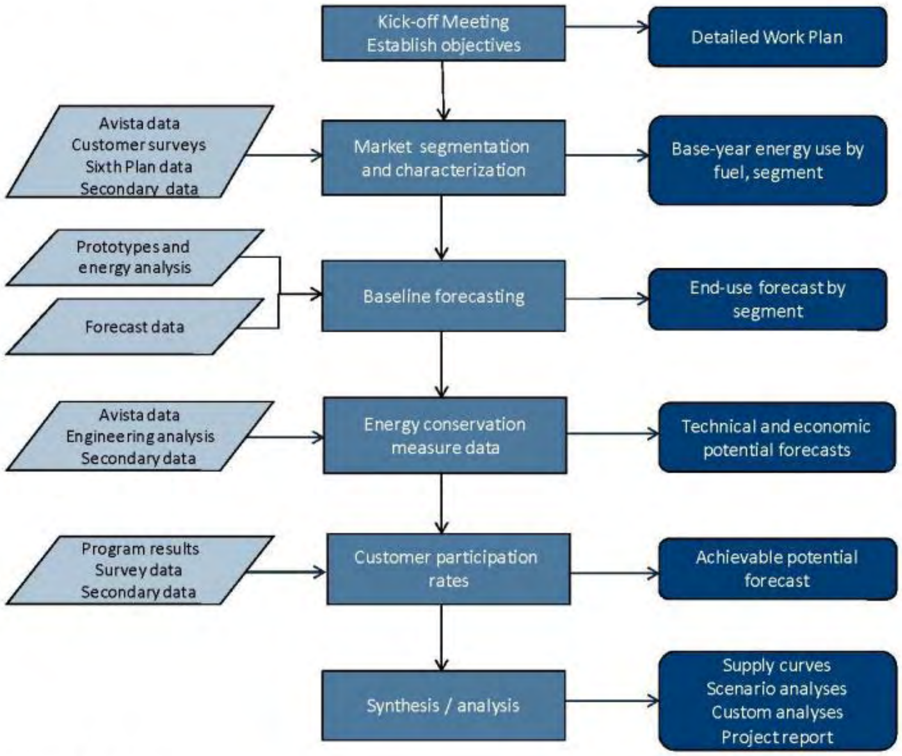
## Introduction

To perform the conservation analysis, Global used a bottom-up analysis approach as shown in Figure 2-1 and summarized below.

1. Met by phone with Avista staff to refine the objectives that were identified in the Avista RFP. This resulted in a work plan for the study.
2. Performed a market characterization to describe sector-level natural gas use for the residential, commercial, and industrial sectors for the base year, 2010. This included using utility data and secondary data from sources such as the American Community Survey (ACS), and the Energy Information Administration (EIA).
3. Utilized secondary sources including Northwest Energy Efficiency Alliance (NEAA) data and market reports to understand how customers in the Avista service territory currently use gas. Combining this information with the market characterization, we developed energy market profiles that describe energy use by sector, segment, and end use for 2010.
4. Developed a baseline gas forecast by sector, segment, and end use for 2013 through 2032.
5. Identified and analyzed energy conservations measures appropriate for the Avista service territory.
6. Estimated three levels of conservation potential, *Technical, Economic,* and *Achievable*.

The steps are described in further detail throughout the remainder of this chapter.

***Figure 2-1 Overview of Analysis Approach***




## LoadMAP Model

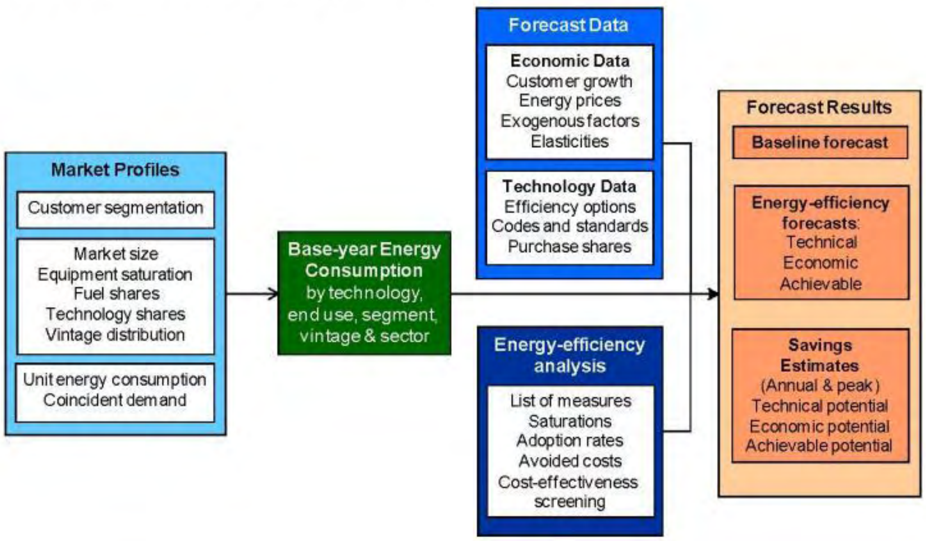
We used the Global Load Management Analysis and Planning tool (LoadMAP$^{TM}$) to develop the baseline forecast, as well as the estimates of conservation potential. Global developed LoadMAP in 2007 and has used it for the EPRI National Potential Study and numerous utility-specific forecasting and potential studies. Built in Excel, the LoadMAP framework (see Figure 2-2) is both accessible and transparent and has the following key features.

- Develops a bottom-up forecast based on energy use by end use of major energy-consuming equipment.
- Embodies the basic principles of rigorous end-use models (such as EPRI's REEPS and COMMEND) but in a more simplified, accessible form.
- Includes stock-accounting algorithms that treat older, less efficient appliance/equipment stock separately from newer, more efficient equipment. Equipment is replaced according to the measure life defined by the user.
- Balances the competing needs of simplicity and robustness by incorporating important modeling details related to equipment saturations, efficiencies, vintage, and the like, where market data are available, and treats end uses separately to account for varying importance and availability of data resources.
- Uses a simple logic for appliance and equipment decisions. Isolates new construction from existing equipment and buildings and treats purchase decisions for new construction and existing buildings separately.

- Includes appliance and equipment models customized by end use. For example, the logic for space heating is distinct from stoves and clothes dryers.
- Can accommodate various levels of segmentation. Analysis can be performed at the sector level (e.g., total residential) or for customized segments within sectors (e.g., housing type or income level).

Consistent with the segmentation scheme and the market profiles we describe below, the LoadMAP model provides forecasts of baseline natural gas use by sector, segment, end use and technology for existing and new buildings. It also provides forecasts of total natural gas use and conservation savings associated with the three types of potential.[6]

***Figure 2-2 LoadMAP Analysis Framework***




## Market Characterization

Before assessing conservation potential, it is critical to develop a good understanding of where Avista is today in terms of natural gas use and customer behavior. The purpose of the market characterization is to develop market profiles that describe current natural gas use in terms of sector, customer segment, and end use. The base year for this study is 2010 because that was the most recent year for which utility sales data were available.

### *Segmentation for Modeling Purposes*

The market assessment began by defining the market segments (building types, end uses, and other dimensions) that are relevant for Avista. The segmentation scheme employed for this project is presented in Table 2-1.

[6] The model computes energy and peak-demand forecasts for each type of potential for each end use as an intermediate calculation. Annual-energy and peak-demand savings are calculated as the difference between the value in the baseline forecast and the value in the potential forecast (e.g., technical potential).

***Table 2-1 Overview of Segmentation Scheme for Potentials Modeling***

| Market Dimension | Segmentation Variable | Dimension Examples |
|---|---|---|
| Dimension 1 | Sector | Residential, commercial, industrial |
| Dimension 2 | Geographic Region | Washington, Idaho, Oregon |
| Dimension 3 | Building type | Residential (Single family, Multi family, Mobile home)<br>Commercial (Small commercial, Large commercial)<br>Industrial (no further segmentation) |
| Dimension 4 | Vintage | Existing and new construction (for residential and commercial sectors) |
| Dimension 5 | End uses | Space heating, water heating, appliances, food preparation, etc. (as appropriate by sector) |
| Dimension 6 | Appliances/end uses and technologies | Technologies such as space heating equipment, ovens, process equipment, etc. |
| Dimension 7 | Equipment efficiency levels for new purchases | Baseline and higher-efficiency options as appropriate for each technology |

For the residential sector, the CPA used the following segmentation.

- ***Single-family homes.*** This segment includes single-family detached homes, townhouses, and duplexes or row houses.
- ***Multi-family homes***. The multi-family segment includes apartments or condos in buildings with more than two units.
- ***Mobile homes***. This segment includes mobile homes and manufactured homes.

In addition to segmentation by housing type, we identified the set of end uses and technologies that are appropriate for Avista. These are shown in Table 2-2.

***Table 2-2 Residential End Uses and Technologies***

| End Use | Technology |
|---|---|
| Space Heating | Furnace |
| Space Heating | Boiler |
| Space Heating | Other Heating |
| Water Heating | Water Heater |
| Appliances | Clothes Dryer |
| Appliances | Stove/Oven |
| Miscellaneous | Pool/Spa Heater |
| Miscellaneous | Miscellaneous |

For the commercial sector, we used rate classes to identify the segments.

- ***Small Commercial.*** This segment includes commercial buildings under rate class 101 in Washington and Idaho, and 420 in Oregon.
- ***Large Commercial.*** This segment includes commercial buildings under rate classes 111, 112, 121, 122, and 132 in Washington and Idaho, and 424 in Oregon.

No further segmentation was applied to the industrial sector.

In addition to segmentation by rate class, we identified the set of commercial and industrial end uses and technologies that are appropriate for Avista's service territory, as shown in Table 2-3.

With the segmentation scheme defined, we then performed a high-level market characterization of natural gas sales in the base year to allocate sales to each customer segment. We used various data sources to identify the annual sales in each customer segment, as well as the number of customers for residential segments, and the square footage for the commercial and industrial segments. This information provided control totals (energy use and customers counts/square footage totals) for calibrating the LoadMAP model to known data for the base-year.

***Table 2-3 Commercial & Industrial End Uses and Technologies***

| End Use | Technology |
|---|---|
| Space Heating | Furnace |
| Space Heating | Boiler |
| Space Heating | Other Heating |
| Water Heating | Water Heater |
| Food Preparation | Fryer |
| Food Preparation | Oven |
| Food Preparation | Broiler |
| Food Preparation | Griddle |
| Food Preparation | Range |
| Food Preparation | Steamer |
| Process | Process Heating |
| Process | Process Cooling |
| Process | Other Process |
| Miscellaneous | Pool/Spa Heater |
| Miscellaneous | Miscellaneous |

### *Market Profiles*

The next step was to develop market profiles for each sector, customer segment, end use, and technology. A market profile includes the following elements:

- ***Market size*** is a representation of the number of customers in the segment. For the residential sector, it is number of households. In the commercial and industrial sector, it is floor space measured in square feet.
- ***Saturations*** define the fraction of buildings with the natural gas technologies. (e.g., homes with natural gas water heating, commercial floor space with natural gas space heating, etc.).
- ***UEC (unit energy consumption) or EUI (energy-use index)*** describes the amount of natural gas consumed in 2010 by a specific technology in buildings that have the technology. We use UECs expressed in therms/household for the residential sector, and EUIs expressed in therms/square foot for the commercial and industrial sectors.
- ***Intensity*** for the residential sector represents the average use for the technology across all homes in 2010. It is computed as the product of the saturation and the UEC and is defined as therms/household. For the commercial and industrial sectors, intensity, computed as the product of the saturation and the EUI, represents the average use for the technology across all floor space in 2010.
- ***Usage*** is the annual gas use by a technology/end use in the segment. It is the product of the market size and intensity and is quantified in 1000 therm.

The market assessment results and the market profiles are presented in Chapter 3.

### Baseline Forecast

The next step was to develop the baseline forecast of annual natural gas use for 2010 through 2032 by customer segment and end use without new utility programs or naturally occurring efficiency scenario. The end-use forecast does include the relatively certain impacts of codes and standards that will unfold over the study timeframe. All such mandates that were defined as of January 2011 are included in the baseline. The baseline forecast is the foundation for the analysis of savings from future EE efforts as well as the metric against which potential savings are measured.

Inputs to the baseline forecast include:

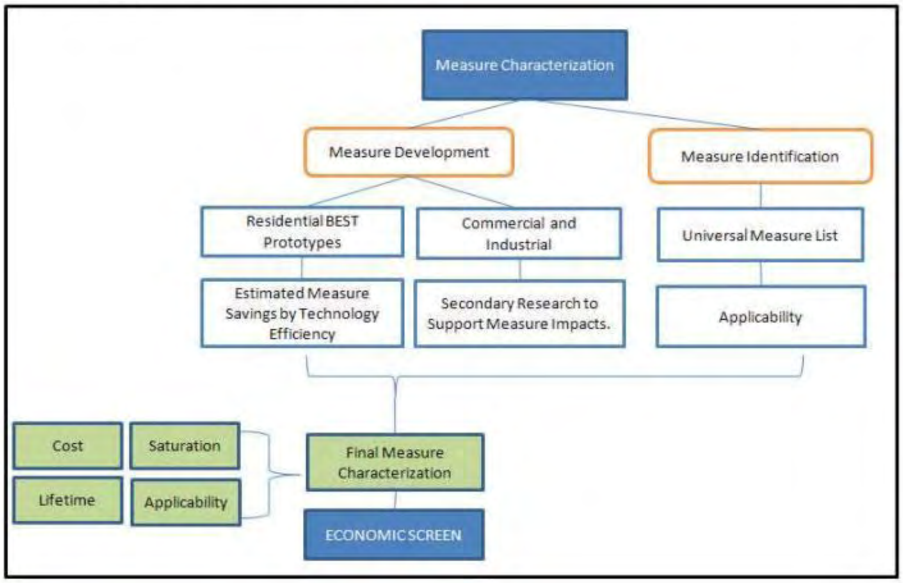
- Current economic growth forecasts (i.e., customer growth, income growth), provided by Avista
- Natural gas price forecasts, provided by Avista
- Trends in fuel shares and equipment saturations, developed by project team
- Existing and approved changes to building codes and equipment standards
- Avista's internally developed forecasts for natural gas sales

We present the results of the baseline forecast development in Chapter 4.

## Conservation Measure Analysis

This section describes the framework used to assess the savings, costs, and other attributes of energy conservation measures. These characteristics form the basis for measure-level cost-effectiveness analyses as well as for determining measure-level savings. For all measures, Global assembled information to reflect equipment performance, incremental costs, and equipment lifetimes. We used this information, along with Avista's avoided costs, in the economic screen to determine economically feasible measures. Figure 2-3 outlines the framework for measure analysis.

***Figure 2-3 Approach for Measure Assessment***




The framework for assessing savings, costs, and other attributes of energy conservation measures involves identifying the list of conservation measures to include in the analysis, determining their applicability to each market sector and segment, fully characterizing each measure, and performing cost-effectiveness screening. Potential measures include the replacement of a unit that has failed or is at the end of its useful life with an efficient unit, retrofit/early replacement of equipment, improvements to the building envelope, the application of controls to optimize energy use, and other actions resulting in improved energy efficiency.

We compiled a robust list of conservation measures for each customer sector, drawing Avista's existing programs, as well as a variety of secondary sources. This universal list of energy conservation measures covers all major types of end-use equipment, as well as devices and actions to reduce energy consumption. If considered today, some of these measures would not pass the economic screens initially, but may pass in future years as a result of lower projected equipment costs or higher avoided costs.

The selected measures can be categorized into types, equipment measures and non-equipment measures, according to the LoadMAP taxonomy:

- ***Equipment measures,*** or efficient energy-consuming equipment, save energy by providing the same service with a lower energy requirement. For equipment measures, many efficiency levels are available for a specific technology that range from the baseline unit (often determined by code or standard) up to the most efficient product commercially available. For instance, in the case of residential furnaces, this list begins with the federal standard energy factor (EF) 0.78 unit and spans a broad spectrum of efficiency, with the highest efficiency level represented by an EF 0.96 unit.

- ***Non-equipment measures*** save energy by reducing the need for delivered energy but do not involve replacement or purchase of major end-use equipment (such as a furnace or water heater). An example would be a programmable thermostat that is pre-set to reduce the load on a furnace or boiler when the building is unoccupied. Non-equipment measures fall into one of the following categories:
    - Building shell (windows, insulation, roofing material)
    - Equipment controls (thermostat, occupancy sensors)
    - Equipment maintenance (cleaning filters, changing setpoints)
    - Whole-building design (natural ventilation, ENERGY STAR home)
    - Commissioning and retrocommissioning

Global developed a preliminary list of energy conservation measures that included gas measures in Avista's existing DSM programs, as well as other measures that are typically included in gas utility conservation programs. The final list included in the study, which reflects feedback and additions from Avista, is presented in Appendices B, C, and D for the residential, commercial, and industrial sectors respectively.

Once we assembled the list of ECMs, the project team assessed their energy-saving characteristics. For each measure, we developed estimates of incremental cost, service life, and other performance factors, drawing upon data from Avista and from secondary sources. The project team also used data from Global's database of measure characteristics and simulation modeling. Following the measure characterization, we performed an economic screening of each measure, which serves as the basis for developing the economic potential.

***Representative Measure Data Inputs***

To provide an example of the measure data, Table 2-4 and Table 2-5 present samples of the detailed data inputs behind equipment and non-equipment measures, respectively, for the case of residential water heaters in single-family homes in Washington. Table 2-4 displays the various efficiency levels available as equipment measures, as well as the corresponding useful life, energy usage, and cost estimates. The columns labeled On Market and Off Market reflect equipment availability due to codes and standards or the entry of new products to the market.

***Table 2-4 Sample Equipment Measures for Water Heaters – Single Family Home (WA)***

| Efficiency Level | Useful Life | Equipment Cost | Energy Usage(thm/yr) | On Market | Off Market |
|---|---|---|---|---|---|
| EF 0.59 | 15 | $445 | 153.3 | 2010 | 2014 |
| EF 0.62 | 15 | $480 | 145.9 | 2010 | 2032 |
| EF 0.64 | 15 | $750 | 141.6 | 2010 | 2032 |
| EF 0.67 | 15 | $760 | 135.2 | 2010 | 2032 |
| EF 0.70 | 15 | $800 | 129.5 | 2010 | 2032 |
| EF .86 (Condensing) | 15 | $2,500 | 105.3 | 2010 | 2032 |
| Solar | 15 | $5,000 | 43.5 | 2010 | 2032 |

Table 2-5 lists some of the non-equipment measures affecting an existing single-family home in Washington with a gas water heater. These measures are also evaluated for cost effectiveness based on the lifetime benefits relative to the cost of the measure. The total savings are calculated for each year of the model and depend on the base year saturation of the measure, the applicability and feasibility[7] of the measure, and the savings as a percentage of the relevant energy end uses.

***Table 2-5 Sample Non-Equipment Measures – Single Family Home (WA), Existing***

| End Use | Measure | Saturation in 2010[8] | Applica-bility | Lifetime (years) | Measure Installed Cost | Energy Savings (%) |
|---|---|---|---|---|---|---|
| Water Heating | Water Heating - Faucet Aerators | 53% | 90% | 25 | $24 | 3.70% |
| Water Heating | Water Heating - Low Flow Showerheads | 42% | 80% | 10 | $96 | 17.10% |
| Water Heating | Water Heating - Pipe Insulation | 17% | 75% | 13 | $10 | 2.00% |
| Water Heating | Water Heating - Tank Blanket/Insulation | 54% | 75% | 10 | $15 | 9.10% |
| Water Heating | Water Heating - Thermostat Setback | 17% | 75% | 5 | $40 | 9.10% |
| Water Heating | Water Heating - Timer | 17% | 40% | 10 | $194 | 8.00% |
| Water Heating | Water Heating - Hot Water Saver | 5% | 50% | 5 | $35 | 8.75% |

***Screening Measures for Cost-Effectiveness***

Only measures that are cost-effective are included in economic and achievable potential. Therefore, for each individual measure, LoadMAP performs an economic screen. This study uses the total resource cost (TRC) test that compares the lifetime benefits (both energy and peak demand) of each applicable measure with its installed cost, which includes material, labor, and administration of a delivery mechanism, such as an energy efficiency program. The lifetime benefits are calculated by multiplying the annual energy and demand savings for each measure by all appropriate avoided costs for each year, and discounting the dollar savings to the present value equivalent. The analysis uses each measure's values for savings, costs, and lifetimes that were developed as part of the measure characterization process described above. For economic screening of measures, incentives are not included because they represent a simple transfer from one party to another, but have no effect on the overall measure cost.

The LoadMAP model performs this screening dynamically, taking into account changing savings and cost data over time. Thus, some measures pass the economic screen for some — but not all — of the years in the forecast.

It is important to note the following about the economic screen:

- The economic evaluation of every measure in the screen is conducted relative to a baseline condition. For instance, in order to determine the savings potential of a measure, consumption in therms with the measure applied must be compared to the consumption n therms of a baseline condition.

[7] The applicability factor takes into account whether the measure is applicable to a particular building type and whether it is feasible to install the measure. For instance, attic fans are not applicable to homes without attics, and in some homes with attics, it may not be feasible to install an attic fan because of lack of space.
[8] Note that saturation levels reflected for 2010 change over time as more measures are adopted.

- The economic screening was conducted only for measures that are applicable to each building type and vintage; thus if a measure is deemed to be irrelevant to a particular building type and vintage, it is excluded from the respective economic screen.

If the measure passes the screen (has a benefit-to-cost (B/C) ratio greater than or equal to 1.0), the measure is included in economic potential. Otherwise, it is screened out for that year. If multiple equipment measures have B/C ratios greater than or equal to 1.0, the most efficient technology with a B/C ration above 1.0 is selected by the economic screen.

Additional information on avoided costs appears later in this chapter, and detailed information on the measure analysis is presented in Appendices B, C, and D for the residential, commercial, and industrial sectors respectively.

### Conservation Potential

The approach we used for this study adheres to the approaches and conventions outlined in the National Action Plan for Energy-Efficiency (NAPEE) Guide for Conducting Potential Studies (November 2007).[9] The NAPEE Guide represents the most credible and comprehensive industry practice for specifying energy-efficiency potential. Specifically, three types of potentials were developed as part of this study:

- ***Technical potential*** is a theoretical construct that assumes the highest efficiency measures that are technically feasible to install are adopted by customers, regardless of cost or customer preferences. Thus, determining the technical potential is relatively straightforward. LoadMAP "chooses" the most efficient equipment options for each technology at the time of equipment replacement. In addition, it installs all relevant non-equipment measures for each technology to calculate savings.

  For example, for water heating, as shown in Table 2-4, the most efficient option is solar water heating. The multiple non-equipment measures shown in Table 2-5 are then applied to the energy used by the solar water heater m to further reduce water heating energy use. LoadMAP applies the savings due to the non-equipment measures one-by-one to avoid double counting of savings. The measures are evaluated in order of their B/C ratio, with the measure with the highest B/C ratio applied first. Each time a measure is applied, the baseline energy use for the end use is reduced and the percentage savings for the next measure is applied to the revised (lower) usage.

- ***Economic potential*** results from the purchase of the most efficient *cost-effective* option available for a given equipment or non-equipment measure as determined in the cost-effectiveness screening process described above. As with technical potential, economic potential is a phased-in approach. Economic potential is still a hypothetical upper-boundary of savings potential as it represents only measures that are economic but does not yet consider customer acceptance and other factors.

- ***Achievable potential*** defines the range of savings that is very likely to occur. It accounts for customers' awareness of efficiency options, any barriers to customer adoption, limits to program design, and other factors that influence the rate at which conservation measures penetrate the market.

The calculation of technical and economic potential is straightforward as described above. To develop estimates for achievable potential, we specify adoption rates for each measure. For Avista, we began with the ramp rates specified in the Sixth Plan conservation workbooks. Although Avista is not required to use the Sixth Plan ramp rates for its gas CPA, the project team chose to use those ramp rates for consistency with the Avista 2011 electricity CPA. Also, these ramp rates have been widely vetted and are accepted by regional stakeholder. Details regarding the ramp rate development appear in Appendix E. Results of all the potentials analysis are presented in Chapter 5.

[9] National Action Plan for Energy Efficiency (2007). *National Action Plan for Energy Efficiency Vision for 2025: Developing a Framework for Change.* www.epa.gov/eeactionplan.

## Data Development

This section begins with a description of the data sources used in this study, followed by a discussion of how these sources were applied.

### Data Sources

The data sources are organized into the following categories:

- Utility-provided data
- Energy conservation measure data
- Global Energy Partners' databases and analysis tools
- Other secondary data and reports

#### *Utility-provided Data*

In order to enable the project team to appropriately characterize the market, Avista provide the following:

- Utility 2010 billing data — customers, usage, revenue
- Number of customers and gas sales by sector (residential, commercial, industrial)
- Energy and peak demand forecasts, at the sector level
- Forecasts of customer growth, persons per household, and income
- Price forecast
- Avoided costs forecast
- Discount rate
- Escalation rate
- Loss factors
- Description of existing conservation and demand side management programs and results from these programs
- Program administration expenses
- Recent conservation potential studies

#### *Energy Conservation Measure Data*

Several sources of data were used to characterize the energy conservation measures.

- ***Northwest Power and Conservation Council Sixth Plan Conservation Supply Curve Workbooks, 2010.*** To develop its Power Plan, the Council used workbooks with detailed information about measures, available at http://www.nwcouncil.org/energy/powerplan/6/supplycurves/default.htm. Although the Plan focuses on electricity and not gas conservation measures, it does provide useful information for a gas CPA, such as cost and savings estimates for weatherization measures.
- ***Regional Technical Forum Deemed Measures.*** The NWPCC Regional Technical Forum maintains databases of deemed measure savings data, available at http://www.nwcouncil.org/energy/rtf/measures/Default.asp . Although the Regional Technical Forum focuses on electricity and not gas conservation measures, it does provide useful information for a gas CPA, such as cost and savings estimates for weatherization measures.
- ***Database for Energy Efficient Resources (DEER).*** The California Energy Commission and California Public Utilities Commission (CPUC) sponsor this database, which is designed to

provide well-documented estimates of energy and peak demand savings values, measure costs, and effective useful life (EUL) for the state of California.

- ***Other cost data sources***
    - RS Means Facilities Maintenance and Repair Cost Data
    - RS Means Mechanical Construction Costs
    - RS Means Building Construction Cost Data
    - USGBC — LEED New Construction & Major Renovation (2008)
    - RS Means Green Buildings Project Planning & Cost Estimating Second Edition (2008)
    - Grainger Catalog Volume 398, (2007-2008)
    - EIA Technology Forecast Updates – Residential and Commercial Building Technologies – Reference Case, Navigant Consulting

***Global Energy Partners Databases, Analysis Tools, and Reports***

Global maintains several databases and modeling tools that we use for forecasting and potential studies.

- ***Energy Market Profiles Database.*** Since the late 1990s, Global staff has maintained a database of end-use profiles by sector, customer segment and region for electricity and natural gas. The database contains market size, fuel shares/saturations, UECs/EUIs, intensities, and total sales.
- ***Building Energy Simulation Tool (BEST).*** BEST is a derivative of the DOE 2.2 building simulation model, used to estimate base-year UECs and EUIs, as well as measure savings for the HVAC-related measures.
- ***Database of Energy Efficiency Measures (DEEM).*** Global maintains a database of energy efficiency measures for residential, commercial, and industrial segments across the U.S. This is analogous to the DEER database developed for California. Global updates the database on a regular basis as it conducts new conservation potential studies.
- ***EnergyShape™ Database.*** This database contains end-use load shapes for residential and commercial segments for nine regions in the U.S. For the non-HVAC end uses, we used the EnergyShape data to develop the peak factors that represent the fraction of annual energy use that occurs during the peak hour. The peak factors were calibrated to available utility data for the system peak. The final peak factors were applied to annual energy savings to calculate the peak-demand savings from energy conservation measures.
- ***Recent Studies.*** Global has conducted numerous studies of conservation potential in the last five years. We checked our input assumptions and analysis results against the results from these other studies which include AmerenUE, Los Angeles Department of Water and Power, Consolidated Edison of New York, State of New Mexico, and Tennessee Valley Authority. In addition, we used the information about impacts of building codes and appliance standards from a recent report for the Institute for Energy Efficiency.

***Other Secondary Data and Reports***

Finally, a variety of secondary data sources and reports were used for this study. The main sources are identified below.

- ***U.S. Census Data***:
    - The American Community Survey (ACS) is an ongoing survey that provides data every year on household characteristics. http://www.census.gov/acs/www/

  - Census Bureau's Economic Census, which is conducted every five years, collects details on business characteristics. We used the 2007 version. http://www.census.gov/econ/census07/

- ***Northwest Energy Efficiency Alliance, Single-Family Residential Existing Construction Stock Assessment***, Market Research Report, E07-179 (10/2007), http://neea.org/research/reportdetail.aspx?ID=194
- ***Northwest Energy Efficiency Alliance, Assessment of Multifamily Building Stock in the Pacific Northwest***, Market Research Report, 05-146, August, 2005. http://neea.org/research/reports/146.pdf
- ***Northwest Energy Efficiency Alliance, Long-Term Northwest Residential Lighting Tracking and Monitoring Study***, Market Research Report, 11-228, August, 2011. http://neea.org/research/reports/E11-231_Combinedv2.pdf
- ***Northwest Energy Efficiency Alliance, Multifamily Residential New Construction characteristics and practices Study, Market*** Research Report, 07-173, June, 2007. http://neea.org/research/reports/07%20173.pdf
- ***Northwest Energy Efficiency Alliance, 2009 Northwest Commercial Building Stock Assessment*** (10-211), http://neea.org/research/reportdetail.aspx?ID=546.
- ***California Statewide Surveys***. The Residential Appliance Saturation Survey (RASS) and the Commercial End Use Survey (CEUS) are comprehensive market research studies conducted by the California Energy Commission. These databases provide a wealth of information on appliance use in homes and businesses. RASS is based on information from almost 25,000 homes and CEUS is based on information from a stratified random sample of almost 3,000 businesses in California.
- ***Annual Energy Outlook***. The Annual Energy Outlook (AEO), conducted each year by the U.S. Energy Information Administration (EIA), presents yearly projections and analysis of energy topics. For this study, we used data from the 2011 AEO.
- ***Electric Power Research Institute – Assessment of Achievable Potential from Energy Efficiency and Demand Response Programs in the U.S.***, also known as the EPRI National Potential Study (2008). In 2008, Global conducted an assessment of the national potential for energy efficiency, with estimates derived for the four DOE regions (including the West region that includes Avista).
- ***EPRI End-Use Models (REEPS and COMMEND)***. These models provide the elasticities we apply to retail gas prices, household income, home size and heating and cooling.

## Data Application

We now discuss how the data sources described above were used for each step of the study.

#### *Data Application for Market Characterization*

To construct the high-level market characterization of gas use and households/floor space for the residential, commercial, and industrial sectors, we applied sales data from Avista, the U.S. Census ACS, the NWPCC Sixth Plan, NEEA market characterization reports, and the Annual Energy Outlook.

To segment the residential customers into the three segments, we determined the housing type breakdown based on the U.S. Census ACS for and applied it to the number of customers reported in the 2010 Avista billing data. We then estimated the usage per household to calibrate total residential use for each state to the Avista sales data control totals. For commercial and industrial customers, we used the Sixth Plan, the NEEA CBSA, and our Energy Market Profiles to develop estimates of energy intensity. We then inferred the floor stock in square footage. As with the residential sector, total sales for C&I customers were calibrated to match to the Avista sales data control totals for each state.

***Data Application for Market Profiles***

To develop the market profiles for each segment, we used the following general approach:

1. Developed control totals for each segment as described above. These include market size, segment-level annual gas use, and annual intensity.
2. Used the Sixth Plan and NEEA studies to incorporate information on existing appliance and equipment saturations, appliance and equipment characteristics, building characteristics, customer behavior, operating characteristics, and energy-efficiency actions already taken.
3. Compared and cross-checked with secondary data sources, Energy Market Profiles, and other sources.
4. Ensured calibration to control totals for annual gas sales in each segment.
5. Worked with Avista staff to vet the data against their knowledge and experience.

The specific data elements for the market profiles, together with the key data sources, are shown in Table 2-6.

***Table 2-6 Data Applied for the Market Profiles***

| Model Inputs | Description | Key Sources |
|---|---|---|
| Market size | Base-year residential dwellings and C&I floor space | • Utility billing data<br>• American Community Survey<br>• NWPCC Sixth Plan<br>• NEEA Regional Surveys<br>• Energy Market Profiles |
| Annual intensity | Residential: Annual energy use (kWh/household)<br>C&I: Annual energy use (kWh/sq ft) | • Utility data<br>• NWPCC Sixth Plan<br>• NEEA CBSA<br>• Energy Market Profiles<br>• Previous studies |
| Appliance/equipment saturations | Fraction of dwellings with an appliance/technology<br><br>Percentage of C&I floor space with equipment/technology | • NWPCC Sixth Plan<br>• NEEA residential and commercial market studies<br>• Energy Market Profiles |
| UEC/EUI for each end-use technology | UEC: Annual gas use for a technology in dwellings that have the technology<br><br>EUI: Annual gas use per square foot for a technology in floor space that has the technology | • NWPCC Sixth Plan and RTF data<br>• HVAC uses: BEST simulations using prototypes developed for Avista<br>• Non HVAC uses: engineering analysis<br>• Energy Market Profiles<br>• California RASS and CEUS<br>• Results from previous studies |
| Appliance/equipment vintage distribution | Age distribution for each technology | • NWPCC Sixth Plan and RTF data<br>• NEEA regional survey data<br>• Previous Global studies |
| Efficiency options for each technology | List of available efficiency options and annual energy use for each technology | • DEEM<br>• DEER<br>• Annual Energy Outlook<br>• Previous studies |
| Peak factors | Share of technology energy use that occurs during the peak hour | • Utility data<br>• EnergyShape database |

### *Data Application for Baseline Forecast*

Table 2-7 summarizes the LoadMAP model inputs required for the baseline forecast. These inputs are required for each segment within each sector, as well as for new construction and existing dwellings/buildings.

***Table 2-7 Data Needs for the Baseline Forecast and Potentials Estimation in LoadMAP***

| Model Inputs | Description | Key Sources |
|---|---|---|
| Customer growth forecasts | Forecasts of residential customer growth and of C&I employment growth | • Data provided by Avista |
| Income growth forecasts | Forecast of per capita income | • Data provided by Avista |
| Equipment purchase shares for baseline forecast | For each equipment/technology, purchase shares for each efficiency level; specified separately for equipment replacement (replace-on-burnout) and new construction | • Shipments data<br>• AEO 2011 forecast assumptions Appliance/efficiency standards analysis<br>• NEEA studies |
| Gas prices | Forecast of average gas prices | • Avista price forecasts |
| Utilization model parameters | Price elasticities, elasticities for other variables (income, weather) | • EPRI's REEPS and COMMEND models |

We developed initial baseline purchase shares based on the Energy Information Agency's *Annual Energy Outlook* report (2011). Beyond 2011, we assumed a frozen efficiency case in which the purchase shares for efficient equipment do not change during the study period, unless equipment standards remove a technology option from the market. Table 2-8 and Table 2-9 show the assumptions regarding upcoming standards, based on known standards as of January 2011. This approach removes any effects of naturally occurring conservation or effects of future conservation programs that may be embedded in the AEO forecasts. Thus the CPA's resulting forecasts of potential compared to this baseline are gross forecasts because naturally occurring conservation effects have been removed.

**Table 2-8 Residential Gas Equipment Standards (Northern)**

- Today's Efficiency or Standard Assumption
- Next Standard (relative to today's standard)
- 2nd Standard (relative to today's standard)

| End Use | Technology | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Heating | Furnace | AFUE 80% | | AFUE 90% -Non-weatherized | | AFUE 90% -Weatherized | | | | | | | | | | |
| | Boiler | EF 0.81 | | EF 0.82 | | | | | | | | | | | | |
| Water Heating | Water Heater (<=55 gallons) | EF 0.59 | | | | EF 0.62 | | | | | | | | | | |
| | Water Heater (>55 gallons) | EF 0.59 | | | | Condensing Technology | | | | | | | | | | |
| Appliances | Clothes Dryer | Conventional | | | | 5% more efficient | | | | | | | | | | |
| | Range/Oven | Conventional | No Standing Pilot Light | | | | | | | | | | | | | |
| Miscellaneous | Pool Heater | Conventional | | EF 0.82 | | | | | | | | | | | | |

**Table 2-9 Commercial and Industrial Gas Equipment Standards**

- Today's Efficiency or Standard Assumption
- Next Standard (relative to today's standard)

| End Use | Technology | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Heating | Furnace | AFUE 76% | | | | | | | | | | | | | | |
| | Boiler | EF 0.76 | EF 0.82 | | | | | | | | | | | | | |
| Water Heating | Water Heater | EF 0.80 | | | | | | | | | | | | | | |
| Miscellaneous | Pool Heater | Conventional | | EF 0.82 | | | | | | | | | | | | |

***Energy Conservation Measure Data Application***

Table 2-10 details the data sources used for measure characterization.

***Table 2-10 Data Needs for the Measure Characteristics in LoadMAP***

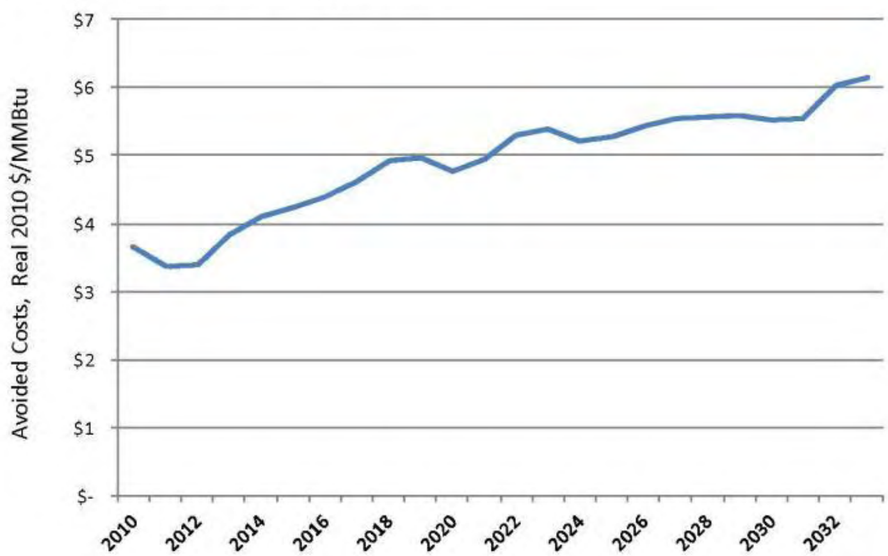
| Model Inputs | Description | Key Sources |
|---|---|---|
| Energy Impacts | The annual reduction in consumption attributable to each specific measure. Savings were developed as a percentage of the energy end use that the measure affects. | • NWPCC Sixth Plan conservation workbooks<br>• RTF deemed measure databases<br>• BEST<br>• EPRI National Study<br>• DEEM<br>• DEER<br>• Other secondary sources |
| Costs | Equipment Measures: Includes the full cost of purchasing and installing the equipment on a per-unit or per-square-foot basis for the residential and C&I sectors, respectively<br>Non-equipment measures: Existing buildings – full installed cost. New Construction - the costs may be either the full cost of the measure, or as appropriate, it may be the incremental cost of upgrading from a standard level to a higher efficiency level. | • NWPCC Sixth Plan conservation workbooks<br>• RTF deemed measure databases<br>• DEEM<br>• DEER<br>• Other secondary sources |
| Measure Lifetimes | Estimates derived from the technical data and secondary data sources that support the measure demand and energy savings analysis | • NWPCC Sixth Plan conservation workbooks<br>• RTF deemed measure databases<br>• DEEM<br>• DEER<br>• Other secondary sources |
| Applicability | Estimate of the percentage of either dwellings in the residential sector or square feet in the C&I sectors where the measures is applicable and where it is technically feasible to implement | • NWPCC Sixth Plan conservation workbooks<br>• RTF deemed measure databases<br>• DEEM<br>• DEER<br>• Other secondary sources |
| On Market and Off Market Availability | Expressed as years for equipment measures to reflect when the equipment technology is available or no longer available in the market | • Appliance, building codes, and standards analysis |

***Data Application for Cost-effectiveness Screening***

To perform the cost-effectiveness screening, the following information was needed:

- Avoided cost of energy provided by Avista, as shown in Figure 2-4. The avoided costs are based on forecasted Henry Hub market costs.
- Line (pipeline) losses of 1.9%, provided by Avista
- Discount rate of 4%, provided by Avista
- Program administration costs. For this study, we used a value of 6% provided by Avista.

***Figure 2-4 Avoided Costs of Energy Forecast***




***Potentials Estimation***

To estimate potentials, two sets of parameters were required.

- ***Adoption rates for non-equipment measures***. Equipment is assumed to be replaced at the end of its useful life, but for non-equipment measures, a set of factors is required to model the gradual implementation over time. Rather than installing all non-equipment measures in the first year of the forecast (instantaneous potential), they are phased in according to adoption schedules that vary based on equipment cost and measure complexity. The adoption rates for the Avista study were bases on ramp rate curves specified in the NWPCC Sixth Power Plan. These adoption rates are used within LoadMAP to generate the technical and economic potentials.
- ***Market acceptance rates (MARs)***. These factors are applied to Economic potential to estimate Achievable potential. These rates were developed using the Council ramp rates. In some cases, the rates were adjusted to reflect Avista DSM program history.

Ramp rates and MARs are discussed in Appendix E.

CHAPTER | 3

# MARKET CHARACTERIZATION AND MARKET PROFILES

Avista Utilities, headquartered in Spokane, Washington is an investor-owned utility with annual revenues of more than $1.3 billion. Avista provides electric and natural gas service to about 481,000 customers in a service territory of more than 30,000 square miles. Avista uses a mix of hydro, natural gas, coal and biomass generation delivered over 2,100 miles of transmission line, 17,000 miles of distribution line, and 6,100 miles of natural gas distribution mains. Avista currently operates a portfolio of electric and natural gas conservation programs in Washington, Idaho, and Oregon for residential, low-income, and non-residential customers that is funded by a non-bypassable systems benefits charge.

Total natural gas use in 2010 for the residential, commercial, and industrial rate classes included in this potential assessment was 315,905,627 therms.[10] As shown in Figure 3-1, the largest sector is residential, accounting for 59.8% of sales, followed by large commercial, with 22.5% of sales.

***Figure 3-1 Sector-Level Gas Use, 2010 (percentage of sales)***

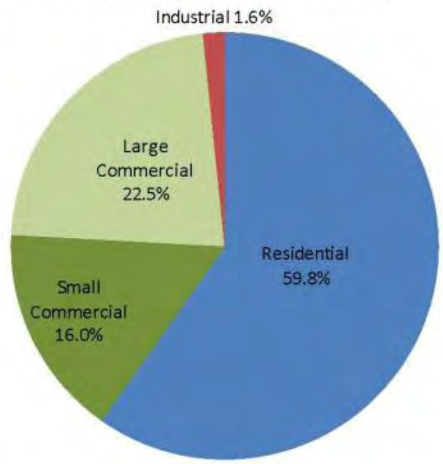



Table 3-1 shows additional detail by state and sector, including the rate classes included in each sector, number of meters, sales, and average use per meter. The gas transportation rate classes, which include relatively large commercial and industrial facilities, were excluded from the CPA analysis. Therefore, most of the remaining industrial customers are relatively small in terms of their gas usage per meter, especially in Oregon.

[10] Energy usage as measured "at-the-meter," i.e., does not include line losses.

***Table 3-1 2010 Gas Sales by State and Sector***

| All States Sector | Rate Class | Number of Meters | 2010 Sales (1000 thm) | % of System Sales | Average Use per Meter (thm) |
|---|---|---|---|---|---|
| Residential | N/A | 282,418 | 188,894 | 59.8% | 669 |
| Small Commercial | N/A | 30,317 | 50,693 | 16.0% | 1,672 |
| Large Commercial | N/A | 3,419 | 71,176 | 22.5% | 20,818 |
| Industrial | N/A | 253 | 5,141 | 1.6% | 20,322 |
| **Total** | | **316,407** | **315,906** | **100.0%** | **998** |
| **Washington Sector** | **Rate Class** | **Number of Meters** | **2010 Sales (1000 thm)** | **% of WA Sales** | **Average Use per Meter (thm)** |
| Residential | 101 | 132,657 | 97,372 | 58.3% | 734 |
| Small Commercial | 101 | 11,906 | 16,706 | 10.0% | 1,403 |
| Large Commercial | 111, 112, 121, 122, 132 | 2,292 | 49,808 | 29.8% | 21,731 |
| Industrial | 101, 111, 121, 122 | 132 | 3,135 | 1.9% | 23,752 |
| **Washington total** | | **146,987** | **167,021** | **100.0%** | **1,136** |
| **Idaho Sector** | **Rate Class** | **Number of Meters** | **2010 Sales (1000 thm)** | **% of ID Sales** | **Average Use per Meter (thm)** |
| Residential | 101 | 65,648 | 44,084 | 61.2% | 672 |
| Small Commercial | 101 | 7,398 | 8,432 | 11.7% | 1,140 |
| Large Commercial | 111, 132 | 1,050 | 17,820 | 24.7% | 16,971 |
| Industrial | 101, 111, 112 | 99 | 1,681 | 2.3% | 16,978 |
| **Idaho total** | | **74,195** | **72,017** | **100.0%** | **971** |
| **Oregon Sector** | **Rate Class** | **Number of Meters** | **2010 Sales (1000 thm)** | **% of OR Sales** | **Average Use per Meter (thm)** |
| Residential | 410 | 84,114 | 47,438 | 61.7% | 564 |
| Small Commercial | 420 | 11,013 | 25,556 | 33.2% | 2,320 |
| Large Commercial | 424 | 77 | 3,548 | 4.6% | 46,081 |
| Industrial | 420, 424 | 22 | 325 | 0.4% | 14,787 |
| **Oregon total** | | **95,226** | **76,867** | **100.0%** | **807** |

## Residential Sector

This section characterizes the residential market at a high level, and then provides a profile of how customers in each segment use gas by end use. Total residential gas use in 2010 was 188.9 million therms. Customer information for each segment is shown in Table 3-2. System wide, the single-family segment consumed 84% of total residential sector gas in 2010 as a result of having the largest number of customers and the highest intensity.

***Table 3-2 Residential Sector Gas Usage and Intensity by State and Segment Type***

| All States Residential Segment | Number of Meters | 2010 Sales (1000 thm) | % of System Res. Sales | Intensity (thm/HH) |
|---|---|---|---|---|
| Single Family | 222,934 | 157,830 | 84% | 708 |
| Multi Family | 25,755 | 11,615 | 6% | 451 |
| Mobile Home | 33,729 | 19,450 | 10% | 577 |
| **Total** | **282,418** | **188,894** | **100%** | **669** |
| **WA Residential Segment** | **Number of Meters** | **2010 Sales (1000 thm)** | **% of WA Res. Sales** | **Intensity (thm/HH)** |
| Single Family | 107,230 | 83,143 | 85% | 775 |
| Multi Family | 14,318 | 6,994 | 7% | 488 |
| Mobile Home | 11,109 | 7,235 | 7% | 651 |
| **Washington Total** | **132,657** | **97,372** | **100%** | **734** |
| **ID Residential Segment** | **Number of Meters** | **2010 Sales (1000 thm)** | **% of ID Res. Sales** | **Intensity (thm/HH)** |
| Single Family | 51,487 | 36,371 | 83% | 706 |
| Multi Family | 4,648 | 2,068 | 5% | 445 |
| Mobile Home | 9,513 | 5,645 | 13% | 593 |
| **Idaho Total** | **65,648** | **44,084** | **100%** | **672** |
| **OR Residential Segment** | **Number of Meters** | **2010 Sales (1000 thm)** | **% of OR Res. Sales** | **Intensity (thm/HH)** |
| Single Family | 64,217 | 38,317 | 81% | 597 |
| Multi Family | 6,789 | 2,552 | 5% | 376 |
| Mobile Home | 13,107 | 6,570 | 14% | 501 |
| **Oregon Total** | **84,114** | **47,438** | **100%** | **564** |

As we describe in the previous chapter, the market profiles provide the foundation upon which we develop the baseline forecast. The market profile for the residential sector as a whole for the base year 2010 is presented in Table 3-3. The residential market profiles for each housing segment and state are presented in Appendix A. Bear in mind that the Avista residential customers included in this analysis all have natural gas service, and thus the percentages with gas space heating and gas water heating, 96% and 77% respectively, are higher than they would be in the general population of all Avista residential customers.

***Table 3-3 Market Profile for the Residential Sector***

**Average Market Profiles**

| End Use | Technology | Saturation | UEC (Thrm) | Intensity (Thrm/HH) | Usage (mmThrm) |
|---|---|---|---|---|---|
| Space Heating | Furnace | 83% | 535 | 446.08 | 125.98 |
| Space Heating | Boiler | 2% | 415 | 10.15 | 2.87 |
| Space Heating | Other Heating | 9% | 472 | 40.29 | 11.38 |
| Water Heating | Water Heater | 77% | 170 | 130.41 | 36.83 |
| Appliances | Clothes Dryer | 24% | 23 | 5.59 | 1.58 |
| Appliances | Stove/Oven | 56% | 37 | 20.63 | 5.83 |
| Miscellaneous | Pool Heater | 4% | 205 | 7.95 | 2.25 |
| Miscellaneous | Miscellaneous | 100% | 8 | 7.75 | 2.19 |
| **Total** | | | | **668.85** | **188.89** |

Figure 3-2 presents the end-use breakout for the average residential household, displaying both annual usage per household and percentage of use. Space heating accounts for the lion's share, with 74% of residential sector gas sales or about 497 therms for the average household in 2010.

***Figure 3-2 Residential Gas Use by End Use, Average Therms/Household and Percentage of Sales, 2010***

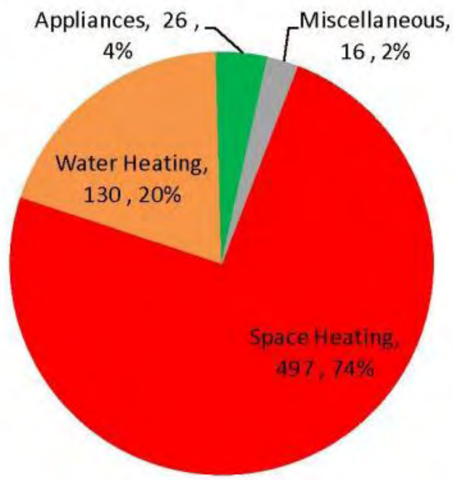
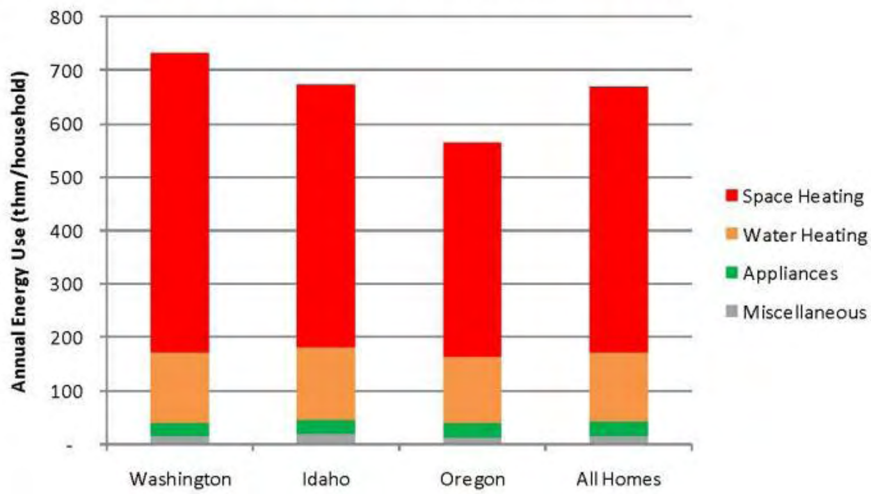



Figure 3-3 shows the breakdown of annual use by end use for the average home in each state and for the Avista residential sector as a whole. Space heating constitutes 77% of gas usage in Washington, 73% in Idaho, and from 71% in Oregon, reflecting the differences in climate among the states.

***Figure 3-3 Annual Residential Natural Gas Use by End Use and State, 2010***




## Commercial and Industrial Sector

Total natural gas use in the commercial and industrial (C&I) sector in 2010 was 127.0 million therms. Avista rate classes were used to allocate this energy use to three segments per state. Intensity estimates in therms/sq. ft. were developed and then used to infer the segment size in floor space for each segment. Table 3-4 displays the resulting sales, intensity, and segment size. Due to the characteristics of the rate structures, a greater percentage of C&I customers in Oregon are classified as small commercial, as compared with Washington and Idaho.

***Table 3-4 C&I Sector Gas Usage and Intensity by State and Segment, 2010***

| All States C&I | | 2010 Sales (1000 thm) | % of All C&I Sales | Intensity (thm/sq. ft.) | Segment Size (million sq. ft) |
|---|---|---|---|---|---|
| Small Commercial | N/A | 50,693 | 40% | 0.343 | 147.798 |
| Large Commercial | N/A | 71,176 | 56% | 0.649 | 109.666 |
| Industrial | N/A | 5,141 | 4% | 0.776 | 6.621 |
| **All States Total** | | **127,011** | **100%** | **0.481** | **264.085** |
| **Washington Sector** | **Rate Class** | **2010 Sales (1000 thm)** | **% of WA C&I Sales** | **Intensity (thm/sq. ft.)** | **Segment Size (million sq. ft)** |
| Small Commercial | 101 | 16,706 | 24% | 0.363 | 46.021 |
| Large Commercial | 111, 112, 121, 122, 132 | 49,808 | 72% | 0.660 | 75.467 |
| Industrial | 101, 111, 121, 122 | 3,135 | 5% | 0.792 | 3.959 |
| **Washington Total** | | **69,649** | **100%** | **0.555** | **125.447** |
| **Idaho Sector** | **Rate Class** | **2010 Sales (1000 thm)** | **% of ID C&I Sales** | **Intensity (thm/sq. ft.)** | **Segment Size (million sq. ft)** |
| Small Commercial | 101 | 8,432 | 30% | 0.347 | 24.335 |
| Large Commercial | 111, 132 | 17,820 | 64% | 0.630 | 28.285 |
| Industrial | 101, 111, 112 | 1,681 | 6% | 0.759 | 2.215 |
| **Idaho Total** | | **27,933** | **100%** | **0.509** | **54.835** |
| **Oregon Sector** | **Rate Class** | **2010 Sales (1000 thm)** | **% of OR C&I Sales** | **Intensity (thm/sq. ft.)** | **Segment Size (million sq. ft)** |
| Small Commercial | 420 | 25,556 | 87% | 0.330 | 77.441 |
| Large Commercial | 424 | 3,548 | 12% | 0.600 | 5.914 |
| Industrial | 420, 424 | 325 | 1% | 0.726 | 0.448 |
| **Oregon Total** | | **29,429** | **100%** | **0.351** | **83.803** |

Table 3-5 shows the market profile for C&I customers as a whole, representing a composite of small commercial, large commercial, and industrial. Overall, about 94% of the floor space for these gas customers is heated with natural gas. Market profiles for each segment and state are presented in Appendix A.

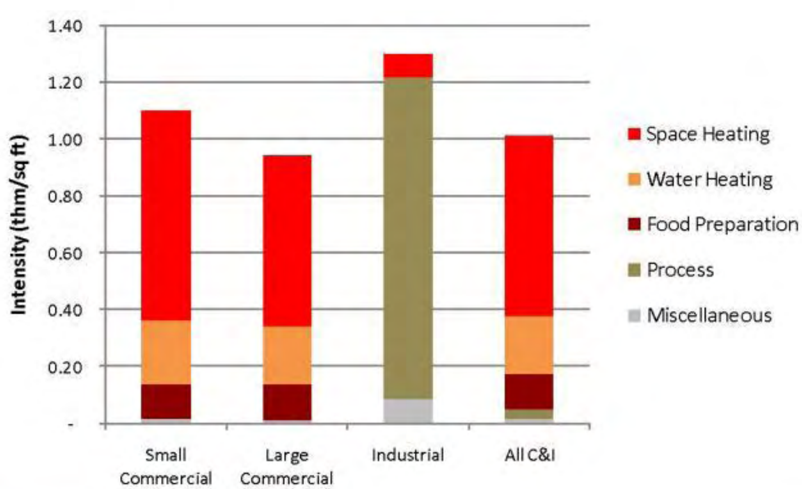
***Table 3-5 Commercial Sector Composite Market Profile, 2010***

**Average Market Profiles**

| End Use | Technology | Saturation | EUI (Thrm) | Intensity (Thrm/Sqft.) | Usage (mmThrm) |
|---|---|---|---|---|---|
| Space Heating | Furnace | 60% | 0.222 | 0.133 | 35.103 |
| Space Heating | Boiler | 20% | 0.697 | 0.140 | 37.098 |
| Space Heating | Other Heating | 14% | 0.198 | 0.028 | 7.379 |
| Water Heating | Water Heater | 37% | 0.264 | 0.098 | 25.816 |
| Food Preparation | Oven | 16% | 0.042 | 0.007 | 1.734 |
| Food Preparation | Fryer | 16% | 0.064 | 0.010 | 2.682 |
| Food Preparation | Broiler | 16% | 0.064 | 0.010 | 2.679 |
| Food Preparation | Griddle | 16% | 0.064 | 0.010 | 2.679 |
| Food Preparation | Range | 16% | 0.047 | 0.007 | 1.978 |
| Food Preparation | Steamer | 16% | 0.080 | 0.013 | 3.342 |
| Process | Process Heating | 3% | 0.671 | 0.017 | 4.446 |
| Process | Process Cooling | 3% | 0.001 | 0.000 | 0.008 |
| Process | Other Process | 3% | 0.005 | 0.000 | 0.030 |
| Miscellaneous | Pool Heater | 1% | 0.137 | 0.002 | 0.409 |
| Miscellaneous | Miscellaneous | 100% | 0.006 | 0.006 | 1.627 |
| | **Total** | | | **0.481** | **127.011** |

Figure 3-4 illustrates the distribution of gas consumption by end use for small commercial, large commercial, industrial, and C&I facilities as a whole. As one would expect, space heating is the predominant use, representing 63% of overall C&I gas consumption. For industrial facilities however, process heating represents the greatest share.

***Figure 3-4 C&I End Use Intensities, 2010***



CHAPTER | 4

# BASELINE FORECAST

Prior to developing estimates of conservation potential, a baseline end-use forecast was developed to quantify how natural gas is used by end use in the base year and what the consumption is likely to be in the future in absence of new utility programs and naturally occurring conservation. The baseline forecast serves as the metric against which conservation potentials are measured.

## Residential Sector

The baseline forecast incorporates assumptions about customer growth, economic growth, natural gas prices, and appliance/equipment standards and building codes already mandated. Figure 4-1 and Table 4-1 present the baseline forecast at the end-use level for the residential sector. Overall, residential use increases, from about 188.9 million therms in 2010 to 269.3 million therms in 2032, a 43% increase, translating to an average annual growth rate of 1.6%.

***Figure 4-1 Residential Baseline Forecast by End Use***

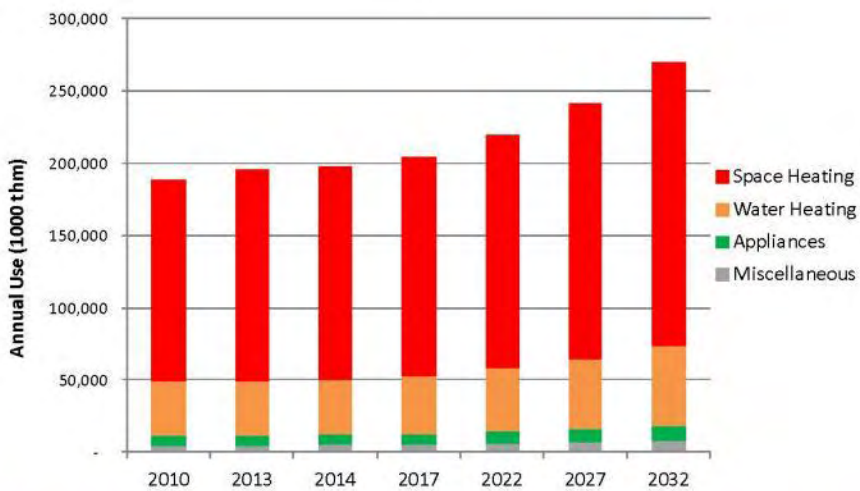



***Table 4-1 Residential Baseline Forecast by End Use (1000 therm)***

| End Use | 2010 | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 | % Change (2010-2032) | Avg. Growth Rate (2010-2032) |
|---|---|---|---|---|---|---|---|---|---|
| Space Heating | 140,227 | 147,112 | 147,684 | 151,812 | 162,067 | 176,430 | 196,022 | 40% | 1.5% |
| Water Heating | 36,830 | 36,943 | 37,540 | 39,382 | 43,315 | 48,652 | 55,025 | 49% | 1.8% |
| Appliances | 7,404 | 7,313 | 7,388 | 7,649 | 8,319 | 9,234 | 10,233 | 38% | 1.5% |
| Miscellaneous | 4,433 | 4,705 | 4,837 | 5,269 | 6,077 | 6,975 | 7,995 | 80% | 2.7% |
| **Total** | **188,894** | **196,073** | **197,449** | **204,112** | **219,778** | **241,292** | **269,274** | **43%** | **1.6%** |

Table 4-2 shows the end-use forecast at the technology level.

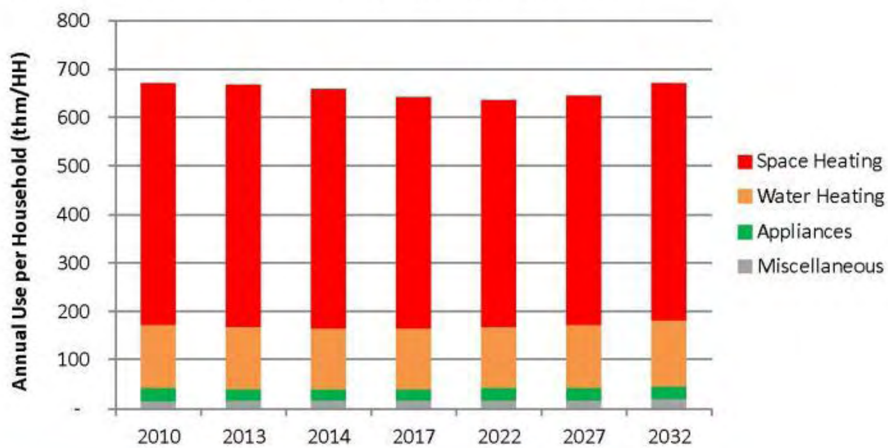
***Table 4-2 Residential Baseline Forecast by End Use and Technology (1000 therm)***

| End Use | Technology | 2010 | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 | % Change (2010-2032) | Avg. Growth Rate (2010-2032) |
|---|---|---|---|---|---|---|---|---|---|---|
| Space Heating | Furnace | 125,981 | 131,500 | 131,729 | 134,695 | 142,731 | 154,426 | 170,969 | 36% | 1.4% |
| | Boiler | 2,866 | 3,062 | 3,106 | 3,242 | 3,526 | 3,912 | 4,377 | 53% | 1.9% |
| | Other Heating | 11,380 | 12,549 | 12,849 | 13,876 | 15,810 | 18,093 | 20,677 | 82% | 2.7% |
| Water Heating | Water Heater | 36,830 | 36,943 | 37,540 | 39,382 | 43,315 | 48,652 | 55,025 | 49% | 1.8% |
| Appliances | Clothes Dryer | 1,579 | 1,363 | 1,328 | 1,199 | 1,113 | 1,180 | 1,294 | -18% | -0.9% |
| | Stove/Oven | 5,825 | 5,950 | 6,060 | 6,451 | 7,206 | 8,054 | 8,939 | 53% | 1.9% |
| Miscellaneous | Miscellaneous | 2,187 | 2,330 | 2,399 | 2,628 | 3,055 | 3,530 | 4,054 | 85% | 2.8% |
| | Pool Heater | 2,246 | 2,376 | 2,438 | 2,642 | 3,022 | 3,445 | 3,941 | 75% | 2.6% |
| **Grand Total** | | **188,894** | **196,073** | **197,449** | **204,112** | **219,778** | **241,292** | **269,274** | **43%** | **1.6%** |

Gas consumption for all end uses and technologies increases, mainly due to the projected 1.7% annual growth in the number of households, but also due to slight increases in the average home physical size. Other heating, which includes unit wall heaters, and miscellaneous loads have a relatively high growth rate compared to other loads, but at the end of the study period these loads are still constitute only a small part of overall use.

Figure 4-2 presents the forecast of use per household. Most noticeable is that space heating, water heating, and appliance use all decrease slightly, due to new equipment standards that come into effect between 2014 and 2015. After 2022, however, total use begins to grow again, due to the assumption that average home size continues to grow slightly as older housing stock is replaced.

***Figure 4-2 Residential Baseline Use per Household by End Use***




## Commercial and Industrial Sector

Natural gas use in the C&I sector continues to grow, albeit slowly, during the forecast horizon, as new C&I construction increases overall square footage in the commercial sector. In addition, existing buildings are renovated to incorporate additional amenities, such as full-scale kitchens. Consumption starts at 127 million therms in 2010 and increases to nearly 136 million therms in 2032, an overall growth of 7.1%.

Figure 4-3 and Table 4-3 present the baseline forecast at the end-use level for the C&I sector as a whole. All end uses show growth over the forecast period, with the exception of space heating with only 2% growth, which is attributed to upcoming equipment standards.

***Figure 4-3 Commercial and Industrial Baseline Forecast by End Use***

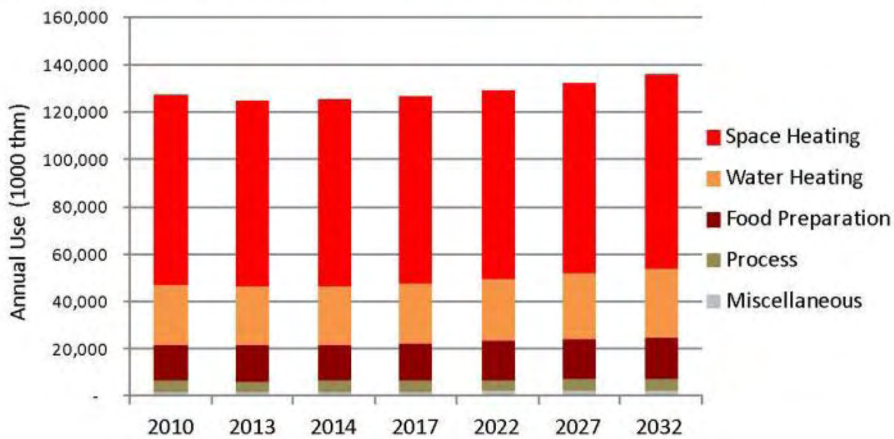



***Table 4-3 Commercial Natural Gas Consumption by End Use (1000-therm)***

| End Use | 2010 | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 | % Change (2010-2032) | Avg. Growth Rate (2010-2032) |
|---|---|---|---|---|---|---|---|---|---|
| Space Heating | 79,580 | 78,184 | 78,553 | 79,021 | 79,488 | 80,114 | 81,826 | 2.8% | 0.1% |
| Water Heating | 25,816 | 24,685 | 24,873 | 25,412 | 26,574 | 27,892 | 29,251 | 13.3% | 0.6% |
| Food Preparation | 15,095 | 15,122 | 15,312 | 15,724 | 16,374 | 16,969 | 17,527 | 16.1% | 0.7% |
| Process | 4,484 | 4,391 | 4,430 | 4,517 | 4,632 | 4,759 | 4,898 | 9.2% | 0.4% |
| Miscellaneous | 2,036 | 2,047 | 2,077 | 2,146 | 2,251 | 2,359 | 2,473 | 21.5% | 0.9% |
| **Total** | **127,011** | **124,429** | **125,244** | **126,819** | **129,319** | **132,094** | **135,976** | **7.1%** | **0.3%** |

Table 4-4 presents the commercial sector forecast by technology. Specific observations include:

- Growth in the HVAC and water heating end uses is moderate, commensurate with projected growth in floor space and employment, the two principal drivers of commercial sector consumption.
- Food preparation, though remaining a small percentage of total usage, grows at a higher rate than other end uses. This reflects the addition of kitchen facilities to commercial office buildings during new construction or renovation, as well as the expansion of food service offerings in other building types as well.
- Consumption by miscellaneous equipment also increases. This reflects the assumption that buildings in the commercial sector will increase use.
- Growth in process heating is also commensurate with projected industrial growth.

**Table 4-4 C&I Baseline Natural Gas Forecast by End Use and Technology (MWh)**

| End Use | Technology | 2010 | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 | % Change (2010-2032) | Avg. Growth Rate (2010-2032) |
|---|---|---|---|---|---|---|---|---|---|---|
| Space Heating | Furnace | 35,103 | 35,003 | 35,302 | 35,791 | 36,092 | 36,193 | 37,071 | 5.6% | 0.2% |
| | Boiler | 37,098 | 35,899 | 35,918 | 35,864 | 36,180 | 36,810 | 37,762 | 1.8% | 0.1% |
| | Other Heating | 7,379 | 7,282 | 7,332 | 7,366 | 7,216 | 7,111 | 6,993 | -5.2% | -0.2% |
| Water Heating | Water Heater | 25,816 | 24,685 | 24,873 | 25,412 | 26,574 | 27,892 | 29,251 | 13.3% | 0.6% |
| Food Preparation | Fryer | 2,682 | 2,695 | 2,732 | 2,814 | 2,942 | 3,062 | 3,178 | 18.5% | 0.8% |
| | Oven | 1,734 | 1,744 | 1,769 | 1,825 | 1,917 | 2,006 | 2,086 | 20.3% | 0.8% |
| | Broiler | 2,679 | 2,712 | 2,758 | 2,864 | 3,035 | 3,206 | 3,376 | 26.0% | 1.1% |
| | Griddle | 2,679 | 2,712 | 2,757 | 2,862 | 3,027 | 3,190 | 3,352 | 25.1% | 1.0% |
| | Range | 1,978 | 2,002 | 2,035 | 2,111 | 2,227 | 2,336 | 2,438 | 23.2% | 0.9% |
| | Steamer | 3,342 | 3,257 | 3,262 | 3,249 | 3,225 | 3,169 | 3,097 | -7.3% | -0.3% |
| Process | Process Heating | 4,446 | 4,353 | 4,392 | 4,478 | 4,593 | 4,719 | 4,857 | 9.2% | 0.4% |
| | Process Cooling | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 9.2% | 0.4% |
| | Other Process | 30 | 30 | 30 | 30 | 31 | 32 | 33 | 9.2% | 0.4% |
| Miscellaneous | Pool Heater | 409 | 412 | 417 | 428 | 442 | 459 | 480 | 17.4% | 0.7% |
| | Miscellaneous | 1,627 | 1,635 | 1,660 | 1,718 | 1,809 | 1,900 | 1,993 | 22.5% | 0.9% |
| **Grand Total** | | **127,011** | **124,429** | **125,244** | **126,819** | **129,319** | **132,094** | **135,976** | **7.1%** | **0.3%** |

## System-wide Baseline Forecast

Table 4-5 and Figure 4-4 provide an overall summary of the baseline forecast by sector for Avista as a whole. Overall, the forecast for the next 20 years grows steadily, dominated by growth in the residential sector, as discussed above.

***Table 4-5 Baseline Forecast Summary (1000 therm)***

| Sector | 2010 | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 | % Change (2010-2032) | Avg. Growth Rate (2010-2032) |
|---|---|---|---|---|---|---|---|---|---|
| Residential | 188,894 | 196,073 | 197,449 | 204,112 | 219,778 | 241,292 | 269,274 | 43% | 1.5% |
| Small Commercial | 50,693 | 50,130 | 50,530 | 51,271 | 52,378 | 53,494 | 55,120 | 9% | 0.4% |
| Large Commercial | 71,176 | 69,274 | 69,647 | 70,392 | 71,667 | 73,191 | 75,295 | 6% | 0.2% |
| Industrial | 5,141 | 5,026 | 5,067 | 5,156 | 5,274 | 5,409 | 5,560 | 8% | 0.3% |
| **Total** | **315,906** | **320,503** | **322,693** | **330,932** | **349,097** | **373,385** | **405,250** | **28%** | **1.1%** |

***Figure 4-4 Baseline Forecast Summary, by Sector***

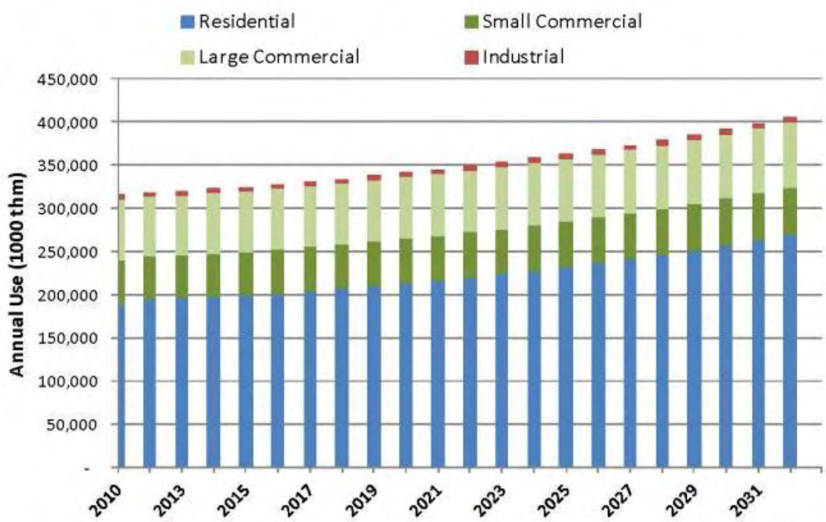


Table 4-6 and Figure 4-5 provide an overall summary of the baseline forecast by state. Growth is projected to be highest in Idaho, based on assumptions regarding customer growth, followed by Oregon.

***Table 4-6 Baseline Forecast Summary, by State (1000-therm)***

| State | 2010 | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 | % Change (2010-2032) | Avg. Growth Rate (2010-2032) |
|---|---|---|---|---|---|---|---|---|---|
| Washington | 167,021 | 168,616 | 169,523 | 173,064 | 180,908 | 191,260 | 205,302 | 23% | 0.9% |
| Idaho | 72,017 | 73,767 | 74,426 | 76,910 | 82,427 | 89,742 | 99,277 | 38% | 1.4% |
| Oregon | 76,867 | 78,120 | 78,744 | 80,958 | 85,762 | 92,383 | 100,671 | 31% | 1.2% |
| Total | 315,906 | 320,503 | 322,693 | 330,932 | 349,097 | 373,385 | 405,250 | 28% | 1.1% |

***Figure 4-5 Baseline Forecast Summary, By State***

CHAPTER | 5

# CONSERVATION POTENTIAL

This chapter presents the results of the potential analysis, with overall potential presented first, followed by results for each sector. All results show cumulative potential. Additional details for all years and incremental annual results appear in Appendix F.

Table 5-1 summarizes achievable potential by state and sector for selected years.

***Table 5-1 Cumulative Achievable Conservation Potential by State and by Sector***

| Cumulative Savings (1000 therm) | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 |
|---|---|---|---|---|---|---|
| Washington | 893 | 2,203 | 6,923 | 15,364 | 21,885 | 26,909 |
| Idaho | 364 | 821 | 2,734 | 5,601 | 8,758 | 11,914 |
| Oregon | 289 | 715 | 3,136 | 7,251 | 10,706 | 13,559 |
| **Total** | **1,546** | **3,738** | **12,794** | **28,216** | **41,349** | **52,381** |

| Cumulative Savings (1000 therm) | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 |
|---|---|---|---|---|---|---|
| Residential | 515 | 1,567 | 6,507 | 14,903 | 22,278 | 29,960 |
| Small Comercial | 206 | 469 | 1,588 | 3,557 | 5,709 | 7,018 |
| Large Commercial | 801 | 1,654 | 4,548 | 9,436 | 13,007 | 15,027 |
| Industrial | 25 | 49 | 151 | 319 | 354 | 377 |
| **Total** | **1,546** | **3,738** | **12,794** | **28,216** | **41,349** | **52,381** |

As shown in Figure 5-2, initially, the large commercial sector provides a relatively higher percentage of the achievable savings compared with its share of sales, but over time this situation changes, so that the residential sector's share of savings is greatest, mainly due to growth in residential customer count.

***Figure 5-1 Cumulative Achievable Conservation Potential Savings by Sector***

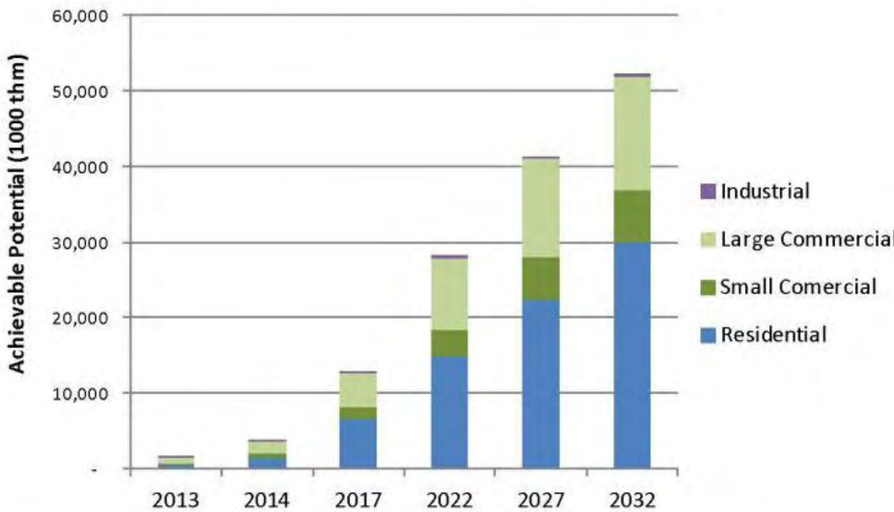



Table 5-2 presents the baseline forecasts of energy consumption, as well as the three levels of conservation potential for the residential, commercial, and industrial sectors. As discussed in detail in Chapter 4, the baseline forecast across all sectors increases over the 20-year time period. This is due largely to the growth in the residential sector, which is tempered somewhat due to appliance and equipment standards, building codes, and a sluggish economy in the initial years. Key findings related to potentials are summarized below.

- ***Achievable potential*** across the residential, commercial, and industrial sectors is 28.2 million therms in 2022 and increases to 52.4 million therms by 2032. These savings represent 8.1% of the baseline forecast in 2022 and 12.9% in 2032.
- ***Economic potential***, which reflects the savings when all cost-effective measures are taken, is 31.8 million therms in 2022. This represents 9.1% of the baseline energy forecast. By 2032, economic potential reaches 59.0 million therms, 14.6% of the baseline energy forecast.
- ***Technical potential***, which reflects the adoption of all conservation measures regardless of cost-effectiveness, is a theoretical upper bound on savings. Technical potential is substantial, because measures such as solar thermal water heating could cut energy use dramatically. In 2022, energy savings are 91.7 million therms, equivalent to 26.3% of the baseline energy forecast. By 2032, technical potential reaches 157.5 million therms, 38.9% of the baseline energy forecast. The relatively wide gap between technical and economic potential reflects the low avoided costs, as well as the fact that Avista's long-running conservation programs have already achieved much of the cost-effective conservation. As a result, additional conservation measures are becoming relatively more costly, and many do not pass the cost-effectiveness screen based on Avista's current avoided costs.

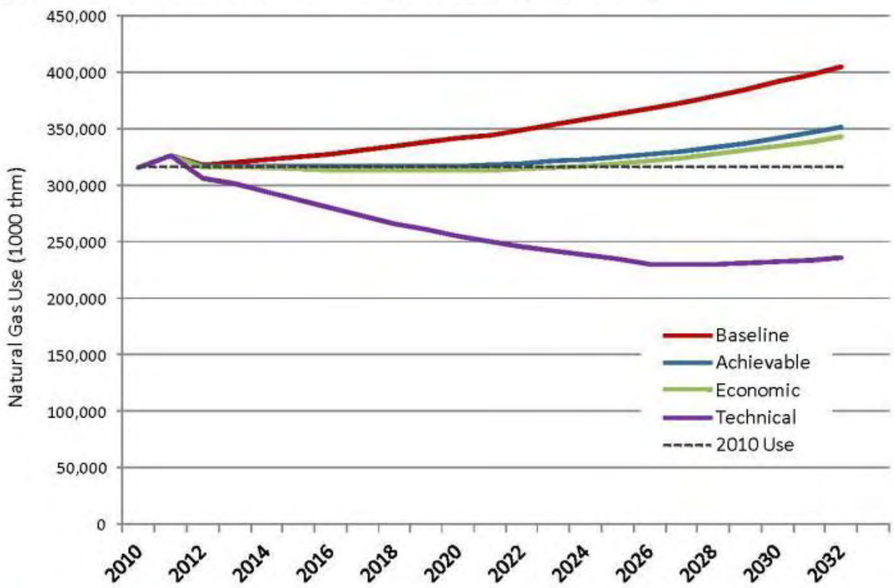
***Table 5-2 Summary of Cumulative Achievable, Economic, and Technical Conservation Potential***

| | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 |
|---|---|---|---|---|---|---|
| **Baseline Forecast (1000 thm)** | | | | | | |
| | 320,503 | 322,693 | 330,932 | 349,097 | 373,385 | 405,250 |
| **Cumulative Natural Gas Savings (1000 thm)** | | | | | | |
| Achievable | 1,546 | 3,738 | 12,794 | 28,216 | 41,349 | 52,381 |
| Economic | 1,797 | 4,333 | 14,785 | 31,757 | 45,809 | 58,965 |
| Technical | 7,623 | 15,844 | 46,189 | 91,655 | 131,422 | 157,520 |
| **Cumulative Natural Gas Savings (% of Baseline)** | | | | | | |
| Achievable | 0.5% | 1.2% | 3.9% | 8.1% | 11.1% | 12.9% |
| Economic | 0.6% | 1.3% | 4.5% | 9.1% | 12.3% | 14.6% |
| Technical | 2.4% | 4.9% | 14.0% | 26.3% | 35.2% | 38.9% |

Figure 5-2 summarizes the energy-efficiency savings for the three levels of potential relative to the baseline forecast. Figure 5-3 displays the baseline and conservation potential forecasts. The dotted black line depicts the 2010 usage level. In 2022, Achievable potential, indicated by the blue line, offsets 89% of the growth in the baseline forecast since 2012. By 2032, Achievable potential offsets 60% of that growth.

***Figure 5-2 Summary of Cumulative Conservation Potential Savings***

***Figure 5-3 Conservation Potential Energy Forecasts (1000 therm)***




## Residential Sector

Table 5-3 presents estimates for the three types of potential for the residential sector. Note that we have included in the achievable and economic potential specific weatherization measures in Oregon, which although not cost-effective, are mandated to be included in residential DSM programs.

- ***Achievable potential*** is 14.9 million therms in 2022. This level of potential is equivalent to 6.8% of the residential baseline forecast for that year. By 2032, the cumulative achievable conservation savings are 30.0 million therms, 11.1% of the baseline forecast.
- ***Economic potential,*** which reflects the savings when all cost-effective measures are taken, is 16.8 million therms in 2022, or 7.6% of the baseline energy forecast. By 2032, economic potential reaches 34.4 million therms, 12.8% of the baseline energy forecast.
- ***Technical potential,*** which reflects the adoption of all energy conservation measures regardless of cost, is a theoretical upper bound on savings. The 10-year technical potential is 55.2 million therms, or 25.1% of the baseline energy forecast. By 2032, technical potential reaches 101.4 million therms, 37.6% of the baseline energy forecast.

***Table 5-3 Residential Sector Cumulative Conservation Potential Summary***

| | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 |
|---|---|---|---|---|---|---|
| **Baseline Forecast (1000 thm)** | | | | | | |
| | 196,073 | 197,449 | 204,112 | 219,778 | 241,292 | 269,274 |
| **Cumulative Natural Gas Savings (1000 thm)** | | | | | | |
| Achievable | 515 | 1,567 | 6,507 | 14,903 | 22,278 | 29,960 |
| Economic | 732 | 2,034 | 7,839 | 16,771 | 25,105 | 34,439 |
| Technical | 4,757 | 9,491 | 28,678 | 55,233 | 80,721 | 101,352 |
| **Cumulative Natural Gas Savings (% of Baseline)** | | | | | | |
| Achievable | 0.3% | 0.8% | 3.2% | 6.8% | 9.2% | 11.1% |
| Economic | 0.4% | 1.0% | 3.8% | 7.6% | 10.4% | 12.8% |
| Technical | 2.4% | 4.8% | 14.0% | 25.1% | 33.5% | 37.6% |

Figure 5-4 summarizes the energy-efficiency savings for the three levels of potential relative to the baseline forecast. Figure 5-5 displays the baseline and conservation potential forecasts. The dotted black line depicts the 2010 usage level. In 2022, Achievable potential, indicated by the blue line, offsets 50% of the growth in the residential baseline forecast since 2012. By 2032, Achievable potential offsets 38% of that growth.

***Figure 5-4 Residential Cumulative Conservation Potential Savings***

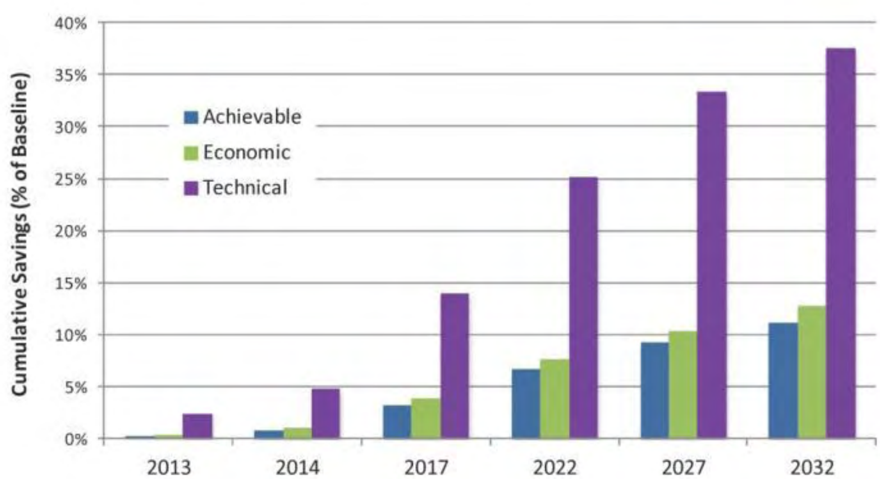
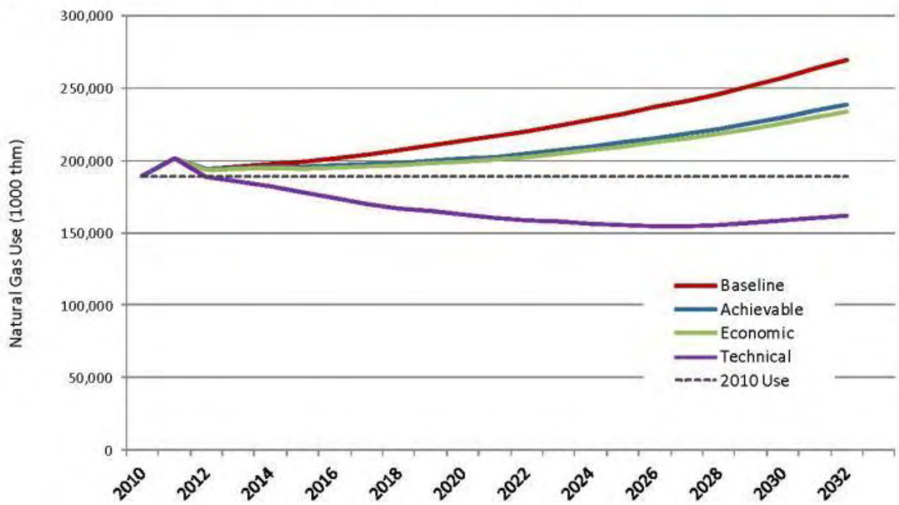


***Figure 5-5 Residential Conservation Potential Forecast***




## Residential Potential by Housing Type and State

Single-family homes represent about 79% of Avista's residential gas customers, but accounted for 84% of the sector's consumption in 2010. The distribution of potential savings by segment is nearly the same as the distribution of consumption among the sectors, as shown in Table 5-4.

***Table 5-4 Residential Cumulative Achievable Potential by Housing Type, Selected Years***

| | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 |
|---|---|---|---|---|---|---|
| **Baseline Forecast (1000 therm)** | | | | | | |
| Single Family | 163,823 | 164,914 | 170,332 | 183,163 | 200,847 | 223,978 |
| Multi Family | 12,108 | 12,234 | 12,736 | 13,824 | 15,255 | 17,033 |
| Mobile Home | 20,143 | 20,300 | 21,045 | 22,791 | 25,189 | 28,263 |
| **Total** | **196,073** | **197,449** | **204,112** | **219,778** | **241,292** | **269,274** |
| **Natural Gas Savings (1000 therm)** | | | | | | |
| Single Family | 427 | 1,343 | 5,472 | 12,713 | 18,853 | 24,847 |
| Multi Family | 26 | 65 | 310 | 750 | 1,265 | 2,041 |
| Mobile Home | 61 | 158 | 724 | 1,441 | 2,161 | 3,072 |
| **Total** | **515** | **1,567** | **6,507** | **14,903** | **22,278** | **29,960** |
| **% of Total Residential Savings** | | | | | | |
| Single Family | 83.0% | 85.7% | 84.1% | 85.3% | 84.6% | 82.9% |
| Multi Family | 5.1% | 4.2% | 4.8% | 5.0% | 5.7% | 6.8% |
| Mobile Home | 11.9% | 10.1% | 11.1% | 9.7% | 9.7% | 10.3% |

The distribution of achievable savings by state is shown in Table 5-5. Whereas Oregon represents only about one-quarter of the baseline forecast, it makes up between 28 and 35% of the achievable potential savings. This is due to the inclusion of mandated weatherization and insulation measures within Oregon's achievable potential.

***Table 5-5 Residential Cumulative Achievable Potential by State, Selected Years***

| | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 |
|---|---|---|---|---|---|---|
| **Baseline Forecast (1000 therm)** | | | | | | |
| Washington | 100,894 | 101,415 | 104,274 | 110,964 | 119,962 | 132,043 |
| Idaho | 46,065 | 46,424 | 48,209 | 52,647 | 58,832 | 67,038 |
| Oregon | 49,114 | 49,609 | 51,629 | 56,167 | 62,498 | 70,193 |
| **Total** | **196,073** | **197,449** | **204,112** | **219,778** | **241,292** | **269,274** |
| **Natural Gas Savings (1000 therm)** | | | | | | |
| Washington | 237 | 838 | 3,017 | 7,268 | 10,634 | 13,894 |
| Idaho | 121 | 306 | 1,248 | 2,337 | 4,002 | 6,246 |
| Oregon | 156 | 422 | 2,242 | 5,298 | 7,642 | 9,819 |
| **Total** | **515** | **1,567** | **6,507** | **14,903** | **22,278** | **29,960** |
| **% of Total Residential Savings** | | | | | | |
| Washington | 46.2% | 53.5% | 46.4% | 48.8% | 47.7% | 46.4% |
| Idaho | 23.6% | 19.6% | 19.2% | 15.7% | 18.0% | 20.8% |
| Oregon | 30.3% | 26.9% | 34.5% | 35.5% | 34.3% | 32.8% |

Table 5-6 shows additional detail by state for 2022, including the cumulative economic and technical potential, as well as achievable potential. We note that technical potential savings as a percentage of baseline is roughly the same across the states. However, economic and achievable potential as a percentage of baseline use is highest in Oregon, again because of the inclusion of mandated weatherization and insulation measures.

***Table 5-6 Residential Cumulative Potential Summary by State, 2022***

| | Washington | Idaho | Oregon[1] | All States |
|---|---|---|---|---|
| Baseline Forecast | 110,964 | 52,647 | 56,167 | 219,778 |
| **Energy Savings (1000 thm)** | | | | |
| Achievable | 7,268 | 2,337 | 5,298 | 14,903 |
| Economic | 8,322 | 2,723 | 5,726 | 16,771 |
| Technical | 27,441 | 13,235 | 14,557 | 55,233 |
| **Energy Savings (% of Baseline)** | | | | |
| Achievable | 6.6% | 4.4% | 9.4% | 6.8% |
| Economic | 7.5% | 5.2% | 10.2% | 7.6% |
| Technical | 24.7% | 25.1% | 25.9% | 25.1% |

1. Oregon potential includes mandated residential weatherization and insulation measures.

## Residential Potential by End Use, Technology and Measure Type

Table 5-7 provides estimates of savings for each end use and type of potential. Focusing first on technical potential, there are significant savings possible; however, due to low avoided costs, many of these measures are cost-ineffective and thus economic and achievable potential are much lower.

- ***Space heating***, which is the highest use in the residential sector, offers between 53% and 59% of the technical potential, depending on the year. This potential would be achieved if all furnaces, boilers, and unit heaters were replaced with the most efficient units available, and all insulation, weatherization, and controls measures were installed as well. However, in most cases, with the exception of boilers and unit heaters in selected housing types, the higher-efficiency units are not cost-effective compared with standard efficiency units. And many of the weatherization measures are likewise cost-ineffective, especially in the earlier years of the forecast. In 2022, space heating represents 69% of economic potential and 70% of achievable potential.
- ***Water Heating*** offers between 40% and 46% of technical potential depending on the year. This potential reflects the across the board-installation of solar water heating. However, solar water heating is not cost-effective, particularly in the Northwestern climate. In addition, higher-efficiency conventional equipment is not cost-effective compared with standard efficiency models. However, many of the water heating non-equipment measures, such as insulating tanks and pipes or flow-reducing devices, are cost-effective and thus do contribute to economic and achievable potential. In 2022, water heating represents 31% of economic potential and 30% of achievable potential.
- ***Appliances and Miscellaneous*** represent a small percentage of the technical potential in any given year — so small that even when combined they constitute less than 1% of the total technical potential. In any case, equipment upgrades were not found to be cost-effective, so economic and achievable potential for these two end uses are zero.

***Table 5-7 Residential Cumulative Savings by End Use and Potential Type (1000-therm)***

| | | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 |
|---|---|---|---|---|---|---|---|
| Space Heating | Achievable | 291 | 991 | 3,922 | 10,416 | 15,924 | 21,100 |
| | Economic | 455 | 1,314 | 4,808 | 11,535 | 17,696 | 24,187 |
| | Technical | 2,666 | 5,061 | 16,073 | 31,492 | 46,405 | 59,916 |
| Water Heating | Achievable | 223 | 576 | 2,585 | 4,488 | 6,354 | 8,859 |
| | Economic | 277 | 721 | 3,032 | 5,235 | 7,409 | 10,252 |
| | Technical | 2,042 | 4,332 | 12,396 | 23,354 | 33,787 | 40,830 |
| Appliances | Achievable | 0 | 0 | 0 | 0 | 0 | 0 |
| | Economic | 0 | 0 | 0 | 0 | 0 | 0 |
| | Technical | 32 | 63 | 114 | 182 | 221 | 240 |
| Misc. | Achievable | 0 | 0 | 0 | 0 | 0 | 0 |
| | Economic | 0 | 0 | 0 | 0 | 0 | 0 |
| | Technical | 17 | 36 | 95 | 205 | 308 | 365 |
| **Total** | **Achievable** | **515** | **1,567** | **6,507** | **14,903** | **22,278** | **29,960** |
| | **Economic** | **732** | **2,034** | **7,839** | **16,771** | **25,105** | **34,439** |
| | **Technical** | **4,757** | **9,491** | **28,678** | **55,233** | **80,721** | **101,352** |

As described in Chapter 2, using our LoadMAP model, we develop separate estimates of potential for equipment and non-equipment measures. Table 5-8 presents results for equipment at the technology level and Table 5-9 presents non-equipment measures in 2022. In any given year, at least 94% of the savings come from the non-equipment measures.

***Table 5-8 Residential Cumulative Achievable Potential, Equipment Measures (1000 thm)***

| End Use | Technology | 2012 | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 |
|---|---|---|---|---|---|---|---|---|
| Space Heating | Furnace | - | - | - | - | - | - | - |
| | Boiler | 3 | 6 | 16 | 78 | 244 | 448 | 682 |
| | Other Heating | 12 | 20 | 34 | 91 | 257 | 506 | 748 |
| Water Heating | Water Heater | 7 | 10 | 24 | 24 | 26 | 24 | - |
| **Total Equipment Savings** | | 22 | **36** | **73** | **193** | **527** | **979** | **1,430** |

***Table 5-9 Residential Cumulative Achievable Potential, Non-equip. Measures (1000 thm)***

| Non-Equipment Measure | 2012 | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 |
|---|---|---|---|---|---|---|---|
| Advanced New Construction Designs | - | - | - | - | - | - | - |
| Home Energy Management System | 109 | 45 | 126 | 446 | 1,655 | 2,565 | 3,626 |
| Doors - Storm and Thermal | - | - | - | - | - | - | - |
| Insulation - Ceiling | 3 | 3 | 7 | 28 | 102 | 187 | 231 |
| Insulation - Ducting | 14 | 11 | 25 | 112 | 396 | 654 | 738 |
| Insulation - Foundation | - | - | - | - | - | - | - |
| Insulation - Infiltration Control | 36 | 46 | 139 | 918 | 3,035 | 4,227 | 5,784 |
| Insulation - Wall Cavity | 13 | 10 | 24 | 107 | 397 | 690 | 824 |
| Thermostat - Clock/Programmable | 96 | 125 | 320 | 1,377 | 1,875 | 1,953 | 2,164 |
| ENERGY STAR Homes | - | - | - | - | - | - | - |
| Furnace - Maintenance | - | - | - | - | - | - | - |
| Boiler - Pipe Insulation | 0 | 0 | 1 | 6 | 16 | 33 | 45 |
| Insulation - Attic Hatch | 1 | 1 | 2 | 8 | 30 | 54 | 80 |
| Ducting - Repair and Sealing | 33 | 25 | 297 | 750 | 2,409 | 4,607 | 6,178 |
| Fireplace - Damper Control | - | - | - | - | - | - | - |
| Windows - ENERGY STAR | - | - | - | - | - | - | - |
| Water Heating - Faucet Aerators | 18 | 25 | 66 | 302 | 474 | 541 | 610 |
| Water Heating - Low Flow Showerheads | 73 | 116 | 295 | 1,406 | 2,409 | 2,821 | 3,166 |
| Water Heating - Pipe Insulation | 30 | 40 | 107 | 497 | 794 | 895 | 1,000 |
| Water Heating - Tank Blanket/Insulation | 26 | 33 | 85 | 355 | 477 | 470 | 469 |
| Water Heating - Thermostat Setback | - | - | - | - | - | 374 | 1,953 |
| Water Heating - Timer | - | - | - | - | - | - | - |
| Water Heating - Hot Water Saver | - | - | - | - | 308 | 1,228 | 1,662 |
| Water Heating - Drainwater Heat Recovery | - | - | - | - | - | - | - |
| **Total, Non-equipment Measures** | **452** | **478** | **1,493** | **6,314** | **14,376** | **21,299** | **28,531** |
| **Total, All Measures** | **475** | **515** | **1,567** | **6,507** | **14,903** | **22,278** | **29,960** |

Based on the above measure-by measure findings, the greatest sources of residential achievable potential in 2022, across all three states, are as follows:

- ***Shell measures and insulation***, which representing 6.4 million therms or 43% of all savings
- ***Thermostats and home energy monitoring systems***, which provide 3.5 million therms or 24% of all savings
- ***Water-saving devices***, including low-flow showerheads and faucet aerators, which combine for 3.2 million therms or 21% of achievable potential
- ***Water heater tank blankets and pipe insulation***, which provide an additional 1.3 million therms or nearly 9% of achievable potential

## Commercial and Industrial Sector Potential

The baseline forecast for the C&I sector grows steadily during the forecast period as the region emerges from the economic downturn. As a result, opportunities for energy-efficiency savings are significant for the commercial sector. However, as with the residential sector, many conservation opportunities are cost-ineffective, given current projections of gas avoided costs.

- ***Achievable potential*** projects 13.3 million therms of energy savings in 2022 and 22.4 million therms in 2032. This corresponds to 10.3% of the baseline forecast in 2022 and 16.5% in 2032.
- ***Economic potential***, which reflects the savings when all cost-effective measures are taken, is 15.0 million therms in 2022. This represents 11.6% of the baseline energy forecast. By 2032, economic potential reaches 24.5 million therms, 18.0% of the baseline energy forecast.
- ***Technical potential***, which reflects the adoption of all energy conservation measures regardless of cost, is a theoretical upper bound on savings. In 2022, technical potential energy savings are 36.4 million therms, or 28.2% of the baseline energy forecast. By 2032, technical potential reaches 56.1 million therms, 41.3% of the baseline energy forecast.

Table 5-10 and Figure 5-6 present the savings associated with each level of potential. Figure 5-7 shows the C&I sector baseline forecast and the three potential level forecasts, as well as the 2010 usage level.

***Table 5-10 C&I Sector Cumulative Conservation Potential Summary***

| | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 |
|---|---|---|---|---|---|---|
| **Baseline Forecast (1000 thm)** | | | | | | |
| | 124,429 | 125,244 | 126,819 | 129,319 | 132,094 | 135,976 |
| **Cumulative Natural Gas Savings (1000 thm)** | | | | | | |
| Achievable | 1,031 | 2,172 | 6,287 | 13,312 | 19,071 | 22,422 |
| Economic | 1,065 | 2,299 | 6,945 | 14,986 | 20,704 | 24,526 |
| Technical | 2,865 | 6,353 | 17,511 | 36,422 | 50,702 | 56,169 |
| **Cumulative Natural Gas Savings (% of Baseline)** | | | | | | |
| Achievable | 0.8% | 1.7% | 5.0% | 10.3% | 14.4% | 16.5% |
| Economic | 0.9% | 1.8% | 5.5% | 11.6% | 15.7% | 18.0% |
| Technical | 2.3% | 5.1% | 13.8% | 28.2% | 38.4% | 41.3% |

***Figure 5-6 C&I Cumulative Conservation Potential Savings***

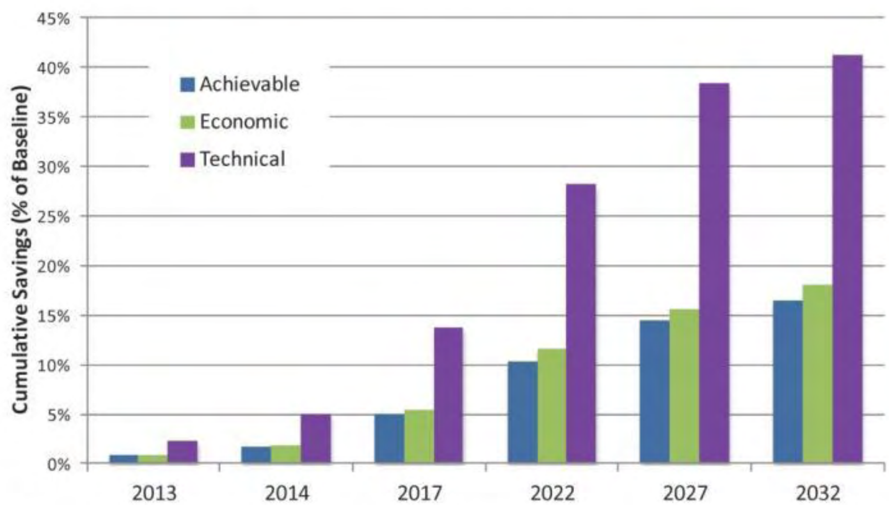
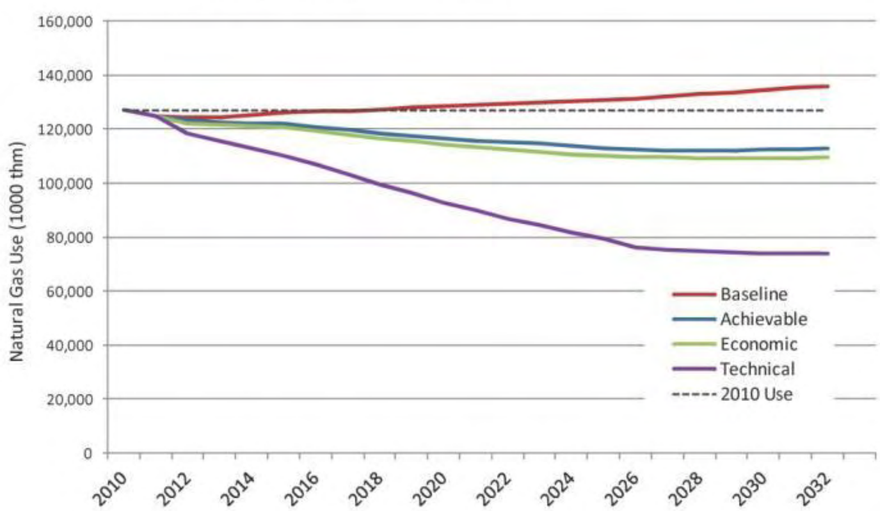



***Figure 5-7 C&I Energy Efficiency Potential Forecast***



## C&I Potential by Segment and State

Table 5-11 and Table 5-12 provide additional detail on the cumulative achievable potential for selected years. As expected, the large commercial segment provides the greatest savings.

***Table 5-11 C&I Cumulative Achievable Potential by Sector, Selected Years***

| | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 |
|---|---|---|---|---|---|---|
| **Baseline Forecast (1000 therm)** | | | | | | |
| Sm. Commercial | 50,130 | 50,530 | 51,271 | 52,378 | 53,494 | 55,120 |
| Lg. Commercial | 69,274 | 69,647 | 70,392 | 71,667 | 73,191 | 75,295 |
| Industrial | 5,026 | 5,067 | 5,156 | 5,274 | 5,409 | 5,560 |
| **Total** | **124,429** | **125,244** | **126,819** | **129,319** | **132,094** | **135,976** |
| **Natural Gas Savings (1000 therm)** | | | | | | |
| Sm. Commercial | 206 | 469 | 1,588 | 3,557 | 5,709 | 7,018 |
| Lg. Commercial | 801 | 1,654 | 4,548 | 9,436 | 13,007 | 15,027 |
| Industrial | 25 | 49 | 151 | 319 | 354 | 377 |
| **Total** | **1,031** | **2,172** | **6,287** | **13,312** | **19,071** | **22,422** |
| **% of Total C&I Savings** | | | | | | |
| Sm. Commercial | 20.0% | 21.6% | 25.3% | 26.7% | 29.9% | 31.3% |
| Lg. Commercial | 77.6% | 76.2% | 72.3% | 70.9% | 68.2% | 67.0% |
| Industrial | 2.4% | 2.2% | 2.4% | 2.4% | 1.9% | 1.7% |

***Table 5-12 C&I Cumulative Achievable Potential by State, Selected Years***

| | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 |
|---|---|---|---|---|---|---|
| **Baseline Forecast (1000 therm)** | | | | | | |
| Washington | 67,722 | 68,107 | 68,790 | 69,944 | 71,299 | 73,259 |
| Idaho | 27,702 | 28,002 | 28,700 | 29,780 | 30,910 | 32,239 |
| Oregon | 29,006 | 29,135 | 29,329 | 29,595 | 29,885 | 30,477 |
| **Total** | **124,429** | **125,244** | **126,819** | **129,319** | **132,094** | **135,976** |
| **Natural Gas Savings (1000 therm)** | | | | | | |
| Washington | 655 | 1,365 | 3,906 | 8,096 | 11,251 | 13,015 |
| Idaho | 243 | 514 | 1,486 | 3,264 | 4,756 | 5,668 |
| Oregon | 133 | 293 | 895 | 1,953 | 3,064 | 3,739 |
| **Total** | **1,031** | **2,172** | **6,287** | **13,312** | **19,071** | **22,422** |
| **% of Total C&I Savings** | | | | | | |
| Washington | 63.5% | 62.8% | 62.1% | 60.8% | 59.0% | 58.0% |
| Idaho | 23.6% | 23.7% | 23.6% | 24.5% | 24.9% | 25.3% |
| Oregon | 12.9% | 13.5% | 14.2% | 14.7% | 16.1% | 16.7% |

Table 5-13 shows additional detail by state and sector for 2022, including the cumulative economic and technical potential, as well as achievable potential. We note that although potential as a percentage of baseline use varies from one sector to the next, results do not vary greatly among the three states.

***Table 5-13 C&I Cumulative Potential Summary by Sector and State, 2022***

| | Washington | | | Idaho | | | Oregon | | | Total C&I |
|---|---|---|---|---|---|---|---|---|---|---|
| | Small Comm. | Large Comm. | Ind. | Small Comm. | Large Comm. | Ind. | Small Comm. | Large Comm. | Ind. | |
| **Baseline (1000 therm)** | | | | | | | | | | |
| | 17,589 | 49,101 | 3,255 | 8,690 | 19,407 | 1,683 | 26,099 | 3,159 | 337 | 129,319 |
| **Cumulative Natural Gas Savings (1000 therm)** | | | | | | | | | | |
| Achievable | 1,425 | 6,477 | 193 | 581 | 2,578 | 105 | 1,550 | 382 | 21 | 13,312 |
| Economic | 1,693 | 7,062 | 203 | 711 | 2,843 | 110 | 1,924 | 418 | 22 | 14,986 |
| Technical | 4,824 | 14,796 | 379 | 2,330 | 6,036 | 197 | 6,927 | 894 | 39 | 36,422 |
| **Cumulative Savings (% of Baseline)** | | | | | | | | | | |
| Achievable | 8.1% | 13.2% | 5.9% | 6.7% | 13.3% | 6.2% | 5.9% | 12.1% | 6.1% | 10.3% |
| Economic | 9.6% | 14.4% | 6.2% | 8.2% | 14.7% | 6.6% | 7.4% | 13.2% | 6.4% | 11.6% |
| Technical | 27.4% | 30.1% | 11.6% | 26.8% | 31.1% | 11.7% | 26.5% | 28.3% | 11.7% | 28.2% |

## Potential by End Use, Technology, and Measure Type

Table 5-14 presents the C&I sector savings by end use and potential type.

- ***Space heating*** has the highest savings for technical potential at 20.0 million therms in 2022. These savings would result from installation of high-efficiency equipment and numerous thermal shell measures, HVAC control strategies, and retrocommissioning. Many of these measures are cost-effective, resulting in economic potential savings of 10.7 million therms in 2022, or 53% of technical potential savings.
- ***Food service equipment*** offers technical potential savings at 2.9 million therms in 2022, and because these equipment upgrades are mostly cost-effective, economic potential in that year is 2.7 million therms.
- ***Water heating***, including equipment upgrades, hot water saving fixtures, and controls, has 2022 technical potential of 12.9 million therms, but because the equipment upgrades are cost-ineffective, economic potential of 1.3 million therms is only 10% of the technical potential.
- ***Process equipment*** for industrial uses has technical potential savings of 0.5 million therms in 2022, and economic potential in that year is 0.3 million therms.

**Table 5-14 C&I Cumulative Potential by End Use and Potential Type (1000 therm)**

| | | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 |
|---|---|---|---|---|---|---|---|
| Space Heating | Achievable | 859 | 1,752 | 4,896 | 10,328 | 14,766 | 17,424 |
| | Economic | 662 | 1,442 | 4,636 | 10,728 | 15,579 | 18,895 |
| | Technical | 1,306 | 2,877 | 8,952 | 20,071 | 27,393 | 31,405 |
| Water Heating | Achievable | 88 | 221 | 675 | 1,113 | 1,647 | 2,133 |
| | Economic | 75 | 193 | 699 | 1,257 | 1,821 | 2,398 |
| | Technical | 1,210 | 2,766 | 6,795 | 12,917 | 19,307 | 20,723 |
| Food Preparation | Achievable | 63 | 158 | 583 | 1,585 | 2,351 | 2,540 |
| | Economic | 314 | 629 | 1,479 | 2,697 | 2,953 | 2,859 |
| | Technical | 321 | 646 | 1,540 | 2,879 | 3,277 | 3,253 |
| Process | Achievable | 21 | 41 | 133 | 286 | 307 | 325 |
| | Economic | 14 | 34 | 131 | 304 | 351 | 374 |
| | Technical | 25 | 57 | 211 | 518 | 671 | 731 |
| Miscellaneous | Achievable | 0 | 0 | 0 | 0 | 0 | 0 |
| | Economic | 1 | 1 | 1 | 1 | 0 | 0 |
| | Technical | 3 | 6 | 13 | 36 | 54 | 57 |
| **Total** | **Achievable** | **1,031** | **1,279** | **6,287** | **13,312** | **19,071** | **22,422** |
| | **Economic** | **1,065** | **2,299** | **6,945** | **14,986** | **20,704** | **24,527** |
| | **Technical** | **2,865** | **6,353** | **17,511** | **36,422** | **50,702** | **56,169** |

Table 5-15 and Table 5-16 present achievable potential savings for equipment measures and non-equipment measures, respectively.

**Table 5-15 C&I Cumulative Achievable Potential, Equipment Measures (1000 thm)**

| End Use | Technology | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 |
|---|---|---|---|---|---|---|---|
| Space Heating | Furnace | 32 | 84 | 361 | 1,031 | 1,959 | 2,385 |
| | Boiler | 60 | 149 | 472 | 928 | 1,419 | 2,114 |
| | Other Heating | 4 | 4 | 4 | 4 | 12 | 48 |
| Water Heating | Water Heater | - | - | - | - | - | - |
| Food Preparation | Fryer | 15 | 37 | 137 | 381 | 583 | 654 |
| | Oven | 9 | 23 | 88 | 250 | 387 | 436 |
| | Broiler | - | - | - | - | - | - |
| | Griddle | 6 | 16 | 59 | 168 | 264 | 306 |
| | Range | 8 | 20 | 75 | 212 | 328 | 370 |
| | Steamer | 25 | 62 | 223 | 574 | 789 | 758 |
| **Total Equipment Savings** | | **158** | **395** | **1,419** | **3,548** | **5,741** | **7,071** |

***Table 5-16 C&I Cumulative Achievable Potential, Non-equip. Measures (1000 thm)***

| Non-Equipment Measure | 2013 | 2014 | 2017 | 2022 | 2027 | 2032 |
|---|---|---|---|---|---|---|
| Advanced New Construction Designs | 17 | 52 | 234 | 971 | 2,338 | 3,456 |
| Custom Measures | - | - | - | - | - | 133 |
| Energy Management System | 252 | 497 | 1,100 | 2,056 | 2,812 | 2,927 |
| Insulation - Ceiling | 8 | 23 | 89 | 286 | 589 | 854 |
| Insulation - Ducting | - | - | - | - | - | - |
| Insulation - Wall Cavity | 4 | 8 | 135 | 326 | 703 | 959 |
| Thermostat - Clock/Programmable | 50 | 98 | 218 | 412 | 564 | 592 |
| Windows - High Efficiency | - | - | - | - | - | - |
| Furnace - Maintenance | - | - | - | - | - | 52 |
| Ducting - Repair and Sealing | - | - | - | - | - | - |
| Water Heating - Faucet Aerators | 75 | 184 | 540 | 701 | 740 | 774 |
| Water Heating - Pipe Insulation | - | - | - | - | - | - |
| Water Heating - Tank Blanket/Insulation | 8 | 19 | 54 | 69 | 73 | 76 |
| Water Heating - Hot Water Saver | - | - | - | - | - | - |
| Boiler - Maintenance | 140 | 273 | 876 | 1,832 | 1,898 | 1,876 |
| Boiler - Hot Water Reset | 122 | 235 | 729 | 1,428 | 1,428 | 1,384 |
| Boiler - High Eff. Hot Water Circulation | 65 | 127 | 276 | 507 | 683 | 699 |
| Space Heating - Heat Recovery Vent. | 112 | 220 | 484 | 888 | 1,193 | 1,243 |
| Comprehensive Retrocommissioning | - | - | - | - | - | - |
| Comprehensive Commissioning | - | - | - | - | - | - |
| Process - Boiler Hot Water Reset | 21 | 41 | 133 | 286 | 307 | 325 |
| **Total, Non-equipment Measures** | **873** | **1,777** | **4,868** | **9,764** | **13,329** | **15,350** |
| **Total, All Measures** | **1,031** | **2,172** | **6,287** | **13,312** | **19,071** | **22,422** |

Based on the above, the primary sources of commercial sector achievable savings are as follows:

- ***Energy management systems and programmable thermostats***, because they can be readily installed, account for about 27% of achievable potential in 2014. These controls remain significant contributors to cumulative potential, with 2.5 million therms or 19% of potential in 2022.
- ***Boiler operating measures***, including maintenance, hot water reset, and efficient circulation, together can provide 4.3 million therms or about 29% of achievable potential in 2022.
- ***Equipment upgrades for furnaces, boilers, and unit heaters*** equal 2.0 million therms, or 15% of 2022 achievable potential.
- ***Foodservice equipment*** has an achievable potential by 2022 of 1.6 million therms, or 12% of achievable potential.

## ABOUT GLOBAL

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## APPENDIX 4.2 ‖ ENVIRONMENTAL EXTERNALITIES OVERVIEW (OREGON JURISDICTION ONLY)

The methodology for determining avoided costs from reduced incremental natural gas usage considers commodity and variable transportation costs only. These avoided cost streams do not include environmental externality costs related to the gathering, transmission, distribution or end-use of natural gas.

Per traditional economic theory and industry practice, an environmental externality factor is typically added to the avoided cost when there is an opportunity to displace traditional supply-side resources with an alternative resource with no adverse environmental impact.

### REGULATORY GUIDANCE

The Oregon Public Utility Commission (OPUC) issued Order 93-965 (UM-424) to address how utilities should consider the impact of environmental externalities in planning for future energy resources. The Order required analysis on the potential natural gas cost impacts from emitting carbon dioxide ($CO_2$) and nitric-oxide (NOx).

The OPUC's Order No. 07-002 in Docket UM 1056 (Investigation Into Integrated Resource Planning) established the following guideline for the treatment of environmental costs used by energy utilities that evaluate demand-side and supply-side energy choices:

> UM 1056, Guideline 8 - Environmental Costs
>
> *"Utilities should include, in their base-case analyses, the regulatory compliance costs they expect for carbon dioxide ($CO_2$), nitrogen oxides (NOx), sulfur oxides ($SO_2$), and mercury (Hg) emissions. Utilities should analyze the range of potential CO2 regulatory costs in Order No. 93-695, from $0 - $40 (1990$). In addition, utilities should perform sensitivity analysis on a range of reasonably possible cost adders for nitrogen oxides (NOx), sulfur dioxide (SO2), and mercury (Hg), if applicable.*

In June 2008, the OPUC issued Order 08-338 (UM1302) which revised UM1056, Guideline 8. The revised guideline requires the utility should construct a base case portfolio to reflect what it considers to be the most likely regulatory compliance future for the various emissions. Additionally the guideline requires the utility to develop several compliance scenarios ranging from the present CO2 regulatory level to the upper reaches of credible proposals and each scenario should include a time profile of CO2 costs. The utility is also required to include a "trigger point" analysis in which the utility must determine at what level of carbon costs its selection of portfolio resources would be significantly different.

### ANALYSIS

Unlike electric utilities, environmental cost issues rarely impact a natural gas utility's supply-side resource options. This is because the only supply-side energy resource is natural gas. The utility cannot choose between say "dirty" coal-fired generation and "clean" wind energy sources. The supply-side implication of environmental externalities generally relates to combustion of fuel to move or compress natural gas. Avista's direct gas distribution system infrastructure relies solely on the upstream line pressure of the interstate pipeline transportation network to distribute natural gas to its customers and thus does not directly combust fuels that result in any $CO_2$, NOx, SO2, or Hg emissions.

Upstream gas system infrastructure (pipelines, storage facilities, and gathering systems), however, do produce $CO_2$ emissions via compressors used to pressurize and move natural gas. Accessing $CO_2$ emissions data on these upstream activities to perform detailed meaningful analysis is challenging. In the 2009 Natural Gas IRP there was significant momentum regarding GHG legislation and the movement towards the creation of carbon cap and trade markets or tax structure. Since then, the momentum has slowed significantly. Where there is still a focus on reducing GHG emissions and improving the nation's carbon footprint, the timing of implementing a carbon cap and trade/tax framework has been delayed. Additionally, the pricing level of the framework has been greatly reduced.. Whichever structure ultimately gets implemented, Avista believes the cost pass through mechanisms for upstream gas system infrastructure will not make a difference in supply-side resource selection although the amount of cost pass through could differ widely.

Table 4.2.1 summarizes a range of environmental cost adders we believe capture several compliance futures including our expected scenario. The CO2 cost adders reflect outlooks we obtained from one of our consultants, and following discussion and feedback from the TAC, have been incorporated into our Expected, Low Growth/High Price, and Alternate Planning Standard portfolios.

The guidelines also call for a trigger point analysis that reflects a "turning point" at which an alternate resource portfolio would be selected at different carbon cost adders levels. Because natural gas is the only supply resource applicable to LDC's any alternate resource portfolio selection would be a result of delivery methods of natural gas to customers. Conceptually, there could be differing levels of cost adders applicable to pipeline transported supply versus in service territory LNG storage gas. From a practical standpoint however, the differences in these relative cost adders would be very minor and would not change supply-side resource selection regardless of various carbon cost adder levels. We do acknowledge there is influence to the avoided costs which would impact the cost effectiveness of demand-side measures in the DSM business planning process.

## CONSERVATON COST ADVANTAGE

For this IRP, we also incorporated a 10 percent environmental externality factor into our assessment of the cost-effectiveness of existing demand-side management programs. Our assessment of prospective demand-side management opportunities is based on an avoided cost stream that includes this 10 percent factor.

Environmental externalities were evaluated in the IRP by adding the cost per therm equivalent of the externality cost values to supply-side resources as described in OPUC Order No. 93-965. Avista found that the environmental cost adders had no impact on the company's supply-side choices, although they did impact the level of demand-side measures that could be cost-effective to acquire.

## REGULATORY FILING

Avista will file revised cost-effectiveness limits (CELs) based upon the updated avoided costs available from this IRP process within the prescribed regulatory timetable.

# Table 4.2.1 Environmental Externalities Cost Adder Analysis (2010$)

| Case | Pollutant | Item | 2020 | 2025 | 2030 | 2035 |
|---|---|---|---|---|---|---|
| Expected Carbon Case | NOx | $/ton | $ 2,500 | $ 2,500 | $ 2,500 | $ 2,500 |
| | | $/lb | $ 1.25 | $ 1.25 | $ 1.25 | $ 1.25 |
| | | lbs/therm | 0.008 | 0.008 | 0.008 | 0.008 |
| | | NOx Adder $/therm | $ 0.01 | $ 0.01 | $ 0.01 | $ 0.01 |
| | CO2 | $/ton | $ - | $ 16.67 | $ 21.05 | $ 22.31 |
| | | $/lb | $ - | $ 0.0079 | $ 0.0105 | $ 0.0112 |
| | | lbs/therm | 11.64 | 11.64 | 11.64 | 11.64 |
| | | CO2 Adder $/therm | $ - | $ 0.10 | $ 0.12 | $ 0.13 |
| | Total | **Total Adders $/therm** | **$ 0.01** | **$ 0.10** | **$ 0.13** | **$ 0.14** |
| | | | **2020** | **2025** | **2030** | **2035** |
| High Carbon Case | NOx | $/ton | $ 2,500 | $ 2,500 | $ 2,500 | $ 2,500 |
| | | $/lb | $ 1.25 | $ 1.25 | $ 1.25 | $ 1.25 |
| | | lbs/therm | 0.008 | 0.008 | 0.008 | 0.008 |
| | | NOx Adder $/therm | $ 0.01 | $ 0.01 | $ 0.01 | $ 0.01 |
| | CO2 | $/ton | $ 40.00 | $ 60.00 | $ 85.00 | $ 100.00 |
| | | $/lb | $ 0.0200 | $ 0.0300 | $ 0.0425 | $ 0.0500 |
| | | lbs/therm | 11.64 | 11.64 | 11.64 | 11.64 |
| | | CO2 Adder $/therm | $ 0.23 | $ 0.35 | $ 0.49 | $ 0.58 |
| | Total | **Total Adders $/therm** | **$ 0.24** | **$ 0.36** | **$ 0.50** | **$ 0.59** |
| | | | **2020** | **2025** | **2030** | **2035** |
| Expected Carbon Low Nox | NOx | $/ton | $ 500 | $ 500 | $ 500 | $ 500 |
| | | $/lb | $ 0.25 | $ 0.25 | $ 0.25 | $ 0.25 |
| | | lbs/therm | 0.008 | 0.008 | 0.008 | 0.008 |
| | | NOx Adder $/therm | $ 0.00 | $ 0.00 | $ 0.00 | $ 0.00 |
| | CO2 | $/ton | $ - | $ 15.73 | $ 21.05 | $ 22.31 |
| | | $/lb | $ - | $ 0.0079 | $ 0.0105 | $ 0.0112 |
| | | lbs/therm | 11.64 | 11.64 | 11.64 | 11.64 |
| | | CO2 Adder $/therm | $ - | $ 0.09 | $ 0.12 | $ 0.13 |
| | Total | **Total Adders $/therm** | **$ 0.00** | **$ 0.09** | **$ 0.12** | **$ 0.13** |

# APPENDIX 5.1 ‖ CURRENT TRANSPORTATION/STORAGE RATES AND ASSUMPTIONS

**Rates in US$/Dth/Day**

| | Reservation | Commodity | Fuel Rate 3/ | Rate Change Assumptions |
|---|---|---|---|---|
| **TransCanada Alberta System Firm Rates -** | | | | |
| Postage Stamp Rates | | | | |
| AECo/NIT to ABC | 0.1910 | - | 0.00% | Changes every three years |
| AECo/NIT to ABC Winter Only | 0.2388 | - | 0.00% | Changes every three years |
| **TransCanada BC System Firm Rates -** | | | | |
| Postage Stamp Rates | | | | |
| ABC to Kingsgate | 0.0990 | 0.0300 | 1.10% | Changes every three years |
| **GTN FTS-1 Rates** | | | | |
| Mileage Based - Representative Example | | | | |
| Kingsgate to Spokane | 0.0931 | 0.0017 | 0.25% | Changes every five years |
| Kingsgate to Medford | 0.3376 | 0.0096 | 1.38% | Changes every five years |
| Meford Lateral | 0.8244 | - | 0.00% | Changes every five years |
| **Spectra Energy/Westcoast System Firm Rates -** | | | | |
| Postage Stamp Rates | | | | |
| Station 2 to Huntington/Sumas | 0.4112 | - | 0.80% | Changes every three years |
| **Williams NWP 4/** | | | | |
| Postage Stamp Rates | | | | |
| TF-1 1/ | 0.4100 | 0.03000 | 1.30% | Changes every five years |
| TF-2 1/ | 0.4100 | 0.03000 | 1.30% | Changes every five years |
| SGS-2F 2/ | 0.4751 | 0.01734 | 0.52% | Changes every five years |

1/ TF-1 based upon annual delivery capability. TF-2 based upon approximately 32 days of delivery capability
2/ Not applicable for WA/ID Customers
3/ Fuel retained in-kind
4/ New rate effective January 2013

# APPENDIX 5.2 ‖ ALTERNATE SUPPLY SCENARIOS

| | Existing Resources | Existing + Expected Available | GTN Fully Subscribed |
|---|---|---|---|
| **INPUT ASSUMPTIONS** | | | |
| **Resources** | Currently contracted capacity net of long term releases | Currently contracted capacity net of long term releases | Currently contracted capacity net of long term releases |
| | | Currently available GTN | |
| | | Capacity Release Recalls | Capacity Release Recalls |
| | | NWP Expansions | NWP Expansions |
| | | Satellite LNG | Satellite LNG |
| **Rates** | Current Rates | Current Rates | Current Rates |

# APPENDIX 6.1 ❚❚ MONTHLY PRICE DATA BY BASIN
# EXPECTED PRICE

| | | | | | | *2010$* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scenario** | **Index** | **Gas Year** | **Nov** | **Dec** | **Jan** | **Feb** | **Mar** | **Apr** | **May** | **Jun** | **Jul** | **Aug** | **Sep** | **Oct** |
| Expected Case | AECo | 2011-2012 | $ 2.90 | $ 2.73 | $ 2.29 | $ 2.82 | $ 2.88 | $ 2.38 | $ 2.49 | $ 2.63 | $ 2.69 | $ 2.57 | $ 2.47 | $ 2.59 |
| Expected Case | AECo | 2012-2013 | $ 3.04 | $ 3.13 | $ 3.37 | $ 3.51 | $ 3.58 | $ 3.52 | $ 3.50 | $ 3.51 | $ 3.54 | $ 3.54 | $ 3.54 | $ 3.57 |
| Expected Case | AECo | 2013-2014 | $ 3.76 | $ 3.84 | $ 3.85 | $ 3.85 | $ 3.86 | $ 3.70 | $ 3.65 | $ 3.68 | $ 3.71 | $ 3.71 | $ 3.72 | $ 3.74 |
| Expected Case | AECo | 2014-2015 | $ 3.93 | $ 3.93 | $ 3.97 | $ 3.98 | $ 3.99 | $ 3.85 | $ 3.84 | $ 3.89 | $ 3.92 | $ 3.91 | $ 3.88 | $ 3.89 |
| Expected Case | AECo | 2015-2016 | $ 4.06 | $ 4.06 | $ 4.09 | $ 4.10 | $ 4.16 | $ 4.01 | $ 4.02 | $ 4.06 | $ 4.08 | $ 4.08 | $ 4.07 | $ 4.08 |
| Expected Case | AECo | 2016-2017 | $ 4.25 | $ 4.24 | $ 4.27 | $ 4.29 | $ 4.31 | $ 4.14 | $ 4.19 | $ 4.22 | $ 4.25 | $ 4.25 | $ 4.25 | $ 4.26 |
| Expected Case | AECo | 2017-2018 | $ 4.40 | $ 4.44 | $ 4.49 | $ 4.52 | $ 4.52 | $ 4.35 | $ 4.39 | $ 4.43 | $ 4.46 | $ 4.47 | $ 4.46 | $ 4.47 |
| Expected Case | AECo | 2018-2019 | $ 4.58 | $ 4.65 | $ 4.67 | $ 4.70 | $ 4.69 | $ 4.52 | $ 4.56 | $ 4.59 | $ 4.63 | $ 4.64 | $ 4.57 | $ 4.58 |
| Expected Case | AECo | 2019-2020 | $ 4.67 | $ 4.72 | $ 4.78 | $ 4.81 | $ 4.75 | $ 4.61 | $ 4.64 | $ 4.68 | $ 4.72 | $ 4.73 | $ 4.66 | $ 4.67 |
| Expected Case | AECo | 2020-2021 | $ 4.79 | $ 4.85 | $ 4.88 | $ 4.91 | $ 4.89 | $ 4.73 | $ 4.77 | $ 4.81 | $ 4.85 | $ 4.87 | $ 4.68 | $ 4.69 |
| Expected Case | AECo | 2021-2022 | $ 4.80 | $ 4.84 | $ 4.87 | $ 4.90 | $ 4.74 | $ 4.62 | $ 4.66 | $ 4.69 | $ 4.72 | $ 4.74 | $ 4.70 | $ 4.69 |
| Expected Case | AECo | 2022-2023 | $ 4.84 | $ 4.87 | $ 4.89 | $ 4.92 | $ 4.91 | $ 4.79 | $ 4.84 | $ 4.89 | $ 4.92 | $ 4.94 | $ 4.78 | $ 4.78 |
| Expected Case | AECo | 2023-2024 | $ 4.89 | $ 4.92 | $ 4.94 | $ 4.97 | $ 4.77 | $ 4.65 | $ 4.67 | $ 4.74 | $ 4.77 | $ 4.79 | $ 4.74 | $ 4.75 |
| Expected Case | AECo | 2024-2025 | $ 4.86 | $ 4.89 | $ 4.91 | $ 4.94 | $ 4.87 | $ 4.74 | $ 4.76 | $ 4.81 | $ 4.87 | $ 4.89 | $ 4.79 | $ 4.80 |
| Expected Case | AECo | 2025-2026 | $ 4.98 | $ 5.00 | $ 5.03 | $ 5.06 | $ 4.90 | $ 4.77 | $ 4.80 | $ 4.86 | $ 4.89 | $ 4.91 | $ 4.87 | $ 4.87 |
| Expected Case | AECo | 2026-2027 | $ 5.00 | $ 5.03 | $ 5.05 | $ 5.08 | $ 4.85 | $ 4.71 | $ 4.74 | $ 4.79 | $ 4.82 | $ 4.84 | $ 4.82 | $ 4.82 |
| Expected Case | AECo | 2027-2028 | $ 4.97 | $ 5.00 | $ 5.03 | $ 5.06 | $ 4.89 | $ 4.75 | $ 4.80 | $ 4.83 | $ 4.87 | $ 4.89 | $ 4.85 | $ 4.86 |
| Expected Case | AECo | 2028-2029 | $ 5.02 | $ 5.05 | $ 5.08 | $ 5.11 | $ 4.96 | $ 4.79 | $ 4.82 | $ 4.86 | $ 4.90 | $ 4.92 | $ 4.91 | $ 4.91 |
| Expected Case | AECo | 2029-2030 | $ 5.06 | $ 5.10 | $ 5.13 | $ 5.15 | $ 4.91 | $ 4.76 | $ 4.79 | $ 4.84 | $ 4.90 | $ 4.91 | $ 4.91 | $ 4.92 |
| Expected Case | AECo | 2030-2031 | $ 5.06 | $ 5.13 | $ 5.16 | $ 5.19 | $ 5.01 | $ 4.86 | $ 4.89 | $ 4.96 | $ 5.00 | $ 5.02 | $ 5.01 | $ 5.02 |
| Expected Case | Malin | 2011-2012 | $ 3.01 | $ 2.97 | $ 2.48 | $ 3.00 | $ 3.06 | $ 2.52 | $ 2.80 | $ 2.94 | $ 3.01 | $ 2.89 | $ 2.78 | $ 2.91 |
| Expected Case | Malin | 2012-2013 | $ 3.34 | $ 3.45 | $ 3.69 | $ 3.83 | $ 3.87 | $ 3.79 | $ 3.82 | $ 3.82 | $ 3.86 | $ 3.87 | $ 3.86 | $ 3.89 |
| Expected Case | Malin | 2013-2014 | $ 4.06 | $ 4.18 | $ 4.18 | $ 4.19 | $ 4.15 | $ 3.98 | $ 3.99 | $ 4.02 | $ 4.05 | $ 4.07 | $ 4.09 | $ 4.12 |
| Expected Case | Malin | 2014-2015 | $ 4.28 | $ 4.31 | $ 4.34 | $ 4.34 | $ 4.29 | $ 4.15 | $ 4.17 | $ 4.19 | $ 4.21 | $ 4.24 | $ 4.26 | $ 4.29 |
| Expected Case | Malin | 2015-2016 | $ 4.44 | $ 4.48 | $ 4.51 | $ 4.52 | $ 4.47 | $ 4.37 | $ 4.38 | $ 4.40 | $ 4.45 | $ 4.47 | $ 4.48 | $ 4.51 |
| Expected Case | Malin | 2016-2017 | $ 4.67 | $ 4.69 | $ 4.71 | $ 4.74 | $ 4.62 | $ 4.55 | $ 4.58 | $ 4.61 | $ 4.64 | $ 4.66 | $ 4.69 | $ 4.71 |
| Expected Case | Malin | 2017-2018 | $ 4.88 | $ 4.93 | $ 4.95 | $ 4.98 | $ 4.87 | $ 4.80 | $ 4.82 | $ 4.85 | $ 4.90 | $ 4.92 | $ 4.94 | $ 4.97 |
| Expected Case | Malin | 2018-2019 | $ 5.08 | $ 5.15 | $ 5.15 | $ 5.18 | $ 5.05 | $ 4.95 | $ 4.95 | $ 4.98 | $ 5.07 | $ 5.10 | $ 5.07 | $ 5.09 |
| Expected Case | Malin | 2019-2020 | $ 5.15 | $ 5.24 | $ 5.19 | $ 5.22 | $ 5.10 | $ 4.97 | $ 5.01 | $ 5.04 | $ 5.13 | $ 5.16 | $ 5.13 | $ 5.15 |
| Expected Case | Malin | 2020-2021 | $ 5.25 | $ 5.32 | $ 5.33 | $ 5.36 | $ 5.23 | $ 5.07 | $ 5.12 | $ 5.15 | $ 5.23 | $ 5.26 | $ 5.19 | $ 5.21 |
| Expected Case | Malin | 2021-2022 | $ 5.30 | $ 5.36 | $ 5.33 | $ 5.36 | $ 5.09 | $ 5.01 | $ 5.05 | $ 5.08 | $ 5.12 | $ 5.16 | $ 5.17 | $ 5.19 |
| Expected Case | Malin | 2022-2023 | $ 5.32 | $ 5.36 | $ 5.38 | $ 5.41 | $ 5.26 | $ 5.19 | $ 5.22 | $ 5.25 | $ 5.31 | $ 5.33 | $ 5.26 | $ 5.29 |
| Expected Case | Malin | 2023-2024 | $ 5.44 | $ 5.48 | $ 5.44 | $ 5.47 | $ 5.16 | $ 5.10 | $ 5.05 | $ 5.12 | $ 5.19 | $ 5.23 | $ 5.18 | $ 5.24 |
| Expected Case | Malin | 2024-2025 | $ 5.40 | $ 5.46 | $ 5.44 | $ 5.47 | $ 5.30 | $ 5.20 | $ 5.14 | $ 5.19 | $ 5.28 | $ 5.31 | $ 5.26 | $ 5.31 |
| Expected Case | Malin | 2025-2026 | $ 5.52 | $ 5.57 | $ 5.55 | $ 5.58 | $ 5.31 | $ 5.22 | $ 5.23 | $ 5.28 | $ 5.32 | $ 5.35 | $ 5.37 | $ 5.40 |
| Expected Case | Malin | 2026-2027 | $ 5.54 | $ 5.59 | $ 5.57 | $ 5.61 | $ 5.26 | $ 5.17 | $ 5.18 | $ 5.23 | $ 5.27 | $ 5.29 | $ 5.32 | $ 5.35 |
| Expected Case | Malin | 2027-2028 | $ 5.49 | $ 5.55 | $ 5.53 | $ 5.56 | $ 5.30 | $ 5.20 | $ 5.23 | $ 5.27 | $ 5.31 | $ 5.34 | $ 5.37 | $ 5.40 |
| Expected Case | Malin | 2028-2029 | $ 5.55 | $ 5.60 | $ 5.59 | $ 5.63 | $ 5.37 | $ 5.24 | $ 5.26 | $ 5.30 | $ 5.35 | $ 5.38 | $ 5.41 | $ 5.44 |
| Expected Case | Malin | 2029-2030 | $ 5.56 | $ 5.64 | $ 5.62 | $ 5.66 | $ 5.33 | $ 5.24 | $ 5.26 | $ 5.30 | $ 5.35 | $ 5.38 | $ 5.41 | $ 5.47 |
| Expected Case | Malin | 2030-2031 | $ 5.60 | $ 5.66 | $ 5.68 | $ 5.72 | $ 5.42 | $ 5.33 | $ 5.36 | $ 5.41 | $ 5.46 | $ 5.49 | $ 5.52 | $ 5.57 |
| Expected Case | Rockies | 2011-2012 | $ 2.92 | $ 2.94 | $ 2.44 | $ 2.96 | $ 3.03 | $ 2.49 | $ 2.73 | $ 2.86 | $ 2.93 | $ 2.81 | $ 2.71 | $ 2.83 |
| Expected Case | Rockies | 2012-2013 | $ 3.25 | $ 3.36 | $ 3.61 | $ 3.75 | $ 3.79 | $ 3.71 | $ 3.74 | $ 3.75 | $ 3.79 | $ 3.79 | $ 3.79 | $ 3.81 |
| Expected Case | Rockies | 2013-2014 | $ 3.98 | $ 4.09 | $ 4.09 | $ 4.10 | $ 4.07 | $ 3.90 | $ 3.92 | $ 3.94 | $ 3.97 | $ 3.99 | $ 4.01 | $ 4.04 |
| Expected Case | Rockies | 2014-2015 | $ 4.19 | $ 4.22 | $ 4.25 | $ 4.26 | $ 4.21 | $ 4.07 | $ 4.09 | $ 4.11 | $ 4.13 | $ 4.16 | $ 4.18 | $ 4.21 |
| Expected Case | Rockies | 2015-2016 | $ 4.35 | $ 4.39 | $ 4.42 | $ 4.43 | $ 4.38 | $ 4.29 | $ 4.30 | $ 4.32 | $ 4.37 | $ 4.39 | $ 4.39 | $ 4.42 |
| Expected Case | Rockies | 2016-2017 | $ 4.58 | $ 4.59 | $ 4.62 | $ 4.64 | $ 4.53 | $ 4.47 | $ 4.50 | $ 4.52 | $ 4.56 | $ 4.58 | $ 4.60 | $ 4.63 |
| Expected Case | Rockies | 2017-2018 | $ 4.79 | $ 4.84 | $ 4.86 | $ 4.89 | $ 4.77 | $ 4.72 | $ 4.74 | $ 4.76 | $ 4.81 | $ 4.84 | $ 4.85 | $ 4.88 |
| Expected Case | Rockies | 2018-2019 | $ 4.98 | $ 5.05 | $ 5.06 | $ 5.08 | $ 4.96 | $ 4.87 | $ 4.87 | $ 4.90 | $ 4.97 | $ 4.99 | $ 4.98 | $ 5.00 |
| Expected Case | Rockies | 2019-2020 | $ 5.01 | $ 5.07 | $ 5.06 | $ 5.09 | $ 4.98 | $ 4.86 | $ 4.84 | $ 4.86 | $ 4.91 | $ 4.93 | $ 4.91 | $ 4.96 |
| Expected Case | Rockies | 2020-2021 | $ 5.08 | $ 5.16 | $ 5.15 | $ 5.18 | $ 5.09 | $ 4.95 | $ 4.94 | $ 4.97 | $ 5.04 | $ 5.05 | $ 4.90 | $ 4.94 |
| Expected Case | Rockies | 2021-2022 | $ 5.06 | $ 5.13 | $ 5.11 | $ 5.14 | $ 4.92 | $ 4.79 | $ 4.80 | $ 4.83 | $ 4.88 | $ 4.90 | $ 4.86 | $ 4.89 |
| Expected Case | Rockies | 2022-2023 | $ 5.04 | $ 5.11 | $ 5.11 | $ 5.14 | $ 5.04 | $ 4.89 | $ 4.91 | $ 4.93 | $ 4.98 | $ 5.01 | $ 4.90 | $ 4.93 |
| Expected Case | Rockies | 2023-2024 | $ 5.04 | $ 5.11 | $ 5.06 | $ 5.09 | $ 4.81 | $ 4.74 | $ 4.69 | $ 4.71 | $ 4.80 | $ 4.83 | $ 4.80 | $ 4.85 |
| Expected Case | Rockies | 2024-2025 | $ 4.95 | $ 5.05 | $ 5.05 | $ 5.08 | $ 4.89 | $ 4.70 | $ 4.64 | $ 4.66 | $ 4.76 | $ 4.79 | $ 4.78 | $ 4.84 |
| Expected Case | Rockies | 2025-2026 | $ 5.17 | $ 5.27 | $ 5.29 | $ 5.32 | $ 5.06 | $ 4.96 | $ 4.97 | $ 5.00 | $ 5.07 | $ 5.10 | $ 5.08 | $ 5.10 |
| Expected Case | Rockies | 2026-2027 | $ 5.21 | $ 5.29 | $ 5.28 | $ 5.30 | $ 4.98 | $ 4.87 | $ 4.90 | $ 4.92 | $ 4.99 | $ 5.01 | $ 5.00 | $ 5.02 |
| Expected Case | Rockies | 2027-2028 | $ 5.14 | $ 5.22 | $ 5.22 | $ 5.23 | $ 4.96 | $ 4.88 | $ 4.90 | $ 4.93 | $ 5.00 | $ 5.03 | $ 4.99 | $ 5.01 |
| Expected Case | Rockies | 2028-2029 | $ 5.13 | $ 5.23 | $ 5.22 | $ 5.25 | $ 4.97 | $ 4.89 | $ 4.89 | $ 4.92 | $ 5.01 | $ 5.04 | $ 5.02 | $ 5.04 |
| Expected Case | Rockies | 2029-2030 | $ 5.13 | $ 5.22 | $ 5.21 | $ 5.24 | $ 4.89 | $ 4.83 | $ 4.85 | $ 4.88 | $ 4.95 | $ 4.97 | $ 4.99 | $ 5.02 |
| Expected Case | Rockies | 2030-2031 | $ 5.10 | $ 5.21 | $ 5.21 | $ 5.25 | $ 4.94 | $ 4.90 | $ 4.93 | $ 4.96 | $ 5.03 | $ 5.05 | $ 5.05 | $ 5.08 |

# APPENDIX 6.1 ‖ MONTHLY PRICE DATA BY BASIN
## EXPECTED PRICE

***2010$***

| Scenario | Index | Gas Year | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Expected Case | Stanfield | 2011-2012 | $ 2.95 | $ 2.97 | $ 2.45 | $ 2.97 | $ 2.95 | $ 2.48 | $ 2.72 | $ 2.86 | $ 2.93 | $ 2.81 | $ 2.67 | $ 2.79 |
| Expected Case | Stanfield | 2012-2013 | $ 3.24 | $ 3.34 | $ 3.58 | $ 3.72 | $ 3.78 | $ 3.71 | $ 3.74 | $ 3.74 | $ 3.78 | $ 3.79 | $ 3.75 | $ 3.77 |
| Expected Case | Stanfield | 2013-2014 | $ 3.97 | $ 4.07 | $ 4.07 | $ 4.08 | $ 4.06 | $ 3.89 | $ 3.89 | $ 3.92 | $ 3.95 | $ 3.97 | $ 3.97 | $ 3.99 |
| Expected Case | Stanfield | 2014-2015 | $ 4.16 | $ 4.18 | $ 4.22 | $ 4.23 | $ 4.20 | $ 4.04 | $ 4.04 | $ 4.08 | $ 4.11 | $ 4.12 | $ 4.13 | $ 4.16 |
| Expected Case | Stanfield | 2015-2016 | $ 4.31 | $ 4.34 | $ 4.37 | $ 4.39 | $ 4.37 | $ 4.23 | $ 4.24 | $ 4.27 | $ 4.31 | $ 4.33 | $ 4.34 | $ 4.37 |
| Expected Case | Stanfield | 2016-2017 | $ 4.54 | $ 4.54 | $ 4.57 | $ 4.60 | $ 4.53 | $ 4.41 | $ 4.44 | $ 4.47 | $ 4.50 | $ 4.52 | $ 4.54 | $ 4.56 |
| Expected Case | Stanfield | 2017-2018 | $ 4.73 | $ 4.77 | $ 4.80 | $ 4.83 | $ 4.74 | $ 4.64 | $ 4.67 | $ 4.70 | $ 4.74 | $ 4.77 | $ 4.77 | $ 4.80 |
| Expected Case | Stanfield | 2018-2019 | $ 4.92 | $ 4.98 | $ 5.12 | $ 5.15 | $ 4.92 | $ 4.80 | $ 4.81 | $ 4.83 | $ 4.90 | $ 4.92 | $ 4.90 | $ 5.04 |
| Expected Case | Stanfield | 2019-2020 | $ 5.11 | $ 5.07 | $ 5.18 | $ 5.21 | $ 4.98 | $ 4.84 | $ 4.86 | $ 4.90 | $ 4.96 | $ 4.98 | $ 4.95 | $ 4.97 |
| Expected Case | Stanfield | 2020-2021 | $ 5.11 | $ 5.30 | $ 5.33 | $ 5.36 | $ 5.12 | $ 4.96 | $ 4.98 | $ 5.02 | $ 5.08 | $ 5.10 | $ 5.00 | $ 5.03 |
| Expected Case | Stanfield | 2021-2022 | $ 5.27 | $ 5.34 | $ 5.32 | $ 5.36 | $ 4.98 | $ 4.86 | $ 4.89 | $ 4.92 | $ 4.96 | $ 4.99 | $ 4.98 | $ 5.01 |
| Expected Case | Stanfield | 2022-2023 | $ 5.30 | $ 5.33 | $ 5.37 | $ 5.40 | $ 5.15 | $ 5.04 | $ 5.07 | $ 5.10 | $ 5.13 | $ 5.16 | $ 5.07 | $ 5.10 |
| Expected Case | Stanfield | 2023-2024 | $ 5.39 | $ 5.43 | $ 5.44 | $ 5.47 | $ 5.03 | $ 4.93 | $ 4.90 | $ 4.96 | $ 5.02 | $ 5.05 | $ 5.00 | $ 5.05 |
| Expected Case | Stanfield | 2024-2025 | $ 5.35 | $ 5.41 | $ 5.42 | $ 5.45 | $ 5.16 | $ 5.04 | $ 4.99 | $ 5.04 | $ 5.11 | $ 5.14 | $ 5.08 | $ 5.11 |
| Expected Case | Stanfield | 2025-2026 | $ 5.47 | $ 5.52 | $ 5.54 | $ 5.57 | $ 5.30 | $ 5.06 | $ 5.06 | $ 5.11 | $ 5.15 | $ 5.17 | $ 5.18 | $ 5.21 |
| Expected Case | Stanfield | 2026-2027 | $ 5.51 | $ 5.56 | $ 5.57 | $ 5.60 | $ 5.25 | $ 5.01 | $ 5.01 | $ 5.06 | $ 5.09 | $ 5.11 | $ 5.13 | $ 5.16 |
| Expected Case | Stanfield | 2027-2028 | $ 5.46 | $ 5.53 | $ 5.52 | $ 5.56 | $ 5.29 | $ 5.05 | $ 5.06 | $ 5.10 | $ 5.14 | $ 5.16 | $ 5.18 | $ 5.20 |
| Expected Case | Stanfield | 2028-2029 | $ 5.52 | $ 5.58 | $ 5.59 | $ 5.62 | $ 5.37 | $ 5.09 | $ 5.10 | $ 5.13 | $ 5.17 | $ 5.20 | $ 5.22 | $ 5.25 |
| Expected Case | Stanfield | 2029-2030 | $ 5.55 | $ 5.62 | $ 5.62 | $ 5.65 | $ 5.32 | $ 5.08 | $ 5.09 | $ 5.13 | $ 5.17 | $ 5.20 | $ 5.22 | $ 5.28 |
| Expected Case | Stanfield | 2030-2031 | $ 5.58 | $ 5.65 | $ 5.67 | $ 5.71 | $ 5.42 | $ 5.17 | $ 5.31 | $ 5.24 | $ 5.28 | $ 5.31 | $ 5.33 | $ 5.38 |
| Expected Case | Sumas | 2011-2012 | $ 3.10 | $ 2.97 | $ 2.48 | $ 3.00 | $ 2.95 | $ 2.43 | $ 2.59 | $ 2.69 | $ 2.79 | $ 2.67 | $ 2.53 | $ 2.73 |
| Expected Case | Sumas | 2012-2013 | $ 3.44 | $ 3.55 | $ 3.79 | $ 3.93 | $ 3.87 | $ 3.62 | $ 3.58 | $ 3.59 | $ 3.63 | $ 3.64 | $ 3.61 | $ 3.68 |
| Expected Case | Sumas | 2013-2014 | $ 4.17 | $ 4.28 | $ 4.29 | $ 4.30 | $ 4.15 | $ 3.75 | $ 3.73 | $ 3.77 | $ 3.79 | $ 3.80 | $ 3.76 | $ 3.80 |
| Expected Case | Sumas | 2014-2015 | $ 4.38 | $ 4.41 | $ 4.45 | $ 4.46 | $ 4.29 | $ 3.89 | $ 3.88 | $ 3.93 | $ 3.96 | $ 3.95 | $ 3.92 | $ 3.94 |
| Expected Case | Sumas | 2015-2016 | $ 4.54 | $ 4.57 | $ 4.61 | $ 4.63 | $ 4.46 | $ 4.06 | $ 4.06 | $ 4.10 | $ 4.13 | $ 4.13 | $ 4.12 | $ 4.13 |
| Expected Case | Sumas | 2016-2017 | $ 4.77 | $ 4.78 | $ 4.81 | $ 4.84 | $ 4.62 | $ 4.20 | $ 4.24 | $ 4.27 | $ 4.30 | $ 4.31 | $ 4.31 | $ 4.32 |
| Expected Case | Sumas | 2017-2018 | $ 4.98 | $ 5.02 | $ 5.05 | $ 5.08 | $ 4.59 | $ 4.41 | $ 4.45 | $ 4.49 | $ 4.52 | $ 4.54 | $ 4.53 | $ 4.54 |
| Expected Case | Sumas | 2018-2019 | $ 4.94 | $ 5.24 | $ 5.27 | $ 5.30 | $ 4.88 | $ 4.69 | $ 4.70 | $ 4.66 | $ 4.69 | $ 4.69 | $ 4.62 | $ 4.65 |
| Expected Case | Sumas | 2019-2020 | $ 4.77 | $ 4.83 | $ 5.33 | $ 5.36 | $ 4.98 | $ 4.75 | $ 4.73 | $ 4.74 | $ 4.81 | $ 4.82 | $ 4.76 | $ 4.78 |
| Expected Case | Sumas | 2020-2021 | $ 5.14 | $ 5.34 | $ 5.38 | $ 5.41 | $ 5.26 | $ 4.85 | $ 4.78 | $ 4.80 | $ 4.93 | $ 4.90 | $ 4.70 | $ 4.81 |
| Expected Case | Sumas | 2021-2022 | $ 5.32 | $ 5.39 | $ 5.42 | $ 5.46 | $ 5.13 | $ 4.74 | $ 4.68 | $ 4.68 | $ 4.79 | $ 4.79 | $ 4.71 | $ 4.84 |
| Expected Case | Sumas | 2022-2023 | $ 5.35 | $ 5.38 | $ 5.42 | $ 5.45 | $ 5.30 | $ 4.92 | $ 4.87 | $ 4.88 | $ 4.99 | $ 4.96 | $ 4.78 | $ 4.88 |
| Expected Case | Sumas | 2023-2024 | $ 5.44 | $ 5.48 | $ 5.51 | $ 5.52 | $ 5.18 | $ 4.79 | $ 4.70 | $ 4.73 | $ 4.84 | $ 4.82 | $ 4.74 | $ 4.87 |
| Expected Case | Sumas | 2024-2025 | $ 5.40 | $ 5.46 | $ 5.49 | $ 5.53 | $ 5.31 | $ 4.89 | $ 4.79 | $ 4.80 | $ 4.99 | $ 4.92 | $ 4.81 | $ 4.94 |
| Expected Case | Sumas | 2025-2026 | $ 5.52 | $ 5.57 | $ 5.61 | $ 5.64 | $ 5.35 | $ 4.92 | $ 4.84 | $ 4.74 | $ 5.02 | $ 4.96 | $ 4.90 | $ 5.04 |
| Expected Case | Sumas | 2026-2027 | $ 5.56 | $ 5.63 | $ 5.67 | $ 5.70 | $ 5.30 | $ 4.86 | $ 4.80 | $ 4.67 | $ 4.96 | $ 4.91 | $ 4.86 | $ 4.98 |
| Expected Case | Sumas | 2027-2028 | $ 5.51 | $ 5.59 | $ 5.62 | $ 5.66 | $ 5.34 | $ 4.90 | $ 4.86 | $ 4.71 | $ 5.01 | $ 4.97 | $ 4.88 | $ 5.03 |
| Expected Case | Sumas | 2028-2029 | $ 5.57 | $ 5.76 | $ 5.80 | $ 5.83 | $ 5.42 | $ 4.94 | $ 4.89 | $ 4.74 | $ 5.04 | $ 5.06 | $ 4.97 | $ 5.08 |
| Expected Case | Sumas | 2029-2030 | $ 5.60 | $ 5.81 | $ 5.84 | $ 5.87 | $ 5.37 | $ 4.92 | $ 4.86 | $ 4.72 | $ 5.04 | $ 5.05 | $ 5.03 | $ 5.09 |
| Expected Case | Sumas | 2030-2031 | $ 5.63 | $ 5.97 | $ 6.01 | $ 6.04 | $ 5.47 | $ 5.02 | $ 4.96 | $ 4.84 | $ 5.15 | $ 5.16 | $ 5.13 | $ 5.20 |

# APPENDIX 6.1 || MONTHLY PRICE DATA BY BASIN
# HIGH GROWTH LOW PRICE

**2010$**

| Scenario | Index | Gas Year | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| High Growth Low Price | AECo | 2011-2012 | $ 2.90 | $ 2.73 | $ 2.29 | $ 2.82 | $ 2.88 | $ 2.38 | $ 2.49 | $ 2.63 | $ 2.69 | $ 2.57 | $ 2.47 | $ 2.59 |
| High Growth Low Price | AECo | 2012-2013 | $ 3.04 | $ 3.13 | $ 3.37 | $ 3.51 | $ 3.58 | $ 3.52 | $ 3.50 | $ 3.51 | $ 3.54 | $ 3.54 | $ 3.54 | $ 3.57 |
| High Growth Low Price | AECo | 2013-2014 | $ 3.76 | $ 3.84 | $ 3.85 | $ 3.85 | $ 3.86 | $ 3.70 | $ 3.65 | $ 3.68 | $ 3.71 | $ 3.71 | $ 3.72 | $ 3.74 |
| High Growth Low Price | AECo | 2014-2015 | $ 3.93 | $ 3.93 | $ 3.97 | $ 3.98 | $ 3.99 | $ 3.85 | $ 3.84 | $ 3.89 | $ 3.92 | $ 3.91 | $ 3.88 | $ 3.89 |
| High Growth Low Price | AECo | 2015-2016 | $ 4.06 | $ 4.06 | $ 4.09 | $ 4.10 | $ 4.16 | $ 4.01 | $ 4.02 | $ 4.06 | $ 4.08 | $ 4.08 | $ 4.07 | $ 4.08 |
| High Growth Low Price | AECo | 2016-2017 | $ 4.25 | $ 4.24 | $ 4.27 | $ 4.29 | $ 4.31 | $ 4.14 | $ 4.19 | $ 4.22 | $ 4.25 | $ 4.25 | $ 4.25 | $ 4.26 |
| High Growth Low Price | AECo | 2017-2018 | $ 4.40 | $ 4.44 | $ 4.49 | $ 4.52 | $ 4.52 | $ 4.35 | $ 4.39 | $ 4.43 | $ 4.46 | $ 4.47 | $ 4.46 | $ 4.47 |
| High Growth Low Price | AECo | 2018-2019 | $ 4.58 | $ 4.65 | $ 4.67 | $ 4.70 | $ 4.69 | $ 4.52 | $ 4.56 | $ 4.59 | $ 4.63 | $ 4.64 | $ 4.57 | $ 4.58 |
| High Growth Low Price | AECo | 2019-2020 | $ 4.67 | $ 4.72 | $ 4.78 | $ 4.81 | $ 4.75 | $ 4.61 | $ 4.64 | $ 4.68 | $ 4.72 | $ 4.73 | $ 4.66 | $ 4.67 |
| High Growth Low Price | AECo | 2020-2021 | $ 4.79 | $ 4.85 | $ 4.88 | $ 4.91 | $ 4.89 | $ 4.73 | $ 4.77 | $ 4.81 | $ 4.85 | $ 4.87 | $ 4.68 | $ 4.69 |
| High Growth Low Price | AECo | 2021-2022 | $ 4.80 | $ 4.84 | $ 4.87 | $ 4.90 | $ 4.74 | $ 4.62 | $ 4.66 | $ 4.69 | $ 4.72 | $ 4.74 | $ 4.70 | $ 4.69 |
| High Growth Low Price | AECo | 2022-2023 | $ 4.84 | $ 4.87 | $ 4.89 | $ 4.92 | $ 4.91 | $ 4.79 | $ 4.84 | $ 4.89 | $ 4.92 | $ 4.94 | $ 4.78 | $ 4.78 |
| High Growth Low Price | AECo | 2023-2024 | $ 4.89 | $ 4.92 | $ 4.94 | $ 4.97 | $ 4.77 | $ 4.65 | $ 4.67 | $ 4.74 | $ 4.77 | $ 4.79 | $ 4.74 | $ 4.75 |
| High Growth Low Price | AECo | 2024-2025 | $ 4.86 | $ 4.89 | $ 4.91 | $ 4.94 | $ 4.87 | $ 4.74 | $ 4.76 | $ 4.81 | $ 4.87 | $ 4.89 | $ 4.79 | $ 4.80 |
| High Growth Low Price | AECo | 2025-2026 | $ 4.98 | $ 5.00 | $ 5.03 | $ 5.06 | $ 4.90 | $ 4.77 | $ 4.80 | $ 4.86 | $ 4.89 | $ 4.91 | $ 4.87 | $ 4.87 |
| High Growth Low Price | AECo | 2026-2027 | $ 5.00 | $ 5.03 | $ 5.05 | $ 5.08 | $ 4.85 | $ 4.71 | $ 4.74 | $ 4.79 | $ 4.82 | $ 4.84 | $ 4.82 | $ 4.82 |
| High Growth Low Price | AECo | 2027-2028 | $ 4.97 | $ 5.00 | $ 5.03 | $ 5.06 | $ 4.89 | $ 4.75 | $ 4.80 | $ 4.83 | $ 4.87 | $ 4.89 | $ 4.85 | $ 4.86 |
| High Growth Low Price | AECo | 2028-2029 | $ 5.02 | $ 5.05 | $ 5.08 | $ 5.11 | $ 4.96 | $ 4.79 | $ 4.82 | $ 4.86 | $ 4.90 | $ 4.92 | $ 4.91 | $ 4.91 |
| High Growth Low Price | AECo | 2029-2030 | $ 5.06 | $ 5.10 | $ 5.13 | $ 5.15 | $ 4.91 | $ 4.76 | $ 4.79 | $ 4.84 | $ 4.90 | $ 4.91 | $ 4.91 | $ 4.92 |
| High Growth Low Price | AECo | 2030-2031 | $ 5.06 | $ 5.13 | $ 5.16 | $ 5.19 | $ 5.01 | $ 4.86 | $ 4.89 | $ 4.96 | $ 5.00 | $ 5.02 | $ 5.01 | $ 5.02 |
| | | | | | | | | | | | | | | |
| High Growth Low Price | Malin | 2011-2012 | $ 3.01 | $ 2.97 | $ 2.48 | $ 3.00 | $ 3.06 | $ 2.52 | $ 2.80 | $ 2.94 | $ 3.01 | $ 2.89 | $ 2.78 | $ 2.91 |
| High Growth Low Price | Malin | 2012-2013 | $ 3.34 | $ 3.45 | $ 3.69 | $ 3.83 | $ 3.87 | $ 3.79 | $ 3.82 | $ 3.82 | $ 3.86 | $ 3.87 | $ 3.86 | $ 3.89 |
| High Growth Low Price | Malin | 2013-2014 | $ 4.06 | $ 4.18 | $ 4.18 | $ 4.19 | $ 4.15 | $ 3.98 | $ 3.99 | $ 4.02 | $ 4.05 | $ 4.07 | $ 4.09 | $ 4.12 |
| High Growth Low Price | Malin | 2014-2015 | $ 4.28 | $ 4.31 | $ 4.34 | $ 4.34 | $ 4.29 | $ 4.15 | $ 4.17 | $ 4.19 | $ 4.21 | $ 4.24 | $ 4.26 | $ 4.29 |
| High Growth Low Price | Malin | 2015-2016 | $ 4.44 | $ 4.48 | $ 4.51 | $ 4.52 | $ 4.47 | $ 4.37 | $ 4.38 | $ 4.40 | $ 4.45 | $ 4.47 | $ 4.48 | $ 4.51 |
| High Growth Low Price | Malin | 2016-2017 | $ 4.67 | $ 4.69 | $ 4.71 | $ 4.74 | $ 4.62 | $ 4.55 | $ 4.58 | $ 4.61 | $ 4.64 | $ 4.66 | $ 4.69 | $ 4.71 |
| High Growth Low Price | Malin | 2017-2018 | $ 4.88 | $ 4.93 | $ 4.95 | $ 4.98 | $ 4.87 | $ 4.80 | $ 4.82 | $ 4.85 | $ 4.90 | $ 4.92 | $ 4.94 | $ 4.97 |
| High Growth Low Price | Malin | 2018-2019 | $ 5.08 | $ 5.15 | $ 5.15 | $ 5.18 | $ 5.05 | $ 4.95 | $ 4.95 | $ 4.98 | $ 5.07 | $ 5.10 | $ 5.07 | $ 5.09 |
| High Growth Low Price | Malin | 2019-2020 | $ 5.15 | $ 5.24 | $ 5.19 | $ 5.22 | $ 5.10 | $ 4.97 | $ 5.01 | $ 5.04 | $ 5.13 | $ 5.16 | $ 5.13 | $ 5.15 |
| High Growth Low Price | Malin | 2020-2021 | $ 5.25 | $ 5.32 | $ 5.33 | $ 5.36 | $ 5.23 | $ 5.07 | $ 5.12 | $ 5.15 | $ 5.23 | $ 5.26 | $ 5.19 | $ 5.21 |
| High Growth Low Price | Malin | 2021-2022 | $ 5.30 | $ 5.36 | $ 5.33 | $ 5.36 | $ 5.09 | $ 5.01 | $ 5.05 | $ 5.08 | $ 5.12 | $ 5.16 | $ 5.17 | $ 5.19 |
| High Growth Low Price | Malin | 2022-2023 | $ 5.32 | $ 5.36 | $ 5.38 | $ 5.41 | $ 5.26 | $ 5.19 | $ 5.22 | $ 5.25 | $ 5.31 | $ 5.33 | $ 5.26 | $ 5.29 |
| High Growth Low Price | Malin | 2023-2024 | $ 5.44 | $ 5.48 | $ 5.44 | $ 5.47 | $ 5.16 | $ 5.10 | $ 5.05 | $ 5.12 | $ 5.19 | $ 5.23 | $ 5.18 | $ 5.24 |
| High Growth Low Price | Malin | 2024-2025 | $ 5.40 | $ 5.46 | $ 5.44 | $ 5.47 | $ 5.30 | $ 5.20 | $ 5.14 | $ 5.19 | $ 5.28 | $ 5.31 | $ 5.26 | $ 5.31 |
| High Growth Low Price | Malin | 2025-2026 | $ 5.52 | $ 5.57 | $ 5.55 | $ 5.58 | $ 5.31 | $ 5.22 | $ 5.23 | $ 5.28 | $ 5.32 | $ 5.35 | $ 5.37 | $ 5.40 |
| High Growth Low Price | Malin | 2026-2027 | $ 5.54 | $ 5.59 | $ 5.57 | $ 5.61 | $ 5.26 | $ 5.17 | $ 5.18 | $ 5.23 | $ 5.27 | $ 5.29 | $ 5.32 | $ 5.35 |
| High Growth Low Price | Malin | 2027-2028 | $ 5.49 | $ 5.55 | $ 5.53 | $ 5.56 | $ 5.30 | $ 5.20 | $ 5.23 | $ 5.27 | $ 5.31 | $ 5.34 | $ 5.37 | $ 5.40 |
| High Growth Low Price | Malin | 2028-2029 | $ 5.55 | $ 5.60 | $ 5.59 | $ 5.63 | $ 5.37 | $ 5.24 | $ 5.26 | $ 5.30 | $ 5.35 | $ 5.38 | $ 5.41 | $ 5.44 |
| High Growth Low Price | Malin | 2029-2030 | $ 5.56 | $ 5.64 | $ 5.62 | $ 5.66 | $ 5.33 | $ 5.24 | $ 5.26 | $ 5.30 | $ 5.35 | $ 5.38 | $ 5.41 | $ 5.47 |
| High Growth Low Price | Malin | 2030-2031 | $ 5.60 | $ 5.66 | $ 5.68 | $ 5.72 | $ 5.42 | $ 5.33 | $ 5.36 | $ 5.41 | $ 5.46 | $ 5.49 | $ 5.52 | $ 5.57 |
| | | | | | | | | | | | | | | |
| High Growth Low Price | Rockies | 2011-2012 | $ 2.92 | $ 2.94 | $ 2.44 | $ 2.96 | $ 3.03 | $ 2.49 | $ 2.73 | $ 2.86 | $ 2.93 | $ 2.81 | $ 2.71 | $ 2.83 |
| High Growth Low Price | Rockies | 2012-2013 | $ 3.25 | $ 3.36 | $ 3.61 | $ 3.75 | $ 3.79 | $ 3.71 | $ 3.74 | $ 3.75 | $ 3.79 | $ 3.79 | $ 3.79 | $ 3.81 |
| High Growth Low Price | Rockies | 2013-2014 | $ 3.98 | $ 4.09 | $ 4.09 | $ 4.10 | $ 4.07 | $ 3.90 | $ 3.92 | $ 3.94 | $ 3.97 | $ 3.99 | $ 4.01 | $ 4.04 |
| High Growth Low Price | Rockies | 2014-2015 | $ 4.19 | $ 4.22 | $ 4.25 | $ 4.26 | $ 4.21 | $ 4.07 | $ 4.09 | $ 4.11 | $ 4.13 | $ 4.16 | $ 4.18 | $ 4.21 |
| High Growth Low Price | Rockies | 2015-2016 | $ 4.35 | $ 4.39 | $ 4.42 | $ 4.43 | $ 4.38 | $ 4.29 | $ 4.30 | $ 4.32 | $ 4.37 | $ 4.39 | $ 4.39 | $ 4.42 |
| High Growth Low Price | Rockies | 2016-2017 | $ 4.58 | $ 4.59 | $ 4.62 | $ 4.64 | $ 4.53 | $ 4.47 | $ 4.50 | $ 4.52 | $ 4.56 | $ 4.58 | $ 4.60 | $ 4.63 |
| High Growth Low Price | Rockies | 2017-2018 | $ 4.79 | $ 4.84 | $ 4.86 | $ 4.89 | $ 4.77 | $ 4.72 | $ 4.74 | $ 4.76 | $ 4.81 | $ 4.84 | $ 4.85 | $ 4.88 |
| High Growth Low Price | Rockies | 2018-2019 | $ 4.98 | $ 5.05 | $ 5.06 | $ 5.08 | $ 4.96 | $ 4.87 | $ 4.87 | $ 4.90 | $ 4.97 | $ 4.99 | $ 4.98 | $ 5.00 |
| High Growth Low Price | Rockies | 2019-2020 | $ 5.01 | $ 5.07 | $ 5.06 | $ 5.09 | $ 4.98 | $ 4.86 | $ 4.84 | $ 4.86 | $ 4.91 | $ 4.93 | $ 4.91 | $ 4.96 |
| High Growth Low Price | Rockies | 2020-2021 | $ 5.08 | $ 5.16 | $ 5.15 | $ 5.18 | $ 5.09 | $ 4.95 | $ 4.94 | $ 4.97 | $ 5.04 | $ 5.05 | $ 4.90 | $ 4.94 |
| High Growth Low Price | Rockies | 2021-2022 | $ 5.06 | $ 5.13 | $ 5.11 | $ 5.14 | $ 4.92 | $ 4.79 | $ 4.80 | $ 4.83 | $ 4.88 | $ 4.90 | $ 4.86 | $ 4.89 |
| High Growth Low Price | Rockies | 2022-2023 | $ 5.04 | $ 5.11 | $ 5.11 | $ 5.14 | $ 5.04 | $ 4.89 | $ 4.91 | $ 4.93 | $ 4.98 | $ 5.01 | $ 4.90 | $ 4.93 |
| High Growth Low Price | Rockies | 2023-2024 | $ 5.04 | $ 5.11 | $ 5.06 | $ 5.09 | $ 4.81 | $ 4.74 | $ 4.69 | $ 4.71 | $ 4.80 | $ 4.83 | $ 4.80 | $ 4.85 |
| High Growth Low Price | Rockies | 2024-2025 | $ 4.95 | $ 5.05 | $ 5.05 | $ 5.08 | $ 4.89 | $ 4.70 | $ 4.64 | $ 4.66 | $ 4.76 | $ 4.79 | $ 4.78 | $ 4.84 |
| High Growth Low Price | Rockies | 2025-2026 | $ 5.17 | $ 5.27 | $ 5.29 | $ 5.32 | $ 5.06 | $ 4.96 | $ 4.97 | $ 5.00 | $ 5.07 | $ 5.10 | $ 5.08 | $ 5.10 |
| High Growth Low Price | Rockies | 2026-2027 | $ 5.21 | $ 5.29 | $ 5.28 | $ 5.30 | $ 4.98 | $ 4.87 | $ 4.90 | $ 4.92 | $ 4.99 | $ 5.01 | $ 5.00 | $ 5.02 |
| High Growth Low Price | Rockies | 2027-2028 | $ 5.14 | $ 5.22 | $ 5.22 | $ 5.23 | $ 4.96 | $ 4.88 | $ 4.90 | $ 4.93 | $ 5.00 | $ 5.03 | $ 4.99 | $ 5.01 |
| High Growth Low Price | Rockies | 2028-2029 | $ 5.13 | $ 5.23 | $ 5.22 | $ 5.25 | $ 4.97 | $ 4.89 | $ 4.89 | $ 4.92 | $ 5.01 | $ 5.04 | $ 5.02 | $ 5.04 |
| High Growth Low Price | Rockies | 2029-2030 | $ 5.13 | $ 5.22 | $ 5.21 | $ 5.24 | $ 4.89 | $ 4.83 | $ 4.85 | $ 4.88 | $ 4.95 | $ 4.97 | $ 4.99 | $ 5.02 |
| High Growth Low Price | Rockies | 2030-2031 | $ 5.10 | $ 5.21 | $ 5.21 | $ 5.25 | $ 4.94 | $ 4.90 | $ 4.93 | $ 4.96 | $ 5.03 | $ 5.05 | $ 5.05 | $ 5.08 |

# APPENDIX 6.1 ‖ MONTHLY PRICE DATA BY BASIN
# HIGH GROWTH LOW PRICE

| | | | | | | | *2010$* | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Scenario** | **Index** | **Gas Year** | **Nov** | **Dec** | **Jan** | **Feb** | **Mar** | **Apr** | **May** | **Jun** | **Jul** | **Aug** | **Sep** | **Oct** |
| High Growth Low Price | Stanfield | 2011-2012 | $ 2.95 | $ 2.97 | $ 2.45 | $ 2.97 | $ 2.95 | $ 2.48 | $ 2.72 | $ 2.86 | $ 2.93 | $ 2.81 | $ 2.67 | $ 2.79 |
| High Growth Low Price | Stanfield | 2012-2013 | $ 3.24 | $ 3.34 | $ 3.58 | $ 3.72 | $ 3.78 | $ 3.71 | $ 3.74 | $ 3.74 | $ 3.78 | $ 3.79 | $ 3.75 | $ 3.77 |
| High Growth Low Price | Stanfield | 2013-2014 | $ 3.97 | $ 4.07 | $ 4.07 | $ 4.08 | $ 4.06 | $ 3.89 | $ 3.89 | $ 3.92 | $ 3.95 | $ 3.97 | $ 3.97 | $ 3.99 |
| High Growth Low Price | Stanfield | 2014-2015 | $ 4.16 | $ 4.18 | $ 4.22 | $ 4.23 | $ 4.20 | $ 4.04 | $ 4.04 | $ 4.08 | $ 4.11 | $ 4.12 | $ 4.13 | $ 4.16 |
| High Growth Low Price | Stanfield | 2015-2016 | $ 4.31 | $ 4.34 | $ 4.37 | $ 4.39 | $ 4.37 | $ 4.23 | $ 4.24 | $ 4.27 | $ 4.31 | $ 4.33 | $ 4.34 | $ 4.37 |
| High Growth Low Price | Stanfield | 2016-2017 | $ 4.54 | $ 4.54 | $ 4.57 | $ 4.60 | $ 4.53 | $ 4.41 | $ 4.44 | $ 4.47 | $ 4.50 | $ 4.52 | $ 4.54 | $ 4.56 |
| High Growth Low Price | Stanfield | 2017-2018 | $ 4.73 | $ 4.77 | $ 4.80 | $ 4.83 | $ 4.74 | $ 4.64 | $ 4.67 | $ 4.70 | $ 4.74 | $ 4.77 | $ 4.77 | $ 4.80 |
| High Growth Low Price | Stanfield | 2018-2019 | $ 4.92 | $ 4.98 | $ 5.12 | $ 5.15 | $ 4.92 | $ 4.80 | $ 4.81 | $ 4.83 | $ 4.90 | $ 4.92 | $ 4.90 | $ 5.04 |
| High Growth Low Price | Stanfield | 2019-2020 | $ 5.11 | $ 5.07 | $ 5.18 | $ 5.21 | $ 4.98 | $ 4.84 | $ 4.86 | $ 4.90 | $ 4.96 | $ 4.98 | $ 4.95 | $ 4.97 |
| High Growth Low Price | Stanfield | 2020-2021 | $ 5.11 | $ 5.30 | $ 5.33 | $ 5.36 | $ 5.12 | $ 4.96 | $ 4.98 | $ 5.02 | $ 5.08 | $ 5.10 | $ 5.00 | $ 5.03 |
| High Growth Low Price | Stanfield | 2021-2022 | $ 5.27 | $ 5.34 | $ 5.32 | $ 5.36 | $ 4.98 | $ 4.86 | $ 4.89 | $ 4.92 | $ 4.96 | $ 4.99 | $ 4.98 | $ 5.01 |
| High Growth Low Price | Stanfield | 2022-2023 | $ 5.30 | $ 5.33 | $ 5.37 | $ 5.40 | $ 5.15 | $ 5.04 | $ 5.07 | $ 5.10 | $ 5.13 | $ 5.16 | $ 5.07 | $ 5.10 |
| High Growth Low Price | Stanfield | 2023-2024 | $ 5.39 | $ 5.43 | $ 5.44 | $ 5.47 | $ 5.03 | $ 4.93 | $ 4.90 | $ 4.96 | $ 5.02 | $ 5.05 | $ 5.00 | $ 5.05 |
| High Growth Low Price | Stanfield | 2024-2025 | $ 5.35 | $ 5.41 | $ 5.42 | $ 5.45 | $ 5.16 | $ 5.04 | $ 4.99 | $ 5.04 | $ 5.11 | $ 5.14 | $ 5.08 | $ 5.11 |
| High Growth Low Price | Stanfield | 2025-2026 | $ 5.47 | $ 5.52 | $ 5.54 | $ 5.57 | $ 5.30 | $ 5.06 | $ 5.06 | $ 5.11 | $ 5.15 | $ 5.17 | $ 5.18 | $ 5.21 |
| High Growth Low Price | Stanfield | 2026-2027 | $ 5.51 | $ 5.56 | $ 5.57 | $ 5.60 | $ 5.25 | $ 5.01 | $ 5.01 | $ 5.06 | $ 5.09 | $ 5.11 | $ 5.13 | $ 5.16 |
| High Growth Low Price | Stanfield | 2027-2028 | $ 5.46 | $ 5.53 | $ 5.52 | $ 5.56 | $ 5.29 | $ 5.05 | $ 5.06 | $ 5.10 | $ 5.14 | $ 5.16 | $ 5.18 | $ 5.20 |
| High Growth Low Price | Stanfield | 2028-2029 | $ 5.52 | $ 5.58 | $ 5.59 | $ 5.62 | $ 5.37 | $ 5.09 | $ 5.10 | $ 5.13 | $ 5.17 | $ 5.20 | $ 5.22 | $ 5.25 |
| High Growth Low Price | Stanfield | 2029-2030 | $ 5.55 | $ 5.62 | $ 5.62 | $ 5.65 | $ 5.32 | $ 5.08 | $ 5.09 | $ 5.13 | $ 5.17 | $ 5.20 | $ 5.22 | $ 5.28 |
| High Growth Low Price | Stanfield | 2030-2031 | $ 5.58 | $ 5.65 | $ 5.67 | $ 5.71 | $ 5.42 | $ 5.17 | $ 5.31 | $ 5.24 | $ 5.28 | $ 5.31 | $ 5.33 | $ 5.38 |
| High Growth Low Price | Sumas | 2011-2012 | $ 3.10 | $ 2.97 | $ 2.48 | $ 3.00 | $ 2.95 | $ 2.43 | $ 2.59 | $ 2.69 | $ 2.79 | $ 2.67 | $ 2.53 | $ 2.73 |
| High Growth Low Price | Sumas | 2012-2013 | $ 3.44 | $ 3.55 | $ 3.79 | $ 3.93 | $ 3.87 | $ 3.62 | $ 3.58 | $ 3.59 | $ 3.63 | $ 3.64 | $ 3.61 | $ 3.68 |
| High Growth Low Price | Sumas | 2013-2014 | $ 4.17 | $ 4.28 | $ 4.29 | $ 4.30 | $ 4.15 | $ 3.75 | $ 3.73 | $ 3.77 | $ 3.79 | $ 3.80 | $ 3.76 | $ 3.80 |
| High Growth Low Price | Sumas | 2014-2015 | $ 4.38 | $ 4.41 | $ 4.45 | $ 4.46 | $ 4.29 | $ 3.89 | $ 3.88 | $ 3.93 | $ 3.96 | $ 3.95 | $ 3.92 | $ 3.94 |
| High Growth Low Price | Sumas | 2015-2016 | $ 4.54 | $ 4.57 | $ 4.61 | $ 4.63 | $ 4.46 | $ 4.06 | $ 4.06 | $ 4.10 | $ 4.13 | $ 4.13 | $ 4.12 | $ 4.13 |
| High Growth Low Price | Sumas | 2016-2017 | $ 4.77 | $ 4.78 | $ 4.81 | $ 4.84 | $ 4.62 | $ 4.20 | $ 4.24 | $ 4.27 | $ 4.30 | $ 4.31 | $ 4.31 | $ 4.32 |
| High Growth Low Price | Sumas | 2017-2018 | $ 4.98 | $ 5.02 | $ 5.05 | $ 5.08 | $ 4.59 | $ 4.41 | $ 4.45 | $ 4.49 | $ 4.52 | $ 4.54 | $ 4.53 | $ 4.54 |
| High Growth Low Price | Sumas | 2018-2019 | $ 4.94 | $ 5.24 | $ 5.27 | $ 5.30 | $ 4.88 | $ 4.69 | $ 4.70 | $ 4.66 | $ 4.69 | $ 4.69 | $ 4.62 | $ 4.65 |
| High Growth Low Price | Sumas | 2019-2020 | $ 4.77 | $ 4.83 | $ 5.33 | $ 5.36 | $ 4.98 | $ 4.75 | $ 4.73 | $ 4.74 | $ 4.81 | $ 4.82 | $ 4.76 | $ 4.78 |
| High Growth Low Price | Sumas | 2020-2021 | $ 5.14 | $ 5.34 | $ 5.38 | $ 5.41 | $ 5.26 | $ 4.85 | $ 4.78 | $ 4.80 | $ 4.93 | $ 4.90 | $ 4.70 | $ 4.81 |
| High Growth Low Price | Sumas | 2021-2022 | $ 5.32 | $ 5.39 | $ 5.42 | $ 5.46 | $ 5.13 | $ 4.74 | $ 4.68 | $ 4.68 | $ 4.79 | $ 4.79 | $ 4.71 | $ 4.84 |
| High Growth Low Price | Sumas | 2022-2023 | $ 5.35 | $ 5.38 | $ 5.42 | $ 5.45 | $ 5.30 | $ 4.92 | $ 4.87 | $ 4.88 | $ 4.99 | $ 4.96 | $ 4.78 | $ 4.88 |
| High Growth Low Price | Sumas | 2023-2024 | $ 5.44 | $ 5.48 | $ 5.51 | $ 5.52 | $ 5.18 | $ 4.79 | $ 4.70 | $ 4.73 | $ 4.84 | $ 4.82 | $ 4.74 | $ 4.87 |
| High Growth Low Price | Sumas | 2024-2025 | $ 5.40 | $ 5.46 | $ 5.49 | $ 5.53 | $ 5.31 | $ 4.89 | $ 4.79 | $ 4.80 | $ 4.99 | $ 4.92 | $ 4.81 | $ 4.94 |
| High Growth Low Price | Sumas | 2025-2026 | $ 5.52 | $ 5.57 | $ 5.61 | $ 5.64 | $ 5.35 | $ 4.92 | $ 4.84 | $ 4.74 | $ 5.02 | $ 4.96 | $ 4.90 | $ 5.04 |
| High Growth Low Price | Sumas | 2026-2027 | $ 5.56 | $ 5.63 | $ 5.67 | $ 5.70 | $ 5.30 | $ 4.86 | $ 4.80 | $ 4.67 | $ 4.96 | $ 4.91 | $ 4.86 | $ 4.98 |
| High Growth Low Price | Sumas | 2027-2028 | $ 5.51 | $ 5.59 | $ 5.62 | $ 5.66 | $ 5.34 | $ 4.90 | $ 4.86 | $ 4.71 | $ 5.01 | $ 4.97 | $ 4.88 | $ 5.03 |
| High Growth Low Price | Sumas | 2028-2029 | $ 5.57 | $ 5.76 | $ 5.80 | $ 5.83 | $ 5.42 | $ 4.94 | $ 4.89 | $ 4.74 | $ 5.04 | $ 5.06 | $ 4.97 | $ 5.08 |
| High Growth Low Price | Sumas | 2029-2030 | $ 5.60 | $ 5.81 | $ 5.84 | $ 5.87 | $ 5.37 | $ 4.92 | $ 4.86 | $ 4.72 | $ 5.04 | $ 5.05 | $ 5.03 | $ 5.09 |
| High Growth Low Price | Sumas | 2030-2031 | $ 5.63 | $ 5.97 | $ 6.01 | $ 6.04 | $ 5.47 | $ 5.02 | $ 4.96 | $ 4.84 | $ 5.15 | $ 5.16 | $ 5.13 | $ 5.20 |

# APPENDIX 6.1 II MONTHLY PRICE DATA BY BASIN
# LOW GROWTH HIGH PRICE

***2010$***

| Scenario | Index | Gas Year | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Low Growth High Price | AECo | 2011-2012 | $ 3.13 | $ 2.97 | $ 2.49 | $ 2.59 | $ 3.99 | $ 3.92 | $ 3.87 | $ 3.94 | $ 3.98 | $ 3.99 | $ 4.04 | $ 4.08 |
| Low Growth High Price | AECo | 2012-2013 | $ 4.39 | $ 4.63 | $ 5.08 | $ 5.05 | $ 5.04 | $ 4.81 | $ 4.78 | $ 4.80 | $ 4.83 | $ 4.86 | $ 4.89 | $ 4.94 |
| Low Growth High Price | AECo | 2013-2014 | $ 5.24 | $ 5.46 | $ 6.02 | $ 5.99 | $ 6.00 | $ 5.66 | $ 5.60 | $ 5.65 | $ 5.67 | $ 5.69 | $ 5.71 | $ 5.76 |
| Low Growth High Price | AECo | 2014-2015 | $ 6.11 | $ 6.36 | $ 7.14 | $ 7.10 | $ 7.05 | $ 6.69 | $ 6.67 | $ 6.73 | $ 6.76 | $ 6.77 | $ 6.76 | $ 6.80 |
| Low Growth High Price | AECo | 2015-2016 | $ 7.21 | $ 7.46 | $ 7.57 | $ 7.53 | $ 7.50 | $ 7.10 | $ 7.10 | $ 7.12 | $ 7.15 | $ 7.17 | $ 7.21 | $ 7.26 |
| Low Growth High Price | AECo | 2016-2017 | $ 7.63 | $ 7.93 | $ 8.15 | $ 8.10 | $ 8.06 | $ 7.58 | $ 7.60 | $ 7.61 | $ 7.62 | $ 7.64 | $ 7.73 | $ 7.78 |
| Low Growth High Price | AECo | 2017-2018 | $ 7.79 | $ 8.11 | $ 8.35 | $ 8.30 | $ 8.25 | $ 7.78 | $ 7.80 | $ 7.83 | $ 7.79 | $ 7.83 | $ 7.91 | $ 7.99 |
| Low Growth High Price | AECo | 2018-2019 | $ 8.00 | $ 8.37 | $ 8.58 | $ 8.54 | $ 8.51 | $ 8.00 | $ 8.02 | $ 8.05 | $ 7.99 | $ 8.03 | $ 8.11 | $ 8.25 |
| Low Growth High Price | AECo | 2019-2020 | $ 8.23 | $ 8.61 | $ 8.85 | $ 8.80 | $ 8.73 | $ 8.23 | $ 8.24 | $ 8.24 | $ 8.21 | $ 8.25 | $ 8.37 | $ 8.49 |
| Low Growth High Price | AECo | 2020-2021 | $ 8.48 | $ 8.89 | $ 9.10 | $ 9.05 | $ 9.00 | $ 8.50 | $ 8.51 | $ 8.49 | $ 8.48 | $ 8.52 | $ 8.66 | $ 8.78 |
| Low Growth High Price | AECo | 2021-2022 | $ 8.77 | $ 9.16 | $ 9.36 | $ 9.31 | $ 9.22 | $ 8.72 | $ 8.74 | $ 8.76 | $ 8.73 | $ 8.78 | $ 8.94 | $ 9.02 |
| Low Growth High Price | AECo | 2022-2023 | $ 9.05 | $ 9.35 | $ 9.55 | $ 9.49 | $ 9.44 | $ 8.95 | $ 8.98 | $ 8.96 | $ 8.95 | $ 9.01 | $ 9.15 | $ 9.23 |
| Low Growth High Price | AECo | 2023-2024 | $ 9.21 | $ 9.61 | $ 9.90 | $ 9.84 | $ 9.82 | $ 9.33 | $ 9.33 | $ 9.36 | $ 9.32 | $ 9.38 | $ 9.46 | $ 9.59 |
| Low Growth High Price | AECo | 2024-2025 | $ 9.58 | $ 9.94 | $ 10.13 | $ 10.07 | $ 10.06 | $ 9.54 | $ 9.53 | $ 9.56 | $ 9.55 | $ 9.60 | $ 9.68 | $ 9.82 |
| Low Growth High Price | AECo | 2025-2026 | $ 9.89 | $ 10.28 | $ 10.78 | $ 10.71 | $ 10.67 | $ 10.13 | $ 10.15 | $ 10.15 | $ 10.14 | $ 10.20 | $ 10.35 | $ 10.48 |
| Low Growth High Price | AECo | 2026-2027 | $ 10.48 | $ 10.91 | $ 11.29 | $ 11.24 | $ 11.19 | $ 10.64 | $ 10.65 | $ 10.65 | $ 10.62 | $ 10.69 | $ 10.88 | $ 10.99 |
| Low Growth High Price | AECo | 2027-2028 | $ 11.00 | $ 11.45 | $ 11.93 | $ 11.88 | $ 11.81 | $ 11.20 | $ 11.22 | $ 11.23 | $ 11.19 | $ 11.26 | $ 11.51 | $ 11.60 |
| Low Growth High Price | AECo | 2028-2029 | $ 11.62 | $ 12.08 | $ 12.56 | $ 12.48 | $ 12.46 | $ 11.80 | $ 11.81 | $ 11.81 | $ 11.80 | $ 11.87 | $ 12.00 | $ 12.18 |
| Low Growth High Price | AECo | 2029-2030 | $ 12.20 | $ 12.69 | $ 13.27 | $ 13.20 | $ 13.16 | $ 12.50 | $ 12.51 | $ 12.51 | $ 12.50 | $ 12.57 | $ 12.73 | $ 12.89 |
| Low Growth High Price | AECo | 2030-2031 | $ 12.90 | $ 13.45 | $ 13.30 | $ 13.23 | $ 13.17 | $ 12.50 | $ 12.51 | $ 12.55 | $ 12.51 | $ 12.59 | $ 12.76 | $ 12.94 |
| | | | | | | | | | | | | | | |
| Low Growth High Price | Malin | 2011-2012 | $ 3.24 | $ 3.22 | $ 2.67 | $ 2.77 | $ 4.16 | $ 4.06 | $ 4.17 | $ 4.25 | $ 4.29 | $ 4.31 | $ 4.36 | $ 4.40 |
| Low Growth High Price | Malin | 2012-2013 | $ 4.69 | $ 4.95 | $ 5.39 | $ 5.37 | $ 5.33 | $ 5.09 | $ 5.09 | $ 5.12 | $ 5.15 | $ 5.18 | $ 5.21 | $ 5.27 |
| Low Growth High Price | Malin | 2013-2014 | $ 5.54 | $ 5.80 | $ 6.36 | $ 6.33 | $ 6.29 | $ 5.95 | $ 5.95 | $ 5.98 | $ 6.01 | $ 6.05 | $ 6.08 | $ 6.14 |
| Low Growth High Price | Malin | 2014-2015 | $ 6.46 | $ 6.73 | $ 7.51 | $ 7.46 | $ 7.35 | $ 7.00 | $ 7.00 | $ 7.03 | $ 7.05 | $ 7.10 | $ 7.14 | $ 7.21 |
| Low Growth High Price | Malin | 2015-2016 | $ 7.58 | $ 7.88 | $ 7.99 | $ 7.95 | $ 7.81 | $ 7.47 | $ 7.46 | $ 7.46 | $ 7.51 | $ 7.56 | $ 7.62 | $ 7.69 |
| Low Growth High Price | Malin | 2016-2017 | $ 8.05 | $ 8.37 | $ 8.59 | $ 8.55 | $ 8.38 | $ 7.99 | $ 7.99 | $ 8.00 | $ 8.01 | $ 8.06 | $ 8.16 | $ 8.23 |
| Low Growth High Price | Malin | 2017-2018 | $ 8.27 | $ 8.60 | $ 8.81 | $ 8.77 | $ 8.60 | $ 8.23 | $ 8.23 | $ 8.24 | $ 8.23 | $ 8.28 | $ 8.39 | $ 8.49 |
| Low Growth High Price | Malin | 2018-2019 | $ 8.49 | $ 8.87 | $ 9.06 | $ 9.01 | $ 8.87 | $ 8.44 | $ 8.41 | $ 8.44 | $ 8.44 | $ 8.49 | $ 8.61 | $ 8.76 |
| Low Growth High Price | Malin | 2019-2020 | $ 8.72 | $ 9.12 | $ 9.25 | $ 9.21 | $ 9.07 | $ 8.59 | $ 8.61 | $ 8.59 | $ 8.62 | $ 8.68 | $ 8.84 | $ 8.97 |
| Low Growth High Price | Malin | 2020-2021 | $ 8.95 | $ 9.35 | $ 9.54 | $ 9.49 | $ 9.34 | $ 8.84 | $ 8.86 | $ 8.83 | $ 8.86 | $ 8.91 | $ 9.17 | $ 9.31 |
| Low Growth High Price | Malin | 2021-2022 | $ 9.26 | $ 9.68 | $ 9.82 | $ 9.77 | $ 9.57 | $ 9.11 | $ 9.13 | $ 9.14 | $ 9.12 | $ 9.20 | $ 9.41 | $ 9.52 |
| Low Growth High Price | Malin | 2022-2023 | $ 9.53 | $ 9.85 | $ 10.03 | $ 9.98 | $ 9.79 | $ 9.35 | $ 9.35 | $ 9.32 | $ 9.34 | $ 9.40 | $ 9.63 | $ 9.75 |
| Low Growth High Price | Malin | 2023-2024 | $ 9.76 | $ 10.17 | $ 10.40 | $ 10.35 | $ 10.21 | $ 9.78 | $ 9.71 | $ 9.74 | $ 9.75 | $ 9.81 | $ 9.90 | $ 10.08 |
| Low Growth High Price | Malin | 2024-2025 | $ 10.12 | $ 10.51 | $ 10.65 | $ 10.60 | $ 10.48 | $ 10.00 | $ 9.92 | $ 9.94 | $ 9.96 | $ 10.02 | $ 10.15 | $ 10.33 |
| Low Growth High Price | Malin | 2025-2026 | $ 10.43 | $ 10.84 | $ 11.29 | $ 11.23 | $ 11.08 | $ 10.58 | $ 10.58 | $ 10.56 | $ 10.57 | $ 10.64 | $ 10.84 | $ 11.00 |
| Low Growth High Price | Malin | 2026-2027 | $ 11.02 | $ 11.47 | $ 11.81 | $ 11.76 | $ 11.61 | $ 11.10 | $ 11.09 | $ 11.08 | $ 11.07 | $ 11.14 | $ 11.38 | $ 11.52 |
| Low Growth High Price | Malin | 2027-2028 | $ 11.52 | $ 12.00 | $ 12.43 | $ 12.38 | $ 12.21 | $ 11.64 | $ 11.65 | $ 11.66 | $ 11.62 | $ 11.70 | $ 12.03 | $ 12.14 |
| Low Growth High Price | Malin | 2028-2029 | $ 12.14 | $ 12.62 | $ 13.07 | $ 13.00 | $ 12.87 | $ 12.26 | $ 12.26 | $ 12.26 | $ 12.25 | $ 12.33 | $ 12.50 | $ 12.71 |
| Low Growth High Price | Malin | 2029-2030 | $ 12.70 | $ 13.24 | $ 13.77 | $ 13.71 | $ 13.58 | $ 12.98 | $ 12.98 | $ 12.97 | $ 12.95 | $ 13.04 | $ 13.23 | $ 13.44 |
| Low Growth High Price | Malin | 2030-2031 | $ 13.43 | $ 13.98 | $ 13.82 | $ 13.75 | $ 13.58 | $ 12.97 | $ 12.98 | $ 12.99 | $ 12.98 | $ 13.06 | $ 13.28 | $ 13.48 |
| | | | | | | | | | | | | | | |
| Low Growth High Price | Rockies | 2011-2012 | $ 3.14 | $ 3.18 | $ 2.63 | $ 2.73 | $ 4.13 | $ 4.03 | $ 4.10 | $ 4.18 | $ 4.21 | $ 4.24 | $ 4.28 | $ 4.33 |
| Low Growth High Price | Rockies | 2012-2013 | $ 4.61 | $ 4.86 | $ 5.31 | $ 5.29 | $ 5.24 | $ 5.01 | $ 5.02 | $ 5.04 | $ 5.08 | $ 5.10 | $ 5.13 | $ 5.19 |
| Low Growth High Price | Rockies | 2013-2014 | $ 5.46 | $ 5.72 | $ 6.27 | $ 6.24 | $ 6.21 | $ 5.87 | $ 5.87 | $ 5.91 | $ 5.93 | $ 5.97 | $ 6.00 | $ 6.05 |
| Low Growth High Price | Rockies | 2014-2015 | $ 6.37 | $ 6.64 | $ 7.42 | $ 7.37 | $ 7.26 | $ 6.92 | $ 6.92 | $ 6.95 | $ 6.97 | $ 7.02 | $ 7.06 | $ 7.12 |
| Low Growth High Price | Rockies | 2015-2016 | $ 7.49 | $ 7.79 | $ 7.90 | $ 7.86 | $ 7.72 | $ 7.38 | $ 7.38 | $ 7.38 | $ 7.43 | $ 7.48 | $ 7.53 | $ 7.61 |
| Low Growth High Price | Rockies | 2016-2017 | $ 7.96 | $ 8.28 | $ 8.50 | $ 8.46 | $ 8.29 | $ 7.91 | $ 7.91 | $ 7.92 | $ 7.93 | $ 7.97 | $ 8.08 | $ 8.15 |
| Low Growth High Price | Rockies | 2017-2018 | $ 8.18 | $ 8.51 | $ 8.72 | $ 8.67 | $ 8.51 | $ 8.15 | $ 8.14 | $ 8.16 | $ 8.14 | $ 8.19 | $ 8.30 | $ 8.40 |
| Low Growth High Price | Rockies | 2018-2019 | $ 8.40 | $ 8.77 | $ 8.96 | $ 8.91 | $ 8.78 | $ 8.35 | $ 8.33 | $ 8.35 | $ 8.33 | $ 8.39 | $ 8.52 | $ 8.67 |
| Low Growth High Price | Rockies | 2019-2020 | $ 8.57 | $ 8.96 | $ 9.13 | $ 9.07 | $ 8.95 | $ 8.48 | $ 8.44 | $ 8.42 | $ 8.41 | $ 8.45 | $ 8.62 | $ 8.78 |
| Low Growth High Price | Rockies | 2020-2021 | $ 8.77 | $ 9.20 | $ 9.37 | $ 9.31 | $ 9.21 | $ 8.72 | $ 8.69 | $ 8.65 | $ 8.67 | $ 8.71 | $ 8.89 | $ 9.03 |
| Low Growth High Price | Rockies | 2021-2022 | $ 9.03 | $ 9.45 | $ 9.61 | $ 9.55 | $ 9.39 | $ 8.89 | $ 8.88 | $ 8.89 | $ 8.88 | $ 8.94 | $ 9.10 | $ 9.22 |
| Low Growth High Price | Rockies | 2022-2023 | $ 9.25 | $ 9.60 | $ 9.77 | $ 9.71 | $ 9.57 | $ 9.05 | $ 9.05 | $ 9.00 | $ 9.01 | $ 9.07 | $ 9.27 | $ 9.38 |
| Low Growth High Price | Rockies | 2023-2024 | $ 9.36 | $ 9.80 | $ 10.02 | $ 9.96 | $ 9.86 | $ 9.42 | $ 9.35 | $ 9.33 | $ 9.36 | $ 9.42 | $ 9.51 | $ 9.69 |
| Low Growth High Price | Rockies | 2024-2025 | $ 9.67 | $ 10.10 | $ 10.27 | $ 10.21 | $ 10.07 | $ 9.50 | $ 9.41 | $ 9.41 | $ 9.44 | $ 9.50 | $ 9.67 | $ 9.87 |
| Low Growth High Price | Rockies | 2025-2026 | $ 10.08 | $ 10.55 | $ 11.04 | $ 10.97 | $ 10.83 | $ 10.32 | $ 10.32 | $ 10.28 | $ 10.32 | $ 10.39 | $ 10.55 | $ 10.71 |
| Low Growth High Price | Rockies | 2026-2027 | $ 10.70 | $ 11.17 | $ 11.52 | $ 11.46 | $ 11.33 | $ 10.80 | $ 10.81 | $ 10.78 | $ 10.79 | $ 10.86 | $ 11.06 | $ 11.20 |
| Low Growth High Price | Rockies | 2027-2028 | $ 11.16 | $ 11.67 | $ 12.12 | $ 12.05 | $ 11.87 | $ 11.33 | $ 11.33 | $ 11.32 | $ 11.32 | $ 11.39 | $ 11.64 | $ 11.75 |
| Low Growth High Price | Rockies | 2028-2029 | $ 11.73 | $ 12.25 | $ 12.70 | $ 12.62 | $ 12.47 | $ 11.91 | $ 11.88 | $ 11.88 | $ 11.91 | $ 11.98 | $ 12.11 | $ 12.31 |
| Low Growth High Price | Rockies | 2029-2030 | $ 12.27 | $ 12.82 | $ 13.35 | $ 13.29 | $ 13.13 | $ 12.56 | $ 12.57 | $ 12.55 | $ 12.55 | $ 12.63 | $ 12.81 | $ 12.99 |
| Low Growth High Price | Rockies | 2030-2031 | $ 12.93 | $ 13.53 | $ 13.35 | $ 13.28 | $ 13.10 | $ 12.54 | $ 12.55 | $ 12.54 | $ 12.54 | $ 12.62 | $ 12.80 | $ 13.00 |

# APPENDIX 6.1 ǁ MONTHLY PRICE DATA BY BASIN
# LOW GROWTH HIGH PRICE

***2010$***

| Scenario | Index | Gas Year | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Low Growth High Price | Stanfield | 2011-2012 | $ 3.18 | $ 3.22 | $ 2.64 | $ 2.74 | $ 4.05 | $ 4.03 | $ 4.10 | $ 4.17 | $ 4.21 | $ 4.23 | $ 4.25 | $ 4.29 |
| Low Growth High Price | Stanfield | 2012-2013 | $ 4.59 | $ 4.85 | $ 5.28 | $ 5.26 | $ 5.24 | $ 5.00 | $ 5.01 | $ 5.04 | $ 5.07 | $ 5.10 | $ 5.10 | $ 5.15 |
| Low Growth High Price | Stanfield | 2013-2014 | $ 5.45 | $ 5.69 | $ 6.25 | $ 6.22 | $ 6.20 | $ 5.86 | $ 5.84 | $ 5.89 | $ 5.91 | $ 5.95 | $ 5.95 | $ 6.01 |
| Low Growth High Price | Stanfield | 2014-2015 | $ 6.34 | $ 6.60 | $ 7.39 | $ 7.35 | $ 7.26 | $ 6.89 | $ 6.88 | $ 6.92 | $ 6.95 | $ 6.98 | $ 7.01 | $ 7.07 |
| Low Growth High Price | Stanfield | 2015-2016 | $ 7.45 | $ 7.74 | $ 7.86 | $ 7.82 | $ 7.72 | $ 7.33 | $ 7.33 | $ 7.33 | $ 7.38 | $ 7.42 | $ 7.48 | $ 7.55 |
| Low Growth High Price | Stanfield | 2016-2017 | $ 7.91 | $ 8.23 | $ 8.45 | $ 8.41 | $ 8.28 | $ 7.85 | $ 7.85 | $ 7.86 | $ 7.87 | $ 7.91 | $ 8.01 | $ 8.08 |
| Low Growth High Price | Stanfield | 2017-2018 | $ 8.12 | $ 8.44 | $ 8.66 | $ 8.62 | $ 8.48 | $ 8.07 | $ 8.07 | $ 8.09 | $ 8.07 | $ 8.12 | $ 8.22 | $ 8.31 |
| Low Growth High Price | Stanfield | 2018-2019 | $ 8.33 | $ 8.71 | $ 9.03 | $ 8.99 | $ 8.74 | $ 8.28 | $ 8.27 | $ 8.29 | $ 8.27 | $ 8.32 | $ 8.43 | $ 8.70 |
| Low Growth High Price | Stanfield | 2019-2020 | $ 8.67 | $ 8.95 | $ 9.24 | $ 9.20 | $ 8.95 | $ 8.46 | $ 8.46 | $ 8.45 | $ 8.46 | $ 8.50 | $ 8.66 | $ 8.79 |
| Low Growth High Price | Stanfield | 2020-2021 | $ 8.80 | $ 9.33 | $ 9.54 | $ 9.49 | $ 9.23 | $ 8.72 | $ 8.73 | $ 8.70 | $ 8.71 | $ 8.75 | $ 8.99 | $ 9.12 |
| Low Growth High Price | Stanfield | 2021-2022 | $ 9.24 | $ 9.66 | $ 9.82 | $ 9.77 | $ 9.46 | $ 8.96 | $ 8.97 | $ 8.99 | $ 8.97 | $ 9.03 | $ 9.23 | $ 9.34 |
| Low Growth High Price | Stanfield | 2022-2023 | $ 9.51 | $ 9.82 | $ 10.02 | $ 9.97 | $ 9.67 | $ 9.20 | $ 9.20 | $ 9.17 | $ 9.17 | $ 9.22 | $ 9.44 | $ 9.56 |
| Low Growth High Price | Stanfield | 2023-2024 | $ 9.71 | $ 10.11 | $ 10.39 | $ 10.34 | $ 10.08 | $ 9.61 | $ 9.56 | $ 9.58 | $ 9.58 | $ 9.64 | $ 9.72 | $ 9.89 |
| Low Growth High Price | Stanfield | 2024-2025 | $ 10.07 | $ 10.46 | $ 10.64 | $ 10.58 | $ 10.35 | $ 9.83 | $ 9.76 | $ 9.79 | $ 9.79 | $ 9.85 | $ 9.96 | $ 10.14 |
| Low Growth High Price | Stanfield | 2025-2026 | $ 10.38 | $ 10.80 | $ 11.28 | $ 11.22 | $ 11.07 | $ 10.43 | $ 10.41 | $ 10.40 | $ 10.40 | $ 10.46 | $ 10.65 | $ 10.81 |
| Low Growth High Price | Stanfield | 2026-2027 | $ 10.99 | $ 11.44 | $ 11.81 | $ 11.76 | $ 11.60 | $ 10.94 | $ 10.92 | $ 10.91 | $ 10.89 | $ 10.96 | $ 11.19 | $ 11.33 |
| Low Growth High Price | Stanfield | 2027-2028 | $ 11.49 | $ 11.97 | $ 12.43 | $ 12.37 | $ 12.20 | $ 11.49 | $ 11.48 | $ 11.49 | $ 11.45 | $ 11.52 | $ 11.84 | $ 11.95 |
| Low Growth High Price | Stanfield | 2028-2029 | $ 12.11 | $ 12.60 | $ 13.06 | $ 12.99 | $ 12.87 | $ 12.10 | $ 12.09 | $ 12.09 | $ 12.07 | $ 12.15 | $ 12.31 | $ 12.52 |
| Low Growth High Price | Stanfield | 2029-2030 | $ 12.69 | $ 13.22 | $ 13.76 | $ 13.70 | $ 13.57 | $ 12.82 | $ 12.81 | $ 12.80 | $ 12.77 | $ 12.85 | $ 13.04 | $ 13.25 |
| Low Growth High Price | Stanfield | 2030-2031 | $ 13.41 | $ 13.97 | $ 13.81 | $ 13.74 | $ 13.58 | $ 12.81 | $ 12.93 | $ 12.83 | $ 12.80 | $ 12.88 | $ 13.08 | $ 13.29 |
| | | | | | | | | | | | | | | |
| Low Growth High Price | Sumas | 2011-2012 | $ 3.32 | $ 3.21 | $ 2.67 | $ 2.77 | $ 4.06 | $ 3.97 | $ 3.97 | $ 4.01 | $ 4.08 | $ 4.09 | $ 4.10 | $ 4.22 |
| Low Growth High Price | Sumas | 2012-2013 | $ 4.79 | $ 5.05 | $ 5.49 | $ 5.47 | $ 5.32 | $ 4.92 | $ 4.86 | $ 4.88 | $ 4.92 | $ 4.95 | $ 4.96 | $ 5.06 |
| Low Growth High Price | Sumas | 2013-2014 | $ 5.64 | $ 5.90 | $ 6.47 | $ 6.44 | $ 6.29 | $ 5.72 | $ 5.69 | $ 5.73 | $ 5.76 | $ 5.78 | $ 5.74 | $ 5.82 |
| Low Growth High Price | Sumas | 2014-2015 | $ 6.56 | $ 6.83 | $ 7.62 | $ 7.58 | $ 7.35 | $ 6.74 | $ 6.71 | $ 6.77 | $ 6.80 | $ 6.82 | $ 6.80 | $ 6.85 |
| Low Growth High Price | Sumas | 2015-2016 | $ 7.68 | $ 7.97 | $ 8.09 | $ 8.05 | $ 7.81 | $ 7.16 | $ 7.14 | $ 7.17 | $ 7.20 | $ 7.22 | $ 7.26 | $ 7.32 |
| Low Growth High Price | Sumas | 2016-2017 | $ 8.15 | $ 8.47 | $ 8.69 | $ 8.65 | $ 8.37 | $ 7.64 | $ 7.65 | $ 7.67 | $ 7.67 | $ 7.70 | $ 7.78 | $ 7.84 |
| Low Growth High Price | Sumas | 2017-2018 | $ 8.37 | $ 8.69 | $ 8.91 | $ 8.87 | $ 8.33 | $ 7.84 | $ 7.86 | $ 7.88 | $ 7.85 | $ 7.89 | $ 7.98 | $ 8.06 |
| Low Growth High Price | Sumas | 2018-2019 | $ 8.36 | $ 8.96 | $ 9.18 | $ 9.13 | $ 8.70 | $ 8.17 | $ 8.16 | $ 8.11 | $ 8.05 | $ 8.08 | $ 8.16 | $ 8.32 |
| Low Growth High Price | Sumas | 2019-2020 | $ 8.34 | $ 8.72 | $ 9.39 | $ 9.35 | $ 8.95 | $ 8.37 | $ 8.33 | $ 8.30 | $ 8.31 | $ 8.34 | $ 8.47 | $ 8.61 |
| Low Growth High Price | Sumas | 2020-2021 | $ 8.83 | $ 9.38 | $ 9.59 | $ 9.54 | $ 9.38 | $ 8.62 | $ 8.52 | $ 8.48 | $ 8.56 | $ 8.56 | $ 8.68 | $ 8.91 |
| Low Growth High Price | Sumas | 2021-2022 | $ 9.29 | $ 9.71 | $ 9.92 | $ 9.87 | $ 9.61 | $ 8.85 | $ 8.77 | $ 8.75 | $ 8.80 | $ 8.83 | $ 8.96 | $ 9.18 |
| Low Growth High Price | Sumas | 2022-2023 | $ 9.56 | $ 9.87 | $ 10.07 | $ 10.02 | $ 9.82 | $ 9.08 | $ 9.01 | $ 8.95 | $ 9.02 | $ 9.02 | $ 9.14 | $ 9.34 |
| Low Growth High Price | Sumas | 2023-2024 | $ 9.76 | $ 10.16 | $ 10.47 | $ 10.39 | $ 10.23 | $ 9.47 | $ 9.36 | $ 9.35 | $ 9.40 | $ 9.41 | $ 9.46 | $ 9.71 |
| Low Growth High Price | Sumas | 2024-2025 | $ 10.12 | $ 10.51 | $ 10.71 | $ 10.65 | $ 10.50 | $ 9.69 | $ 9.57 | $ 9.55 | $ 9.66 | $ 9.63 | $ 9.70 | $ 9.97 |
| Low Growth High Price | Sumas | 2025-2026 | $ 10.43 | $ 10.85 | $ 11.35 | $ 11.29 | $ 11.12 | $ 10.28 | $ 10.19 | $ 10.03 | $ 10.27 | $ 10.25 | $ 10.38 | $ 10.64 |
| Low Growth High Price | Sumas | 2026-2027 | $ 11.04 | $ 11.51 | $ 11.91 | $ 11.85 | $ 11.65 | $ 10.79 | $ 10.71 | $ 10.52 | $ 10.76 | $ 10.76 | $ 10.92 | $ 11.16 |
| Low Growth High Price | Sumas | 2027-2028 | $ 11.54 | $ 12.03 | $ 12.52 | $ 12.47 | $ 12.25 | $ 11.35 | $ 11.28 | $ 11.11 | $ 11.33 | $ 11.33 | $ 11.54 | $ 11.77 |
| Low Growth High Price | Sumas | 2028-2029 | $ 12.16 | $ 12.79 | $ 13.27 | $ 13.21 | $ 12.92 | $ 11.95 | $ 11.88 | $ 11.69 | $ 11.94 | $ 12.00 | $ 12.06 | $ 12.35 |
| Low Growth High Price | Sumas | 2029-2030 | $ 12.74 | $ 13.40 | $ 13.98 | $ 13.92 | $ 13.62 | $ 12.66 | $ 12.58 | $ 12.39 | $ 12.64 | $ 12.70 | $ 12.85 | $ 13.07 |
| Low Growth High Price | Sumas | 2030-2031 | $ 13.46 | $ 14.29 | $ 14.15 | $ 14.08 | $ 13.63 | $ 12.66 | $ 12.58 | $ 12.43 | $ 12.66 | $ 12.73 | $ 12.88 | $ 13.11 |

# APPENDIX 6.2 ‖ WEIGHTED AVERAGE COST OF CAPITAL

## Avista Corporation Capital Structure and Overall Rate of Return

**OREGON**

| Cost of Capital as of | Amount | Percent of Total | Cost | Component | After Tax Component |
|---|---|---|---|---|---|
| L/T Debt | | 50.00% | 5.90% | 2.95% | 1.92% |
| Trust Preferred Securities | | 0.00% | 0.00% | 0.00% | |
| Common Equity | | 50.00% | 10.10% | 5.05% | 5.05% |
| **TOTAL** | | **100.00%** | | **8.00%** | **6.97%** |

**WASHINGTON**

| Agreed-upon Cost of Capital | Percent of Total Capital | Cost | Component | After Tax Component |
|---|---|---|---|---|
| L/T Debt | 53.50% | 5.93% | 3.17% | 2.06% |
| Trust Preferred Securities | | | 0.00% | |
| Common Equity | 46.50% | 10.20% | 4.74% | 4.74% |
| **TOTAL** | **100.00%** | | **7.92%** | **6.81%** |

**IDAHO**

| Agreed-upon Cost of Capital | Amount | Percent of Total Capital | Cost | Component | After Tax Component |
|---|---|---|---|---|---|
| L/T Debt (1) | | 50.00% | 6.60% | 3.30% | 2.15% |
| Trust Preferred Securities | | | | 0.00% | |
| Preferred Stock | | | | 0.00% | 0.00% |
| Common Equity | | 50.00% | 10.50% | 5.25% | 5.25% |
| **TOTAL** | | **100.00%** | | **8.55%** | **7.40%** |

| **Rate Base from Commission Basis Reports** | | |
|---|---|---|
| OR | $ 141,728,000 | 31% |
| WA | $ 205,507,000 | 45% |
| ID | $ 107,759,000 | 24% |
| | $ 454,994,000 | |

| | | |
|---|---|---|
| **System Weighted Average Cost of Capital (Nominal$)*** | 8.09% | 7.00% |
| GDP price deflator | 1.56% | 1.56% |
| **After Tax WACC** | 6.43% | **5.35%** |

*Weighting based on Commission Basis Reports
**Tax rate applied to L/T Debt 35%

# APPENDIX 6.2 || AUTHORIZED RATES OF RETURN

**Washington Electric**
General Case Settlement in 2008 (UE-080416)
*effective 1/1/2009*

| Component | Capital Structure | ProForma Cost | ProForma Weighted Cost |
|---|---|---|---|
| L/T Debt (1) | 53.70% | 6.51% | 3.50% |
| Pref Trust | | | 0.00% |
| Common | 46.30% | 10.20% | 4.72% |
| Total | 100.00% | | 8.22% |

*(1) includes short-term debt*

**Washington Gas**
General Case Settlement in 2008 (UG-080417)
*effective 1/1/2009*

| Component | Capital Structure | ProForma Cost | ProForma Weighted Cost |
|---|---|---|---|
| L/T Debt (1) | 53.70% | 6.51% | 3.50% |
| Pref Trust | | | 0.00% |
| Common | 46.30% | 10.20% | 4.72% |
| Total | 100.00% | | 8.22% |

*(1) includes short-term debt*

**Idaho Electric**
Case Decided in 2008-AVU-E-08-01
*effective 10/1/2008*

| Component | Capital Structure | ProForma Cost | ProForma Weighted Cost |
|---|---|---|---|
| L/T Debt | 52.06% | 6.84% | 3.56% |
| Pref Trust | | | 0.00% |
| Pref Stock | | | 0.00% |
| Common | 47.94% | 10.20% | 4.89% |
| Total | 100.00% | | 8.45% |

*(excludes short-term debt)*

**Idaho Gas**
Case Decided in 2008-AVU-G-08-01
*effective 10/1/2008*

| Component | Capital Structure | ProForma Cost | ProForma Weighted Cost |
|---|---|---|---|
| L/T Debt | 52.06% | 6.84% | 3.56% |
| Pref Trust | | | 0.00% |
| Pref Stock | | | 0.00% |
| Common | 47.94% | 10.20% | 4.89% |
| Total | 100.00% | | 8.45% |

*(excludes short-term debt)*

**Oregon Gas**
General Case Settlement in 2007 (UG-181)
*effective 4/1/2008*

| Component | Capital Structure | ProForma Cost | ProForma Weighted Cost |
|---|---|---|---|
| L/T Debt | 45.00% | 6.40% | 2.88% |
| Pref Trust | 5.00% | 6.57% | 0.33% |
| Common | 50.00% | 10.00% | 5.00% |
| Total | 100.00% | | 8.21% |

*(excludes short-term debt)*

# APPENDIX 6.2 ‖ ESCALATION/INFLATION FORECASTS

Implicit Price Deflators — U. S. Average 5/20/2011
Source: Randy Barcus, Finance--Analysis, Budget & Forecasting
Discount Rate: Levelizing is Not Applicable to Escalation Rates

| Year | E1 Gross Domestic Product (% change) | E2 Personal Consumption Expenditures (% change) | E3 Power Equipment Investment (% change) | E4 Consumer Price Index-Urban (% change) |
|---|---|---|---|---|
| 1996 | 1.9 | 2.2 | 1.6 | 2.9 |
| 1997 | 1.7 | 1.7 | 2.1 | 2.3 |
| 1998 | 1.1 | 0.9 | 1.9 | 1.5 |
| 1999 | 1.4 | 1.7 | 1.6 | 2.2 |
| 2000 | 2.2 | 2.5 | 4.1 | 3.4 |
| 2001 | 2.3 | 1.9 | 2.8 | 2.8 |
| 2002 | 1.6 | 1.4 | 2.7 | 1.6 |
| 2003 | 2.2 | 2.0 | 2.3 | 2.3 |
| 2004 | 2.8 | 2.6 | 8.3 | 2.7 |
| 2005 | 3.3 | 3.0 | 9.3 | 3.4 |
| 2006 | 3.3 | 2.7 | 6.1 | 3.2 |
| 2007 | 2.9 | 2.7 | 4.7 | 2.9 |
| 2008 | 2.2 | 3.3 | 9.4 | 3.8 |
| 2009 | 0.9 | 0.2 | -0.7 | -0.3 |
| 2010 | 1.0 | 1.7 | 1.0 | 1.6 |
| 2011 | 1.3 | 1.4 | 3.5 | 1.9 |
| 2012 | 1.3 | 1.5 | 1.6 | 1.7 |
| 2013 | 1.6 | 1.7 | 2.2 | 1.9 |
| 2014 | 1.8 | 2.0 | 3.0 | 2.2 |
| 2015 | 1.8 | 2.1 | 3.0 | 2.2 |
| 2016 | 1.8 | 2.0 | 2.8 | 2.1 |
| 2017 | 1.8 | 2.0 | 2.9 | 2.1 |
| 2018 | 1.8 | 2.1 | 2.9 | 2.1 |
| 2019 | 1.8 | 1.9 | 2.8 | 2.0 |
| 2020 | 1.8 | 1.9 | 2.8 | 1.9 |
| 2021 | 1.8 | 1.9 | 2.7 | 1.9 |
| 2022 | 1.7 | 1.8 | 2.6 | 1.9 |
| 2023 | 1.7 | 1.8 | 2.4 | 1.9 |
| 2024 | 1.7 | 1.9 | 2.5 | 2.0 |
| 2025 | 1.7 | 1.9 | 2.5 | 2.0 |
| 2026 | 1.8 | 2.0 | 2.5 | 2.0 |
| 2027 | 1.8 | 2.0 | 2.6 | 2.1 |
| 2028 | 1.8 | 2.0 | 2.6 | 2.1 |
| 2029 | 1.8 | 2.0 | 2.6 | 2.1 |
| 2030 | 1.8 | 2.0 | 2.5 | 2.1 |
| 2031 | 1.8 | 2.0 | 2.6 | 2.0 |
| 2032 | 1.8 | 2.0 | 2.6 | 2.0 |
| 2033 | 1.8 | 2.0 | 2.6 | 2.0 |
| 2034 | 1.8 | 2.0 | 2.5 | 2.0 |
| 2035 | 1.7 | 2.0 | 2.5 | 1.9 |
| 2036 | 1.7 | 2.0 | 2.4 | 2.0 |
| 2037 | 1.8 | 2.0 | 2.5 | 2.0 |
| 2038 | 1.8 | 2.1 | 2.6 | 2.1 |
| 2039 | 1.9 | 2.1 | 2.6 | 2.1 |
| 2040 | 1.8 | 2.1 | 2.5 | 2.1 |
| 2010-2040 Avg. | 1.7 | 1.9 | 2.6 | 2.0 |
| 5 Year Avg. | 1.6 | 1.7 | 2.6 | 2.0 |
| 10 Year Avg. | 1.7 | 1.9 | 2.7 | 2.0 |
| 20 Year Avg. | 1.7 | 1.9 | 2.6 | 2.0 |
| 25 Year Avg. | 1.7 | 1.9 | 2.6 | 2.0 |
| 30 Year Avg. | 1.7 | 1.9 | 2.6 | 2.0 |
| Std. Dev. | 1.0 | 1.0 | 1.5 | 1.0 |
| | 0.5 | 0.5 | 1.9 | 0.6 |

E1 Applies to inflation of all good & services produced & consumed in the U.S.
E2 Applies to inflation of goods & services consumed by individuals.
E3 Applies to inflation of non-residential power equipment
E4 For all urban consumers, applies to inflation of a fixed market basket of typical goods & services.

***Reference: Global Insight's Review of the U.S. Economy First Quarter 2011***

# APPENDIX 6.2 II COST OF CAPITAL

Source: Damien Lysiak, Treasury Department 6/20/2011

**Projected Long-Term Cost of Capital – Avista Utilities for Net Present Value Analysis**

| | Target Capital Structure | Component Cost | | |
|---|---|---|---|---|
| Debt | 50% | 5.85% | | 2.93% |
| Common Equity | 50% | 10.90% | [1] | 5.45% |
| Weighted Cost of Capital | | | | 8.38% |

1: Based on Avista's WUTC 2011 rate case

**Authorized Cost of Capital – Avista Utilities for Revenue Requirements Analysis Washington Elec/Gas Decided 2010**

| | Authorized Capital Structure | Component Cost | Component Return |
|---|---|---|---|
| Debt | 53.50% | 5.92% | 3.17% |
| Common Equity | 46.50% | 10.20% | 4.74% |
| Rate of Return | | | 7.91% |

**Authorized Cost of Capital – Avista Utilities for Revenue Requirements Analysis Idaho Elec/Gas Decided**

| | Authorized Capital Structure | Component Cost | Component Return |
|---|---|---|---|
| Debt | 50.00% | 6.60% | 3.30% |
| Common Equity | 50.00% | 10.50% | 5.25% |
| Rate of Return | | | 8.55% |

# APPENDIX 6.3 ‖ POTENTIAL SUPPLY SIDE RESOURCE ADDITIONS

| Additional Resources | Jurisdiction | Size | Cost/Rates | Availability | Modeled | Case(s) | Notes |
|---|---|---|---|---|---|---|---|
| **Pipeline** | | | | | | | |
| Capacity Release Recalls | WA/ID | 28,000 Dth/d | NWPL fixed rate | 2018 | Yes | Expected/High | Recall previously released capacity |
| GTN Capacity | WA/ID | 25,000 - 75,000 Dth/d | GTN rate | 2013 | Yes | Expected/High | Currently available unsubscribed capacity from Kingsgate to Spokane |
| GTN Capacity | OR | 25,000 - 50,000 Dth/d | GTN rate | 2013 | Yes | Expected/High | Currently available unsubscribed capacity; requires expansion of Medford Lateral |
| GTN Medford Lateral Expansion | OR | 25,000 - 50,000 Dth/d | GTN rate | 2014 | Yes | Expected/High | Additional compression to allow more gas to flow from GTN mailine to the lateral |
| NWP Expansion | WA/ID | 75,000 Dth/d | NWPL fixed rate x 3 | 2018 | Yes | Expected/High | Transport expansion from Sumas/JP to WA/ID |
| NWP Expansion | OR | 50,000 Dth/d | NWPL fixed rate x 5 | 2018 | Yes | Expected/High | Transport expansion from Sumas/JP to Oregon |
| **Statellite LNG** | | | | | | | |
| WA/ID Satellite LNG | WA/ID | 270,000 capacity; 90,000 delivery for 3 days | $132 million capital cost $1 million annual O&M | November 2018 | Yes | Expected/High | |
| Medford/Roseburg Satellite LNG | OR | 135,000 capacity; 45,000 delivery for 3 days | $66 million capital cost $850,000 annual O&M | November 2018 | Yes | Expected/High | |
| Klamath Falls Satellite LNG | OR | 45,000 capacity; 15,000 delivery for 3 days | $22 million capital cost $850,000 annual O&M | November 2018 | Yes | Expected/High | |
| La Grande Satellite LNG | OR | 45,000 capacity; 15,000 delivery for 3 days | $22 million capital cost $850,000 annual O&M | November 2018 | Yes | Expected/High | |
| **Company Owned Liquifaction LNG** | | | | | | | |
| WA/ID | WA | 600 MMcf capacity; 150,000 delivery for 4 days | $75 million capital cost, $2 million annual O&M | November 2018 | No | | Considered and discussed but not taken to full cycle modeling. |
| **Export LNG** | | | | | | | |
| An Oregon Export LNG Facility plus pipeline build through Avista service territory. | OR | 25,000 Dth/d | Pipeline charge $1.00/Dth/d | November 2018 | No | | Considered and discussed but not taken to full cycle modeling. |
| **Other Resources Considered** | | | | | | | |
| Citygate deliveries | WA/ID/OR | | | | No | | Represents the ability to buy a delivered product fron another utility or marketer. Limited counterparties to structure transaction |
| **Inground Storage** | | | | | | | |
| California | | | | | No | | Dependent on GTN backhaul or convert to bidirectional pipeline |
| JP Expansion | | | | | No | | Dependent on NWP Expansion or other Tport arrangements back to service territory |
| Mist | | | | | No | | Dependent on NWP Expansion or other Tport arrangements back to service territory; Long term subscription may not be available |

# APPENDIX 6.4 II EXPECTED CASE AVOIDED COST

**Annual Avoided Costs 1/**
**2010$**

| Scenario | Gas Year | Klam Falls | La Grande | Medford GTN | Medford NWP | Roseburg | WA/ID Both | WA/ID GTN | WA/ID NWP | WA/ID Annual | OR Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Expected | 2011-2012 | $ 2.69 | $ 2.84 | $ 2.69 | $ 2.69 | $ 2.69 | $ 2.69 | $ 2.65 | $ 2.87 | $ 2.74 | $ 2.72 |
| Expected | 2012-2013 | $ 3.54 | $ 3.77 | $ 3.54 | $ 3.54 | $ 3.54 | $ 3.58 | $ 3.48 | $ 3.77 | $ 3.61 | $ 3.58 |
| Expected | 2013-2014 | $ 3.85 | $ 4.07 | $ 3.85 | $ 3.85 | $ 3.85 | $ 3.86 | $ 3.80 | $ 4.08 | $ 3.91 | $ 3.90 |
| Expected | 2014-2015 | $ 4.01 | $ 4.24 | $ 4.01 | $ 4.01 | $ 4.01 | $ 4.03 | $ 3.96 | $ 4.25 | $ 4.08 | $ 4.06 |
| Expected | 2015-2016 | $ 4.18 | $ 4.45 | $ 4.18 | $ 4.18 | $ 4.18 | $ 4.21 | $ 4.12 | $ 4.47 | $ 4.26 | $ 4.23 |
| Expected | 2016-2017 | $ 4.35 | $ 4.64 | $ 4.35 | $ 4.35 | $ 4.35 | $ 4.39 | $ 4.29 | $ 4.65 | $ 4.44 | $ 4.41 |
| Expected | 2017-2018 | $ 4.56 | $ 4.88 | $ 4.56 | $ 4.56 | $ 4.56 | $ 4.60 | $ 4.50 | $ 4.89 | $ 4.67 | $ 4.63 |
| Expected | 2018-2019 | $ 4.73 | $ 5.06 | $ 4.73 | $ 4.73 | $ 4.73 | $ 4.78 | $ 4.67 | $ 5.08 | $ 4.84 | $ 4.80 |
| Expected | 2019-2020 | $ 4.82 | $ 5.03 | $ 4.83 | $ 4.83 | $ 4.83 | $ 4.84 | $ 4.76 | $ 5.05 | $ 4.88 | $ 4.87 |
| Expected | 2020-2021 | $ 4.93 | $ 5.10 | $ 4.93 | $ 4.93 | $ 4.93 | $ 4.94 | $ 4.86 | $ 5.11 | $ 4.97 | $ 4.96 |
| Expected | 2021-2022 | $ 4.87 | $ 5.01 | $ 4.88 | $ 4.88 | $ 4.88 | $ 4.87 | $ 4.80 | $ 5.02 | $ 4.90 | $ 4.90 |
| Expected | 2022-2023 | $ 4.99 | $ 5.08 | $ 4.99 | $ 4.99 | $ 4.99 | $ 4.99 | $ 4.92 | $ 5.09 | $ 5.00 | $ 5.01 |
| Expected | 2023-2024 | $ 4.92 | $ 4.98 | $ 4.93 | $ 4.93 | $ 4.93 | $ 4.91 | $ 4.85 | $ 4.99 | $ 4.92 | $ 4.94 |
| Expected | 2024-2025 | $ 4.96 | $ 4.98 | $ 4.95 | $ 4.95 | $ 4.95 | $ 4.94 | $ 4.90 | $ 4.97 | $ 4.94 | $ 4.96 |
| Expected | 2025-2026 | $ 5.04 | $ 5.20 | $ 5.05 | $ 5.05 | $ 5.05 | $ 5.01 | $ 4.98 | $ 5.22 | $ 5.07 | $ 5.08 |
| Expected | 2026-2027 | $ 5.01 | $ 5.15 | $ 5.02 | $ 5.02 | $ 5.02 | $ 4.97 | $ 4.94 | $ 5.16 | $ 5.03 | $ 5.04 |
| Expected | 2027-2028 | $ 5.03 | $ 5.13 | $ 5.04 | $ 5.04 | $ 5.04 | $ 5.00 | $ 4.96 | $ 5.14 | $ 5.04 | $ 5.06 |
| Expected | 2028-2029 | $ 5.07 | $ 5.14 | $ 5.08 | $ 5.08 | $ 5.08 | $ 5.04 | $ 5.00 | $ 5.16 | $ 5.07 | $ 5.09 |
| Expected | 2029-2030 | $ 5.08 | $ 5.12 | $ 5.08 | $ 5.08 | $ 5.08 | $ 5.03 | $ 5.00 | $ 5.14 | $ 5.06 | $ 5.09 |
| Expected | 2030-2031 | $ 5.15 | $ 5.17 | $ 5.16 | $ 5.16 | $ 5.16 | $ 5.11 | $ 5.08 | $ 5.19 | $ 5.13 | $ 5.16 |

**Winter Avoided Costs 1/**
**2010$**

| Scenario | Gas Year | Klam Falls | La Grande | Medford GTN | Medford NWP | Roseburg | WA/ID Both | WA/ID GTN | WA/ID NWP | WA/ID Winter | OR Winter |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Expected | 2011-2012 | $ 2.80 | $ 2.88 | $ 2.80 | $ 2.80 | $ 2.80 | $ 2.86 | $ 2.75 | $ 2.87 | $ 2.83 | $ 2.81 |
| Expected | 2012-2013 | $ 3.42 | $ 3.68 | $ 3.43 | $ 3.43 | $ 3.43 | $ 3.59 | $ 3.36 | $ 3.68 | $ 3.55 | $ 3.48 |
| Expected | 2013-2014 | $ 3.94 | $ 4.11 | $ 3.94 | $ 3.94 | $ 3.94 | $ 4.03 | $ 3.88 | $ 4.11 | $ 4.00 | $ 3.97 |
| Expected | 2014-2015 | $ 4.07 | $ 4.28 | $ 4.07 | $ 4.07 | $ 4.07 | $ 4.19 | $ 4.00 | $ 4.27 | $ 4.15 | $ 4.11 |
| Expected | 2015-2016 | $ 4.21 | $ 4.47 | $ 4.21 | $ 4.21 | $ 4.21 | $ 4.36 | $ 4.14 | $ 4.47 | $ 4.32 | $ 4.26 |
| Expected | 2016-2017 | $ 4.39 | $ 4.67 | $ 4.39 | $ 4.39 | $ 4.39 | $ 4.55 | $ 4.32 | $ 4.67 | $ 4.51 | $ 4.44 |
| Expected | 2017-2018 | $ 4.60 | $ 4.91 | $ 4.60 | $ 4.60 | $ 4.60 | $ 4.77 | $ 4.52 | $ 4.91 | $ 4.73 | $ 4.66 |
| Expected | 2018-2019 | $ 4.79 | $ 5.11 | $ 4.79 | $ 4.79 | $ 4.79 | $ 4.97 | $ 4.71 | $ 5.11 | $ 4.93 | $ 4.85 |
| Expected | 2019-2020 | $ 4.88 | $ 5.10 | $ 4.88 | $ 4.88 | $ 4.88 | $ 5.00 | $ 4.80 | $ 5.10 | $ 4.97 | $ 4.92 |
| Expected | 2020-2021 | $ 5.00 | $ 5.18 | $ 5.00 | $ 5.00 | $ 5.00 | $ 5.11 | $ 4.92 | $ 5.18 | $ 5.07 | $ 5.03 |
| Expected | 2021-2022 | $ 4.97 | $ 5.12 | $ 4.97 | $ 4.97 | $ 4.97 | $ 5.05 | $ 4.88 | $ 5.12 | $ 5.02 | $ 5.00 |
| Expected | 2022-2023 | $ 5.02 | $ 5.15 | $ 5.02 | $ 5.02 | $ 5.02 | $ 5.10 | $ 4.94 | $ 5.15 | $ 5.06 | $ 5.05 |
| Expected | 2023-2024 | $ 5.04 | $ 5.13 | $ 5.04 | $ 5.04 | $ 5.04 | $ 5.08 | $ 4.95 | $ 5.11 | $ 5.05 | $ 5.06 |
| Expected | 2024-2025 | $ 5.03 | $ 5.09 | $ 5.03 | $ 5.03 | $ 5.03 | $ 5.06 | $ 4.95 | $ 5.07 | $ 5.02 | $ 5.04 |
| Expected | 2025-2026 | $ 5.14 | $ 5.29 | $ 5.14 | $ 5.14 | $ 5.14 | $ 5.15 | $ 5.07 | $ 5.28 | $ 5.17 | $ 5.17 |
| Expected | 2026-2027 | $ 5.15 | $ 5.28 | $ 5.15 | $ 5.15 | $ 5.15 | $ 5.16 | $ 5.08 | $ 5.27 | $ 5.17 | $ 5.18 |
| Expected | 2027-2028 | $ 5.14 | $ 5.23 | $ 5.14 | $ 5.14 | $ 5.14 | $ 5.15 | $ 5.07 | $ 5.22 | $ 5.15 | $ 5.16 |
| Expected | 2028-2029 | $ 5.19 | $ 5.24 | $ 5.19 | $ 5.19 | $ 5.19 | $ 5.19 | $ 5.10 | $ 5.23 | $ 5.18 | $ 5.20 |
| Expected | 2029-2030 | $ 5.21 | $ 5.24 | $ 5.22 | $ 5.22 | $ 5.22 | $ 5.20 | $ 5.13 | $ 5.23 | $ 5.18 | $ 5.22 |
| Expected | 2030-2031 | $ 5.25 | $ 5.26 | $ 5.26 | $ 5.26 | $ 5.26 | $ 5.23 | $ 5.17 | $ 5.26 | $ 5.22 | $ 5.26 |

1/ Avoided costs are before Environmental Externalities adder.

# APPENDIX 6.4 II LOW GROWTH CASE AVOIDED COST

**Annual Avoided Costs 1/**
**2010$**

| Scenario | Gas Year | Klam Falls | La Grande | Medford GTN | Medford NWP | Roseburg | WA/ID Both | WA/ID GTN | WA/ID NWP | WA/ID Annual | OR Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Low Growth | 2011-2012 | $ 3.68 | $ 3.82 | $ 3.68 | $ 3.68 | $ 3.68 | $ 3.71 | $ 3.63 | $ 3.82 | $ 3.72 | $ 3.71 |
| Low Growth | 2012-2013 | $ 4.96 | $ 5.13 | $ 4.96 | $ 4.96 | $ 4.96 | $ 4.95 | $ 4.90 | $ 5.13 | $ 4.99 | $ 5.00 |
| Low Growth | 2013-2014 | $ 5.84 | $ 6.02 | $ 5.84 | $ 5.84 | $ 5.84 | $ 5.80 | $ 5.77 | $ 6.01 | $ 5.86 | $ 5.88 |
| Low Growth | 2014-2015 | $ 6.91 | $ 7.07 | $ 6.91 | $ 6.91 | $ 6.91 | $ 6.85 | $ 6.82 | $ 7.05 | $ 6.91 | $ 6.94 |
| Low Growth | 2015-2016 | $ 7.45 | $ 7.65 | $ 7.45 | $ 7.45 | $ 7.45 | $ 7.42 | $ 7.36 | $ 7.65 | $ 7.48 | $ 7.49 |
| Low Growth | 2016-2017 | $ 7.97 | $ 8.18 | $ 7.97 | $ 7.97 | $ 7.97 | $ 7.92 | $ 7.87 | $ 8.16 | $ 7.99 | $ 8.01 |
| Low Growth | 2017-2018 | $ 8.17 | $ 8.41 | $ 8.17 | $ 8.17 | $ 8.17 | $ 8.12 | $ 8.06 | $ 8.39 | $ 8.19 | $ 8.21 |
| Low Growth | 2018-2019 | $ 8.40 | $ 8.64 | $ 8.40 | $ 8.40 | $ 8.40 | $ 8.35 | $ 8.29 | $ 8.62 | $ 8.42 | $ 8.45 |
| Low Growth | 2019-2020 | $ 8.64 | $ 8.78 | $ 8.64 | $ 8.64 | $ 8.64 | $ 8.58 | $ 8.53 | $ 8.78 | $ 8.63 | $ 8.67 |
| Low Growth | 2020-2021 | $ 8.91 | $ 9.03 | $ 8.90 | $ 8.90 | $ 8.90 | $ 8.84 | $ 8.80 | $ 9.02 | $ 8.89 | $ 8.93 |
| Low Growth | 2021-2022 | $ 9.17 | $ 9.26 | $ 9.16 | $ 9.16 | $ 9.16 | $ 9.10 | $ 9.06 | $ 9.25 | $ 9.13 | $ 9.18 |
| Low Growth | 2022-2023 | $ 9.39 | $ 9.43 | $ 9.38 | $ 9.38 | $ 9.38 | $ 9.31 | $ 9.28 | $ 9.42 | $ 9.34 | $ 9.39 |
| Low Growth | 2023-2024 | $ 9.74 | $ 9.75 | $ 9.72 | $ 9.72 | $ 9.72 | $ 9.64 | $ 9.62 | $ 9.75 | $ 9.67 | $ 9.73 |
| Low Growth | 2024-2025 | $ 9.98 | $ 9.97 | $ 9.96 | $ 9.96 | $ 9.96 | $ 9.89 | $ 9.86 | $ 9.98 | $ 9.91 | $ 9.97 |
| Low Growth | 2025-2026 | $ 10.57 | $ 10.65 | $ 10.56 | $ 10.56 | $ 10.56 | $ 10.47 | $ 10.44 | $ 10.64 | $ 10.52 | $ 10.58 |
| Low Growth | 2026-2027 | $ 11.10 | $ 11.18 | $ 11.10 | $ 11.10 | $ 11.10 | $ 11.00 | $ 10.97 | $ 11.16 | $ 11.04 | $ 11.12 |
| Low Growth | 2027-2028 | $ 11.71 | $ 11.74 | $ 11.70 | $ 11.70 | $ 11.70 | $ 11.59 | $ 11.57 | $ 11.72 | $ 11.63 | $ 11.71 |
| Low Growth | 2028-2029 | $ 12.32 | $ 12.33 | $ 12.31 | $ 12.31 | $ 12.31 | $ 12.19 | $ 12.17 | $ 12.33 | $ 12.23 | $ 12.32 |
| Low Growth | 2029-2030 | $ 13.02 | $ 13.01 | $ 13.01 | $ 13.01 | $ 13.01 | $ 12.89 | $ 12.87 | $ 13.02 | $ 12.93 | $ 13.01 |
| Low Growth | 2030-2031 | $ 13.16 | $ 13.12 | $ 13.14 | $ 13.14 | $ 13.14 | $ 13.03 | $ 13.01 | $ 13.16 | $ 13.06 | $ 13.14 |

**Winter Avoided Costs 1/**
**2010$**

| Scenario | Gas Year | Klam Falls | La Grande | Medford GTN | Medford NWP | Roseburg | WA/ID Both | WA/ID GTN | WA/ID NWP | WA/ID Winter | OR Winter |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Low Growth | 2011-2012 | $ 3.13 | $ 3.32 | $ 3.13 | $ 3.13 | $ 3.13 | $ 3.28 | $ 3.07 | $ 3.32 | $ 3.23 | $ 3.17 |
| Low Growth | 2012-2013 | $ 4.96 | $ 5.09 | $ 4.97 | $ 4.97 | $ 4.97 | $ 5.03 | $ 4.89 | $ 5.07 | $ 5.00 | $ 4.99 |
| Low Growth | 2013-2014 | $ 5.88 | $ 5.99 | $ 5.89 | $ 5.89 | $ 5.89 | $ 5.89 | $ 5.80 | $ 5.94 | $ 5.88 | $ 5.91 |
| Low Growth | 2014-2015 | $ 6.92 | $ 7.03 | $ 6.92 | $ 6.92 | $ 6.92 | $ 6.91 | $ 6.82 | $ 6.97 | $ 6.90 | $ 6.94 |
| Low Growth | 2015-2016 | $ 7.64 | $ 7.78 | $ 7.64 | $ 7.64 | $ 7.64 | $ 7.68 | $ 7.54 | $ 7.74 | $ 7.65 | $ 7.67 |
| Low Growth | 2016-2017 | $ 8.17 | $ 8.31 | $ 8.17 | $ 8.17 | $ 8.17 | $ 8.19 | $ 8.06 | $ 8.26 | $ 8.17 | $ 8.20 |
| Low Growth | 2017-2018 | $ 8.36 | $ 8.53 | $ 8.36 | $ 8.36 | $ 8.36 | $ 8.38 | $ 8.25 | $ 8.48 | $ 8.37 | $ 8.39 |
| Low Growth | 2018-2019 | $ 8.60 | $ 8.78 | $ 8.60 | $ 8.60 | $ 8.60 | $ 8.63 | $ 8.49 | $ 8.73 | $ 8.62 | $ 8.64 |
| Low Growth | 2019-2020 | $ 8.85 | $ 8.99 | $ 8.85 | $ 8.85 | $ 8.85 | $ 8.85 | $ 8.74 | $ 8.93 | $ 8.84 | $ 8.88 |
| Low Growth | 2020-2021 | $ 9.12 | $ 9.23 | $ 9.12 | $ 9.12 | $ 9.12 | $ 9.11 | $ 9.00 | $ 9.17 | $ 9.09 | $ 9.14 |
| Low Growth | 2021-2022 | $ 9.38 | $ 9.48 | $ 9.38 | $ 9.38 | $ 9.38 | $ 9.36 | $ 9.26 | $ 9.42 | $ 9.35 | $ 9.40 |
| Low Growth | 2022-2023 | $ 9.60 | $ 9.67 | $ 9.60 | $ 9.60 | $ 9.60 | $ 9.57 | $ 9.48 | $ 9.62 | $ 9.55 | $ 9.62 |
| Low Growth | 2023-2024 | $ 9.91 | $ 9.94 | $ 9.91 | $ 9.91 | $ 9.91 | $ 9.84 | $ 9.78 | $ 9.88 | $ 9.83 | $ 9.92 |
| Low Growth | 2024-2025 | $ 10.19 | $ 10.21 | $ 10.19 | $ 10.19 | $ 10.19 | $ 10.13 | $ 10.07 | $ 10.16 | $ 10.12 | $ 10.20 |
| Low Growth | 2025-2026 | $ 10.72 | $ 10.78 | $ 10.72 | $ 10.72 | $ 10.72 | $ 10.65 | $ 10.58 | $ 10.70 | $ 10.64 | $ 10.73 |
| Low Growth | 2026-2027 | $ 11.28 | $ 11.35 | $ 11.28 | $ 11.28 | $ 11.28 | $ 11.22 | $ 11.14 | $ 11.27 | $ 11.21 | $ 11.30 |
| Low Growth | 2027-2028 | $ 11.89 | $ 11.93 | $ 11.89 | $ 11.89 | $ 11.89 | $ 11.79 | $ 11.74 | $ 11.84 | $ 11.79 | $ 11.90 |
| Low Growth | 2028-2029 | $ 12.53 | $ 12.54 | $ 12.53 | $ 12.53 | $ 12.53 | $ 12.43 | $ 12.37 | $ 12.46 | $ 12.42 | $ 12.53 |
| Low Growth | 2029-2030 | $ 13.20 | $ 13.19 | $ 13.20 | $ 13.20 | $ 13.20 | $ 13.10 | $ 13.04 | $ 13.13 | $ 13.09 | $ 13.20 |
| Low Growth | 2030-2031 | $ 13.51 | $ 13.45 | $ 13.50 | $ 13.50 | $ 13.50 | $ 13.40 | $ 13.36 | $ 13.42 | $ 13.39 | $ 13.49 |

1/ Avoided costs are before Environmental Externalities adder.

# APPENDIX 6.4 ‖ HIGH GROWTH CASE AVOIDED COST

**Annual Avoided Costs 1/**
**2010$**

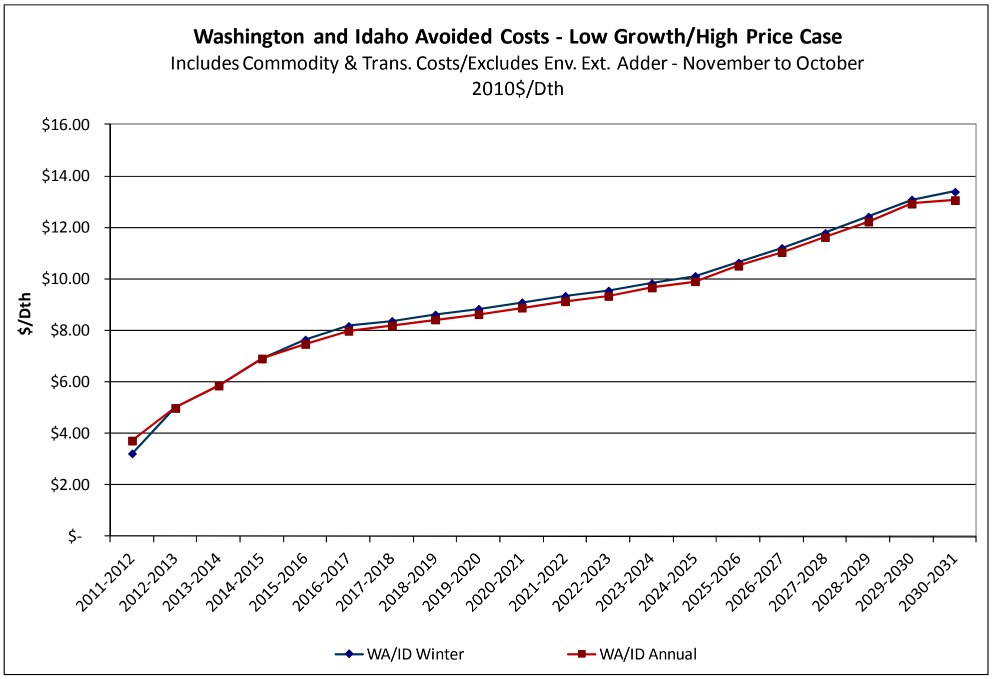
| Scenario | Gas Year | Klam Falls | La Grande | Medford GTN | Medford NWP | Roseburg | WA/ID Both | WA/ID GTN | WA/ID NWP | WA/ID Annual | OR Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| High Growth | 2011-2012 | $ 2.69 | $ 2.84 | $ 2.69 | $ 2.69 | $ 2.69 | $ 2.65 | $ 2.65 | $ 2.87 | $ 2.72 | $ 2.72 |
| High Growth | 2012-2013 | $ 3.54 | $ 3.74 | $ 3.54 | $ 3.54 | $ 3.54 | $ 3.49 | $ 3.49 | $ 3.76 | $ 3.58 | $ 3.58 |
| High Growth | 2013-2014 | $ 3.85 | $ 4.07 | $ 3.85 | $ 3.85 | $ 3.85 | $ 3.80 | $ 3.80 | $ 4.08 | $ 3.89 | $ 3.90 |
| High Growth | 2014-2015 | $ 4.02 | $ 4.23 | $ 4.02 | $ 4.02 | $ 4.02 | $ 3.96 | $ 3.96 | $ 4.24 | $ 4.05 | $ 4.06 |
| High Growth | 2015-2016 | $ 4.18 | $ 4.45 | $ 4.18 | $ 4.18 | $ 4.18 | $ 4.12 | $ 4.12 | $ 4.46 | $ 4.23 | $ 4.23 |
| High Growth | 2016-2017 | $ 4.87 | $ 5.15 | $ 4.87 | $ 4.87 | $ 4.87 | $ 4.80 | $ 4.80 | $ 5.16 | $ 4.92 | $ 4.93 |
| High Growth | 2017-2018 | $ 5.08 | $ 5.39 | $ 5.09 | $ 5.09 | $ 5.09 | $ 5.01 | $ 5.01 | $ 5.40 | $ 5.14 | $ 5.15 |
| High Growth | 2018-2019 | $ 5.25 | $ 5.57 | $ 5.25 | $ 5.25 | $ 5.25 | $ 5.18 | $ 5.18 | $ 5.59 | $ 5.31 | $ 5.32 |
| High Growth | 2019-2020 | $ 5.34 | $ 5.54 | $ 5.35 | $ 5.35 | $ 5.35 | $ 5.27 | $ 5.27 | $ 5.55 | $ 5.36 | $ 5.39 |
| High Growth | 2020-2021 | $ 5.45 | $ 5.63 | $ 5.46 | $ 5.46 | $ 5.46 | $ 5.38 | $ 5.38 | $ 5.66 | $ 5.47 | $ 5.49 |
| High Growth | 2021-2022 | $ 5.39 | $ 5.53 | $ 5.40 | $ 5.40 | $ 5.40 | $ 5.31 | $ 5.31 | $ 5.54 | $ 5.39 | $ 5.42 |
| High Growth | 2022-2023 | $ 5.52 | $ 5.59 | $ 5.52 | $ 5.52 | $ 5.52 | $ 5.43 | $ 5.43 | $ 5.61 | $ 5.49 | $ 5.53 |
| High Growth | 2023-2024 | $ 5.44 | $ 5.48 | $ 5.45 | $ 5.45 | $ 5.45 | $ 5.36 | $ 5.36 | $ 5.50 | $ 5.41 | $ 5.45 |
| High Growth | 2024-2025 | $ 5.50 | $ 5.50 | $ 5.50 | $ 5.50 | $ 5.50 | $ 5.41 | $ 5.41 | $ 5.50 | $ 5.44 | $ 5.50 |
| High Growth | 2025-2026 | $ 5.62 | $ 5.72 | $ 5.63 | $ 5.63 | $ 5.63 | $ 5.48 | $ 5.48 | $ 5.74 | $ 5.57 | $ 5.65 |
| High Growth | 2026-2027 | $ 5.58 | $ 5.67 | $ 5.60 | $ 5.60 | $ 5.60 | $ 5.45 | $ 5.45 | $ 5.68 | $ 5.52 | $ 5.61 |
| High Growth | 2027-2028 | $ 5.59 | $ 5.65 | $ 5.61 | $ 5.61 | $ 5.61 | $ 5.47 | $ 5.47 | $ 5.67 | $ 5.54 | $ 5.61 |
| High Growth | 2028-2029 | $ 5.65 | $ 5.68 | $ 5.66 | $ 5.66 | $ 5.66 | $ 5.52 | $ 5.52 | $ 5.71 | $ 5.59 | $ 5.66 |
| High Growth | 2029-2030 | $ 5.69 | $ 5.70 | $ 5.70 | $ 5.70 | $ 5.70 | $ 5.54 | $ 5.54 | $ 5.76 | $ 5.61 | $ 5.70 |
| High Growth | 2030-2031 | $ 5.78 | $ 5.78 | $ 5.79 | $ 5.79 | $ 5.79 | $ 5.62 | $ 5.62 | $ 5.82 | $ 5.69 | $ 5.79 |

**Winter Avoided Costs 1/**
**2010$**

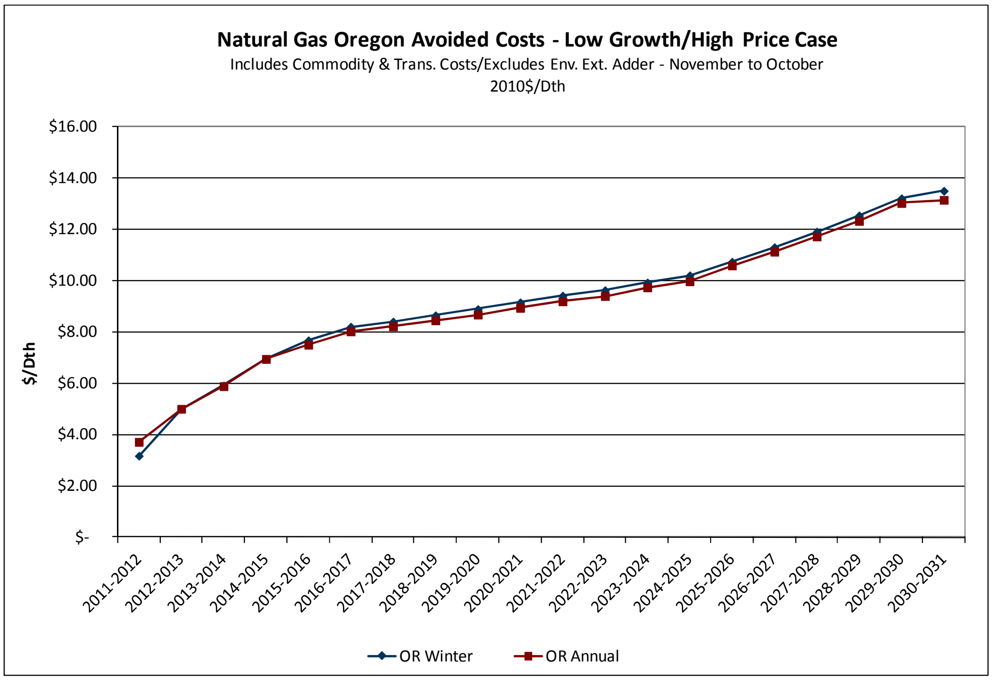
| Scenario | Gas Year | Klam Falls | La Grande | Medford GTN | Medford NWP | Roseburg | WA/ID Both | WA/ID GTN | WA/ID NWP | WA/ID Winter | OR Winter |
|---|---|---|---|---|---|---|---|---|---|---|---|
| High Growth | 2011-2012 | $ 2.80 | $ 2.87 | $ 2.80 | $ 2.80 | $ 2.80 | $ 2.75 | $ 2.75 | $ 2.85 | $ 2.79 | $ 2.81 |
| High Growth | 2012-2013 | $ 3.42 | $ 3.61 | $ 3.42 | $ 3.42 | $ 3.42 | $ 3.36 | $ 3.36 | $ 3.65 | $ 3.46 | $ 3.46 |
| High Growth | 2013-2014 | $ 3.94 | $ 4.11 | $ 3.94 | $ 3.94 | $ 3.94 | $ 3.88 | $ 3.88 | $ 4.10 | $ 3.95 | $ 3.97 |
| High Growth | 2014-2015 | $ 4.07 | $ 4.27 | $ 4.07 | $ 4.07 | $ 4.07 | $ 4.01 | $ 4.01 | $ 4.27 | $ 4.09 | $ 4.11 |
| High Growth | 2015-2016 | $ 4.21 | $ 4.46 | $ 4.21 | $ 4.21 | $ 4.21 | $ 4.14 | $ 4.14 | $ 4.46 | $ 4.25 | $ 4.26 |
| High Growth | 2016-2017 | $ 4.91 | $ 5.17 | $ 4.91 | $ 4.91 | $ 4.91 | $ 4.83 | $ 4.83 | $ 5.17 | $ 4.94 | $ 4.96 |
| High Growth | 2017-2018 | $ 5.12 | $ 5.41 | $ 5.12 | $ 5.12 | $ 5.12 | $ 5.04 | $ 5.04 | $ 5.41 | $ 5.16 | $ 5.18 |
| High Growth | 2018-2019 | $ 5.31 | $ 5.61 | $ 5.31 | $ 5.31 | $ 5.31 | $ 5.23 | $ 5.23 | $ 5.61 | $ 5.36 | $ 5.37 |
| High Growth | 2019-2020 | $ 5.41 | $ 5.60 | $ 5.41 | $ 5.41 | $ 5.41 | $ 5.32 | $ 5.32 | $ 5.60 | $ 5.41 | $ 5.45 |
| High Growth | 2020-2021 | $ 5.53 | $ 5.71 | $ 5.53 | $ 5.53 | $ 5.53 | $ 5.44 | $ 5.44 | $ 5.71 | $ 5.53 | $ 5.57 |
| High Growth | 2021-2022 | $ 5.49 | $ 5.64 | $ 5.49 | $ 5.49 | $ 5.49 | $ 5.41 | $ 5.41 | $ 5.63 | $ 5.48 | $ 5.52 |
| High Growth | 2022-2023 | $ 5.58 | $ 5.67 | $ 5.58 | $ 5.58 | $ 5.58 | $ 5.47 | $ 5.47 | $ 5.67 | $ 5.53 | $ 5.60 |
| High Growth | 2023-2024 | $ 5.57 | $ 5.61 | $ 5.57 | $ 5.57 | $ 5.57 | $ 5.47 | $ 5.47 | $ 5.60 | $ 5.51 | $ 5.58 |
| High Growth | 2024-2025 | $ 5.61 | $ 5.60 | $ 5.61 | $ 5.61 | $ 5.61 | $ 5.47 | $ 5.47 | $ 5.59 | $ 5.51 | $ 5.61 |
| High Growth | 2025-2026 | $ 5.81 | $ 5.84 | $ 5.81 | $ 5.81 | $ 5.81 | $ 5.58 | $ 5.58 | $ 5.82 | $ 5.66 | $ 5.81 |
| High Growth | 2026-2027 | $ 5.81 | $ 5.82 | $ 5.81 | $ 5.81 | $ 5.81 | $ 5.58 | $ 5.58 | $ 5.80 | $ 5.65 | $ 5.81 |
| High Growth | 2027-2028 | $ 5.77 | $ 5.77 | $ 5.77 | $ 5.77 | $ 5.77 | $ 5.57 | $ 5.57 | $ 5.76 | $ 5.63 | $ 5.77 |
| High Growth | 2028-2029 | $ 5.84 | $ 5.84 | $ 5.84 | $ 5.84 | $ 5.84 | $ 5.63 | $ 5.63 | $ 5.84 | $ 5.70 | $ 5.84 |
| High Growth | 2029-2030 | $ 5.94 | $ 5.93 | $ 5.94 | $ 5.94 | $ 5.94 | $ 5.68 | $ 5.68 | $ 5.95 | $ 5.77 | $ 5.94 |
| High Growth | 2030-2031 | $ 6.01 | $ 5.99 | $ 6.01 | $ 6.01 | $ 6.01 | $ 5.73 | $ 5.73 | $ 6.04 | $ 5.84 | $ 6.01 |

1/ Avoided costs are before Environmental Externalities adder.

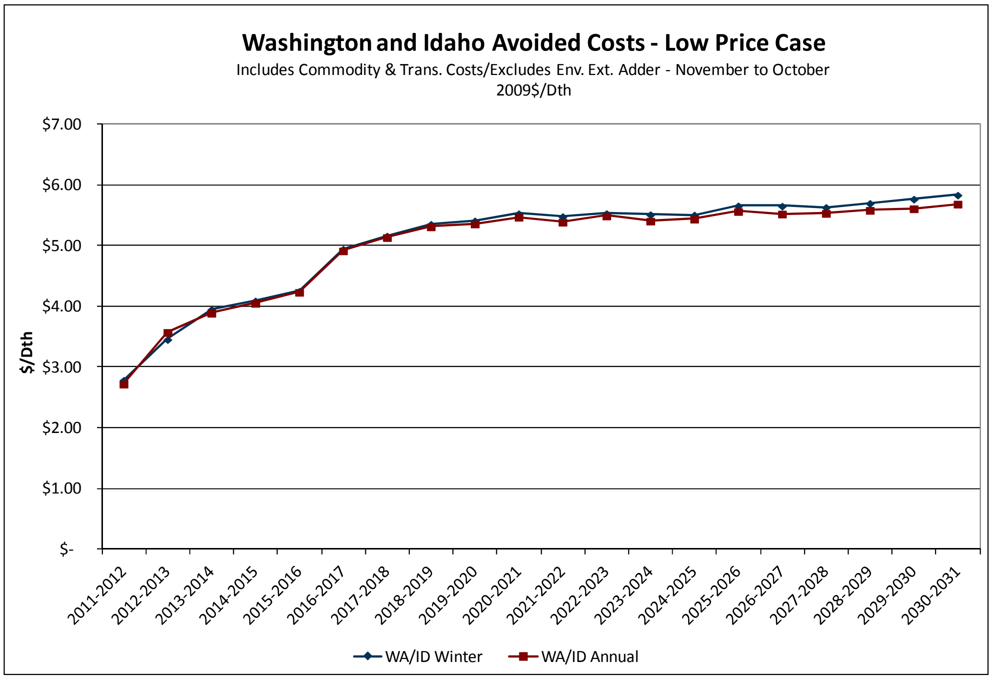
## APPENDIX 6.4 || WASHINGTON AND IDAHO AVOIDED COSTS - LOW GROWTH/HIGH PRICE CASE



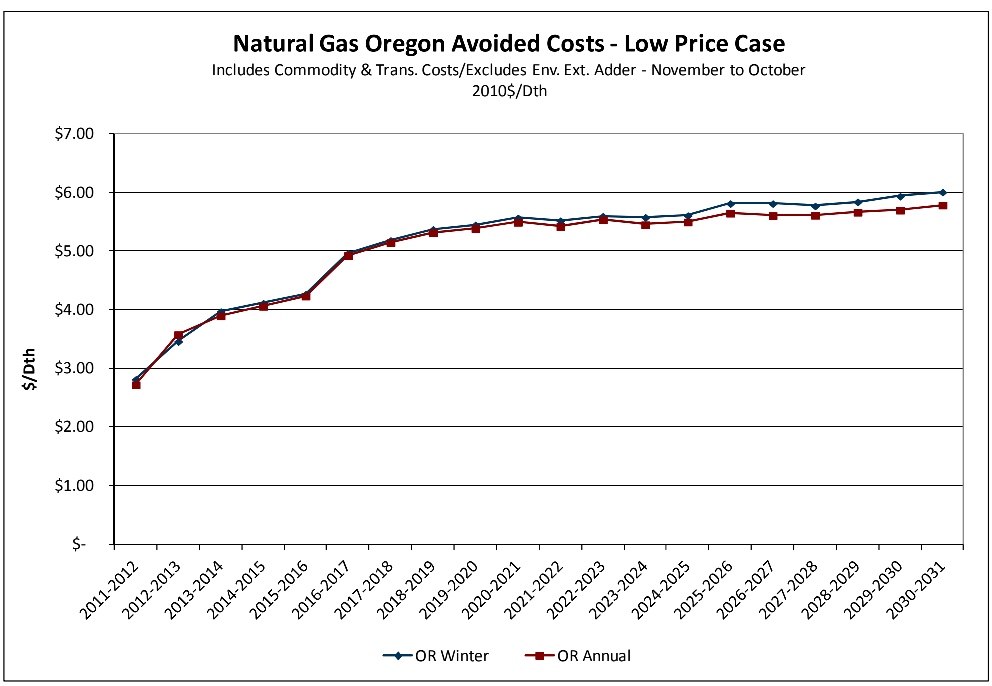

## APPENDIX 6.4 || NATURAL GAS OREGON AVOIDED COSTS - LOW GROWTH/HIGH PRICE CASE



## APPENDIX 6.4 II WASHINGTON AND IDAHO AVOIDED COSTS - LOW PRICE CASE




## APPENDIX 6.4 II NATURAL GAS OREGON AVOIDED COSTS - LOW PRICE CASE



# APPENDIX 6.4 ‖ LOW GROWTH – HIGH PRICE MONTHLY DETAIL

Monthly Avoided Cost Detail 1/
2010$

| Scenario | Gas Year | Month | Klam Falls | La Grande | Medford GTN | Medford NWP | Roseburg | WA/ID Both | WA/ID GTN | WA/ID NWP | WA/ID Annual | OR Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Low Growth & High Price | 2011-2012 | Nov | $ 3.21 | $ 3.21 | $ 3.21 | $ 3.21 | $ 3.21 | $ 3.18 | $ 3.17 | $ 3.21 | $ 3.19 | $ 3.21 |
| Low Growth & High Price | 2011-2012 | Dec | $ 3.07 | $ 3.48 | $ 3.11 | $ 3.11 | $ 3.11 | $ 3.48 | $ 3.00 | $ 3.48 | $ 3.32 | $ 3.18 |
| Low Growth & High Price | 2011-2012 | Jan | $ 2.55 | $ 2.74 | $ 2.55 | $ 2.55 | $ 2.55 | $ 2.74 | $ 2.52 | $ 2.75 | $ 2.67 | $ 2.59 |
| Low Growth & High Price | 2011-2012 | Feb | $ 2.68 | $ 3.03 | $ 2.68 | $ 2.68 | $ 2.68 | $ 2.95 | $ 2.62 | $ 3.03 | $ 2.87 | $ 2.75 |
| Low Growth & High Price | 2011-2012 | Mar | $ 4.09 | $ 4.11 | $ 4.09 | $ 4.09 | $ 4.09 | $ 4.03 | $ 4.03 | $ 4.11 | $ 4.06 | $ 4.09 |
| Low Growth & High Price | 2011-2012 | Apr | $ 4.02 | $ 4.11 | $ 4.02 | $ 4.02 | $ 4.02 | $ 3.96 | $ 3.96 | $ 4.11 | $ 4.01 | $ 4.04 |
| Low Growth & High Price | 2011-2012 | May | $ 3.97 | $ 4.12 | $ 3.97 | $ 3.97 | $ 3.97 | $ 3.91 | $ 3.91 | $ 4.12 | $ 3.98 | $ 4.00 |
| Low Growth & High Price | 2011-2012 | Jun | $ 4.04 | $ 4.12 | $ 4.04 | $ 4.04 | $ 4.04 | $ 3.98 | $ 3.98 | $ 4.12 | $ 4.03 | $ 4.05 |
| Low Growth & High Price | 2011-2012 | Jul | $ 4.08 | $ 4.16 | $ 4.08 | $ 4.08 | $ 4.08 | $ 4.02 | $ 4.02 | $ 4.16 | $ 4.07 | $ 4.09 |
| Low Growth & High Price | 2011-2012 | Aug | $ 4.09 | $ 4.17 | $ 4.09 | $ 4.09 | $ 4.09 | $ 4.03 | $ 4.03 | $ 4.17 | $ 4.08 | $ 4.10 |
| Low Growth & High Price | 2011-2012 | Sep | $ 4.14 | $ 4.18 | $ 4.14 | $ 4.14 | $ 4.14 | $ 4.09 | $ 4.09 | $ 4.18 | $ 4.12 | $ 4.15 |
| Low Growth & High Price | 2011-2012 | Oct | $ 4.18 | $ 4.42 | $ 4.18 | $ 4.18 | $ 4.18 | $ 4.13 | $ 4.13 | $ 4.42 | $ 4.22 | $ 4.23 |
| Low Growth & High Price | 2012-2013 | Nov | $ 4.50 | $ 4.70 | $ 4.50 | $ 4.50 | $ 4.50 | $ 4.52 | $ 4.44 | $ 4.70 | $ 4.55 | $ 4.54 |
| Low Growth & High Price | 2012-2013 | Dec | $ 4.78 | $ 5.13 | $ 4.82 | $ 4.82 | $ 4.82 | $ 5.13 | $ 4.68 | $ 5.13 | $ 4.98 | $ 4.87 |
| Low Growth & High Price | 2012-2013 | Jan | $ 5.20 | $ 5.23 | $ 5.20 | $ 5.20 | $ 5.20 | $ 5.23 | $ 5.14 | $ 5.23 | $ 5.20 | $ 5.21 |
| Low Growth & High Price | 2012-2013 | Feb | $ 5.17 | $ 5.21 | $ 5.17 | $ 5.17 | $ 5.17 | $ 5.15 | $ 5.11 | $ 5.16 | $ 5.14 | $ 5.18 |
| Low Growth & High Price | 2012-2013 | Mar | $ 5.16 | $ 5.16 | $ 5.16 | $ 5.16 | $ 5.16 | $ 5.10 | $ 5.10 | $ 5.14 | $ 5.11 | $ 5.16 |
| Low Growth & High Price | 2012-2013 | Apr | $ 4.93 | $ 5.11 | $ 4.93 | $ 4.93 | $ 4.93 | $ 4.86 | $ 4.86 | $ 5.14 | $ 4.95 | $ 4.96 |
| Low Growth & High Price | 2012-2013 | May | $ 4.90 | $ 5.12 | $ 4.90 | $ 4.90 | $ 4.90 | $ 4.83 | $ 4.83 | $ 5.14 | $ 4.94 | $ 4.94 |
| Low Growth & High Price | 2012-2013 | Jun | $ 4.92 | $ 5.14 | $ 4.92 | $ 4.92 | $ 4.92 | $ 4.85 | $ 4.85 | $ 5.14 | $ 4.95 | $ 4.96 |
| Low Growth & High Price | 2012-2013 | Jul | $ 4.95 | $ 5.14 | $ 4.95 | $ 4.95 | $ 4.95 | $ 4.88 | $ 4.88 | $ 5.14 | $ 4.97 | $ 4.99 |
| Low Growth & High Price | 2012-2013 | Aug | $ 4.98 | $ 5.15 | $ 4.98 | $ 4.98 | $ 4.98 | $ 4.91 | $ 4.91 | $ 5.15 | $ 4.99 | $ 5.01 |
| Low Growth & High Price | 2012-2013 | Sep | $ 5.01 | $ 5.15 | $ 5.01 | $ 5.01 | $ 5.01 | $ 4.94 | $ 4.94 | $ 5.15 | $ 5.01 | $ 5.04 |
| Low Growth & High Price | 2012-2013 | Oct | $ 5.06 | $ 5.29 | $ 5.06 | $ 5.06 | $ 5.06 | $ 5.00 | $ 5.00 | $ 5.29 | $ 5.09 | $ 5.10 |
| Low Growth & High Price | 2013-2014 | Nov | $ 5.37 | $ 5.56 | $ 5.37 | $ 5.37 | $ 5.37 | $ 5.30 | $ 5.30 | $ 5.56 | $ 5.39 | $ 5.40 |
| Low Growth & High Price | 2013-2014 | Dec | $ 5.62 | $ 5.90 | $ 5.66 | $ 5.66 | $ 5.66 | $ 5.90 | $ 5.52 | $ 5.90 | $ 5.77 | $ 5.70 |
| Low Growth & High Price | 2013-2014 | Jan | $ 6.16 | $ 6.16 | $ 6.16 | $ 6.16 | $ 6.16 | $ 6.10 | $ 6.09 | $ 6.10 | $ 6.09 | $ 6.16 |
| Low Growth & High Price | 2013-2014 | Feb | $ 6.13 | $ 6.17 | $ 6.13 | $ 6.13 | $ 6.13 | $ 6.08 | $ 6.06 | $ 6.08 | $ 6.07 | $ 6.14 |
| Low Growth & High Price | 2013-2014 | Mar | $ 6.14 | $ 6.14 | $ 6.14 | $ 6.14 | $ 6.14 | $ 6.07 | $ 6.07 | $ 6.07 | $ 6.07 | $ 6.14 |
| Low Growth & High Price | 2013-2014 | Apr | $ 5.79 | $ 5.98 | $ 5.79 | $ 5.79 | $ 5.79 | $ 5.72 | $ 5.72 | $ 6.03 | $ 5.83 | $ 5.83 |
| Low Growth & High Price | 2013-2014 | May | $ 5.73 | $ 5.98 | $ 5.73 | $ 5.73 | $ 5.73 | $ 5.66 | $ 5.66 | $ 6.03 | $ 5.79 | $ 5.78 |
| Low Growth & High Price | 2013-2014 | Jun | $ 5.78 | $ 6.02 | $ 5.78 | $ 5.78 | $ 5.78 | $ 5.71 | $ 5.71 | $ 6.04 | $ 5.82 | $ 5.83 |
| Low Growth & High Price | 2013-2014 | Jul | $ 5.80 | $ 6.04 | $ 5.80 | $ 5.80 | $ 5.80 | $ 5.73 | $ 5.73 | $ 6.04 | $ 5.83 | $ 5.85 |
| Low Growth & High Price | 2013-2014 | Aug | $ 5.83 | $ 6.04 | $ 5.83 | $ 5.83 | $ 5.83 | $ 5.75 | $ 5.75 | $ 6.04 | $ 5.85 | $ 5.87 |
| Low Growth & High Price | 2013-2014 | Sep | $ 5.85 | $ 6.04 | $ 5.85 | $ 5.85 | $ 5.85 | $ 5.77 | $ 5.77 | $ 6.04 | $ 5.86 | $ 5.88 |
| Low Growth & High Price | 2013-2014 | Oct | $ 5.90 | $ 6.16 | $ 5.90 | $ 5.90 | $ 5.90 | $ 5.82 | $ 5.82 | $ 6.16 | $ 5.94 | $ 5.95 |
| Low Growth & High Price | 2014-2015 | Nov | $ 6.25 | $ 6.48 | $ 6.25 | $ 6.25 | $ 6.25 | $ 6.18 | $ 6.18 | $ 6.48 | $ 6.28 | $ 6.30 |
| Low Growth & High Price | 2014-2015 | Dec | $ 6.55 | $ 6.83 | $ 6.58 | $ 6.58 | $ 6.58 | $ 6.83 | $ 6.43 | $ 6.84 | $ 6.70 | $ 6.62 |
| Low Growth & High Price | 2014-2015 | Jan | $ 7.31 | $ 7.31 | $ 7.31 | $ 7.31 | $ 7.31 | $ 7.22 | $ 7.22 | $ 7.22 | $ 7.22 | $ 7.31 |
| Low Growth & High Price | 2014-2015 | Feb | $ 7.27 | $ 7.31 | $ 7.27 | $ 7.27 | $ 7.27 | $ 7.19 | $ 7.18 | $ 7.19 | $ 7.19 | $ 7.27 |
| Low Growth & High Price | 2014-2015 | Mar | $ 7.22 | $ 7.22 | $ 7.22 | $ 7.22 | $ 7.22 | $ 7.13 | $ 7.13 | $ 7.13 | $ 7.13 | $ 7.22 |
| Low Growth & High Price | 2014-2015 | Apr | $ 6.85 | $ 7.04 | $ 6.85 | $ 6.85 | $ 6.85 | $ 6.76 | $ 6.76 | $ 7.09 | $ 6.87 | $ 6.89 |
| Low Growth & High Price | 2014-2015 | May | $ 6.83 | $ 7.04 | $ 6.83 | $ 6.83 | $ 6.83 | $ 6.74 | $ 6.74 | $ 7.09 | $ 6.86 | $ 6.87 |
| Low Growth & High Price | 2014-2015 | Jun | $ 6.89 | $ 7.07 | $ 6.89 | $ 6.89 | $ 6.89 | $ 6.80 | $ 6.80 | $ 7.09 | $ 6.90 | $ 6.92 |
| Low Growth & High Price | 2014-2015 | Jul | $ 6.92 | $ 7.09 | $ 6.92 | $ 6.92 | $ 6.92 | $ 6.83 | $ 6.83 | $ 7.09 | $ 6.92 | $ 6.95 |
| Low Growth & High Price | 2014-2015 | Aug | $ 6.93 | $ 7.09 | $ 6.93 | $ 6.93 | $ 6.93 | $ 6.84 | $ 6.84 | $ 7.09 | $ 6.93 | $ 6.96 |
| Low Growth & High Price | 2014-2015 | Sep | $ 6.92 | $ 7.10 | $ 6.92 | $ 6.92 | $ 6.92 | $ 6.83 | $ 6.83 | $ 7.10 | $ 6.92 | $ 6.95 |
| Low Growth & High Price | 2014-2015 | Oct | $ 6.96 | $ 7.24 | $ 6.96 | $ 6.96 | $ 6.96 | $ 6.88 | $ 6.88 | $ 7.24 | $ 7.00 | $ 7.02 |
| Low Growth & High Price | 2015-2016 | Nov | $ 7.38 | $ 7.62 | $ 7.38 | $ 7.38 | $ 7.38 | $ 7.29 | $ 7.29 | $ 7.62 | $ 7.40 | $ 7.43 |
| Low Growth & High Price | 2015-2016 | Dec | $ 7.67 | $ 7.93 | $ 7.67 | $ 7.67 | $ 7.67 | $ 7.93 | $ 7.54 | $ 7.93 | $ 7.80 | $ 7.72 |
| Low Growth & High Price | 2015-2016 | Jan | $ 7.75 | $ 7.93 | $ 7.75 | $ 7.75 | $ 7.75 | $ 7.93 | $ 7.65 | $ 7.93 | $ 7.84 | $ 7.78 |
| Low Growth & High Price | 2015-2016 | Feb | $ 7.71 | $ 7.76 | $ 7.71 | $ 7.71 | $ 7.71 | $ 7.64 | $ 7.61 | $ 7.64 | $ 7.63 | $ 7.72 |
| Low Growth & High Price | 2015-2016 | Mar | $ 7.68 | $ 7.68 | $ 7.68 | $ 7.68 | $ 7.68 | $ 7.58 | $ 7.58 | $ 7.58 | $ 7.58 | $ 7.68 |
| Low Growth & High Price | 2015-2016 | Apr | $ 7.27 | $ 7.51 | $ 7.27 | $ 7.27 | $ 7.27 | $ 7.18 | $ 7.18 | $ 7.55 | $ 7.30 | $ 7.31 |
| Low Growth & High Price | 2015-2016 | May | $ 7.27 | $ 7.51 | $ 7.27 | $ 7.27 | $ 7.27 | $ 7.18 | $ 7.18 | $ 7.55 | $ 7.30 | $ 7.31 |
| Low Growth & High Price | 2015-2016 | Jun | $ 7.29 | $ 7.51 | $ 7.29 | $ 7.29 | $ 7.29 | $ 7.20 | $ 7.20 | $ 7.56 | $ 7.32 | $ 7.33 |
| Low Growth & High Price | 2015-2016 | Jul | $ 7.32 | $ 7.56 | $ 7.32 | $ 7.32 | $ 7.32 | $ 7.23 | $ 7.23 | $ 7.56 | $ 7.34 | $ 7.37 |
| Low Growth & High Price | 2015-2016 | Aug | $ 7.34 | $ 7.56 | $ 7.34 | $ 7.34 | $ 7.34 | $ 7.25 | $ 7.25 | $ 7.56 | $ 7.35 | $ 7.38 |
| Low Growth & High Price | 2015-2016 | Sep | $ 7.38 | $ 7.56 | $ 7.38 | $ 7.38 | $ 7.38 | $ 7.29 | $ 7.29 | $ 7.56 | $ 7.38 | $ 7.42 |
| Low Growth & High Price | 2015-2016 | Oct | $ 7.43 | $ 7.74 | $ 7.43 | $ 7.43 | $ 7.43 | $ 7.34 | $ 7.34 | $ 7.74 | $ 7.47 | $ 7.49 |
| Low Growth & High Price | 2016-2017 | Nov | $ 7.81 | $ 8.09 | $ 7.81 | $ 7.81 | $ 7.81 | $ 7.71 | $ 7.71 | $ 8.09 | $ 7.84 | $ 7.87 |
| Low Growth & High Price | 2016-2017 | Dec | $ 8.15 | $ 8.42 | $ 8.15 | $ 8.15 | $ 8.15 | $ 8.42 | $ 8.02 | $ 8.42 | $ 8.29 | $ 8.21 |
| Low Growth & High Price | 2016-2017 | Jan | $ 8.34 | $ 8.43 | $ 8.34 | $ 8.34 | $ 8.34 | $ 8.43 | $ 8.24 | $ 8.43 | $ 8.37 | $ 8.36 |
| Low Growth & High Price | 2016-2017 | Feb | $ 8.29 | $ 8.34 | $ 8.29 | $ 8.29 | $ 8.29 | $ 8.20 | $ 8.19 | $ 8.20 | $ 8.20 | $ 8.30 |
| Low Growth & High Price | 2016-2017 | Mar | $ 8.25 | $ 8.25 | $ 8.25 | $ 8.25 | $ 8.25 | $ 8.15 | $ 8.15 | $ 8.15 | $ 8.15 | $ 8.25 |
| Low Growth & High Price | 2016-2017 | Apr | $ 7.76 | $ 8.04 | $ 7.76 | $ 7.76 | $ 7.76 | $ 7.66 | $ 7.66 | $ 8.06 | $ 7.80 | $ 7.81 |
| Low Growth & High Price | 2016-2017 | May | $ 7.78 | $ 8.04 | $ 7.78 | $ 7.78 | $ 7.78 | $ 7.68 | $ 7.68 | $ 8.06 | $ 7.81 | $ 7.83 |
| Low Growth & High Price | 2016-2017 | Jun | $ 7.79 | $ 8.05 | $ 7.79 | $ 7.79 | $ 7.79 | $ 7.69 | $ 7.69 | $ 8.06 | $ 7.82 | $ 7.84 |
| Low Growth & High Price | 2016-2017 | Jul | $ 7.80 | $ 8.06 | $ 7.80 | $ 7.80 | $ 7.80 | $ 7.70 | $ 7.70 | $ 8.06 | $ 7.82 | $ 7.85 |
| Low Growth & High Price | 2016-2017 | Aug | $ 7.82 | $ 8.07 | $ 7.82 | $ 7.82 | $ 7.82 | $ 7.72 | $ 7.72 | $ 8.07 | $ 7.84 | $ 7.87 |
| Low Growth & High Price | 2016-2017 | Sep | $ 7.91 | $ 8.07 | $ 7.91 | $ 7.91 | $ 7.91 | $ 7.82 | $ 7.82 | $ 8.07 | $ 7.90 | $ 7.94 |
| Low Growth & High Price | 2016-2017 | Oct | $ 7.96 | $ 8.29 | $ 7.96 | $ 7.96 | $ 7.96 | $ 7.87 | $ 7.87 | $ 8.29 | $ 8.01 | $ 8.03 |
| Low Growth & High Price | 2017-2018 | Nov | $ 7.97 | $ 8.32 | $ 7.97 | $ 7.97 | $ 7.97 | $ 7.88 | $ 7.88 | $ 8.32 | $ 8.02 | $ 8.04 |
| Low Growth & High Price | 2017-2018 | Dec | $ 8.34 | $ 8.65 | $ 8.34 | $ 8.34 | $ 8.34 | $ 8.62 | $ 8.20 | $ 8.65 | $ 8.49 | $ 8.40 |
| Low Growth & High Price | 2017-2018 | Jan | $ 8.54 | $ 8.66 | $ 8.54 | $ 8.54 | $ 8.54 | $ 8.66 | $ 8.44 | $ 8.66 | $ 8.59 | $ 8.57 |
| Low Growth & High Price | 2017-2018 | Feb | $ 8.49 | $ 8.55 | $ 8.49 | $ 8.49 | $ 8.49 | $ 8.41 | $ 8.39 | $ 8.41 | $ 8.40 | $ 8.50 |
| Low Growth & High Price | 2017-2018 | Mar | $ 8.44 | $ 8.44 | $ 8.44 | $ 8.44 | $ 8.44 | $ 8.34 | $ 8.34 | $ 8.34 | $ 8.34 | $ 8.44 |
| Low Growth & High Price | 2017-2018 | Apr | $ 7.96 | $ 8.29 | $ 7.96 | $ 7.96 | $ 7.96 | $ 7.87 | $ 7.87 | $ 8.29 | $ 8.01 | $ 8.03 |
| Low Growth & High Price | 2017-2018 | May | $ 7.98 | $ 8.28 | $ 7.98 | $ 7.98 | $ 7.98 | $ 7.89 | $ 7.89 | $ 8.30 | $ 8.02 | $ 8.04 |
| Low Growth & High Price | 2017-2018 | Jun | $ 8.01 | $ 8.30 | $ 8.01 | $ 8.01 | $ 8.01 | $ 7.92 | $ 7.92 | $ 8.30 | $ 8.04 | $ 8.07 |
| Low Growth & High Price | 2017-2018 | Jul | $ 7.97 | $ 8.28 | $ 7.97 | $ 7.97 | $ 7.97 | $ 7.88 | $ 7.88 | $ 8.30 | $ 8.02 | $ 8.03 |
| Low Growth & High Price | 2017-2018 | Aug | $ 8.01 | $ 8.30 | $ 8.01 | $ 8.01 | $ 8.01 | $ 7.92 | $ 7.92 | $ 8.30 | $ 8.04 | $ 8.07 |
| Low Growth & High Price | 2017-2018 | Sep | $ 8.09 | $ 8.30 | $ 8.09 | $ 8.09 | $ 8.09 | $ 8.00 | $ 8.00 | $ 8.30 | $ 8.10 | $ 8.14 |
| Low Growth & High Price | 2017-2018 | Oct | $ 8.18 | $ 8.54 | $ 8.18 | $ 8.18 | $ 8.18 | $ 8.08 | $ 8.08 | $ 8.54 | $ 8.23 | $ 8.25 |
| Low Growth & High Price | 2018-2019 | Nov | $ 8.19 | $ 8.54 | $ 8.19 | $ 8.19 | $ 8.19 | $ 8.09 | $ 8.09 | $ 8.54 | $ 8.24 | $ 8.26 |
| Low Growth & High Price | 2018-2019 | Dec | $ 8.61 | $ 8.92 | $ 8.61 | $ 8.61 | $ 8.61 | $ 8.88 | $ 8.46 | $ 8.92 | $ 8.75 | $ 8.67 |
| Low Growth & High Price | 2018-2019 | Jan | $ 8.78 | $ 8.94 | $ 8.78 | $ 8.78 | $ 8.78 | $ 8.94 | $ 8.67 | $ 8.94 | $ 8.85 | $ 8.81 |
| Low Growth & High Price | 2018-2019 | Feb | $ 8.74 | $ 8.80 | $ 8.74 | $ 8.74 | $ 8.74 | $ 8.65 | $ 8.63 | $ 8.65 | $ 8.64 | $ 8.75 |
| Low Growth & High Price | 2018-2019 | Mar | $ 8.71 | $ 8.71 | $ 8.71 | $ 8.71 | $ 8.71 | $ 8.60 | $ 8.60 | $ 8.60 | $ 8.60 | $ 8.71 |
| Low Growth & High Price | 2018-2019 | Apr | $ 8.19 | $ 8.49 | $ 8.19 | $ 8.19 | $ 8.19 | $ 8.09 | $ 8.09 | $ 8.50 | $ 8.22 | $ 8.25 |
| Low Growth & High Price | 2018-2019 | May | $ 8.21 | $ 8.47 | $ 8.21 | $ 8.21 | $ 8.21 | $ 8.11 | $ 8.11 | $ 8.50 | $ 8.24 | $ 8.26 |
| Low Growth & High Price | 2018-2019 | Jun | $ 8.24 | $ 8.49 | $ 8.24 | $ 8.24 | $ 8.24 | $ 8.14 | $ 8.14 | $ 8.50 | $ 8.26 | $ 8.29 |
| Low Growth & High Price | 2018-2019 | Jul | $ 8.18 | $ 8.47 | $ 8.18 | $ 8.18 | $ 8.18 | $ 8.08 | $ 8.08 | $ 8.50 | $ 8.22 | $ 8.23 |
| Low Growth & High Price | 2018-2019 | Aug | $ 8.22 | $ 8.50 | $ 8.22 | $ 8.22 | $ 8.22 | $ 8.12 | $ 8.12 | $ 8.50 | $ 8.25 | $ 8.27 |

# APPENDIX 6.4 II LOW GROWTH – HIGH PRICE MONTHLY DETAIL

Monthly Avoided Cost Detail 1/
2010$

| Scenario | Gas Year | Month | Klam Falls | La Grande | Medford GTN | Medford NWP | Roseburg | WA/ID Both | WA/ID GTN | WA/ID NWP | WA/ID Annual | OR Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Low Growth & High Price | 2018-2019 | Sep | $ 8.30 | $ 8.51 | $ 8.30 | $ 8.30 | $ 8.30 | $ 8.20 | $ 8.20 | $ 8.51 | $ 8.30 | $ 8.34 |
| Low Growth & High Price | 2018-2019 | Oct | $ 8.44 | $ 8.81 | $ 8.44 | $ 8.44 | $ 8.44 | $ 8.34 | $ 8.34 | $ 8.81 | $ 8.50 | $ 8.52 |
| Low Growth & High Price | 2019-2020 | Nov | $ 8.42 | $ 8.71 | $ 8.42 | $ 8.42 | $ 8.42 | $ 8.32 | $ 8.32 | $ 8.71 | $ 8.45 | $ 8.48 |
| Low Growth & High Price | 2019-2020 | Dec | $ 8.86 | $ 9.11 | $ 8.86 | $ 8.86 | $ 8.86 | $ 9.11 | $ 8.70 | $ 9.11 | $ 8.97 | $ 8.91 |
| Low Growth & High Price | 2019-2020 | Jan | $ 9.06 | $ 9.13 | $ 9.06 | $ 9.06 | $ 9.06 | $ 9.13 | $ 8.95 | $ 9.13 | $ 9.07 | $ 9.07 |
| Low Growth & High Price | 2019-2020 | Feb | $ 9.00 | $ 9.04 | $ 9.00 | $ 9.00 | $ 9.00 | $ 8.87 | $ 8.90 | $ 8.87 | $ 8.88 | $ 9.01 |
| Low Growth & High Price | 2019-2020 | Mar | $ 8.93 | $ 8.93 | $ 8.93 | $ 8.93 | $ 8.93 | $ 8.83 | $ 8.83 | $ 8.83 | $ 8.83 | $ 8.93 |
| Low Growth & High Price | 2019-2020 | Apr | $ 8.42 | $ 8.62 | $ 8.42 | $ 8.42 | $ 8.42 | $ 8.32 | $ 8.32 | $ 8.62 | $ 8.42 | $ 8.46 |
| Low Growth & High Price | 2019-2020 | May | $ 8.43 | $ 8.58 | $ 8.43 | $ 8.43 | $ 8.43 | $ 8.33 | $ 8.33 | $ 8.62 | $ 8.43 | $ 8.46 |
| Low Growth & High Price | 2019-2020 | Jun | $ 8.43 | $ 8.56 | $ 8.43 | $ 8.43 | $ 8.43 | $ 8.33 | $ 8.33 | $ 8.63 | $ 8.43 | $ 8.46 |
| Low Growth & High Price | 2019-2020 | Jul | $ 8.40 | $ 8.55 | $ 8.40 | $ 8.40 | $ 8.40 | $ 8.30 | $ 8.30 | $ 8.63 | $ 8.41 | $ 8.43 |
| Low Growth & High Price | 2019-2020 | Aug | $ 8.44 | $ 8.59 | $ 8.44 | $ 8.44 | $ 8.44 | $ 8.34 | $ 8.34 | $ 8.63 | $ 8.44 | $ 8.47 |
| Low Growth & High Price | 2019-2020 | Sep | $ 8.56 | $ 8.63 | $ 8.56 | $ 8.56 | $ 8.56 | $ 8.46 | $ 8.46 | $ 8.63 | $ 8.52 | $ 8.58 |
| Low Growth & High Price | 2019-2020 | Oct | $ 8.69 | $ 8.93 | $ 8.69 | $ 8.69 | $ 8.69 | $ 8.58 | $ 8.58 | $ 8.93 | $ 8.70 | $ 8.73 |
| Low Growth & High Price | 2020-2021 | Nov | $ 8.68 | $ 8.92 | $ 8.68 | $ 8.68 | $ 8.68 | $ 8.57 | $ 8.57 | $ 8.92 | $ 8.69 | $ 8.72 |
| Low Growth & High Price | 2020-2021 | Dec | $ 9.14 | $ 9.35 | $ 9.14 | $ 9.14 | $ 9.14 | $ 9.35 | $ 8.99 | $ 9.35 | $ 9.23 | $ 9.18 |
| Low Growth & High Price | 2020-2021 | Jan | $ 9.31 | $ 9.37 | $ 9.31 | $ 9.31 | $ 9.31 | $ 9.37 | $ 9.20 | $ 9.37 | $ 9.32 | $ 9.32 |
| Low Growth & High Price | 2020-2021 | Feb | $ 9.26 | $ 9.30 | $ 9.26 | $ 9.26 | $ 9.26 | $ 9.12 | $ 9.15 | $ 9.12 | $ 9.13 | $ 9.27 |
| Low Growth & High Price | 2020-2021 | Mar | $ 9.21 | $ 9.21 | $ 9.21 | $ 9.21 | $ 9.21 | $ 9.10 | $ 9.10 | $ 9.10 | $ 9.10 | $ 9.21 |
| Low Growth & High Price | 2020-2021 | Apr | $ 8.70 | $ 8.86 | $ 8.70 | $ 8.70 | $ 8.70 | $ 8.59 | $ 8.59 | $ 8.86 | $ 8.68 | $ 8.73 |
| Low Growth & High Price | 2020-2021 | May | $ 8.71 | $ 8.83 | $ 8.70 | $ 8.70 | $ 8.70 | $ 8.60 | $ 8.60 | $ 8.87 | $ 8.69 | $ 8.73 |
| Low Growth & High Price | 2020-2021 | Jun | $ 8.69 | $ 8.79 | $ 8.69 | $ 8.69 | $ 8.69 | $ 8.58 | $ 8.58 | $ 8.87 | $ 8.68 | $ 8.71 |
| Low Growth & High Price | 2020-2021 | Jul | $ 8.68 | $ 8.81 | $ 8.68 | $ 8.68 | $ 8.68 | $ 8.57 | $ 8.57 | $ 8.87 | $ 8.67 | $ 8.70 |
| Low Growth & High Price | 2020-2021 | Aug | $ 8.72 | $ 8.85 | $ 8.71 | $ 8.71 | $ 8.71 | $ 8.61 | $ 8.61 | $ 8.87 | $ 8.70 | $ 8.74 |
| Low Growth & High Price | 2020-2021 | Sep | $ 8.86 | $ 8.88 | $ 8.82 | $ 8.82 | $ 8.82 | $ 8.76 | $ 8.76 | $ 8.88 | $ 8.80 | $ 8.84 |
| Low Growth & High Price | 2020-2021 | Oct | $ 8.98 | $ 9.18 | $ 8.98 | $ 8.98 | $ 8.98 | $ 8.88 | $ 8.88 | $ 9.18 | $ 8.98 | $ 9.02 |
| Low Growth & High Price | 2021-2022 | Nov | $ 8.97 | $ 9.18 | $ 8.97 | $ 8.97 | $ 8.97 | $ 8.87 | $ 8.87 | $ 9.18 | $ 8.97 | $ 9.01 |
| Low Growth & High Price | 2021-2022 | Dec | $ 9.41 | $ 9.61 | $ 9.41 | $ 9.41 | $ 9.41 | $ 9.61 | $ 9.26 | $ 9.61 | $ 9.49 | $ 9.45 |
| Low Growth & High Price | 2021-2022 | Jan | $ 9.58 | $ 9.63 | $ 9.58 | $ 9.58 | $ 9.58 | $ 9.63 | $ 9.46 | $ 9.63 | $ 9.58 | $ 9.59 |
| Low Growth & High Price | 2021-2022 | Feb | $ 9.53 | $ 9.56 | $ 9.53 | $ 9.53 | $ 9.53 | $ 9.35 | $ 9.41 | $ 9.35 | $ 9.37 | $ 9.53 |
| Low Growth & High Price | 2021-2022 | Mar | $ 9.43 | $ 9.43 | $ 9.43 | $ 9.43 | $ 9.43 | $ 9.32 | $ 9.32 | $ 9.32 | $ 9.32 | $ 9.43 |
| Low Growth & High Price | 2021-2022 | Apr | $ 8.92 | $ 9.04 | $ 8.92 | $ 8.92 | $ 8.92 | $ 8.82 | $ 8.82 | $ 9.08 | $ 8.90 | $ 8.95 |
| Low Growth & High Price | 2021-2022 | May | $ 8.94 | $ 9.03 | $ 8.94 | $ 8.94 | $ 8.94 | $ 8.84 | $ 8.84 | $ 9.08 | $ 8.92 | $ 8.96 |
| Low Growth & High Price | 2021-2022 | Jun | $ 8.96 | $ 9.04 | $ 8.95 | $ 8.95 | $ 8.95 | $ 8.86 | $ 8.86 | $ 9.08 | $ 8.93 | $ 8.97 |
| Low Growth & High Price | 2021-2022 | Jul | $ 8.93 | $ 9.03 | $ 8.93 | $ 8.93 | $ 8.93 | $ 8.83 | $ 8.83 | $ 9.09 | $ 8.91 | $ 8.95 |
| Low Growth & High Price | 2021-2022 | Aug | $ 8.98 | $ 9.09 | $ 8.98 | $ 8.98 | $ 8.98 | $ 8.88 | $ 8.88 | $ 9.09 | $ 8.95 | $ 9.00 |
| Low Growth & High Price | 2021-2022 | Sep | $ 9.15 | $ 9.11 | $ 9.11 | $ 9.11 | $ 9.11 | $ 9.04 | $ 9.04 | $ 9.11 | $ 9.06 | $ 9.12 |
| Low Growth & High Price | 2021-2022 | Oct | $ 9.23 | $ 9.37 | $ 9.23 | $ 9.23 | $ 9.23 | $ 9.12 | $ 9.12 | $ 9.37 | $ 9.20 | $ 9.26 |
| Low Growth & High Price | 2022-2023 | Nov | $ 9.26 | $ 9.40 | $ 9.26 | $ 9.26 | $ 9.26 | $ 9.15 | $ 9.15 | $ 9.40 | $ 9.23 | $ 9.29 |
| Low Growth & High Price | 2022-2023 | Dec | $ 9.61 | $ 9.77 | $ 9.61 | $ 9.61 | $ 9.61 | $ 9.77 | $ 9.45 | $ 9.77 | $ 9.66 | $ 9.64 |
| Low Growth & High Price | 2022-2023 | Jan | $ 9.77 | $ 9.80 | $ 9.77 | $ 9.77 | $ 9.77 | $ 9.79 | $ 9.65 | $ 9.79 | $ 9.75 | $ 9.78 |
| Low Growth & High Price | 2022-2023 | Feb | $ 9.71 | $ 9.74 | $ 9.71 | $ 9.71 | $ 9.71 | $ 9.56 | $ 9.59 | $ 9.56 | $ 9.57 | $ 9.71 |
| Low Growth & High Price | 2022-2023 | Mar | $ 9.66 | $ 9.66 | $ 9.66 | $ 9.66 | $ 9.66 | $ 9.54 | $ 9.54 | $ 9.55 | $ 9.54 | $ 9.66 |
| Low Growth & High Price | 2022-2023 | Apr | $ 9.16 | $ 9.20 | $ 9.16 | $ 9.16 | $ 9.16 | $ 9.05 | $ 9.05 | $ 9.23 | $ 9.11 | $ 9.17 |
| Low Growth & High Price | 2022-2023 | May | $ 9.19 | $ 9.20 | $ 9.16 | $ 9.16 | $ 9.16 | $ 9.08 | $ 9.08 | $ 9.23 | $ 9.13 | $ 9.17 |
| Low Growth & High Price | 2022-2023 | Jun | $ 9.17 | $ 9.16 | $ 9.16 | $ 9.16 | $ 9.16 | $ 9.06 | $ 9.06 | $ 9.23 | $ 9.12 | $ 9.16 |
| Low Growth & High Price | 2022-2023 | Jul | $ 9.16 | $ 9.17 | $ 9.16 | $ 9.16 | $ 9.16 | $ 9.05 | $ 9.05 | $ 9.24 | $ 9.11 | $ 9.16 |
| Low Growth & High Price | 2022-2023 | Aug | $ 9.22 | $ 9.22 | $ 9.17 | $ 9.17 | $ 9.17 | $ 9.11 | $ 9.11 | $ 9.24 | $ 9.15 | $ 9.19 |
| Low Growth & High Price | 2022-2023 | Sep | $ 9.36 | $ 9.29 | $ 9.29 | $ 9.29 | $ 9.29 | $ 9.25 | $ 9.25 | $ 9.29 | $ 9.26 | $ 9.30 |
| Low Growth & High Price | 2022-2023 | Oct | $ 9.44 | $ 9.53 | $ 9.44 | $ 9.44 | $ 9.44 | $ 9.33 | $ 9.33 | $ 9.53 | $ 9.40 | $ 9.46 |
| Low Growth & High Price | 2023-2024 | Nov | $ 9.42 | $ 9.51 | $ 9.42 | $ 9.42 | $ 9.42 | $ 9.31 | $ 9.31 | $ 9.51 | $ 9.38 | $ 9.44 |
| Low Growth & High Price | 2023-2024 | Dec | $ 9.88 | $ 9.98 | $ 9.88 | $ 9.88 | $ 9.88 | $ 9.98 | $ 9.72 | $ 9.98 | $ 9.89 | $ 9.90 |
| Low Growth & High Price | 2023-2024 | Jan | $ 10.13 | $ 10.13 | $ 10.13 | $ 10.13 | $ 10.13 | $ 10.03 | $ 10.01 | $ 10.03 | $ 10.03 | $ 10.13 |
| Low Growth & High Price | 2023-2024 | Feb | $ 10.07 | $ 10.08 | $ 10.07 | $ 10.07 | $ 10.07 | $ 9.94 | $ 9.95 | $ 9.94 | $ 9.94 | $ 10.07 |
| Low Growth & High Price | 2023-2024 | Mar | $ 10.05 | $ 10.02 | $ 10.05 | $ 10.05 | $ 10.05 | $ 9.93 | $ 9.93 | $ 9.93 | $ 9.93 | $ 10.04 |
| Low Growth & High Price | 2023-2024 | Apr | $ 9.55 | $ 9.57 | $ 9.55 | $ 9.55 | $ 9.55 | $ 9.43 | $ 9.43 | $ 9.62 | $ 9.50 | $ 9.55 |
| Low Growth & High Price | 2023-2024 | May | $ 9.55 | $ 9.53 | $ 9.53 | $ 9.53 | $ 9.53 | $ 9.43 | $ 9.43 | $ 9.63 | $ 9.50 | $ 9.53 |
| Low Growth & High Price | 2023-2024 | Jun | $ 9.58 | $ 9.53 | $ 9.53 | $ 9.53 | $ 9.53 | $ 9.46 | $ 9.46 | $ 9.63 | $ 9.52 | $ 9.54 |
| Low Growth & High Price | 2023-2024 | Jul | $ 9.54 | $ 9.54 | $ 9.54 | $ 9.54 | $ 9.54 | $ 9.42 | $ 9.42 | $ 9.63 | $ 9.49 | $ 9.54 |
| Low Growth & High Price | 2023-2024 | Aug | $ 9.60 | $ 9.57 | $ 9.56 | $ 9.56 | $ 9.56 | $ 9.48 | $ 9.48 | $ 9.63 | $ 9.53 | $ 9.57 |
| Low Growth & High Price | 2023-2024 | Sep | $ 9.68 | $ 9.64 | $ 9.61 | $ 9.61 | $ 9.61 | $ 9.56 | $ 9.56 | $ 9.64 | $ 9.59 | $ 9.63 |
| Low Growth & High Price | 2023-2024 | Oct | $ 9.81 | $ 9.85 | $ 9.81 | $ 9.81 | $ 9.81 | $ 9.70 | $ 9.70 | $ 9.85 | $ 9.75 | $ 9.82 |
| Low Growth & High Price | 2024-2025 | Nov | $ 9.80 | $ 9.83 | $ 9.80 | $ 9.80 | $ 9.80 | $ 9.69 | $ 9.69 | $ 9.83 | $ 9.73 | $ 9.81 |
| Low Growth & High Price | 2024-2025 | Dec | $ 10.21 | $ 10.28 | $ 10.21 | $ 10.21 | $ 10.21 | $ 10.28 | $ 10.05 | $ 10.28 | $ 10.21 | $ 10.22 |
| Low Growth & High Price | 2024-2025 | Jan | $ 10.36 | $ 10.38 | $ 10.36 | $ 10.36 | $ 10.36 | $ 10.32 | $ 10.24 | $ 10.32 | $ 10.30 | $ 10.37 |
| Low Growth & High Price | 2024-2025 | Feb | $ 10.30 | $ 10.31 | $ 10.30 | $ 10.30 | $ 10.30 | $ 10.18 | $ 10.18 | $ 10.18 | $ 10.18 | $ 10.30 |
| Low Growth & High Price | 2024-2025 | Mar | $ 10.29 | $ 10.23 | $ 10.29 | $ 10.29 | $ 10.29 | $ 10.17 | $ 10.17 | $ 10.18 | $ 10.17 | $ 10.28 |
| Low Growth & High Price | 2024-2025 | Apr | $ 9.76 | $ 9.76 | $ 9.76 | $ 9.76 | $ 9.76 | $ 9.64 | $ 9.64 | $ 9.82 | $ 9.70 | $ 9.76 |
| Low Growth & High Price | 2024-2025 | May | $ 9.75 | $ 9.74 | $ 9.74 | $ 9.74 | $ 9.74 | $ 9.63 | $ 9.63 | $ 9.82 | $ 9.70 | $ 9.74 |
| Low Growth & High Price | 2024-2025 | Jun | $ 9.78 | $ 9.74 | $ 9.74 | $ 9.74 | $ 9.74 | $ 9.66 | $ 9.66 | $ 9.82 | $ 9.72 | $ 9.75 |
| Low Growth & High Price | 2024-2025 | Jul | $ 9.77 | $ 9.74 | $ 9.74 | $ 9.74 | $ 9.74 | $ 9.65 | $ 9.65 | $ 9.82 | $ 9.71 | $ 9.75 |
| Low Growth & High Price | 2024-2025 | Aug | $ 9.82 | $ 9.74 | $ 9.74 | $ 9.74 | $ 9.74 | $ 9.71 | $ 9.71 | $ 9.83 | $ 9.75 | $ 9.76 |
| Low Growth & High Price | 2024-2025 | Sep | $ 9.90 | $ 9.83 | $ 9.83 | $ 9.83 | $ 9.83 | $ 9.79 | $ 9.79 | $ 9.83 | $ 9.80 | $ 9.84 |
| Low Growth & High Price | 2024-2025 | Oct | $ 10.05 | $ 10.03 | $ 10.03 | $ 10.03 | $ 10.03 | $ 9.93 | $ 9.93 | $ 10.03 | $ 9.96 | $ 10.03 |
| Low Growth & High Price | 2025-2026 | Nov | $ 10.12 | $ 10.24 | $ 10.12 | $ 10.12 | $ 10.12 | $ 10.00 | $ 10.00 | $ 10.24 | $ 10.08 | $ 10.14 |
| Low Growth & High Price | 2025-2026 | Dec | $ 10.57 | $ 10.73 | $ 10.57 | $ 10.57 | $ 10.57 | $ 10.73 | $ 10.39 | $ 10.73 | $ 10.62 | $ 10.60 |
| Low Growth & High Price | 2025-2026 | Jan | $ 11.03 | $ 11.03 | $ 11.03 | $ 11.03 | $ 11.03 | $ 10.90 | $ 10.90 | $ 10.90 | $ 10.90 | $ 11.03 |
| Low Growth & High Price | 2025-2026 | Feb | $ 10.96 | $ 10.99 | $ 10.96 | $ 10.96 | $ 10.96 | $ 10.83 | $ 10.83 | $ 10.83 | $ 10.83 | $ 10.96 |
| Low Growth & High Price | 2025-2026 | Mar | $ 10.92 | $ 10.92 | $ 10.92 | $ 10.92 | $ 10.92 | $ 10.79 | $ 10.79 | $ 10.79 | $ 10.79 | $ 10.92 |
| Low Growth & High Price | 2025-2026 | Apr | $ 10.36 | $ 10.49 | $ 10.36 | $ 10.36 | $ 10.36 | $ 10.24 | $ 10.24 | $ 10.55 | $ 10.34 | $ 10.39 |
| Low Growth & High Price | 2025-2026 | May | $ 10.38 | $ 10.49 | $ 10.38 | $ 10.38 | $ 10.38 | $ 10.26 | $ 10.26 | $ 10.55 | $ 10.36 | $ 10.40 |
| Low Growth & High Price | 2025-2026 | Jun | $ 10.38 | $ 10.45 | $ 10.38 | $ 10.38 | $ 10.38 | $ 10.26 | $ 10.26 | $ 10.55 | $ 10.36 | $ 10.40 |
| Low Growth & High Price | 2025-2026 | Jul | $ 10.37 | $ 10.49 | $ 10.37 | $ 10.37 | $ 10.37 | $ 10.25 | $ 10.25 | $ 10.55 | $ 10.35 | $ 10.40 |
| Low Growth & High Price | 2025-2026 | Aug | $ 10.43 | $ 10.56 | $ 10.42 | $ 10.42 | $ 10.42 | $ 10.31 | $ 10.31 | $ 10.56 | $ 10.39 | $ 10.45 |
| Low Growth & High Price | 2025-2026 | Sep | $ 10.59 | $ 10.56 | $ 10.55 | $ 10.55 | $ 10.55 | $ 10.46 | $ 10.46 | $ 10.56 | $ 10.50 | $ 10.56 |
| Low Growth & High Price | 2025-2026 | Oct | $ 10.72 | $ 10.88 | $ 10.72 | $ 10.72 | $ 10.72 | $ 10.59 | $ 10.59 | $ 10.88 | $ 10.69 | $ 10.75 |
| Low Growth & High Price | 2026-2027 | Nov | $ 10.72 | $ 10.87 | $ 10.72 | $ 10.72 | $ 10.72 | $ 10.59 | $ 10.59 | $ 10.87 | $ 10.69 | $ 10.75 |
| Low Growth & High Price | 2026-2027 | Dec | $ 11.21 | $ 11.36 | $ 11.21 | $ 11.21 | $ 11.21 | $ 11.36 | $ 11.03 | $ 11.36 | $ 11.25 | $ 11.24 |
| Low Growth & High Price | 2026-2027 | Jan | $ 11.55 | $ 11.55 | $ 11.55 | $ 11.55 | $ 11.55 | $ 11.47 | $ 11.41 | $ 11.47 | $ 11.45 | $ 11.55 |

# APPENDIX 6.4 ‖ LOW GROWTH – HIGH PRICE MONTHLY DETAIL

**Monthly Avoided Cost Detail 1/**
**2010$**

| Scenario | Gas Year | Month | Klam Falls | La Grande | Medford GTN | Medford NWP | Roseburg | WA/ID Both | WA/ID GTN | WA/ID NWP | WA/ID Annual | OR Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Low Growth & High Price | 2026-2027 | Feb | $ 11.50 | $ 11.52 | $ 11.50 | $ 11.50 | $ 11.50 | $ 11.34 | $ 11.36 | $ 11.34 | $ 11.35 | $ 11.50 |
| Low Growth & High Price | 2026-2027 | Mar | $ 11.45 | $ 11.45 | $ 11.45 | $ 11.45 | $ 11.45 | $ 11.31 | $ 11.31 | $ 11.31 | $ 11.31 | $ 11.45 |
| Low Growth & High Price | 2026-2027 | Apr | $ 10.88 | $ 10.97 | $ 10.88 | $ 10.88 | $ 10.88 | $ 10.76 | $ 10.76 | $ 11.02 | $ 10.85 | $ 10.90 |
| Low Growth & High Price | 2026-2027 | May | $ 10.89 | $ 10.98 | $ 10.89 | $ 10.89 | $ 10.89 | $ 10.77 | $ 10.77 | $ 11.03 | $ 10.85 | $ 10.91 |
| Low Growth & High Price | 2026-2027 | Jun | $ 10.89 | $ 10.95 | $ 10.89 | $ 10.89 | $ 10.89 | $ 10.77 | $ 10.77 | $ 11.03 | $ 10.85 | $ 10.91 |
| Low Growth & High Price | 2026-2027 | Jul | $ 10.86 | $ 10.96 | $ 10.86 | $ 10.86 | $ 10.86 | $ 10.74 | $ 10.74 | $ 11.03 | $ 10.83 | $ 10.88 |
| Low Growth & High Price | 2026-2027 | Aug | $ 10.94 | $ 11.03 | $ 10.93 | $ 10.93 | $ 10.93 | $ 10.81 | $ 10.81 | $ 11.03 | $ 10.88 | $ 10.95 |
| Low Growth & High Price | 2026-2027 | Sep | $ 11.13 | $ 11.09 | $ 11.09 | $ 11.09 | $ 11.09 | $ 11.00 | $ 11.00 | $ 11.09 | $ 11.03 | $ 11.10 |
| Low Growth & High Price | 2026-2027 | Oct | $ 11.24 | $ 11.38 | $ 11.24 | $ 11.24 | $ 11.24 | $ 11.11 | $ 11.11 | $ 11.38 | $ 11.20 | $ 11.27 |
| Low Growth & High Price | 2027-2028 | Nov | $ 11.25 | $ 11.34 | $ 11.25 | $ 11.25 | $ 11.25 | $ 11.12 | $ 11.12 | $ 11.34 | $ 11.19 | $ 11.27 |
| Low Growth & High Price | 2027-2028 | Dec | $ 11.76 | $ 11.88 | $ 11.76 | $ 11.76 | $ 11.76 | $ 11.88 | $ 11.58 | $ 11.88 | $ 11.78 | $ 11.78 |
| Low Growth & High Price | 2027-2028 | Jan | $ 12.20 | $ 12.20 | $ 12.20 | $ 12.20 | $ 12.20 | $ 12.06 | $ 12.06 | $ 12.06 | $ 12.06 | $ 12.20 |
| Low Growth & High Price | 2027-2028 | Feb | $ 12.15 | $ 12.17 | $ 12.15 | $ 12.15 | $ 12.15 | $ 11.96 | $ 12.01 | $ 11.96 | $ 11.98 | $ 12.16 |
| Low Growth & High Price | 2027-2028 | Mar | $ 12.08 | $ 12.06 | $ 12.08 | $ 12.08 | $ 12.08 | $ 11.94 | $ 11.94 | $ 11.95 | $ 11.94 | $ 12.08 |
| Low Growth & High Price | 2027-2028 | Apr | $ 11.46 | $ 11.51 | $ 11.46 | $ 11.46 | $ 11.46 | $ 11.32 | $ 11.32 | $ 11.56 | $ 11.40 | $ 11.47 |
| Low Growth & High Price | 2027-2028 | May | $ 11.48 | $ 11.51 | $ 11.48 | $ 11.48 | $ 11.48 | $ 11.34 | $ 11.34 | $ 11.56 | $ 11.42 | $ 11.48 |
| Low Growth & High Price | 2027-2028 | Jun | $ 11.49 | $ 11.50 | $ 11.49 | $ 11.49 | $ 11.49 | $ 11.35 | $ 11.35 | $ 11.57 | $ 11.42 | $ 11.49 |
| Low Growth & High Price | 2027-2028 | Jul | $ 11.45 | $ 11.50 | $ 11.45 | $ 11.45 | $ 11.45 | $ 11.31 | $ 11.31 | $ 11.57 | $ 11.40 | $ 11.46 |
| Low Growth & High Price | 2027-2028 | Aug | $ 11.52 | $ 11.57 | $ 11.51 | $ 11.51 | $ 11.51 | $ 11.38 | $ 11.38 | $ 11.57 | $ 11.45 | $ 11.52 |
| Low Growth & High Price | 2027-2028 | Sep | $ 11.77 | $ 11.72 | $ 11.72 | $ 11.72 | $ 11.72 | $ 11.64 | $ 11.64 | $ 11.72 | $ 11.66 | $ 11.73 |
| Low Growth & High Price | 2027-2028 | Oct | $ 11.87 | $ 11.93 | $ 11.87 | $ 11.87 | $ 11.87 | $ 11.73 | $ 11.73 | $ 11.93 | $ 11.80 | $ 11.88 |
| Low Growth & High Price | 2028-2029 | Nov | $ 11.89 | $ 11.91 | $ 11.89 | $ 11.89 | $ 11.89 | $ 11.75 | $ 11.75 | $ 11.91 | $ 11.80 | $ 11.89 |
| Low Growth & High Price | 2028-2029 | Dec | $ 12.40 | $ 12.49 | $ 12.40 | $ 12.40 | $ 12.40 | $ 12.49 | $ 12.21 | $ 12.49 | $ 12.40 | $ 12.42 |
| Low Growth & High Price | 2028-2029 | Jan | $ 12.85 | $ 12.85 | $ 12.85 | $ 12.85 | $ 12.85 | $ 12.70 | $ 12.70 | $ 12.70 | $ 12.70 | $ 12.85 |
| Low Growth & High Price | 2028-2029 | Feb | $ 12.77 | $ 12.77 | $ 12.77 | $ 12.77 | $ 12.77 | $ 12.61 | $ 12.62 | $ 12.61 | $ 12.61 | $ 12.77 |
| Low Growth & High Price | 2028-2029 | Mar | $ 12.74 | $ 12.66 | $ 12.74 | $ 12.74 | $ 12.74 | $ 12.60 | $ 12.60 | $ 12.61 | $ 12.60 | $ 12.73 |
| Low Growth & High Price | 2028-2029 | Apr | $ 12.07 | $ 12.10 | $ 12.07 | $ 12.07 | $ 12.07 | $ 11.93 | $ 11.93 | $ 12.18 | $ 12.01 | $ 12.08 |
| Low Growth & High Price | 2028-2029 | May | $ 12.08 | $ 12.08 | $ 12.08 | $ 12.08 | $ 12.08 | $ 11.94 | $ 11.94 | $ 12.18 | $ 12.02 | $ 12.08 |
| Low Growth & High Price | 2028-2029 | Jun | $ 12.08 | $ 12.08 | $ 12.08 | $ 12.08 | $ 12.08 | $ 11.94 | $ 11.94 | $ 12.18 | $ 12.02 | $ 12.08 |
| Low Growth & High Price | 2028-2029 | Jul | $ 12.07 | $ 12.10 | $ 12.07 | $ 12.07 | $ 12.07 | $ 11.93 | $ 11.93 | $ 12.19 | $ 12.01 | $ 12.08 |
| Low Growth & High Price | 2028-2029 | Aug | $ 12.14 | $ 12.17 | $ 12.14 | $ 12.14 | $ 12.14 | $ 12.00 | $ 12.00 | $ 12.19 | $ 12.06 | $ 12.15 |
| Low Growth & High Price | 2028-2029 | Sep | $ 12.27 | $ 12.25 | $ 12.25 | $ 12.25 | $ 12.25 | $ 12.13 | $ 12.13 | $ 12.25 | $ 12.17 | $ 12.25 |
| Low Growth & High Price | 2028-2029 | Oct | $ 12.46 | $ 12.50 | $ 12.46 | $ 12.46 | $ 12.46 | $ 12.31 | $ 12.31 | $ 12.50 | $ 12.38 | $ 12.47 |
| Low Growth & High Price | 2029-2030 | Nov | $ 12.48 | $ 12.46 | $ 12.48 | $ 12.48 | $ 12.48 | $ 12.33 | $ 12.33 | $ 12.46 | $ 12.38 | $ 12.48 |
| Low Growth & High Price | 2029-2030 | Dec | $ 13.02 | $ 13.13 | $ 13.02 | $ 13.02 | $ 13.02 | $ 13.13 | $ 12.83 | $ 13.13 | $ 13.03 | $ 13.04 |
| Low Growth & High Price | 2029-2030 | Jan | $ 13.57 | $ 13.56 | $ 13.56 | $ 13.56 | $ 13.56 | $ 13.41 | $ 13.41 | $ 13.41 | $ 13.41 | $ 13.56 |
| Low Growth & High Price | 2029-2030 | Feb | $ 13.50 | $ 13.50 | $ 13.50 | $ 13.50 | $ 13.50 | $ 13.31 | $ 13.34 | $ 13.31 | $ 13.32 | $ 13.50 |
| Low Growth & High Price | 2029-2030 | Mar | $ 13.44 | $ 13.33 | $ 13.44 | $ 13.44 | $ 13.44 | $ 13.30 | $ 13.30 | $ 13.31 | $ 13.30 | $ 13.42 |
| Low Growth & High Price | 2029-2030 | Apr | $ 12.79 | $ 12.79 | $ 12.79 | $ 12.79 | $ 12.79 | $ 12.64 | $ 12.64 | $ 12.89 | $ 12.72 | $ 12.79 |
| Low Growth & High Price | 2029-2030 | May | $ 12.80 | $ 12.78 | $ 12.78 | $ 12.78 | $ 12.78 | $ 12.65 | $ 12.65 | $ 12.89 | $ 12.73 | $ 12.78 |
| Low Growth & High Price | 2029-2030 | Jun | $ 12.80 | $ 12.78 | $ 12.78 | $ 12.78 | $ 12.78 | $ 12.65 | $ 12.65 | $ 12.89 | $ 12.73 | $ 12.79 |
| Low Growth & High Price | 2029-2030 | Jul | $ 12.79 | $ 12.79 | $ 12.79 | $ 12.79 | $ 12.79 | $ 12.64 | $ 12.64 | $ 12.90 | $ 12.72 | $ 12.79 |
| Low Growth & High Price | 2029-2030 | Aug | $ 12.86 | $ 12.83 | $ 12.83 | $ 12.83 | $ 12.83 | $ 12.71 | $ 12.71 | $ 12.90 | $ 12.77 | $ 12.83 |
| Low Growth & High Price | 2029-2030 | Sep | $ 13.02 | $ 13.01 | $ 13.01 | $ 13.01 | $ 13.01 | $ 12.87 | $ 12.87 | $ 13.01 | $ 12.92 | $ 13.01 |
| Low Growth & High Price | 2029-2030 | Oct | $ 13.18 | $ 13.19 | $ 13.18 | $ 13.18 | $ 13.18 | $ 13.03 | $ 13.03 | $ 13.19 | $ 13.08 | $ 13.19 |
| Low Growth & High Price | 2030-2031 | Nov | $ 13.19 | $ 13.13 | $ 13.19 | $ 13.19 | $ 13.19 | $ 13.04 | $ 13.04 | $ 13.13 | $ 13.07 | $ 13.18 |
| Low Growth & High Price | 2030-2031 | Dec | $ 13.76 | $ 13.74 | $ 13.75 | $ 13.75 | $ 13.75 | $ 13.74 | $ 13.60 | $ 13.74 | $ 13.69 | $ 13.75 |
| Low Growth & High Price | 2030-2031 | Jan | $ 13.60 | $ 13.56 | $ 13.59 | $ 13.59 | $ 13.59 | $ 13.56 | $ 13.45 | $ 13.56 | $ 13.52 | $ 13.58 |
| Low Growth & High Price | 2030-2031 | Feb | $ 13.53 | $ 13.48 | $ 13.53 | $ 13.53 | $ 13.53 | $ 13.33 | $ 13.37 | $ 13.33 | $ 13.34 | $ 13.52 |
| Low Growth & High Price | 2030-2031 | Mar | $ 13.43 | $ 13.31 | $ 13.43 | $ 13.43 | $ 13.43 | $ 13.31 | $ 13.31 | $ 13.31 | $ 13.31 | $ 13.41 |
| Low Growth & High Price | 2030-2031 | Apr | $ 12.79 | $ 12.79 | $ 12.79 | $ 12.79 | $ 12.79 | $ 12.64 | $ 12.64 | $ 12.92 | $ 12.73 | $ 12.79 |
| Low Growth & High Price | 2030-2031 | May | $ 12.80 | $ 12.79 | $ 12.79 | $ 12.79 | $ 12.79 | $ 12.65 | $ 12.65 | $ 12.92 | $ 12.74 | $ 12.79 |
| Low Growth & High Price | 2030-2031 | Jun | $ 12.84 | $ 12.79 | $ 12.79 | $ 12.79 | $ 12.79 | $ 12.69 | $ 12.69 | $ 12.92 | $ 12.77 | $ 12.80 |
| Low Growth & High Price | 2030-2031 | Jul | $ 12.80 | $ 12.79 | $ 12.79 | $ 12.79 | $ 12.79 | $ 12.65 | $ 12.65 | $ 12.93 | $ 12.74 | $ 12.79 |
| Low Growth & High Price | 2030-2031 | Aug | $ 12.88 | $ 12.82 | $ 12.82 | $ 12.82 | $ 12.82 | $ 12.73 | $ 12.73 | $ 12.93 | $ 12.79 | $ 12.83 |
| Low Growth & High Price | 2030-2031 | Sep | $ 13.05 | $ 13.00 | $ 13.00 | $ 13.00 | $ 13.00 | $ 12.90 | $ 12.90 | $ 13.00 | $ 12.93 | $ 13.01 |
| Low Growth & High Price | 2030-2031 | Oct | $ 13.24 | $ 13.20 | $ 13.20 | $ 13.20 | $ 13.20 | $ 13.08 | $ 13.08 | $ 13.20 | $ 13.12 | $ 13.21 |

1/ Avoided costs shown before Environmental Externalities adder.

# APPENDIX 6.4 ‖ EXPECTED MONTHLY DETAIL

**Appendix 6.4 - Monthly Avoided Cost Detail 1/**
**2010$**

| Scenario | Gas Year | Month | Klam Falls | La Grande | Medford GTN | Medford NWP | Roseburg | WA/ID Both | WA/ID GTN | WA/ID NWP | WA/ID Annual | OR Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Expected | 2011-2012 | Nov | $ 2.97 | $ 2.99 | $ 2.97 | $ 2.97 | $ 2.97 | $ 2.95 | $ 2.93 | $ 2.99 | $ 2.96 | $ 2.98 |
| Expected | 2011-2012 | Dec | $ 2.83 | $ 3.02 | $ 2.83 | $ 2.83 | $ 2.83 | $ 3.02 | $ 2.76 | $ 3.02 | $ 2.93 | $ 2.87 |
| Expected | 2011-2012 | Jan | $ 2.35 | $ 2.55 | $ 2.35 | $ 2.35 | $ 2.35 | $ 2.55 | $ 2.32 | $ 2.55 | $ 2.47 | $ 2.39 |
| Expected | 2011-2012 | Feb | $ 2.89 | $ 2.92 | $ 2.89 | $ 2.89 | $ 2.89 | $ 2.88 | $ 2.85 | $ 2.89 | $ 2.87 | $ 2.90 |
| Expected | 2011-2012 | Mar | $ 2.95 | $ 2.95 | $ 2.95 | $ 2.95 | $ 2.95 | $ 2.91 | $ 2.91 | $ 2.91 | $ 2.91 | $ 2.95 |
| Expected | 2011-2012 | Apr | $ 2.44 | $ 2.59 | $ 2.44 | $ 2.44 | $ 2.44 | $ 2.41 | $ 2.41 | $ 2.87 | $ 2.56 | $ 2.47 |
| Expected | 2011-2012 | May | $ 2.55 | $ 2.80 | $ 2.55 | $ 2.55 | $ 2.55 | $ 2.52 | $ 2.52 | $ 2.87 | $ 2.64 | $ 2.60 |
| Expected | 2011-2012 | Jun | $ 2.70 | $ 2.87 | $ 2.70 | $ 2.70 | $ 2.70 | $ 2.66 | $ 2.66 | $ 2.87 | $ 2.73 | $ 2.73 |
| Expected | 2011-2012 | Jul | $ 2.76 | $ 2.88 | $ 2.76 | $ 2.76 | $ 2.76 | $ 2.72 | $ 2.72 | $ 2.88 | $ 2.77 | $ 2.78 |
| Expected | 2011-2012 | Aug | $ 2.64 | $ 2.88 | $ 2.64 | $ 2.64 | $ 2.64 | $ 2.60 | $ 2.60 | $ 2.88 | $ 2.69 | $ 2.68 |
| Expected | 2011-2012 | Sep | $ 2.53 | $ 2.78 | $ 2.53 | $ 2.53 | $ 2.53 | $ 2.50 | $ 2.50 | $ 2.88 | $ 2.63 | $ 2.58 |
| Expected | 2011-2012 | Oct | $ 2.66 | $ 2.90 | $ 2.66 | $ 2.66 | $ 2.66 | $ 2.62 | $ 2.62 | $ 2.90 | $ 2.71 | $ 2.70 |
| Expected | 2012-2013 | Nov | $ 3.12 | $ 3.32 | $ 3.12 | $ 3.12 | $ 3.12 | $ 3.15 | $ 3.07 | $ 3.32 | $ 3.18 | $ 3.16 |
| Expected | 2012-2013 | Dec | $ 3.26 | $ 3.66 | $ 3.29 | $ 3.29 | $ 3.29 | $ 3.66 | $ 3.17 | $ 3.66 | $ 3.50 | $ 3.36 |
| Expected | 2012-2013 | Jan | $ 3.45 | $ 3.79 | $ 3.45 | $ 3.45 | $ 3.45 | $ 3.79 | $ 3.41 | $ 3.79 | $ 3.67 | $ 3.52 |
| Expected | 2012-2013 | Feb | $ 3.61 | $ 3.83 | $ 3.61 | $ 3.61 | $ 3.61 | $ 3.74 | $ 3.55 | $ 3.83 | $ 3.71 | $ 3.65 |
| Expected | 2012-2013 | Mar | $ 3.67 | $ 3.82 | $ 3.67 | $ 3.67 | $ 3.67 | $ 3.62 | $ 3.62 | $ 3.82 | $ 3.69 | $ 3.70 |
| Expected | 2012-2013 | Apr | $ 3.61 | $ 3.79 | $ 3.61 | $ 3.61 | $ 3.61 | $ 3.56 | $ 3.56 | $ 3.82 | $ 3.65 | $ 3.64 |
| Expected | 2012-2013 | May | $ 3.59 | $ 3.82 | $ 3.59 | $ 3.59 | $ 3.59 | $ 3.54 | $ 3.54 | $ 3.82 | $ 3.63 | $ 3.63 |
| Expected | 2012-2013 | Jun | $ 3.60 | $ 3.82 | $ 3.60 | $ 3.60 | $ 3.60 | $ 3.55 | $ 3.55 | $ 3.82 | $ 3.64 | $ 3.64 |
| Expected | 2012-2013 | Jul | $ 3.63 | $ 3.82 | $ 3.63 | $ 3.63 | $ 3.63 | $ 3.58 | $ 3.58 | $ 3.82 | $ 3.66 | $ 3.67 |
| Expected | 2012-2013 | Aug | $ 3.63 | $ 3.82 | $ 3.63 | $ 3.63 | $ 3.63 | $ 3.58 | $ 3.58 | $ 3.82 | $ 3.66 | $ 3.67 |
| Expected | 2012-2013 | Sep | $ 3.63 | $ 3.83 | $ 3.63 | $ 3.63 | $ 3.63 | $ 3.58 | $ 3.58 | $ 3.83 | $ 3.66 | $ 3.67 |
| Expected | 2012-2013 | Oct | $ 3.66 | $ 3.89 | $ 3.66 | $ 3.66 | $ 3.66 | $ 3.61 | $ 3.61 | $ 3.89 | $ 3.70 | $ 3.70 |
| Expected | 2013-2014 | Nov | $ 3.85 | $ 4.06 | $ 3.85 | $ 3.85 | $ 3.85 | $ 3.88 | $ 3.80 | $ 4.06 | $ 3.92 | $ 3.89 |
| Expected | 2013-2014 | Dec | $ 3.97 | $ 4.18 | $ 3.97 | $ 3.97 | $ 3.97 | $ 4.18 | $ 3.88 | $ 4.18 | $ 4.08 | $ 4.02 |
| Expected | 2013-2014 | Jan | $ 3.94 | $ 4.17 | $ 3.94 | $ 3.94 | $ 3.94 | $ 4.17 | $ 3.89 | $ 4.17 | $ 4.08 | $ 3.99 |
| Expected | 2013-2014 | Feb | $ 3.95 | $ 4.07 | $ 3.95 | $ 3.95 | $ 3.95 | $ 4.00 | $ 3.89 | $ 4.06 | $ 3.99 | $ 3.98 |
| Expected | 2013-2014 | Mar | $ 3.95 | $ 4.05 | $ 3.95 | $ 3.95 | $ 3.95 | $ 3.90 | $ 3.90 | $ 4.05 | $ 3.95 | $ 3.97 |
| Expected | 2013-2014 | Apr | $ 3.79 | $ 3.98 | $ 3.79 | $ 3.79 | $ 3.79 | $ 3.74 | $ 3.74 | $ 4.05 | $ 3.84 | $ 3.83 |
| Expected | 2013-2014 | May | $ 3.74 | $ 4.00 | $ 3.74 | $ 3.74 | $ 3.74 | $ 3.69 | $ 3.69 | $ 4.05 | $ 3.81 | $ 3.79 |
| Expected | 2013-2014 | Jun | $ 3.77 | $ 4.02 | $ 3.77 | $ 3.77 | $ 3.77 | $ 3.72 | $ 3.72 | $ 4.05 | $ 3.83 | $ 3.82 |
| Expected | 2013-2014 | Jul | $ 3.80 | $ 4.05 | $ 3.80 | $ 3.80 | $ 3.80 | $ 3.75 | $ 3.75 | $ 4.05 | $ 3.85 | $ 3.85 |
| Expected | 2013-2014 | Aug | $ 3.80 | $ 4.05 | $ 3.80 | $ 3.80 | $ 3.80 | $ 3.75 | $ 3.75 | $ 4.05 | $ 3.85 | $ 3.85 |
| Expected | 2013-2014 | Sep | $ 3.81 | $ 4.06 | $ 3.81 | $ 3.81 | $ 3.81 | $ 3.76 | $ 3.76 | $ 4.06 | $ 3.86 | $ 3.86 |
| Expected | 2013-2014 | Oct | $ 3.83 | $ 4.12 | $ 3.83 | $ 3.83 | $ 3.83 | $ 3.78 | $ 3.78 | $ 4.12 | $ 3.90 | $ 3.89 |
| Expected | 2014-2015 | Nov | $ 4.03 | $ 4.28 | $ 4.03 | $ 4.03 | $ 4.03 | $ 4.06 | $ 3.97 | $ 4.28 | $ 4.10 | $ 4.08 |
| Expected | 2014-2015 | Dec | $ 4.07 | $ 4.32 | $ 4.07 | $ 4.07 | $ 4.07 | $ 4.32 | $ 3.97 | $ 4.32 | $ 4.20 | $ 4.12 |
| Expected | 2014-2015 | Jan | $ 4.07 | $ 4.34 | $ 4.07 | $ 4.07 | $ 4.07 | $ 4.34 | $ 4.01 | $ 4.34 | $ 4.23 | $ 4.12 |
| Expected | 2014-2015 | Feb | $ 4.08 | $ 4.23 | $ 4.08 | $ 4.08 | $ 4.08 | $ 4.17 | $ 4.02 | $ 4.23 | $ 4.14 | $ 4.11 |
| Expected | 2014-2015 | Mar | $ 4.09 | $ 4.21 | $ 4.09 | $ 4.09 | $ 4.09 | $ 4.03 | $ 4.03 | $ 4.21 | $ 4.09 | $ 4.11 |
| Expected | 2014-2015 | Apr | $ 3.94 | $ 4.15 | $ 3.94 | $ 3.94 | $ 3.94 | $ 3.89 | $ 3.89 | $ 4.21 | $ 4.00 | $ 3.99 |
| Expected | 2014-2015 | May | $ 3.93 | $ 4.17 | $ 3.93 | $ 3.93 | $ 3.93 | $ 3.88 | $ 3.88 | $ 4.21 | $ 3.99 | $ 3.98 |
| Expected | 2014-2015 | Jun | $ 3.99 | $ 4.19 | $ 3.99 | $ 3.99 | $ 3.99 | $ 3.93 | $ 3.93 | $ 4.21 | $ 4.03 | $ 4.03 |
| Expected | 2014-2015 | Jul | $ 4.02 | $ 4.21 | $ 4.02 | $ 4.02 | $ 4.02 | $ 3.96 | $ 3.96 | $ 4.21 | $ 4.05 | $ 4.06 |
| Expected | 2014-2015 | Aug | $ 4.01 | $ 4.22 | $ 4.01 | $ 4.01 | $ 4.01 | $ 3.95 | $ 3.95 | $ 4.22 | $ 4.04 | $ 4.05 |
| Expected | 2014-2015 | Sep | $ 3.98 | $ 4.22 | $ 3.98 | $ 3.98 | $ 3.98 | $ 3.92 | $ 3.92 | $ 4.22 | $ 4.02 | $ 4.02 |
| Expected | 2014-2015 | Oct | $ 3.99 | $ 4.30 | $ 3.99 | $ 3.99 | $ 3.99 | $ 3.93 | $ 3.93 | $ 4.30 | $ 4.05 | $ 4.05 |
| Expected | 2015-2016 | Nov | $ 4.16 | $ 4.44 | $ 4.16 | $ 4.16 | $ 4.16 | $ 4.21 | $ 4.11 | $ 4.44 | $ 4.25 | $ 4.21 |
| Expected | 2015-2016 | Dec | $ 4.21 | $ 4.49 | $ 4.21 | $ 4.21 | $ 4.21 | $ 4.49 | $ 4.11 | $ 4.49 | $ 4.36 | $ 4.27 |
| Expected | 2015-2016 | Jan | $ 4.19 | $ 4.51 | $ 4.19 | $ 4.19 | $ 4.19 | $ 4.51 | $ 4.14 | $ 4.51 | $ 4.38 | $ 4.25 |
| Expected | 2015-2016 | Feb | $ 4.20 | $ 4.47 | $ 4.20 | $ 4.20 | $ 4.20 | $ 4.37 | $ 4.15 | $ 4.47 | $ 4.33 | $ 4.25 |
| Expected | 2015-2016 | Mar | $ 4.26 | $ 4.45 | $ 4.26 | $ 4.26 | $ 4.26 | $ 4.21 | $ 4.21 | $ 4.45 | $ 4.29 | $ 4.30 |
| Expected | 2015-2016 | Apr | $ 4.11 | $ 4.38 | $ 4.11 | $ 4.11 | $ 4.11 | $ 4.06 | $ 4.06 | $ 4.45 | $ 4.19 | $ 4.16 |
| Expected | 2015-2016 | May | $ 4.12 | $ 4.39 | $ 4.12 | $ 4.12 | $ 4.12 | $ 4.07 | $ 4.07 | $ 4.45 | $ 4.19 | $ 4.17 |
| Expected | 2015-2016 | Jun | $ 4.16 | $ 4.41 | $ 4.16 | $ 4.16 | $ 4.16 | $ 4.11 | $ 4.11 | $ 4.46 | $ 4.22 | $ 4.21 |
| Expected | 2015-2016 | Jul | $ 4.18 | $ 4.46 | $ 4.18 | $ 4.18 | $ 4.18 | $ 4.13 | $ 4.13 | $ 4.46 | $ 4.24 | $ 4.24 |
| Expected | 2015-2016 | Aug | $ 4.18 | $ 4.46 | $ 4.18 | $ 4.18 | $ 4.18 | $ 4.13 | $ 4.13 | $ 4.46 | $ 4.24 | $ 4.24 |
| Expected | 2015-2016 | Sep | $ 4.17 | $ 4.46 | $ 4.17 | $ 4.17 | $ 4.17 | $ 4.12 | $ 4.12 | $ 4.46 | $ 4.23 | $ 4.23 |
| Expected | 2015-2016 | Oct | $ 4.18 | $ 4.51 | $ 4.18 | $ 4.18 | $ 4.18 | $ 4.13 | $ 4.13 | $ 4.51 | $ 4.25 | $ 4.25 |
| Expected | 2016-2017 | Nov | $ 4.35 | $ 4.67 | $ 4.35 | $ 4.35 | $ 4.35 | $ 4.41 | $ 4.30 | $ 4.67 | $ 4.46 | $ 4.42 |
| Expected | 2016-2017 | Dec | $ 4.40 | $ 4.69 | $ 4.40 | $ 4.40 | $ 4.40 | $ 4.69 | $ 4.29 | $ 4.69 | $ 4.56 | $ 4.46 |
| Expected | 2016-2017 | Jan | $ 4.37 | $ 4.71 | $ 4.37 | $ 4.37 | $ 4.37 | $ 4.71 | $ 4.32 | $ 4.71 | $ 4.58 | $ 4.44 |
| Expected | 2016-2017 | Feb | $ 4.39 | $ 4.64 | $ 4.39 | $ 4.39 | $ 4.39 | $ 4.58 | $ 4.34 | $ 4.64 | $ 4.52 | $ 4.44 |
| Expected | 2016-2017 | Mar | $ 4.41 | $ 4.62 | $ 4.41 | $ 4.41 | $ 4.41 | $ 4.36 | $ 4.36 | $ 4.62 | $ 4.45 | $ 4.46 |
| Expected | 2016-2017 | Apr | $ 4.24 | $ 4.56 | $ 4.24 | $ 4.24 | $ 4.24 | $ 4.19 | $ 4.19 | $ 4.62 | $ 4.33 | $ 4.30 |
| Expected | 2016-2017 | May | $ 4.29 | $ 4.59 | $ 4.29 | $ 4.29 | $ 4.29 | $ 4.24 | $ 4.24 | $ 4.62 | $ 4.37 | $ 4.35 |
| Expected | 2016-2017 | Jun | $ 4.32 | $ 4.61 | $ 4.32 | $ 4.32 | $ 4.32 | $ 4.27 | $ 4.27 | $ 4.62 | $ 4.39 | $ 4.38 |
| Expected | 2016-2017 | Jul | $ 4.35 | $ 4.63 | $ 4.35 | $ 4.35 | $ 4.35 | $ 4.30 | $ 4.30 | $ 4.63 | $ 4.41 | $ 4.41 |
| Expected | 2016-2017 | Aug | $ 4.35 | $ 4.63 | $ 4.35 | $ 4.35 | $ 4.35 | $ 4.30 | $ 4.30 | $ 4.63 | $ 4.41 | $ 4.41 |
| Expected | 2016-2017 | Sep | $ 4.35 | $ 4.63 | $ 4.35 | $ 4.35 | $ 4.35 | $ 4.30 | $ 4.30 | $ 4.63 | $ 4.41 | $ 4.41 |
| Expected | 2016-2017 | Oct | $ 4.36 | $ 4.72 | $ 4.36 | $ 4.36 | $ 4.36 | $ 4.31 | $ 4.31 | $ 4.72 | $ 4.45 | $ 4.44 |
| Expected | 2017-2018 | Nov | $ 4.51 | $ 4.88 | $ 4.51 | $ 4.51 | $ 4.51 | $ 4.58 | $ 4.45 | $ 4.88 | $ 4.64 | $ 4.58 |
| Expected | 2017-2018 | Dec | $ 4.62 | $ 4.94 | $ 4.62 | $ 4.62 | $ 4.62 | $ 4.94 | $ 4.49 | $ 4.94 | $ 4.79 | $ 4.68 |
| Expected | 2017-2018 | Jan | $ 4.60 | $ 4.95 | $ 4.60 | $ 4.60 | $ 4.60 | $ 4.95 | $ 4.54 | $ 4.95 | $ 4.82 | $ 4.67 |
| Expected | 2017-2018 | Feb | $ 4.63 | $ 4.89 | $ 4.63 | $ 4.63 | $ 4.63 | $ 4.83 | $ 4.57 | $ 4.89 | $ 4.76 | $ 4.68 |
| Expected | 2017-2018 | Mar | $ 4.63 | $ 4.86 | $ 4.63 | $ 4.63 | $ 4.63 | $ 4.57 | $ 4.57 | $ 4.86 | $ 4.67 | $ 4.68 |
| Expected | 2017-2018 | Apr | $ 4.46 | $ 4.81 | $ 4.46 | $ 4.46 | $ 4.46 | $ 4.40 | $ 4.40 | $ 4.86 | $ 4.55 | $ 4.53 |
| Expected | 2017-2018 | May | $ 4.50 | $ 4.83 | $ 4.50 | $ 4.50 | $ 4.50 | $ 4.44 | $ 4.44 | $ 4.87 | $ 4.58 | $ 4.56 |
| Expected | 2017-2018 | Jun | $ 4.54 | $ 4.85 | $ 4.54 | $ 4.54 | $ 4.54 | $ 4.48 | $ 4.48 | $ 4.87 | $ 4.61 | $ 4.60 |
| Expected | 2017-2018 | Jul | $ 4.57 | $ 4.87 | $ 4.57 | $ 4.57 | $ 4.57 | $ 4.51 | $ 4.51 | $ 4.87 | $ 4.63 | $ 4.63 |
| Expected | 2017-2018 | Aug | $ 4.58 | $ 4.87 | $ 4.58 | $ 4.58 | $ 4.58 | $ 4.52 | $ 4.52 | $ 4.87 | $ 4.64 | $ 4.64 |
| Expected | 2017-2018 | Sep | $ 4.57 | $ 4.87 | $ 4.57 | $ 4.57 | $ 4.57 | $ 4.51 | $ 4.51 | $ 4.87 | $ 4.63 | $ 4.63 |

# APPENDIX 6.4 ‖ EXPECTED MONTHLY DETAIL

**Appendix 6.4 - Monthly Avoided Cost Detail 1/**
**2010$**

| Scenario | Gas Year | Month | Klam Falls | La Grande | Medford GTN | Medford NWP | Roseburg | WA/ID Both | WA/ID GTN | WA/ID NWP | WA/ID Annual | OR Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Expected | 2017-2018 | Oct | $ 4.58 | $ 4.97 | $ 4.58 | $ 4.58 | $ 4.58 | $ 4.52 | $ 4.52 | $ 4.97 | $ 4.67 | $ 4.66 |
| Expected | 2018-2019 | Nov | $ 4.69 | $ 5.08 | $ 4.69 | $ 4.69 | $ 4.69 | $ 4.76 | $ 4.63 | $ 5.08 | $ 4.82 | $ 4.77 |
| Expected | 2018-2019 | Dec | $ 4.84 | $ 5.15 | $ 4.84 | $ 4.84 | $ 4.84 | $ 5.15 | $ 4.70 | $ 5.15 | $ 5.00 | $ 4.90 |
| Expected | 2018-2019 | Jan | $ 4.78 | $ 5.16 | $ 4.78 | $ 4.78 | $ 4.78 | $ 5.16 | $ 4.72 | $ 5.16 | $ 5.01 | $ 4.86 |
| Expected | 2018-2019 | Feb | $ 4.81 | $ 5.09 | $ 4.81 | $ 4.81 | $ 4.81 | $ 5.05 | $ 4.75 | $ 5.08 | $ 4.96 | $ 4.87 |
| Expected | 2018-2019 | Mar | $ 4.80 | $ 5.06 | $ 4.80 | $ 4.80 | $ 4.80 | $ 4.74 | $ 4.74 | $ 5.06 | $ 4.85 | $ 4.85 |
| Expected | 2018-2019 | Apr | $ 4.63 | $ 4.96 | $ 4.63 | $ 4.63 | $ 4.63 | $ 4.57 | $ 4.57 | $ 5.06 | $ 4.73 | $ 4.70 |
| Expected | 2018-2019 | May | $ 4.67 | $ 4.96 | $ 4.67 | $ 4.67 | $ 4.67 | $ 4.61 | $ 4.61 | $ 5.06 | $ 4.76 | $ 4.73 |
| Expected | 2018-2019 | Jun | $ 4.70 | $ 4.99 | $ 4.70 | $ 4.70 | $ 4.70 | $ 4.64 | $ 4.64 | $ 5.06 | $ 4.78 | $ 4.76 |
| Expected | 2018-2019 | Jul | $ 4.74 | $ 5.06 | $ 4.74 | $ 4.74 | $ 4.74 | $ 4.68 | $ 4.68 | $ 5.06 | $ 4.81 | $ 4.81 |
| Expected | 2018-2019 | Aug | $ 4.75 | $ 5.06 | $ 4.75 | $ 4.75 | $ 4.75 | $ 4.69 | $ 4.69 | $ 5.06 | $ 4.82 | $ 4.81 |
| Expected | 2018-2019 | Sep | $ 4.68 | $ 5.06 | $ 4.68 | $ 4.68 | $ 4.68 | $ 4.62 | $ 4.62 | $ 5.06 | $ 4.77 | $ 4.76 |
| Expected | 2018-2019 | Oct | $ 4.69 | $ 5.10 | $ 4.69 | $ 4.69 | $ 4.69 | $ 4.63 | $ 4.63 | $ 5.10 | $ 4.79 | $ 4.77 |
| Expected | 2019-2020 | Nov | $ 4.78 | $ 5.11 | $ 4.78 | $ 4.78 | $ 4.78 | $ 4.84 | $ 4.72 | $ 5.11 | $ 4.89 | $ 4.85 |
| Expected | 2019-2020 | Dec | $ 4.92 | $ 5.18 | $ 4.92 | $ 4.92 | $ 4.92 | $ 5.18 | $ 4.77 | $ 5.18 | $ 5.04 | $ 4.97 |
| Expected | 2019-2020 | Jan | $ 4.90 | $ 5.16 | $ 4.90 | $ 4.90 | $ 4.90 | $ 5.16 | $ 4.83 | $ 5.16 | $ 5.05 | $ 4.95 |
| Expected | 2019-2020 | Feb | $ 4.93 | $ 5.06 | $ 4.93 | $ 4.93 | $ 4.93 | $ 5.04 | $ 4.86 | $ 5.05 | $ 4.98 | $ 4.96 |
| Expected | 2019-2020 | Mar | $ 4.86 | $ 5.00 | $ 4.86 | $ 4.86 | $ 4.86 | $ 4.80 | $ 4.80 | $ 5.00 | $ 4.87 | $ 4.89 |
| Expected | 2019-2020 | Apr | $ 4.72 | $ 4.95 | $ 4.72 | $ 4.72 | $ 4.72 | $ 4.66 | $ 4.66 | $ 5.00 | $ 4.77 | $ 4.77 |
| Expected | 2019-2020 | May | $ 4.75 | $ 4.93 | $ 4.75 | $ 4.75 | $ 4.75 | $ 4.69 | $ 4.69 | $ 5.00 | $ 4.79 | $ 4.79 |
| Expected | 2019-2020 | Jun | $ 4.79 | $ 4.95 | $ 4.79 | $ 4.79 | $ 4.79 | $ 4.73 | $ 4.73 | $ 5.00 | $ 4.82 | $ 4.83 |
| Expected | 2019-2020 | Jul | $ 4.83 | $ 5.00 | $ 4.83 | $ 4.83 | $ 4.83 | $ 4.77 | $ 4.77 | $ 5.00 | $ 4.85 | $ 4.87 |
| Expected | 2019-2020 | Aug | $ 4.84 | $ 5.00 | $ 4.84 | $ 4.84 | $ 4.84 | $ 4.78 | $ 4.78 | $ 5.00 | $ 4.86 | $ 4.88 |
| Expected | 2019-2020 | Sep | $ 4.77 | $ 5.00 | $ 4.77 | $ 4.77 | $ 4.77 | $ 4.71 | $ 4.71 | $ 5.00 | $ 4.81 | $ 4.82 |
| Expected | 2019-2020 | Oct | $ 4.78 | $ 5.06 | $ 4.78 | $ 4.78 | $ 4.78 | $ 4.72 | $ 4.72 | $ 5.06 | $ 4.83 | $ 4.84 |
| Expected | 2020-2021 | Nov | $ 4.91 | $ 5.18 | $ 4.91 | $ 4.91 | $ 4.91 | $ 4.94 | $ 4.84 | $ 5.18 | $ 4.99 | $ 4.96 |
| Expected | 2020-2021 | Dec | $ 5.04 | $ 5.27 | $ 5.04 | $ 5.04 | $ 5.04 | $ 5.27 | $ 4.90 | $ 5.27 | $ 5.15 | $ 5.09 |
| Expected | 2020-2021 | Jan | $ 5.00 | $ 5.25 | $ 5.00 | $ 5.00 | $ 5.00 | $ 5.25 | $ 4.93 | $ 5.25 | $ 5.14 | $ 5.05 |
| Expected | 2020-2021 | Feb | $ 5.03 | $ 5.13 | $ 5.03 | $ 5.03 | $ 5.03 | $ 5.12 | $ 4.96 | $ 5.12 | $ 5.07 | $ 5.05 |
| Expected | 2020-2021 | Mar | $ 5.01 | $ 5.06 | $ 5.01 | $ 5.01 | $ 5.01 | $ 4.94 | $ 4.94 | $ 5.06 | $ 4.98 | $ 5.02 |
| Expected | 2020-2021 | Apr | $ 4.84 | $ 5.05 | $ 4.84 | $ 4.84 | $ 4.84 | $ 4.78 | $ 4.78 | $ 5.06 | $ 4.88 | $ 4.88 |
| Expected | 2020-2021 | May | $ 4.88 | $ 5.04 | $ 4.88 | $ 4.88 | $ 4.88 | $ 4.82 | $ 4.82 | $ 5.06 | $ 4.90 | $ 4.92 |
| Expected | 2020-2021 | Jun | $ 4.93 | $ 5.07 | $ 4.89 | $ 4.89 | $ 4.89 | $ 4.86 | $ 4.86 | $ 5.07 | $ 4.93 | $ 4.93 |
| Expected | 2020-2021 | Jul | $ 4.97 | $ 5.07 | $ 4.97 | $ 4.97 | $ 4.97 | $ 4.90 | $ 4.90 | $ 5.07 | $ 4.96 | $ 4.99 |
| Expected | 2020-2021 | Aug | $ 4.99 | $ 5.07 | $ 4.99 | $ 4.99 | $ 4.99 | $ 4.92 | $ 4.92 | $ 5.07 | $ 4.97 | $ 5.00 |
| Expected | 2020-2021 | Sep | $ 4.79 | $ 4.99 | $ 4.79 | $ 4.79 | $ 4.79 | $ 4.73 | $ 4.73 | $ 5.07 | $ 4.85 | $ 4.83 |
| Expected | 2020-2021 | Oct | $ 4.80 | $ 5.04 | $ 4.80 | $ 4.80 | $ 4.80 | $ 4.74 | $ 4.74 | $ 5.04 | $ 4.84 | $ 4.85 |
| Expected | 2021-2022 | Nov | $ 4.92 | $ 5.16 | $ 4.92 | $ 4.92 | $ 4.92 | $ 4.97 | $ 4.85 | $ 5.16 | $ 5.00 | $ 4.96 |
| Expected | 2021-2022 | Dec | $ 5.02 | $ 5.24 | $ 5.02 | $ 5.02 | $ 5.02 | $ 5.24 | $ 4.89 | $ 5.24 | $ 5.12 | $ 5.06 |
| Expected | 2021-2022 | Jan | $ 4.99 | $ 5.21 | $ 4.99 | $ 4.99 | $ 4.99 | $ 5.21 | $ 4.92 | $ 5.21 | $ 5.11 | $ 5.03 |
| Expected | 2021-2022 | Feb | $ 5.06 | $ 5.07 | $ 5.06 | $ 5.06 | $ 5.06 | $ 5.03 | $ 4.95 | $ 5.03 | $ 5.00 | $ 5.06 |
| Expected | 2021-2022 | Mar | $ 4.85 | $ 4.95 | $ 4.85 | $ 4.85 | $ 4.85 | $ 4.80 | $ 4.79 | $ 4.95 | $ 4.85 | $ 4.87 |
| Expected | 2021-2022 | Apr | $ 4.73 | $ 4.88 | $ 4.73 | $ 4.73 | $ 4.73 | $ 4.67 | $ 4.67 | $ 4.95 | $ 4.76 | $ 4.76 |
| Expected | 2021-2022 | May | $ 4.77 | $ 4.89 | $ 4.77 | $ 4.77 | $ 4.77 | $ 4.71 | $ 4.71 | $ 4.95 | $ 4.79 | $ 4.80 |
| Expected | 2021-2022 | Jun | $ 4.80 | $ 4.92 | $ 4.80 | $ 4.80 | $ 4.80 | $ 4.74 | $ 4.74 | $ 4.95 | $ 4.81 | $ 4.82 |
| Expected | 2021-2022 | Jul | $ 4.83 | $ 4.95 | $ 4.83 | $ 4.83 | $ 4.83 | $ 4.77 | $ 4.77 | $ 4.95 | $ 4.83 | $ 4.86 |
| Expected | 2021-2022 | Aug | $ 4.85 | $ 4.95 | $ 4.85 | $ 4.85 | $ 4.85 | $ 4.79 | $ 4.79 | $ 4.95 | $ 4.85 | $ 4.87 |
| Expected | 2021-2022 | Sep | $ 4.81 | $ 4.95 | $ 4.80 | $ 4.80 | $ 4.80 | $ 4.75 | $ 4.75 | $ 4.95 | $ 4.82 | $ 4.83 |
| Expected | 2021-2022 | Oct | $ 4.80 | $ 4.98 | $ 4.93 | $ 4.93 | $ 4.93 | $ 4.74 | $ 4.74 | $ 4.98 | $ 4.82 | $ 4.92 |
| Expected | 2022-2023 | Nov | $ 4.96 | $ 5.14 | $ 4.96 | $ 4.96 | $ 4.96 | $ 5.00 | $ 4.89 | $ 5.14 | $ 5.01 | $ 4.99 |
| Expected | 2022-2023 | Dec | $ 5.06 | $ 5.22 | $ 5.06 | $ 5.06 | $ 5.06 | $ 5.22 | $ 4.92 | $ 5.22 | $ 5.12 | $ 5.09 |
| Expected | 2022-2023 | Jan | $ 5.01 | $ 5.21 | $ 5.01 | $ 5.01 | $ 5.01 | $ 5.21 | $ 4.94 | $ 5.21 | $ 5.12 | $ 5.05 |
| Expected | 2022-2023 | Feb | $ 5.05 | $ 5.13 | $ 5.05 | $ 5.05 | $ 5.05 | $ 5.13 | $ 4.97 | $ 5.13 | $ 5.08 | $ 5.07 |
| Expected | 2022-2023 | Mar | $ 5.03 | $ 5.05 | $ 5.03 | $ 5.03 | $ 5.03 | $ 4.97 | $ 4.96 | $ 5.05 | $ 4.99 | $ 5.03 |
| Expected | 2022-2023 | Apr | $ 4.91 | $ 4.98 | $ 4.91 | $ 4.91 | $ 4.91 | $ 4.84 | $ 4.84 | $ 5.05 | $ 4.91 | $ 4.92 |
| Expected | 2022-2023 | May | $ 4.96 | $ 5.00 | $ 4.96 | $ 4.96 | $ 4.96 | $ 4.89 | $ 4.89 | $ 5.05 | $ 4.95 | $ 4.97 |
| Expected | 2022-2023 | Jun | $ 5.01 | $ 5.02 | $ 4.97 | $ 4.97 | $ 4.97 | $ 4.94 | $ 4.94 | $ 5.05 | $ 4.98 | $ 4.99 |
| Expected | 2022-2023 | Jul | $ 5.04 | $ 5.08 | $ 5.04 | $ 5.04 | $ 5.04 | $ 4.97 | $ 4.97 | $ 5.08 | $ 5.01 | $ 5.05 |
| Expected | 2022-2023 | Aug | $ 5.06 | $ 5.06 | $ 5.06 | $ 5.06 | $ 5.06 | $ 5.00 | $ 5.00 | $ 5.06 | $ 5.02 | $ 5.06 |
| Expected | 2022-2023 | Sep | $ 4.90 | $ 4.99 | $ 4.87 | $ 4.87 | $ 4.87 | $ 4.83 | $ 4.83 | $ 5.06 | $ 4.91 | $ 4.90 |
| Expected | 2022-2023 | Oct | $ 4.90 | $ 5.02 | $ 4.97 | $ 4.97 | $ 4.97 | $ 4.83 | $ 4.83 | $ 5.03 | $ 4.90 | $ 4.97 |
| Expected | 2023-2024 | Nov | $ 5.01 | $ 5.16 | $ 5.01 | $ 5.01 | $ 5.01 | $ 5.06 | $ 4.94 | $ 5.16 | $ 5.05 | $ 5.04 |
| Expected | 2023-2024 | Dec | $ 5.10 | $ 5.22 | $ 5.10 | $ 5.10 | $ 5.10 | $ 5.22 | $ 4.97 | $ 5.22 | $ 5.14 | $ 5.13 |
| Expected | 2023-2024 | Jan | $ 5.06 | $ 5.21 | $ 5.06 | $ 5.06 | $ 5.06 | $ 5.21 | $ 5.00 | $ 5.21 | $ 5.14 | $ 5.09 |
| Expected | 2023-2024 | Feb | $ 5.14 | $ 5.15 | $ 5.14 | $ 5.14 | $ 5.14 | $ 5.08 | $ 5.03 | $ 5.08 | $ 5.06 | $ 5.14 |
| Expected | 2023-2024 | Mar | $ 4.88 | $ 4.89 | $ 4.88 | $ 4.88 | $ 4.88 | $ 4.83 | $ 4.82 | $ 4.89 | $ 4.85 | $ 4.89 |
| Expected | 2023-2024 | Apr | $ 4.76 | $ 4.83 | $ 4.76 | $ 4.76 | $ 4.76 | $ 4.70 | $ 4.70 | $ 4.89 | $ 4.76 | $ 4.78 |
| Expected | 2023-2024 | May | $ 4.78 | $ 4.82 | $ 4.78 | $ 4.78 | $ 4.78 | $ 4.72 | $ 4.72 | $ 4.89 | $ 4.78 | $ 4.79 |
| Expected | 2023-2024 | Jun | $ 4.85 | $ 4.82 | $ 4.82 | $ 4.82 | $ 4.82 | $ 4.79 | $ 4.79 | $ 4.89 | $ 4.83 | $ 4.83 |
| Expected | 2023-2024 | Jul | $ 4.88 | $ 4.89 | $ 4.88 | $ 4.88 | $ 4.88 | $ 4.82 | $ 4.82 | $ 4.89 | $ 4.85 | $ 4.89 |
| Expected | 2023-2024 | Aug | $ 4.91 | $ 4.91 | $ 4.91 | $ 4.91 | $ 4.91 | $ 4.84 | $ 4.84 | $ 4.91 | $ 4.87 | $ 4.91 |
| Expected | 2023-2024 | Sep | $ 4.85 | $ 4.89 | $ 4.83 | $ 4.83 | $ 4.83 | $ 4.79 | $ 4.79 | $ 4.90 | $ 4.83 | $ 4.85 |
| Expected | 2023-2024 | Oct | $ 4.86 | $ 4.94 | $ 4.94 | $ 4.94 | $ 4.94 | $ 4.80 | $ 4.80 | $ 4.94 | $ 4.85 | $ 4.93 |
| Expected | 2024-2025 | Nov | $ 4.98 | $ 5.08 | $ 4.98 | $ 4.98 | $ 4.98 | $ 5.01 | $ 4.91 | $ 5.08 | $ 5.00 | $ 5.00 |
| Expected | 2024-2025 | Dec | $ 5.09 | $ 5.16 | $ 5.09 | $ 5.09 | $ 5.09 | $ 5.16 | $ 4.94 | $ 5.16 | $ 5.09 | $ 5.10 |
| Expected | 2024-2025 | Jan | $ 5.03 | $ 5.15 | $ 5.03 | $ 5.03 | $ 5.03 | $ 5.15 | $ 4.96 | $ 5.15 | $ 5.09 | $ 5.05 |
| Expected | 2024-2025 | Feb | $ 5.08 | $ 5.09 | $ 5.08 | $ 5.08 | $ 5.08 | $ 5.03 | $ 5.00 | $ 5.03 | $ 5.02 | $ 5.08 |
| Expected | 2024-2025 | Mar | $ 4.99 | $ 4.98 | $ 4.99 | $ 4.99 | $ 4.99 | $ 4.92 | $ 4.92 | $ 4.92 | $ 4.92 | $ 4.99 |
| Expected | 2024-2025 | Apr | $ 4.85 | $ 4.88 | $ 4.85 | $ 4.85 | $ 4.85 | $ 4.79 | $ 4.79 | $ 4.90 | $ 4.83 | $ 4.86 |

# APPENDIX 6.4 II EXPECTED MONTHLY DETAIL

**Appendix 6.4 - Monthly Avoided Cost Detail 1/**
**2010$**

| Scenario | Gas Year | Month | Klam Falls | La Grande | Medford GTN | Medford NWP | Roseburg | WA/ID Both | WA/ID GTN | WA/ID NWP | WA/ID Annual | OR Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Expected | 2024-2025 | May | $ 4.87 | $ 4.88 | $ 4.87 | $ 4.87 | $ 4.87 | $ 4.81 | $ 4.81 | $ 4.90 | $ 4.84 | $ 4.88 |
| Expected | 2024-2025 | Jun | $ 4.93 | $ 4.89 | $ 4.89 | $ 4.89 | $ 4.89 | $ 4.86 | $ 4.86 | $ 4.90 | $ 4.88 | $ 4.90 |
| Expected | 2024-2025 | Jul | $ 4.94 | $ 4.90 | $ 4.90 | $ 4.90 | $ 4.90 | $ 4.90 | $ 4.92 | $ 4.90 | $ 4.91 | $ 4.91 |
| Expected | 2024-2025 | Aug | $ 4.94 | $ 4.90 | $ 4.90 | $ 4.90 | $ 4.90 | $ 4.90 | $ 4.94 | $ 4.90 | $ 4.92 | $ 4.91 |
| Expected | 2024-2025 | Sep | $ 4.91 | $ 4.90 | $ 4.90 | $ 4.90 | $ 4.90 | $ 4.84 | $ 4.84 | $ 4.90 | $ 4.86 | $ 4.90 |
| Expected | 2024-2025 | Oct | $ 4.92 | $ 4.93 | $ 4.93 | $ 4.93 | $ 4.93 | $ 4.85 | $ 4.85 | $ 4.93 | $ 4.88 | $ 4.93 |
| Expected | 2025-2026 | Nov | $ 5.10 | $ 5.27 | $ 5.10 | $ 5.10 | $ 5.10 | $ 5.04 | $ 5.04 | $ 5.27 | $ 5.11 | $ 5.13 |
| Expected | 2025-2026 | Dec | $ 5.22 | $ 5.39 | $ 5.22 | $ 5.22 | $ 5.22 | $ 5.35 | $ 5.14 | $ 5.39 | $ 5.29 | $ 5.25 |
| Expected | 2025-2026 | Jan | $ 5.15 | $ 5.39 | $ 5.15 | $ 5.15 | $ 5.15 | $ 5.22 | $ 5.09 | $ 5.39 | $ 5.23 | $ 5.20 |
| Expected | 2025-2026 | Feb | $ 5.23 | $ 5.23 | $ 5.23 | $ 5.23 | $ 5.23 | $ 5.16 | $ 5.16 | $ 5.20 | $ 5.17 | $ 5.23 |
| Expected | 2025-2026 | Mar | $ 5.02 | $ 5.16 | $ 5.02 | $ 5.02 | $ 5.02 | $ 4.95 | $ 4.95 | $ 5.16 | $ 5.02 | $ 5.05 |
| Expected | 2025-2026 | Apr | $ 4.88 | $ 5.06 | $ 4.88 | $ 4.88 | $ 4.88 | $ 4.82 | $ 4.82 | $ 5.16 | $ 4.94 | $ 4.92 |
| Expected | 2025-2026 | May | $ 4.92 | $ 5.07 | $ 4.92 | $ 4.92 | $ 4.92 | $ 4.85 | $ 4.85 | $ 5.16 | $ 4.96 | $ 4.95 |
| Expected | 2025-2026 | Jun | $ 4.98 | $ 5.10 | $ 4.98 | $ 4.98 | $ 4.98 | $ 4.91 | $ 4.91 | $ 5.17 | $ 5.00 | $ 5.00 |
| Expected | 2025-2026 | Jul | $ 5.01 | $ 5.17 | $ 5.01 | $ 5.01 | $ 5.01 | $ 4.94 | $ 4.94 | $ 5.17 | $ 5.02 | $ 5.04 |
| Expected | 2025-2026 | Aug | $ 5.03 | $ 5.17 | $ 5.03 | $ 5.03 | $ 5.03 | $ 4.96 | $ 4.96 | $ 5.17 | $ 5.03 | $ 5.06 |
| Expected | 2025-2026 | Sep | $ 4.99 | $ 5.17 | $ 4.99 | $ 4.99 | $ 4.99 | $ 4.92 | $ 4.92 | $ 5.17 | $ 5.01 | $ 5.02 |
| Expected | 2025-2026 | Oct | $ 4.99 | $ 5.20 | $ 5.14 | $ 5.14 | $ 5.14 | $ 4.92 | $ 4.92 | $ 5.20 | $ 5.02 | $ 5.12 |
| Expected | 2026-2027 | Nov | $ 5.12 | $ 5.31 | $ 5.12 | $ 5.12 | $ 5.12 | $ 5.06 | $ 5.06 | $ 5.31 | $ 5.14 | $ 5.16 |
| Expected | 2026-2027 | Dec | $ 5.23 | $ 5.40 | $ 5.23 | $ 5.23 | $ 5.23 | $ 5.40 | $ 5.15 | $ 5.40 | $ 5.32 | $ 5.26 |
| Expected | 2026-2027 | Jan | $ 5.20 | $ 5.38 | $ 5.20 | $ 5.20 | $ 5.20 | $ 5.25 | $ 5.14 | $ 5.38 | $ 5.26 | $ 5.24 |
| Expected | 2026-2027 | Feb | $ 5.25 | $ 5.24 | $ 5.25 | $ 5.25 | $ 5.25 | $ 5.17 | $ 5.17 | $ 5.18 | $ 5.17 | $ 5.25 |
| Expected | 2026-2027 | Mar | $ 4.97 | $ 5.08 | $ 4.97 | $ 4.97 | $ 4.97 | $ 4.90 | $ 4.90 | $ 5.08 | $ 4.96 | $ 4.99 |
| Expected | 2026-2027 | Apr | $ 4.82 | $ 4.96 | $ 4.82 | $ 4.82 | $ 4.82 | $ 4.76 | $ 4.76 | $ 5.08 | $ 4.87 | $ 4.85 |
| Expected | 2026-2027 | May | $ 4.85 | $ 4.99 | $ 4.85 | $ 4.85 | $ 4.85 | $ 4.79 | $ 4.79 | $ 5.08 | $ 4.89 | $ 4.88 |
| Expected | 2026-2027 | Jun | $ 4.91 | $ 5.01 | $ 4.91 | $ 4.91 | $ 4.91 | $ 4.84 | $ 4.84 | $ 5.08 | $ 4.92 | $ 4.93 |
| Expected | 2026-2027 | Jul | $ 4.94 | $ 5.09 | $ 4.94 | $ 4.94 | $ 4.94 | $ 4.87 | $ 4.87 | $ 5.09 | $ 4.94 | $ 4.97 |
| Expected | 2026-2027 | Aug | $ 4.96 | $ 5.09 | $ 4.96 | $ 4.96 | $ 4.96 | $ 4.89 | $ 4.89 | $ 5.09 | $ 4.96 | $ 4.98 |
| Expected | 2026-2027 | Sep | $ 4.94 | $ 5.09 | $ 4.94 | $ 4.94 | $ 4.94 | $ 4.87 | $ 4.87 | $ 5.09 | $ 4.95 | $ 4.97 |
| Expected | 2026-2027 | Oct | $ 4.94 | $ 5.12 | $ 5.08 | $ 5.08 | $ 5.08 | $ 4.87 | $ 4.87 | $ 5.12 | $ 4.95 | $ 5.06 |
| Expected | 2027-2028 | Nov | $ 5.09 | $ 5.24 | $ 5.09 | $ 5.09 | $ 5.09 | $ 5.03 | $ 5.03 | $ 5.24 | $ 5.10 | $ 5.12 |
| Expected | 2027-2028 | Dec | $ 5.22 | $ 5.33 | $ 5.22 | $ 5.22 | $ 5.22 | $ 5.33 | $ 5.14 | $ 5.33 | $ 5.27 | $ 5.24 |
| Expected | 2027-2028 | Jan | $ 5.16 | $ 5.32 | $ 5.16 | $ 5.16 | $ 5.16 | $ 5.28 | $ 5.09 | $ 5.32 | $ 5.23 | $ 5.19 |
| Expected | 2027-2028 | Feb | $ 5.22 | $ 5.21 | $ 5.22 | $ 5.22 | $ 5.22 | $ 5.15 | $ 5.15 | $ 5.16 | $ 5.15 | $ 5.22 |
| Expected | 2027-2028 | Mar | $ 5.01 | $ 5.06 | $ 5.01 | $ 5.01 | $ 5.01 | $ 4.94 | $ 4.94 | $ 5.06 | $ 4.98 | $ 5.02 |
| Expected | 2027-2028 | Apr | $ 4.86 | $ 4.97 | $ 4.86 | $ 4.86 | $ 4.86 | $ 4.80 | $ 4.80 | $ 5.08 | $ 4.89 | $ 4.89 |
| Expected | 2027-2028 | May | $ 4.92 | $ 4.99 | $ 4.92 | $ 4.92 | $ 4.92 | $ 4.85 | $ 4.85 | $ 5.08 | $ 4.93 | $ 4.93 |
| Expected | 2027-2028 | Jun | $ 4.95 | $ 5.02 | $ 4.95 | $ 4.95 | $ 4.95 | $ 4.88 | $ 4.88 | $ 5.08 | $ 4.95 | $ 4.96 |
| Expected | 2027-2028 | Jul | $ 4.99 | $ 5.10 | $ 4.99 | $ 4.99 | $ 4.99 | $ 4.92 | $ 4.92 | $ 5.10 | $ 4.98 | $ 5.01 |
| Expected | 2027-2028 | Aug | $ 5.01 | $ 5.08 | $ 5.01 | $ 5.01 | $ 5.01 | $ 4.94 | $ 4.94 | $ 5.08 | $ 4.99 | $ 5.02 |
| Expected | 2027-2028 | Sep | $ 4.97 | $ 5.09 | $ 4.97 | $ 4.97 | $ 4.97 | $ 4.90 | $ 4.90 | $ 5.09 | $ 4.96 | $ 4.99 |
| Expected | 2027-2028 | Oct | $ 4.98 | $ 5.11 | $ 5.11 | $ 5.11 | $ 5.11 | $ 4.91 | $ 4.91 | $ 5.11 | $ 4.98 | $ 5.08 |
| Expected | 2028-2029 | Nov | $ 5.14 | $ 5.23 | $ 5.14 | $ 5.14 | $ 5.14 | $ 5.08 | $ 5.08 | $ 5.24 | $ 5.13 | $ 5.16 |
| Expected | 2028-2029 | Dec | $ 5.27 | $ 5.34 | $ 5.27 | $ 5.27 | $ 5.27 | $ 5.34 | $ 5.11 | $ 5.34 | $ 5.26 | $ 5.28 |
| Expected | 2028-2029 | Jan | $ 5.20 | $ 5.32 | $ 5.20 | $ 5.20 | $ 5.20 | $ 5.32 | $ 5.14 | $ 5.32 | $ 5.26 | $ 5.23 |
| Expected | 2028-2029 | Feb | $ 5.26 | $ 5.26 | $ 5.26 | $ 5.26 | $ 5.26 | $ 5.20 | $ 5.18 | $ 5.20 | $ 5.19 | $ 5.26 |
| Expected | 2028-2029 | Mar | $ 5.08 | $ 5.07 | $ 5.08 | $ 5.08 | $ 5.08 | $ 5.02 | $ 5.02 | $ 5.07 | $ 5.03 | $ 5.08 |
| Expected | 2028-2029 | Apr | $ 4.91 | $ 4.98 | $ 4.91 | $ 4.91 | $ 4.91 | $ 4.84 | $ 4.84 | $ 5.10 | $ 4.93 | $ 4.92 |
| Expected | 2028-2029 | May | $ 4.94 | $ 4.98 | $ 4.94 | $ 4.94 | $ 4.94 | $ 4.87 | $ 4.87 | $ 5.10 | $ 4.95 | $ 4.95 |
| Expected | 2028-2029 | Jun | $ 4.98 | $ 5.01 | $ 4.98 | $ 4.98 | $ 4.98 | $ 4.91 | $ 4.91 | $ 5.10 | $ 4.98 | $ 4.98 |
| Expected | 2028-2029 | Jul | $ 5.02 | $ 5.11 | $ 5.02 | $ 5.02 | $ 5.02 | $ 4.95 | $ 4.95 | $ 5.11 | $ 5.01 | $ 5.04 |
| Expected | 2028-2029 | Aug | $ 5.04 | $ 5.14 | $ 5.04 | $ 5.04 | $ 5.04 | $ 4.97 | $ 4.97 | $ 5.14 | $ 5.03 | $ 5.06 |
| Expected | 2028-2029 | Sep | $ 5.03 | $ 5.11 | $ 5.03 | $ 5.03 | $ 5.03 | $ 4.96 | $ 4.96 | $ 5.11 | $ 5.01 | $ 5.04 |
| Expected | 2028-2029 | Oct | $ 5.03 | $ 5.14 | $ 5.14 | $ 5.14 | $ 5.14 | $ 4.96 | $ 4.96 | $ 5.14 | $ 5.02 | $ 5.11 |
| Expected | 2029-2030 | Nov | $ 5.19 | $ 5.23 | $ 5.19 | $ 5.19 | $ 5.19 | $ 5.12 | $ 5.12 | $ 5.25 | $ 5.16 | $ 5.19 |
| Expected | 2029-2030 | Dec | $ 5.29 | $ 5.33 | $ 5.29 | $ 5.29 | $ 5.29 | $ 5.33 | $ 5.16 | $ 5.33 | $ 5.27 | $ 5.30 |
| Expected | 2029-2030 | Jan | $ 5.25 | $ 5.31 | $ 5.25 | $ 5.25 | $ 5.25 | $ 5.31 | $ 5.19 | $ 5.31 | $ 5.27 | $ 5.26 |
| Expected | 2029-2030 | Feb | $ 5.32 | $ 5.34 | $ 5.33 | $ 5.33 | $ 5.33 | $ 5.26 | $ 5.22 | $ 5.27 | $ 5.25 | $ 5.33 |
| Expected | 2029-2030 | Mar | $ 5.03 | $ 5.00 | $ 5.03 | $ 5.03 | $ 5.03 | $ 4.96 | $ 4.96 | $ 5.00 | $ 4.98 | $ 5.02 |
| Expected | 2029-2030 | Apr | $ 4.87 | $ 4.95 | $ 4.87 | $ 4.87 | $ 4.87 | $ 4.81 | $ 4.81 | $ 5.06 | $ 4.90 | $ 4.89 |
| Expected | 2029-2030 | May | $ 4.91 | $ 4.95 | $ 4.91 | $ 4.91 | $ 4.91 | $ 4.84 | $ 4.84 | $ 5.06 | $ 4.92 | $ 4.92 |
| Expected | 2029-2030 | Jun | $ 4.96 | $ 4.97 | $ 4.96 | $ 4.96 | $ 4.96 | $ 4.89 | $ 4.89 | $ 5.06 | $ 4.95 | $ 4.96 |
| Expected | 2029-2030 | Jul | $ 5.02 | $ 5.05 | $ 5.02 | $ 5.02 | $ 5.02 | $ 4.95 | $ 4.95 | $ 5.06 | $ 4.99 | $ 5.02 |
| Expected | 2029-2030 | Aug | $ 5.03 | $ 5.07 | $ 5.03 | $ 5.03 | $ 5.03 | $ 4.96 | $ 4.96 | $ 5.07 | $ 5.00 | $ 5.04 |
| Expected | 2029-2030 | Sep | $ 5.03 | $ 5.09 | $ 5.03 | $ 5.03 | $ 5.03 | $ 4.96 | $ 4.96 | $ 5.09 | $ 5.01 | $ 5.04 |
| Expected | 2029-2030 | Oct | $ 5.04 | $ 5.12 | $ 5.12 | $ 5.12 | $ 5.12 | $ 4.97 | $ 4.97 | $ 5.12 | $ 5.02 | $ 5.10 |
| Expected | 2030-2031 | Nov | $ 5.18 | $ 5.20 | $ 5.18 | $ 5.18 | $ 5.18 | $ 5.12 | $ 5.12 | $ 5.23 | $ 5.15 | $ 5.19 |
| Expected | 2030-2031 | Dec | $ 5.32 | $ 5.32 | $ 5.32 | $ 5.32 | $ 5.32 | $ 5.32 | $ 5.19 | $ 5.32 | $ 5.28 | $ 5.32 |
| Expected | 2030-2031 | Jan | $ 5.28 | $ 5.31 | $ 5.28 | $ 5.28 | $ 5.28 | $ 5.31 | $ 5.22 | $ 5.31 | $ 5.28 | $ 5.29 |
| Expected | 2030-2031 | Feb | $ 5.36 | $ 5.38 | $ 5.38 | $ 5.38 | $ 5.38 | $ 5.32 | $ 5.28 | $ 5.32 | $ 5.31 | $ 5.37 |
| Expected | 2030-2031 | Mar | $ 5.13 | $ 5.10 | $ 5.13 | $ 5.13 | $ 5.13 | $ 5.07 | $ 5.07 | $ 5.10 | $ 5.08 | $ 5.12 |
| Expected | 2030-2031 | Apr | $ 4.98 | $ 5.05 | $ 4.98 | $ 4.98 | $ 4.98 | $ 4.91 | $ 4.91 | $ 5.14 | $ 4.99 | $ 4.99 |
| Expected | 2030-2031 | May | $ 5.01 | $ 5.06 | $ 5.01 | $ 5.01 | $ 5.01 | $ 4.94 | $ 4.94 | $ 5.14 | $ 5.01 | $ 5.02 |
| Expected | 2030-2031 | Jun | $ 5.08 | $ 5.06 | $ 5.06 | $ 5.06 | $ 5.06 | $ 5.02 | $ 5.02 | $ 5.14 | $ 5.06 | $ 5.06 |
| Expected | 2030-2031 | Jul | $ 5.12 | $ 5.13 | $ 5.12 | $ 5.12 | $ 5.12 | $ 5.06 | $ 5.06 | $ 5.14 | $ 5.08 | $ 5.12 |
| Expected | 2030-2031 | Aug | $ 5.14 | $ 5.15 | $ 5.14 | $ 5.14 | $ 5.14 | $ 5.08 | $ 5.08 | $ 5.15 | $ 5.10 | $ 5.14 |
| Expected | 2030-2031 | Sep | $ 5.13 | $ 5.15 | $ 5.13 | $ 5.13 | $ 5.13 | $ 5.07 | $ 5.07 | $ 5.15 | $ 5.09 | $ 5.13 |
| Expected | 2030-2031 | Oct | $ 5.14 | $ 5.18 | $ 5.18 | $ 5.18 | $ 5.18 | $ 5.08 | $ 5.08 | $ 5.18 | $ 5.11 | $ 5.17 |

1/ Avoided costs shown before Environmental Externalities adder.

# APPENDIX 6.4 ‖ HIGH GROWTH – LOW PRICE MONTHLY DETAIL

Appendix 6.4 - Monthly Avoided Cost Detail 1/
2010$

| Scenario | Gas Year | Month | Klam Falls | La Grande | Medford GTN | Medford NWP | Roseburg | WA/ID Both | WA/ID GTN | WA/ID NWP | WA/ID Annual | OR Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| High Growth & Low Price | 2011-2012 | Nov | $ 2.97 | $ 2.99 | $ 2.97 | $ 2.97 | $ 2.97 | $ 2.93 | $ 2.93 | $ 2.99 | $ 2.95 | $ 2.98 |
| High Growth & Low Price | 2011-2012 | Dec | $ 2.83 | $ 3.00 | $ 2.83 | $ 2.83 | $ 2.83 | $ 2.76 | $ 2.76 | $ 3.00 | $ 2.84 | $ 2.87 |
| High Growth & Low Price | 2011-2012 | Jan | $ 2.35 | $ 2.50 | $ 2.35 | $ 2.35 | $ 2.35 | $ 2.32 | $ 2.32 | $ 2.50 | $ 2.38 | $ 2.38 |
| High Growth & Low Price | 2011-2012 | Feb | $ 2.89 | $ 2.92 | $ 2.89 | $ 2.89 | $ 2.89 | $ 2.86 | $ 2.86 | $ 2.88 | $ 2.86 | $ 2.90 |
| High Growth & Low Price | 2011-2012 | Mar | $ 2.95 | $ 2.95 | $ 2.95 | $ 2.95 | $ 2.95 | $ 2.91 | $ 2.91 | $ 2.91 | $ 2.91 | $ 2.95 |
| High Growth & Low Price | 2011-2012 | Apr | $ 2.44 | $ 2.65 | $ 2.44 | $ 2.44 | $ 2.44 | $ 2.41 | $ 2.41 | $ 2.87 | $ 2.56 | $ 2.48 |
| High Growth & Low Price | 2011-2012 | May | $ 2.55 | $ 2.80 | $ 2.55 | $ 2.55 | $ 2.55 | $ 2.52 | $ 2.52 | $ 2.87 | $ 2.64 | $ 2.60 |
| High Growth & Low Price | 2011-2012 | Jun | $ 2.70 | $ 2.87 | $ 2.70 | $ 2.70 | $ 2.70 | $ 2.66 | $ 2.66 | $ 2.87 | $ 2.73 | $ 2.73 |
| High Growth & Low Price | 2011-2012 | Jul | $ 2.76 | $ 2.87 | $ 2.76 | $ 2.76 | $ 2.76 | $ 2.72 | $ 2.72 | $ 2.88 | $ 2.77 | $ 2.78 |
| High Growth & Low Price | 2011-2012 | Aug | $ 2.64 | $ 2.88 | $ 2.64 | $ 2.64 | $ 2.64 | $ 2.60 | $ 2.60 | $ 2.88 | $ 2.69 | $ 2.68 |
| High Growth & Low Price | 2011-2012 | Sep | $ 2.53 | $ 2.78 | $ 2.53 | $ 2.53 | $ 2.53 | $ 2.50 | $ 2.50 | $ 2.88 | $ 2.63 | $ 2.58 |
| High Growth & Low Price | 2011-2012 | Oct | $ 2.66 | $ 2.90 | $ 2.66 | $ 2.66 | $ 2.66 | $ 2.62 | $ 2.62 | $ 2.90 | $ 2.71 | $ 2.70 |
| High Growth & Low Price | 2012-2013 | Nov | $ 3.12 | $ 3.32 | $ 3.12 | $ 3.12 | $ 3.12 | $ 3.07 | $ 3.07 | $ 3.32 | $ 3.16 | $ 3.16 |
| High Growth & Low Price | 2012-2013 | Dec | $ 3.26 | $ 3.44 | $ 3.26 | $ 3.26 | $ 3.26 | $ 3.17 | $ 3.17 | $ 3.58 | $ 3.30 | $ 3.30 |
| High Growth & Low Price | 2012-2013 | Jan | $ 3.45 | $ 3.69 | $ 3.45 | $ 3.45 | $ 3.45 | $ 3.41 | $ 3.41 | $ 3.70 | $ 3.51 | $ 3.50 |
| High Growth & Low Price | 2012-2013 | Feb | $ 3.61 | $ 3.82 | $ 3.61 | $ 3.61 | $ 3.61 | $ 3.56 | $ 3.56 | $ 3.82 | $ 3.64 | $ 3.65 |
| High Growth & Low Price | 2012-2013 | Mar | $ 3.67 | $ 3.82 | $ 3.67 | $ 3.67 | $ 3.67 | $ 3.62 | $ 3.62 | $ 3.82 | $ 3.69 | $ 3.70 |
| High Growth & Low Price | 2012-2013 | Apr | $ 3.61 | $ 3.79 | $ 3.61 | $ 3.61 | $ 3.61 | $ 3.56 | $ 3.56 | $ 3.82 | $ 3.65 | $ 3.64 |
| High Growth & Low Price | 2012-2013 | May | $ 3.59 | $ 3.82 | $ 3.59 | $ 3.59 | $ 3.59 | $ 3.54 | $ 3.54 | $ 3.82 | $ 3.63 | $ 3.63 |
| High Growth & Low Price | 2012-2013 | Jun | $ 3.60 | $ 3.82 | $ 3.60 | $ 3.60 | $ 3.60 | $ 3.55 | $ 3.55 | $ 3.82 | $ 3.64 | $ 3.64 |
| High Growth & Low Price | 2012-2013 | Jul | $ 3.63 | $ 3.82 | $ 3.63 | $ 3.63 | $ 3.63 | $ 3.58 | $ 3.58 | $ 3.82 | $ 3.66 | $ 3.67 |
| High Growth & Low Price | 2012-2013 | Aug | $ 3.63 | $ 3.83 | $ 3.63 | $ 3.63 | $ 3.63 | $ 3.58 | $ 3.58 | $ 3.83 | $ 3.66 | $ 3.67 |
| High Growth & Low Price | 2012-2013 | Sep | $ 3.63 | $ 3.83 | $ 3.63 | $ 3.63 | $ 3.63 | $ 3.58 | $ 3.58 | $ 3.83 | $ 3.66 | $ 3.67 |
| High Growth & Low Price | 2012-2013 | Oct | $ 3.66 | $ 3.89 | $ 3.66 | $ 3.66 | $ 3.66 | $ 3.61 | $ 3.61 | $ 3.89 | $ 3.70 | $ 3.70 |
| High Growth & Low Price | 2013-2014 | Nov | $ 3.85 | $ 4.06 | $ 3.85 | $ 3.85 | $ 3.85 | $ 3.80 | $ 3.80 | $ 4.06 | $ 3.89 | $ 3.89 |
| High Growth & Low Price | 2013-2014 | Dec | $ 3.97 | $ 4.17 | $ 3.97 | $ 3.97 | $ 3.97 | $ 3.88 | $ 3.88 | $ 4.17 | $ 3.98 | $ 4.01 |
| High Growth & Low Price | 2013-2014 | Jan | $ 3.94 | $ 4.17 | $ 3.94 | $ 3.94 | $ 3.94 | $ 3.89 | $ 3.89 | $ 4.17 | $ 3.99 | $ 3.99 |
| High Growth & Low Price | 2013-2014 | Feb | $ 3.95 | $ 4.07 | $ 3.95 | $ 3.95 | $ 3.95 | $ 3.90 | $ 3.90 | $ 4.06 | $ 3.95 | $ 3.97 |
| High Growth & Low Price | 2013-2014 | Mar | $ 3.95 | $ 4.04 | $ 3.95 | $ 3.95 | $ 3.95 | $ 3.90 | $ 3.90 | $ 4.04 | $ 3.95 | $ 3.97 |
| High Growth & Low Price | 2013-2014 | Apr | $ 3.79 | $ 3.98 | $ 3.79 | $ 3.79 | $ 3.79 | $ 3.74 | $ 3.74 | $ 4.05 | $ 3.84 | $ 3.83 |
| High Growth & Low Price | 2013-2014 | May | $ 3.74 | $ 4.00 | $ 3.74 | $ 3.74 | $ 3.74 | $ 3.69 | $ 3.69 | $ 4.05 | $ 3.81 | $ 3.79 |
| High Growth & Low Price | 2013-2014 | Jun | $ 3.77 | $ 4.02 | $ 3.77 | $ 3.77 | $ 3.77 | $ 3.72 | $ 3.72 | $ 4.05 | $ 3.83 | $ 3.82 |
| High Growth & Low Price | 2013-2014 | Jul | $ 3.80 | $ 4.05 | $ 3.80 | $ 3.80 | $ 3.80 | $ 3.75 | $ 3.75 | $ 4.05 | $ 3.85 | $ 3.85 |
| High Growth & Low Price | 2013-2014 | Aug | $ 3.80 | $ 4.05 | $ 3.80 | $ 3.80 | $ 3.80 | $ 3.75 | $ 3.75 | $ 4.05 | $ 3.85 | $ 3.85 |
| High Growth & Low Price | 2013-2014 | Sep | $ 3.81 | $ 4.06 | $ 3.81 | $ 3.81 | $ 3.81 | $ 3.76 | $ 3.76 | $ 4.06 | $ 3.86 | $ 3.86 |
| High Growth & Low Price | 2013-2014 | Oct | $ 3.83 | $ 4.12 | $ 3.83 | $ 3.83 | $ 3.83 | $ 3.78 | $ 3.78 | $ 4.12 | $ 3.90 | $ 3.89 |
| High Growth & Low Price | 2014-2015 | Nov | $ 4.03 | $ 4.28 | $ 4.03 | $ 4.03 | $ 4.03 | $ 3.97 | $ 3.97 | $ 4.28 | $ 4.07 | $ 4.08 |
| High Growth & Low Price | 2014-2015 | Dec | $ 4.09 | $ 4.31 | $ 4.09 | $ 4.09 | $ 4.09 | $ 3.97 | $ 3.97 | $ 4.31 | $ 4.08 | $ 4.13 |
| High Growth & Low Price | 2014-2015 | Jan | $ 4.07 | $ 4.31 | $ 4.07 | $ 4.07 | $ 4.07 | $ 4.01 | $ 4.01 | $ 4.31 | $ 4.11 | $ 4.12 |
| High Growth & Low Price | 2014-2015 | Feb | $ 4.09 | $ 4.23 | $ 4.09 | $ 4.09 | $ 4.09 | $ 4.04 | $ 4.04 | $ 4.22 | $ 4.10 | $ 4.12 |
| High Growth & Low Price | 2014-2015 | Mar | $ 4.09 | $ 4.21 | $ 4.09 | $ 4.09 | $ 4.09 | $ 4.03 | $ 4.03 | $ 4.21 | $ 4.09 | $ 4.11 |
| High Growth & Low Price | 2014-2015 | Apr | $ 3.94 | $ 4.15 | $ 3.94 | $ 3.94 | $ 3.94 | $ 3.89 | $ 3.89 | $ 4.21 | $ 4.00 | $ 3.99 |
| High Growth & Low Price | 2014-2015 | May | $ 3.93 | $ 4.17 | $ 3.93 | $ 3.93 | $ 3.93 | $ 3.88 | $ 3.88 | $ 4.21 | $ 3.99 | $ 3.98 |
| High Growth & Low Price | 2014-2015 | Jun | $ 3.99 | $ 4.19 | $ 3.99 | $ 3.99 | $ 3.99 | $ 3.93 | $ 3.93 | $ 4.21 | $ 4.03 | $ 4.03 |
| High Growth & Low Price | 2014-2015 | Jul | $ 4.02 | $ 4.21 | $ 4.02 | $ 4.02 | $ 4.02 | $ 3.96 | $ 3.96 | $ 4.21 | $ 4.05 | $ 4.06 |
| High Growth & Low Price | 2014-2015 | Aug | $ 4.01 | $ 4.22 | $ 4.01 | $ 4.01 | $ 4.01 | $ 3.95 | $ 3.95 | $ 4.22 | $ 4.04 | $ 4.05 |
| High Growth & Low Price | 2014-2015 | Sep | $ 3.98 | $ 4.22 | $ 3.98 | $ 3.98 | $ 3.98 | $ 3.92 | $ 3.92 | $ 4.22 | $ 4.02 | $ 4.02 |
| High Growth & Low Price | 2014-2015 | Oct | $ 3.99 | $ 4.30 | $ 3.99 | $ 3.99 | $ 3.99 | $ 3.93 | $ 3.93 | $ 4.30 | $ 4.05 | $ 4.05 |
| High Growth & Low Price | 2015-2016 | Nov | $ 4.16 | $ 4.44 | $ 4.16 | $ 4.16 | $ 4.16 | $ 4.11 | $ 4.11 | $ 4.44 | $ 4.22 | $ 4.21 |
| High Growth & Low Price | 2015-2016 | Dec | $ 4.23 | $ 4.48 | $ 4.23 | $ 4.23 | $ 4.23 | $ 4.11 | $ 4.11 | $ 4.48 | $ 4.23 | $ 4.28 |
| High Growth & Low Price | 2015-2016 | Jan | $ 4.19 | $ 4.49 | $ 4.19 | $ 4.19 | $ 4.19 | $ 4.14 | $ 4.14 | $ 4.49 | $ 4.25 | $ 4.25 |
| High Growth & Low Price | 2015-2016 | Feb | $ 4.22 | $ 4.46 | $ 4.22 | $ 4.22 | $ 4.22 | $ 4.16 | $ 4.16 | $ 4.46 | $ 4.26 | $ 4.26 |
| High Growth & Low Price | 2015-2016 | Mar | $ 4.26 | $ 4.45 | $ 4.26 | $ 4.26 | $ 4.26 | $ 4.21 | $ 4.21 | $ 4.45 | $ 4.29 | $ 4.30 |
| High Growth & Low Price | 2015-2016 | Apr | $ 4.11 | $ 4.38 | $ 4.11 | $ 4.11 | $ 4.11 | $ 4.06 | $ 4.06 | $ 4.45 | $ 4.19 | $ 4.16 |
| High Growth & Low Price | 2015-2016 | May | $ 4.12 | $ 4.39 | $ 4.12 | $ 4.12 | $ 4.12 | $ 4.07 | $ 4.07 | $ 4.45 | $ 4.19 | $ 4.17 |
| High Growth & Low Price | 2015-2016 | Jun | $ 4.16 | $ 4.41 | $ 4.16 | $ 4.16 | $ 4.16 | $ 4.11 | $ 4.11 | $ 4.46 | $ 4.22 | $ 4.21 |
| High Growth & Low Price | 2015-2016 | Jul | $ 4.18 | $ 4.46 | $ 4.18 | $ 4.18 | $ 4.18 | $ 4.13 | $ 4.13 | $ 4.46 | $ 4.24 | $ 4.24 |
| High Growth & Low Price | 2015-2016 | Aug | $ 4.18 | $ 4.46 | $ 4.18 | $ 4.18 | $ 4.18 | $ 4.13 | $ 4.13 | $ 4.46 | $ 4.24 | $ 4.24 |
| High Growth & Low Price | 2015-2016 | Sep | $ 4.17 | $ 4.46 | $ 4.17 | $ 4.17 | $ 4.17 | $ 4.12 | $ 4.12 | $ 4.46 | $ 4.23 | $ 4.23 |
| High Growth & Low Price | 2015-2016 | Oct | $ 4.18 | $ 4.51 | $ 4.18 | $ 4.18 | $ 4.18 | $ 4.13 | $ 4.13 | $ 4.51 | $ 4.25 | $ 4.25 |
| High Growth & Low Price | 2016-2017 | Nov | $ 4.86 | $ 5.18 | $ 4.86 | $ 4.86 | $ 4.86 | $ 4.80 | $ 4.80 | $ 5.18 | $ 4.93 | $ 4.93 |
| High Growth & Low Price | 2016-2017 | Dec | $ 4.94 | $ 5.19 | $ 4.94 | $ 4.94 | $ 4.94 | $ 4.80 | $ 4.80 | $ 5.19 | $ 4.93 | $ 4.99 |
| High Growth & Low Price | 2016-2017 | Jan | $ 4.90 | $ 5.22 | $ 4.90 | $ 4.90 | $ 4.90 | $ 4.82 | $ 4.82 | $ 5.22 | $ 4.95 | $ 4.96 |
| High Growth & Low Price | 2016-2017 | Feb | $ 4.93 | $ 5.14 | $ 4.93 | $ 4.93 | $ 4.93 | $ 4.87 | $ 4.86 | $ 5.14 | $ 4.96 | $ 4.97 |
| High Growth & Low Price | 2016-2017 | Mar | $ 4.93 | $ 5.13 | $ 4.93 | $ 4.93 | $ 4.93 | $ 4.86 | $ 4.86 | $ 5.13 | $ 4.95 | $ 4.97 |
| High Growth & Low Price | 2016-2017 | Apr | $ 4.75 | $ 5.07 | $ 4.75 | $ 4.75 | $ 4.75 | $ 4.69 | $ 4.69 | $ 5.13 | $ 4.84 | $ 4.81 |
| High Growth & Low Price | 2016-2017 | May | $ 4.80 | $ 5.10 | $ 4.80 | $ 4.80 | $ 4.80 | $ 4.74 | $ 4.74 | $ 5.13 | $ 4.87 | $ 4.86 |
| High Growth & Low Price | 2016-2017 | Jun | $ 4.83 | $ 5.12 | $ 4.83 | $ 4.83 | $ 4.83 | $ 4.77 | $ 4.77 | $ 5.13 | $ 4.89 | $ 4.89 |
| High Growth & Low Price | 2016-2017 | Jul | $ 4.86 | $ 5.13 | $ 4.86 | $ 4.86 | $ 4.86 | $ 4.80 | $ 4.80 | $ 5.13 | $ 4.91 | $ 4.92 |
| High Growth & Low Price | 2016-2017 | Aug | $ 4.86 | $ 5.14 | $ 4.86 | $ 4.86 | $ 4.86 | $ 4.80 | $ 4.80 | $ 5.14 | $ 4.91 | $ 4.92 |
| High Growth & Low Price | 2016-2017 | Sep | $ 4.86 | $ 5.14 | $ 4.86 | $ 4.86 | $ 4.86 | $ 4.80 | $ 4.80 | $ 5.14 | $ 4.91 | $ 4.92 |
| High Growth & Low Price | 2016-2017 | Oct | $ 4.87 | $ 5.23 | $ 4.91 | $ 4.91 | $ 4.91 | $ 4.81 | $ 4.81 | $ 5.23 | $ 4.95 | $ 4.97 |
| High Growth & Low Price | 2017-2018 | Nov | $ 5.02 | $ 5.39 | $ 5.02 | $ 5.02 | $ 5.02 | $ 4.95 | $ 4.95 | $ 5.39 | $ 5.10 | $ 5.09 |
| High Growth & Low Price | 2017-2018 | Dec | $ 5.17 | $ 5.44 | $ 5.17 | $ 5.17 | $ 5.17 | $ 5.01 | $ 5.01 | $ 5.44 | $ 5.15 | $ 5.22 |
| High Growth & Low Price | 2017-2018 | Jan | $ 5.12 | $ 5.46 | $ 5.12 | $ 5.12 | $ 5.12 | $ 5.05 | $ 5.05 | $ 5.46 | $ 5.18 | $ 5.19 |
| High Growth & Low Price | 2017-2018 | Feb | $ 5.17 | $ 5.39 | $ 5.17 | $ 5.17 | $ 5.17 | $ 5.11 | $ 5.10 | $ 5.39 | $ 5.20 | $ 5.22 |
| High Growth & Low Price | 2017-2018 | Mar | $ 5.14 | $ 5.37 | $ 5.14 | $ 5.14 | $ 5.14 | $ 5.08 | $ 5.08 | $ 5.37 | $ 5.17 | $ 5.19 |
| High Growth & Low Price | 2017-2018 | Apr | $ 4.97 | $ 5.32 | $ 4.97 | $ 4.97 | $ 4.97 | $ 4.90 | $ 4.90 | $ 5.37 | $ 5.06 | $ 5.04 |
| High Growth & Low Price | 2017-2018 | May | $ 5.01 | $ 5.34 | $ 5.01 | $ 5.01 | $ 5.01 | $ 4.94 | $ 4.94 | $ 5.37 | $ 5.09 | $ 5.07 |
| High Growth & Low Price | 2017-2018 | Jun | $ 5.05 | $ 5.36 | $ 5.05 | $ 5.05 | $ 5.05 | $ 4.99 | $ 4.99 | $ 5.37 | $ 5.11 | $ 5.11 |
| High Growth & Low Price | 2017-2018 | Jul | $ 5.08 | $ 5.38 | $ 5.08 | $ 5.08 | $ 5.08 | $ 5.02 | $ 5.02 | $ 5.38 | $ 5.14 | $ 5.14 |
| High Growth & Low Price | 2017-2018 | Aug | $ 5.09 | $ 5.38 | $ 5.09 | $ 5.09 | $ 5.09 | $ 5.03 | $ 5.03 | $ 5.38 | $ 5.14 | $ 5.15 |
| High Growth & Low Price | 2017-2018 | Sep | $ 5.08 | $ 5.38 | $ 5.08 | $ 5.08 | $ 5.08 | $ 5.02 | $ 5.02 | $ 5.38 | $ 5.14 | $ 5.14 |
| High Growth & Low Price | 2017-2018 | Oct | $ 5.09 | $ 5.48 | $ 5.14 | $ 5.14 | $ 5.14 | $ 5.03 | $ 5.03 | $ 5.48 | $ 5.18 | $ 5.20 |
| High Growth & Low Price | 2018-2019 | Nov | $ 5.20 | $ 5.58 | $ 5.20 | $ 5.20 | $ 5.20 | $ 5.14 | $ 5.14 | $ 5.58 | $ 5.29 | $ 5.28 |
| High Growth & Low Price | 2018-2019 | Dec | $ 5.36 | $ 5.65 | $ 5.36 | $ 5.36 | $ 5.36 | $ 5.23 | $ 5.23 | $ 5.65 | $ 5.37 | $ 5.42 |
| High Growth & Low Price | 2018-2019 | Jan | $ 5.31 | $ 5.66 | $ 5.31 | $ 5.31 | $ 5.31 | $ 5.23 | $ 5.23 | $ 5.66 | $ 5.37 | $ 5.38 |
| High Growth & Low Price | 2018-2019 | Feb | $ 5.37 | $ 5.59 | $ 5.37 | $ 5.37 | $ 5.37 | $ 5.30 | $ 5.30 | $ 5.59 | $ 5.40 | $ 5.41 |
| High Growth & Low Price | 2018-2019 | Mar | $ 5.31 | $ 5.56 | $ 5.31 | $ 5.31 | $ 5.31 | $ 5.25 | $ 5.25 | $ 5.56 | $ 5.35 | $ 5.36 |
| High Growth & Low Price | 2018-2019 | Apr | $ 5.14 | $ 5.47 | $ 5.14 | $ 5.14 | $ 5.14 | $ 5.08 | $ 5.08 | $ 5.56 | $ 5.24 | $ 5.21 |
| High Growth & Low Price | 2018-2019 | May | $ 5.18 | $ 5.47 | $ 5.18 | $ 5.18 | $ 5.18 | $ 5.12 | $ 5.12 | $ 5.57 | $ 5.27 | $ 5.24 |
| High Growth & Low Price | 2018-2019 | Jun | $ 5.21 | $ 5.50 | $ 5.21 | $ 5.21 | $ 5.21 | $ 5.15 | $ 5.15 | $ 5.57 | $ 5.29 | $ 5.27 |
| High Growth & Low Price | 2018-2019 | Jul | $ 5.25 | $ 5.57 | $ 5.25 | $ 5.25 | $ 5.25 | $ 5.19 | $ 5.19 | $ 5.57 | $ 5.31 | $ 5.32 |
| High Growth & Low Price | 2018-2019 | Aug | $ 5.26 | $ 5.57 | $ 5.26 | $ 5.26 | $ 5.26 | $ 5.20 | $ 5.20 | $ 5.57 | $ 5.32 | $ 5.32 |

# APPENDIX 6.4 || HIGH GROWTH – LOW PRICE MONTHLY DETAIL

**Appendix 6.4 - Monthly Avoided Cost Detail 1/**
**2010$**

| Scenario | Gas Year | Month | Klam Falls | La Grande | Medford GTN | Medford NWP | Roseburg | WA/ID Both | WA/ID GTN | WA/ID NWP | WA/ID Annual | OR Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| High Growth & Low Price | 2018-2019 | Sep | $ 5.19 | $ 5.57 | $ 5.19 | $ 5.19 | $ 5.19 | $ 5.13 | $ 5.13 | $ 5.57 | $ 5.28 | $ 5.27 |
| High Growth & Low Price | 2018-2019 | Oct | $ 5.20 | $ 5.60 | $ 5.25 | $ 5.25 | $ 5.25 | $ 5.14 | $ 5.14 | $ 5.60 | $ 5.29 | $ 5.31 |
| High Growth & Low Price | 2019-2020 | Nov | $ 5.29 | $ 5.61 | $ 5.29 | $ 5.29 | $ 5.29 | $ 5.23 | $ 5.23 | $ 5.61 | $ 5.36 | $ 5.36 |
| High Growth & Low Price | 2019-2020 | Dec | $ 5.48 | $ 5.68 | $ 5.48 | $ 5.48 | $ 5.48 | $ 5.30 | $ 5.30 | $ 5.68 | $ 5.43 | $ 5.52 |
| High Growth & Low Price | 2019-2020 | Jan | $ 5.43 | $ 5.66 | $ 5.43 | $ 5.43 | $ 5.43 | $ 5.34 | $ 5.34 | $ 5.66 | $ 5.45 | $ 5.48 |
| High Growth & Low Price | 2019-2020 | Feb | $ 5.47 | $ 5.57 | $ 5.47 | $ 5.47 | $ 5.47 | $ 5.40 | $ 5.40 | $ 5.55 | $ 5.45 | $ 5.49 |
| High Growth & Low Price | 2019-2020 | Mar | $ 5.38 | $ 5.50 | $ 5.38 | $ 5.38 | $ 5.38 | $ 5.31 | $ 5.31 | $ 5.50 | $ 5.37 | $ 5.40 |
| High Growth & Low Price | 2019-2020 | Apr | $ 5.23 | $ 5.46 | $ 5.23 | $ 5.23 | $ 5.23 | $ 5.17 | $ 5.17 | $ 5.50 | $ 5.28 | $ 5.28 |
| High Growth & Low Price | 2019-2020 | May | $ 5.26 | $ 5.44 | $ 5.26 | $ 5.26 | $ 5.26 | $ 5.20 | $ 5.20 | $ 5.50 | $ 5.30 | $ 5.30 |
| High Growth & Low Price | 2019-2020 | Jun | $ 5.30 | $ 5.46 | $ 5.30 | $ 5.30 | $ 5.30 | $ 5.24 | $ 5.24 | $ 5.51 | $ 5.33 | $ 5.34 |
| High Growth & Low Price | 2019-2020 | Jul | $ 5.34 | $ 5.51 | $ 5.34 | $ 5.34 | $ 5.34 | $ 5.28 | $ 5.28 | $ 5.51 | $ 5.35 | $ 5.38 |
| High Growth & Low Price | 2019-2020 | Aug | $ 5.36 | $ 5.51 | $ 5.36 | $ 5.36 | $ 5.36 | $ 5.29 | $ 5.29 | $ 5.51 | $ 5.36 | $ 5.39 |
| High Growth & Low Price | 2019-2020 | Sep | $ 5.28 | $ 5.51 | $ 5.28 | $ 5.28 | $ 5.28 | $ 5.22 | $ 5.22 | $ 5.51 | $ 5.32 | $ 5.33 |
| High Growth & Low Price | 2019-2020 | Oct | $ 5.29 | $ 5.56 | $ 5.38 | $ 5.38 | $ 5.38 | $ 5.23 | $ 5.23 | $ 5.56 | $ 5.34 | $ 5.40 |
| High Growth & Low Price | 2020-2021 | Nov | $ 5.44 | $ 5.68 | $ 5.44 | $ 5.44 | $ 5.44 | $ 5.35 | $ 5.35 | $ 5.70 | $ 5.47 | $ 5.49 |
| High Growth & Low Price | 2020-2021 | Dec | $ 5.58 | $ 5.77 | $ 5.58 | $ 5.58 | $ 5.58 | $ 5.45 | $ 5.45 | $ 5.77 | $ 5.56 | $ 5.62 |
| High Growth & Low Price | 2020-2021 | Jan | $ 5.54 | $ 5.75 | $ 5.54 | $ 5.54 | $ 5.54 | $ 5.44 | $ 5.44 | $ 5.75 | $ 5.54 | $ 5.58 |
| High Growth & Low Price | 2020-2021 | Feb | $ 5.58 | $ 5.70 | $ 5.58 | $ 5.58 | $ 5.58 | $ 5.51 | $ 5.51 | $ 5.69 | $ 5.57 | $ 5.60 |
| High Growth & Low Price | 2020-2021 | Mar | $ 5.52 | $ 5.64 | $ 5.52 | $ 5.52 | $ 5.52 | $ 5.45 | $ 5.45 | $ 5.64 | $ 5.51 | $ 5.54 |
| High Growth & Low Price | 2020-2021 | Apr | $ 5.36 | $ 5.55 | $ 5.36 | $ 5.36 | $ 5.36 | $ 5.29 | $ 5.29 | $ 5.64 | $ 5.40 | $ 5.39 |
| High Growth & Low Price | 2020-2021 | May | $ 5.40 | $ 5.54 | $ 5.40 | $ 5.40 | $ 5.40 | $ 5.33 | $ 5.33 | $ 5.64 | $ 5.43 | $ 5.43 |
| High Growth & Low Price | 2020-2021 | Jun | $ 5.44 | $ 5.57 | $ 5.44 | $ 5.44 | $ 5.44 | $ 5.37 | $ 5.37 | $ 5.64 | $ 5.46 | $ 5.46 |
| High Growth & Low Price | 2020-2021 | Jul | $ 5.48 | $ 5.64 | $ 5.48 | $ 5.48 | $ 5.48 | $ 5.41 | $ 5.41 | $ 5.64 | $ 5.49 | $ 5.51 |
| High Growth & Low Price | 2020-2021 | Aug | $ 5.50 | $ 5.65 | $ 5.50 | $ 5.50 | $ 5.50 | $ 5.43 | $ 5.43 | $ 5.65 | $ 5.50 | $ 5.53 |
| High Growth & Low Price | 2020-2021 | Sep | $ 5.30 | $ 5.50 | $ 5.30 | $ 5.30 | $ 5.30 | $ 5.24 | $ 5.24 | $ 5.65 | $ 5.37 | $ 5.34 |
| High Growth & Low Price | 2020-2021 | Oct | $ 5.31 | $ 5.54 | $ 5.41 | $ 5.41 | $ 5.41 | $ 5.25 | $ 5.25 | $ 5.54 | $ 5.35 | $ 5.42 |
| High Growth & Low Price | 2021-2022 | Nov | $ 5.45 | $ 5.66 | $ 5.45 | $ 5.45 | $ 5.45 | $ 5.36 | $ 5.36 | $ 5.68 | $ 5.47 | $ 5.49 |
| High Growth & Low Price | 2021-2022 | Dec | $ 5.56 | $ 5.74 | $ 5.56 | $ 5.56 | $ 5.56 | $ 5.46 | $ 5.46 | $ 5.74 | $ 5.55 | $ 5.60 |
| High Growth & Low Price | 2021-2022 | Jan | $ 5.51 | $ 5.71 | $ 5.51 | $ 5.51 | $ 5.51 | $ 5.43 | $ 5.43 | $ 5.71 | $ 5.52 | $ 5.55 |
| High Growth & Low Price | 2021-2022 | Feb | $ 5.58 | $ 5.59 | $ 5.58 | $ 5.58 | $ 5.58 | $ 5.49 | $ 5.49 | $ 5.55 | $ 5.51 | $ 5.58 |
| High Growth & Low Price | 2021-2022 | Mar | $ 5.37 | $ 5.47 | $ 5.37 | $ 5.37 | $ 5.37 | $ 5.30 | $ 5.30 | $ 5.47 | $ 5.36 | $ 5.39 |
| High Growth & Low Price | 2021-2022 | Apr | $ 5.24 | $ 5.39 | $ 5.24 | $ 5.24 | $ 5.24 | $ 5.18 | $ 5.18 | $ 5.47 | $ 5.28 | $ 5.27 |
| High Growth & Low Price | 2021-2022 | May | $ 5.28 | $ 5.40 | $ 5.28 | $ 5.28 | $ 5.28 | $ 5.22 | $ 5.22 | $ 5.48 | $ 5.30 | $ 5.31 |
| High Growth & Low Price | 2021-2022 | Jun | $ 5.31 | $ 5.43 | $ 5.31 | $ 5.31 | $ 5.31 | $ 5.25 | $ 5.25 | $ 5.48 | $ 5.32 | $ 5.34 |
| High Growth & Low Price | 2021-2022 | Jul | $ 5.34 | $ 5.48 | $ 5.34 | $ 5.34 | $ 5.34 | $ 5.28 | $ 5.28 | $ 5.48 | $ 5.35 | $ 5.37 |
| High Growth & Low Price | 2021-2022 | Aug | $ 5.37 | $ 5.48 | $ 5.37 | $ 5.37 | $ 5.37 | $ 5.30 | $ 5.30 | $ 5.48 | $ 5.36 | $ 5.39 |
| High Growth & Low Price | 2021-2022 | Sep | $ 5.32 | $ 5.46 | $ 5.32 | $ 5.32 | $ 5.32 | $ 5.26 | $ 5.26 | $ 5.49 | $ 5.33 | $ 5.35 |
| High Growth & Low Price | 2021-2022 | Oct | $ 5.31 | $ 5.49 | $ 5.44 | $ 5.44 | $ 5.44 | $ 5.25 | $ 5.25 | $ 5.49 | $ 5.33 | $ 5.43 |
| High Growth & Low Price | 2022-2023 | Nov | $ 5.50 | $ 5.64 | $ 5.50 | $ 5.50 | $ 5.50 | $ 5.40 | $ 5.40 | $ 5.66 | $ 5.49 | $ 5.53 |
| High Growth & Low Price | 2022-2023 | Dec | $ 5.64 | $ 5.73 | $ 5.64 | $ 5.64 | $ 5.64 | $ 5.49 | $ 5.49 | $ 5.73 | $ 5.57 | $ 5.65 |
| High Growth & Low Price | 2022-2023 | Jan | $ 5.59 | $ 5.71 | $ 5.59 | $ 5.59 | $ 5.59 | $ 5.45 | $ 5.45 | $ 5.71 | $ 5.54 | $ 5.62 |
| High Growth & Low Price | 2022-2023 | Feb | $ 5.62 | $ 5.67 | $ 5.62 | $ 5.62 | $ 5.62 | $ 5.52 | $ 5.52 | $ 5.66 | $ 5.57 | $ 5.63 |
| High Growth & Low Price | 2022-2023 | Mar | $ 5.54 | $ 5.57 | $ 5.54 | $ 5.54 | $ 5.54 | $ 5.47 | $ 5.47 | $ 5.57 | $ 5.51 | $ 5.55 |
| High Growth & Low Price | 2022-2023 | Apr | $ 5.42 | $ 5.49 | $ 5.42 | $ 5.42 | $ 5.42 | $ 5.35 | $ 5.35 | $ 5.58 | $ 5.42 | $ 5.43 |
| High Growth & Low Price | 2022-2023 | May | $ 5.47 | $ 5.51 | $ 5.47 | $ 5.47 | $ 5.47 | $ 5.40 | $ 5.40 | $ 5.58 | $ 5.46 | $ 5.48 |
| High Growth & Low Price | 2022-2023 | Jun | $ 5.52 | $ 5.53 | $ 5.50 | $ 5.50 | $ 5.50 | $ 5.45 | $ 5.45 | $ 5.58 | $ 5.49 | $ 5.51 |
| High Growth & Low Price | 2022-2023 | Jul | $ 5.55 | $ 5.58 | $ 5.55 | $ 5.55 | $ 5.55 | $ 5.48 | $ 5.48 | $ 5.58 | $ 5.51 | $ 5.56 |
| High Growth & Low Price | 2022-2023 | Aug | $ 5.57 | $ 5.58 | $ 5.56 | $ 5.56 | $ 5.56 | $ 5.50 | $ 5.50 | $ 5.58 | $ 5.53 | $ 5.57 |
| High Growth & Low Price | 2022-2023 | Sep | $ 5.41 | $ 5.50 | $ 5.41 | $ 5.41 | $ 5.41 | $ 5.34 | $ 5.34 | $ 5.59 | $ 5.42 | $ 5.43 |
| High Growth & Low Price | 2022-2023 | Oct | $ 5.41 | $ 5.53 | $ 5.48 | $ 5.48 | $ 5.48 | $ 5.34 | $ 5.34 | $ 5.53 | $ 5.40 | $ 5.48 |
| High Growth & Low Price | 2023-2024 | Nov | $ 5.54 | $ 5.64 | $ 5.54 | $ 5.54 | $ 5.54 | $ 5.45 | $ 5.45 | $ 5.65 | $ 5.52 | $ 5.56 |
| High Growth & Low Price | 2023-2024 | Dec | $ 5.65 | $ 5.72 | $ 5.65 | $ 5.65 | $ 5.65 | $ 5.53 | $ 5.53 | $ 5.72 | $ 5.59 | $ 5.67 |
| High Growth & Low Price | 2023-2024 | Jan | $ 5.59 | $ 5.66 | $ 5.59 | $ 5.59 | $ 5.59 | $ 5.50 | $ 5.50 | $ 5.66 | $ 5.55 | $ 5.60 |
| High Growth & Low Price | 2023-2024 | Feb | $ 5.66 | $ 5.63 | $ 5.66 | $ 5.66 | $ 5.66 | $ 5.55 | $ 5.55 | $ 5.55 | $ 5.55 | $ 5.65 |
| High Growth & Low Price | 2023-2024 | Mar | $ 5.40 | $ 5.41 | $ 5.40 | $ 5.40 | $ 5.40 | $ 5.33 | $ 5.33 | $ 5.41 | $ 5.36 | $ 5.40 |
| High Growth & Low Price | 2023-2024 | Apr | $ 5.27 | $ 5.34 | $ 5.27 | $ 5.27 | $ 5.27 | $ 5.21 | $ 5.21 | $ 5.41 | $ 5.28 | $ 5.29 |
| High Growth & Low Price | 2023-2024 | May | $ 5.29 | $ 5.33 | $ 5.33 | $ 5.33 | $ 5.33 | $ 5.23 | $ 5.23 | $ 5.41 | $ 5.29 | $ 5.32 |
| High Growth & Low Price | 2023-2024 | Jun | $ 5.37 | $ 5.33 | $ 5.33 | $ 5.33 | $ 5.33 | $ 5.30 | $ 5.30 | $ 5.42 | $ 5.34 | $ 5.34 |
| High Growth & Low Price | 2023-2024 | Jul | $ 5.40 | $ 5.40 | $ 5.40 | $ 5.40 | $ 5.40 | $ 5.33 | $ 5.33 | $ 5.42 | $ 5.36 | $ 5.40 |
| High Growth & Low Price | 2023-2024 | Aug | $ 5.42 | $ 5.42 | $ 5.42 | $ 5.42 | $ 5.42 | $ 5.35 | $ 5.35 | $ 5.42 | $ 5.37 | $ 5.42 |
| High Growth & Low Price | 2023-2024 | Sep | $ 5.37 | $ 5.40 | $ 5.34 | $ 5.34 | $ 5.34 | $ 5.30 | $ 5.30 | $ 5.42 | $ 5.34 | $ 5.36 |
| High Growth & Low Price | 2023-2024 | Oct | $ 5.38 | $ 5.45 | $ 5.45 | $ 5.45 | $ 5.45 | $ 5.31 | $ 5.31 | $ 5.45 | $ 5.36 | $ 5.44 |
| High Growth & Low Price | 2024-2025 | Nov | $ 5.52 | $ 5.56 | $ 5.52 | $ 5.52 | $ 5.52 | $ 5.42 | $ 5.42 | $ 5.60 | $ 5.48 | $ 5.53 |
| High Growth & Low Price | 2024-2025 | Dec | $ 5.69 | $ 5.67 | $ 5.69 | $ 5.69 | $ 5.69 | $ 5.50 | $ 5.50 | $ 5.67 | $ 5.56 | $ 5.69 |
| High Growth & Low Price | 2024-2025 | Jan | $ 5.64 | $ 5.65 | $ 5.64 | $ 5.64 | $ 5.64 | $ 5.47 | $ 5.47 | $ 5.65 | $ 5.53 | $ 5.65 |
| High Growth & Low Price | 2024-2025 | Feb | $ 5.69 | $ 5.65 | $ 5.69 | $ 5.69 | $ 5.69 | $ 5.53 | $ 5.53 | $ 5.56 | $ 5.54 | $ 5.68 |
| High Growth & Low Price | 2024-2025 | Mar | $ 5.50 | $ 5.49 | $ 5.50 | $ 5.50 | $ 5.50 | $ 5.43 | $ 5.43 | $ 5.44 | $ 5.43 | $ 5.50 |
| High Growth & Low Price | 2024-2025 | Apr | $ 5.37 | $ 5.39 | $ 5.37 | $ 5.37 | $ 5.37 | $ 5.30 | $ 5.30 | $ 5.44 | $ 5.35 | $ 5.37 |
| High Growth & Low Price | 2024-2025 | May | $ 5.39 | $ 5.40 | $ 5.40 | $ 5.40 | $ 5.40 | $ 5.32 | $ 5.32 | $ 5.44 | $ 5.36 | $ 5.39 |
| High Growth & Low Price | 2024-2025 | Jun | $ 5.44 | $ 5.40 | $ 5.40 | $ 5.40 | $ 5.40 | $ 5.37 | $ 5.37 | $ 5.45 | $ 5.39 | $ 5.41 |
| High Growth & Low Price | 2024-2025 | Jul | $ 5.49 | $ 5.45 | $ 5.45 | $ 5.45 | $ 5.45 | $ 5.43 | $ 5.43 | $ 5.45 | $ 5.44 | $ 5.46 |
| High Growth & Low Price | 2024-2025 | Aug | $ 5.50 | $ 5.45 | $ 5.45 | $ 5.45 | $ 5.45 | $ 5.45 | $ 5.45 | $ 5.45 | $ 5.45 | $ 5.46 |
| High Growth & Low Price | 2024-2025 | Sep | $ 5.42 | $ 5.41 | $ 5.41 | $ 5.41 | $ 5.41 | $ 5.35 | $ 5.35 | $ 5.45 | $ 5.38 | $ 5.41 |
| High Growth & Low Price | 2024-2025 | Oct | $ 5.43 | $ 5.44 | $ 5.44 | $ 5.44 | $ 5.44 | $ 5.36 | $ 5.36 | $ 5.44 | $ 5.39 | $ 5.44 |
| High Growth & Low Price | 2025-2026 | Nov | $ 5.74 | $ 5.80 | $ 5.74 | $ 5.74 | $ 5.74 | $ 5.54 | $ 5.54 | $ 5.85 | $ 5.64 | $ 5.75 |
| High Growth & Low Price | 2025-2026 | Dec | $ 5.91 | $ 5.90 | $ 5.91 | $ 5.91 | $ 5.91 | $ 5.63 | $ 5.63 | $ 5.91 | $ 5.72 | $ 5.90 |
| High Growth & Low Price | 2025-2026 | Jan | $ 5.89 | $ 5.90 | $ 5.89 | $ 5.89 | $ 5.89 | $ 5.59 | $ 5.59 | $ 5.90 | $ 5.69 | $ 5.89 |
| High Growth & Low Price | 2025-2026 | Feb | $ 5.95 | $ 5.92 | $ 5.95 | $ 5.95 | $ 5.95 | $ 5.67 | $ 5.67 | $ 5.79 | $ 5.71 | $ 5.94 |
| High Growth & Low Price | 2025-2026 | Mar | $ 5.56 | $ 5.66 | $ 5.56 | $ 5.56 | $ 5.56 | $ 5.46 | $ 5.46 | $ 5.66 | $ 5.53 | $ 5.58 |
| High Growth & Low Price | 2025-2026 | Apr | $ 5.40 | $ 5.56 | $ 5.40 | $ 5.40 | $ 5.40 | $ 5.33 | $ 5.33 | $ 5.67 | $ 5.44 | $ 5.43 |
| High Growth & Low Price | 2025-2026 | May | $ 5.43 | $ 5.57 | $ 5.49 | $ 5.49 | $ 5.49 | $ 5.36 | $ 5.36 | $ 5.67 | $ 5.46 | $ 5.49 |
| High Growth & Low Price | 2025-2026 | Jun | $ 5.49 | $ 5.60 | $ 5.49 | $ 5.49 | $ 5.49 | $ 5.42 | $ 5.42 | $ 5.67 | $ 5.50 | $ 5.51 |
| High Growth & Low Price | 2025-2026 | Jul | $ 5.52 | $ 5.67 | $ 5.52 | $ 5.52 | $ 5.52 | $ 5.45 | $ 5.45 | $ 5.67 | $ 5.52 | $ 5.55 |
| High Growth & Low Price | 2025-2026 | Aug | $ 5.54 | $ 5.68 | $ 5.54 | $ 5.54 | $ 5.54 | $ 5.47 | $ 5.47 | $ 5.68 | $ 5.54 | $ 5.57 |
| High Growth & Low Price | 2025-2026 | Sep | $ 5.50 | $ 5.68 | $ 5.50 | $ 5.50 | $ 5.50 | $ 5.43 | $ 5.43 | $ 5.68 | $ 5.51 | $ 5.54 |
| High Growth & Low Price | 2025-2026 | Oct | $ 5.50 | $ 5.70 | $ 5.64 | $ 5.64 | $ 5.64 | $ 5.43 | $ 5.43 | $ 5.70 | $ 5.52 | $ 5.63 |
| High Growth & Low Price | 2026-2027 | Nov | $ 5.77 | $ 5.83 | $ 5.77 | $ 5.77 | $ 5.77 | $ 5.56 | $ 5.56 | $ 5.87 | $ 5.66 | $ 5.79 |
| High Growth & Low Price | 2026-2027 | Dec | $ 5.92 | $ 5.91 | $ 5.92 | $ 5.92 | $ 5.92 | $ 5.66 | $ 5.66 | $ 5.91 | $ 5.74 | $ 5.92 |
| High Growth & Low Price | 2026-2027 | Jan | $ 5.89 | $ 5.89 | $ 5.89 | $ 5.89 | $ 5.89 | $ 5.61 | $ 5.61 | $ 5.90 | $ 5.71 | $ 5.89 |
| High Growth & Low Price | 2026-2027 | Feb | $ 5.94 | $ 5.92 | $ 5.94 | $ 5.94 | $ 5.94 | $ 5.68 | $ 5.68 | $ 5.72 | $ 5.70 | $ 5.94 |

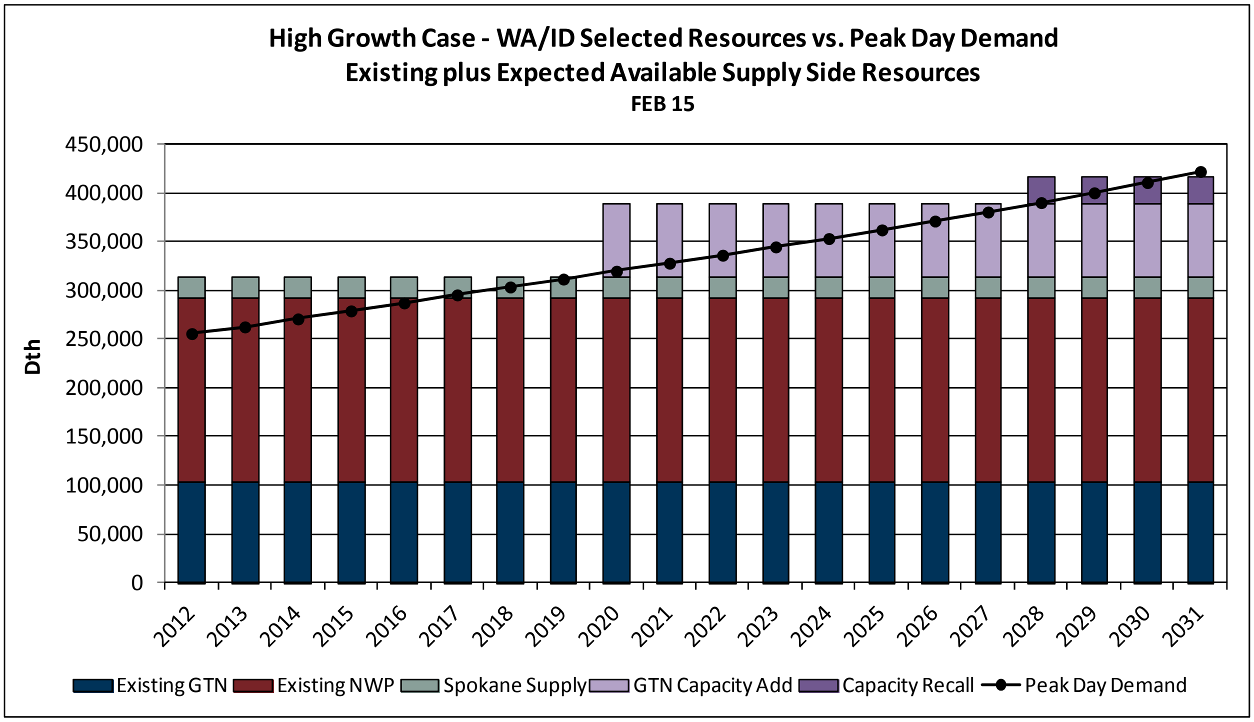
# APPENDIX 6.4 ‖ HIGH GROWTH – LOW PRICE MONTHLY DETAIL

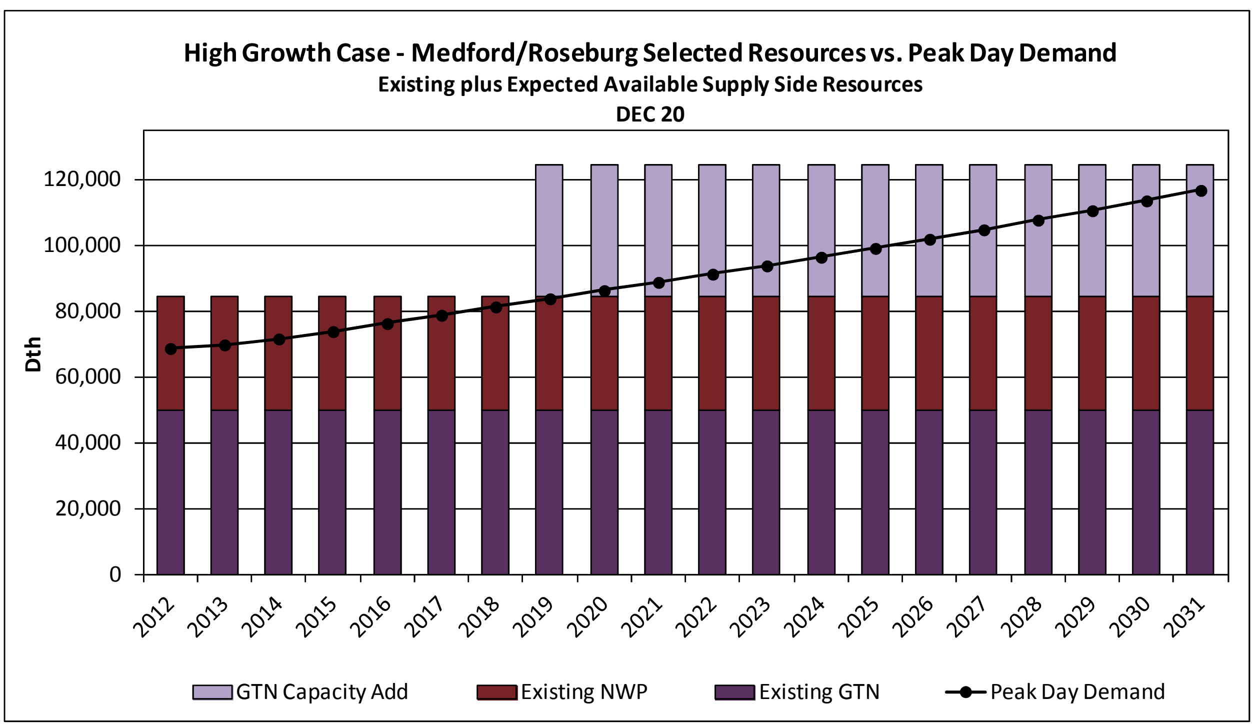
**Appendix 6.4 - Monthly Avoided Cost Detail 1/**
**2010$**

| Scenario | Gas Year | Month | Klam Falls | La Grande | Medford GTN | Medford NWP | Roseburg | WA/ID Both | WA/ID GTN | WA/ID NWP | WA/ID Annual | OR Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| High Growth & Low Price | 2026-2027 | Mar | $ 5.52 | $ 5.58 | $ 5.52 | $ 5.52 | $ 5.52 | $ 5.41 | $ 5.41 | $ 5.58 | $ 5.47 | $ 5.53 |
| High Growth & Low Price | 2026-2027 | Apr | $ 5.33 | $ 5.47 | $ 5.33 | $ 5.33 | $ 5.33 | $ 5.27 | $ 5.27 | $ 5.59 | $ 5.37 | $ 5.36 |
| High Growth & Low Price | 2026-2027 | May | $ 5.37 | $ 5.50 | $ 5.45 | $ 5.45 | $ 5.45 | $ 5.30 | $ 5.30 | $ 5.59 | $ 5.39 | $ 5.44 |
| High Growth & Low Price | 2026-2027 | Jun | $ 5.42 | $ 5.52 | $ 5.42 | $ 5.42 | $ 5.42 | $ 5.35 | $ 5.35 | $ 5.59 | $ 5.43 | $ 5.44 |
| High Growth & Low Price | 2026-2027 | Jul | $ 5.45 | $ 5.59 | $ 5.45 | $ 5.45 | $ 5.45 | $ 5.38 | $ 5.38 | $ 5.59 | $ 5.45 | $ 5.48 |
| High Growth & Low Price | 2026-2027 | Aug | $ 5.47 | $ 5.59 | $ 5.47 | $ 5.47 | $ 5.47 | $ 5.40 | $ 5.40 | $ 5.59 | $ 5.46 | $ 5.49 |
| High Growth & Low Price | 2026-2027 | Sep | $ 5.45 | $ 5.60 | $ 5.45 | $ 5.45 | $ 5.45 | $ 5.38 | $ 5.38 | $ 5.60 | $ 5.45 | $ 5.48 |
| High Growth & Low Price | 2026-2027 | Oct | $ 5.45 | $ 5.62 | $ 5.58 | $ 5.58 | $ 5.58 | $ 5.38 | $ 5.38 | $ 5.62 | $ 5.46 | $ 5.56 |
| High Growth & Low Price | 2027-2028 | Nov | $ 5.74 | $ 5.77 | $ 5.74 | $ 5.74 | $ 5.74 | $ 5.53 | $ 5.53 | $ 5.82 | $ 5.63 | $ 5.75 |
| High Growth & Low Price | 2027-2028 | Dec | $ 5.86 | $ 5.84 | $ 5.86 | $ 5.86 | $ 5.86 | $ 5.62 | $ 5.62 | $ 5.84 | $ 5.69 | $ 5.86 |
| High Growth & Low Price | 2027-2028 | Jan | $ 5.83 | $ 5.83 | $ 5.83 | $ 5.83 | $ 5.83 | $ 5.59 | $ 5.59 | $ 5.83 | $ 5.67 | $ 5.83 |
| High Growth & Low Price | 2027-2028 | Feb | $ 5.87 | $ 5.85 | $ 5.87 | $ 5.87 | $ 5.87 | $ 5.67 | $ 5.67 | $ 5.73 | $ 5.69 | $ 5.87 |
| High Growth & Low Price | 2027-2028 | Mar | $ 5.55 | $ 5.56 | $ 5.55 | $ 5.55 | $ 5.55 | $ 5.45 | $ 5.45 | $ 5.58 | $ 5.49 | $ 5.56 |
| High Growth & Low Price | 2027-2028 | Apr | $ 5.38 | $ 5.48 | $ 5.38 | $ 5.38 | $ 5.38 | $ 5.31 | $ 5.31 | $ 5.60 | $ 5.40 | $ 5.40 |
| High Growth & Low Price | 2027-2028 | May | $ 5.43 | $ 5.50 | $ 5.47 | $ 5.47 | $ 5.47 | $ 5.36 | $ 5.36 | $ 5.60 | $ 5.44 | $ 5.47 |
| High Growth & Low Price | 2027-2028 | Jun | $ 5.46 | $ 5.53 | $ 5.46 | $ 5.46 | $ 5.46 | $ 5.39 | $ 5.39 | $ 5.60 | $ 5.46 | $ 5.47 |
| High Growth & Low Price | 2027-2028 | Jul | $ 5.50 | $ 5.60 | $ 5.50 | $ 5.50 | $ 5.50 | $ 5.43 | $ 5.43 | $ 5.60 | $ 5.49 | $ 5.52 |
| High Growth & Low Price | 2027-2028 | Aug | $ 5.52 | $ 5.63 | $ 5.52 | $ 5.52 | $ 5.52 | $ 5.45 | $ 5.45 | $ 5.63 | $ 5.51 | $ 5.54 |
| High Growth & Low Price | 2027-2028 | Sep | $ 5.48 | $ 5.59 | $ 5.48 | $ 5.48 | $ 5.48 | $ 5.41 | $ 5.41 | $ 5.61 | $ 5.48 | $ 5.50 |
| High Growth & Low Price | 2027-2028 | Oct | $ 5.49 | $ 5.61 | $ 5.61 | $ 5.61 | $ 5.61 | $ 5.42 | $ 5.42 | $ 5.61 | $ 5.48 | $ 5.59 |
| High Growth & Low Price | 2028-2029 | Nov | $ 5.82 | $ 5.83 | $ 5.82 | $ 5.82 | $ 5.82 | $ 5.58 | $ 5.58 | $ 5.94 | $ 5.70 | $ 5.82 |
| High Growth & Low Price | 2028-2029 | Dec | $ 5.95 | $ 5.95 | $ 5.95 | $ 5.95 | $ 5.95 | $ 5.69 | $ 5.69 | $ 5.96 | $ 5.78 | $ 5.95 |
| High Growth & Low Price | 2028-2029 | Jan | $ 5.94 | $ 5.94 | $ 5.94 | $ 5.94 | $ 5.94 | $ 5.64 | $ 5.64 | $ 5.94 | $ 5.74 | $ 5.94 |
| High Growth & Low Price | 2028-2029 | Feb | $ 5.91 | $ 5.88 | $ 5.91 | $ 5.91 | $ 5.91 | $ 5.72 | $ 5.72 | $ 5.76 | $ 5.73 | $ 5.90 |
| High Growth & Low Price | 2028-2029 | Mar | $ 5.59 | $ 5.59 | $ 5.59 | $ 5.59 | $ 5.59 | $ 5.52 | $ 5.52 | $ 5.61 | $ 5.55 | $ 5.59 |
| High Growth & Low Price | 2028-2029 | Apr | $ 5.49 | $ 5.49 | $ 5.49 | $ 5.49 | $ 5.49 | $ 5.42 | $ 5.42 | $ 5.61 | $ 5.49 | $ 5.49 |
| High Growth & Low Price | 2028-2029 | May | $ 5.45 | $ 5.49 | $ 5.49 | $ 5.49 | $ 5.49 | $ 5.38 | $ 5.38 | $ 5.61 | $ 5.46 | $ 5.48 |
| High Growth & Low Price | 2028-2029 | Jun | $ 5.49 | $ 5.52 | $ 5.49 | $ 5.49 | $ 5.49 | $ 5.42 | $ 5.42 | $ 5.62 | $ 5.49 | $ 5.49 |
| High Growth & Low Price | 2028-2029 | Jul | $ 5.53 | $ 5.61 | $ 5.53 | $ 5.53 | $ 5.53 | $ 5.46 | $ 5.46 | $ 5.62 | $ 5.51 | $ 5.55 |
| High Growth & Low Price | 2028-2029 | Aug | $ 5.55 | $ 5.64 | $ 5.55 | $ 5.55 | $ 5.55 | $ 5.48 | $ 5.48 | $ 5.64 | $ 5.53 | $ 5.57 |
| High Growth & Low Price | 2028-2029 | Sep | $ 5.54 | $ 5.62 | $ 5.54 | $ 5.54 | $ 5.54 | $ 5.47 | $ 5.47 | $ 5.62 | $ 5.52 | $ 5.56 |
| High Growth & Low Price | 2028-2029 | Oct | $ 5.54 | $ 5.64 | $ 5.64 | $ 5.64 | $ 5.64 | $ 5.47 | $ 5.47 | $ 5.64 | $ 5.53 | $ 5.62 |
| High Growth & Low Price | 2029-2030 | Nov | $ 5.96 | $ 5.96 | $ 5.96 | $ 5.96 | $ 5.96 | $ 5.62 | $ 5.62 | $ 6.12 | $ 5.79 | $ 5.96 |
| High Growth & Low Price | 2029-2030 | Dec | $ 6.12 | $ 6.12 | $ 6.12 | $ 6.12 | $ 6.12 | $ 5.85 | $ 5.84 | $ 6.14 | $ 5.94 | $ 6.12 |
| High Growth & Low Price | 2029-2030 | Jan | $ 6.12 | $ 6.12 | $ 6.12 | $ 6.12 | $ 6.12 | $ 5.69 | $ 5.69 | $ 6.12 | $ 5.84 | $ 6.12 |
| High Growth & Low Price | 2029-2030 | Feb | $ 5.93 | $ 5.88 | $ 5.93 | $ 5.93 | $ 5.93 | $ 5.77 | $ 5.76 | $ 5.77 | $ 5.77 | $ 5.92 |
| High Growth & Low Price | 2029-2030 | Mar | $ 5.56 | $ 5.56 | $ 5.56 | $ 5.56 | $ 5.56 | $ 5.47 | $ 5.47 | $ 5.61 | $ 5.52 | $ 5.56 |
| High Growth & Low Price | 2029-2030 | Apr | $ 5.52 | $ 5.52 | $ 5.52 | $ 5.52 | $ 5.52 | $ 5.45 | $ 5.45 | $ 5.61 | $ 5.51 | $ 5.52 |
| High Growth & Low Price | 2029-2030 | May | $ 5.42 | $ 5.48 | $ 5.48 | $ 5.48 | $ 5.48 | $ 5.35 | $ 5.35 | $ 5.61 | $ 5.44 | $ 5.47 |
| High Growth & Low Price | 2029-2030 | Jun | $ 5.47 | $ 5.48 | $ 5.48 | $ 5.48 | $ 5.48 | $ 5.40 | $ 5.40 | $ 5.62 | $ 5.47 | $ 5.48 |
| High Growth & Low Price | 2029-2030 | Jul | $ 5.53 | $ 5.55 | $ 5.53 | $ 5.53 | $ 5.53 | $ 5.46 | $ 5.46 | $ 5.62 | $ 5.51 | $ 5.53 |
| High Growth & Low Price | 2029-2030 | Aug | $ 5.54 | $ 5.57 | $ 5.54 | $ 5.54 | $ 5.54 | $ 5.47 | $ 5.47 | $ 5.62 | $ 5.52 | $ 5.55 |
| High Growth & Low Price | 2029-2030 | Sep | $ 5.54 | $ 5.59 | $ 5.59 | $ 5.59 | $ 5.59 | $ 5.47 | $ 5.47 | $ 5.62 | $ 5.52 | $ 5.58 |
| High Growth & Low Price | 2029-2030 | Oct | $ 5.55 | $ 5.62 | $ 5.62 | $ 5.62 | $ 5.62 | $ 5.48 | $ 5.48 | $ 5.62 | $ 5.53 | $ 5.61 |
| High Growth & Low Price | 2030-2031 | Nov | $ 6.02 | $ 6.02 | $ 6.02 | $ 6.02 | $ 6.02 | $ 5.62 | $ 5.62 | $ 6.24 | $ 5.83 | $ 6.02 |
| High Growth & Low Price | 2030-2031 | Dec | $ 6.17 | $ 6.18 | $ 6.18 | $ 6.18 | $ 6.18 | $ 5.90 | $ 5.89 | $ 6.26 | $ 6.02 | $ 6.18 |
| High Growth & Low Price | 2030-2031 | Jan | $ 6.18 | $ 6.18 | $ 6.18 | $ 6.18 | $ 6.18 | $ 5.77 | $ 5.77 | $ 6.24 | $ 5.93 | $ 6.18 |
| High Growth & Low Price | 2030-2031 | Feb | $ 6.03 | $ 5.89 | $ 6.03 | $ 6.03 | $ 6.03 | $ 5.81 | $ 5.81 | $ 5.81 | $ 5.81 | $ 6.00 |
| High Growth & Low Price | 2030-2031 | Mar | $ 5.65 | $ 5.65 | $ 5.65 | $ 5.65 | $ 5.65 | $ 5.57 | $ 5.57 | $ 5.65 | $ 5.60 | $ 5.65 |
| High Growth & Low Price | 2030-2031 | Apr | $ 5.62 | $ 5.62 | $ 5.62 | $ 5.62 | $ 5.62 | $ 5.55 | $ 5.55 | $ 5.65 | $ 5.59 | $ 5.62 |
| High Growth & Low Price | 2030-2031 | May | $ 5.52 | $ 5.59 | $ 5.59 | $ 5.59 | $ 5.59 | $ 5.45 | $ 5.45 | $ 5.65 | $ 5.52 | $ 5.57 |
| High Growth & Low Price | 2030-2031 | Jun | $ 5.59 | $ 5.59 | $ 5.59 | $ 5.59 | $ 5.59 | $ 5.52 | $ 5.52 | $ 5.66 | $ 5.57 | $ 5.59 |
| High Growth & Low Price | 2030-2031 | Jul | $ 5.63 | $ 5.63 | $ 5.63 | $ 5.63 | $ 5.63 | $ 5.56 | $ 5.56 | $ 5.66 | $ 5.59 | $ 5.63 |
| High Growth & Low Price | 2030-2031 | Aug | $ 5.65 | $ 5.65 | $ 5.65 | $ 5.65 | $ 5.65 | $ 5.58 | $ 5.58 | $ 5.66 | $ 5.61 | $ 5.65 |
| High Growth & Low Price | 2030-2031 | Sep | $ 5.64 | $ 5.65 | $ 5.65 | $ 5.65 | $ 5.65 | $ 5.57 | $ 5.57 | $ 5.66 | $ 5.60 | $ 5.65 |
| High Growth & Low Price | 2030-2031 | Oct | $ 5.65 | $ 5.68 | $ 5.68 | $ 5.68 | $ 5.68 | $ 5.58 | $ 5.58 | $ 5.68 | $ 5.62 | $ 5.68 |

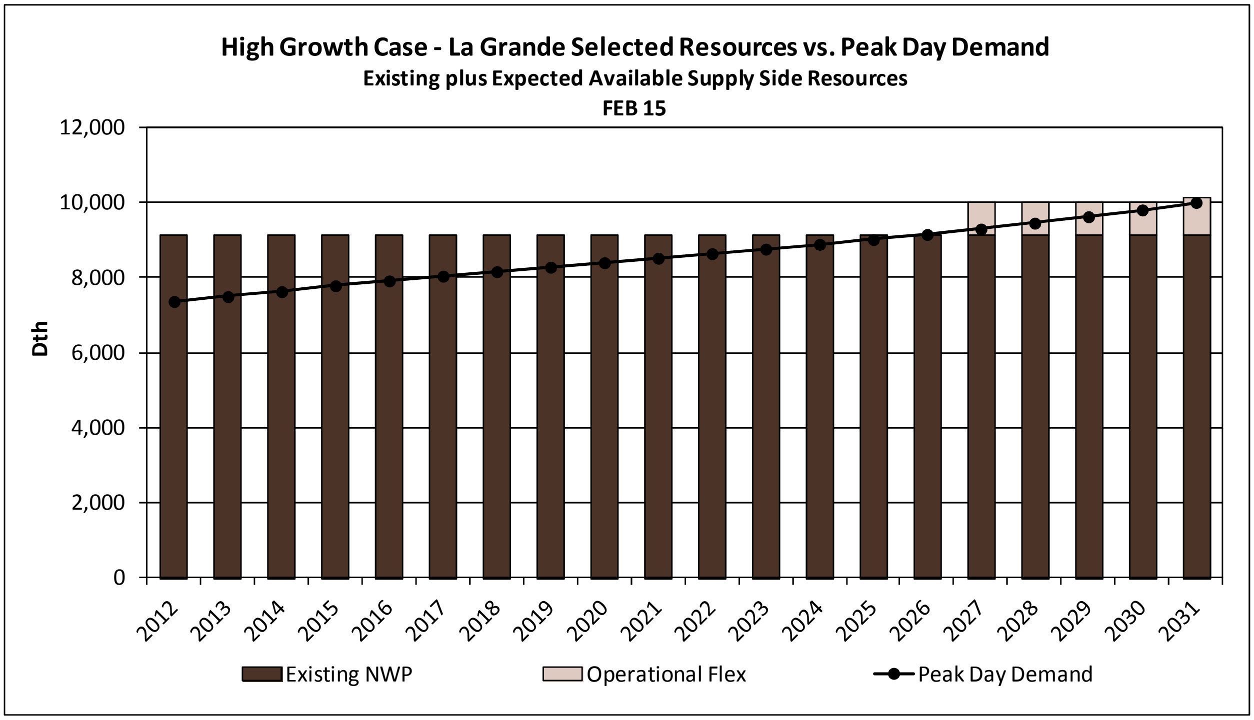
1/ Avoided costs shown before Environmental Externalities adder.

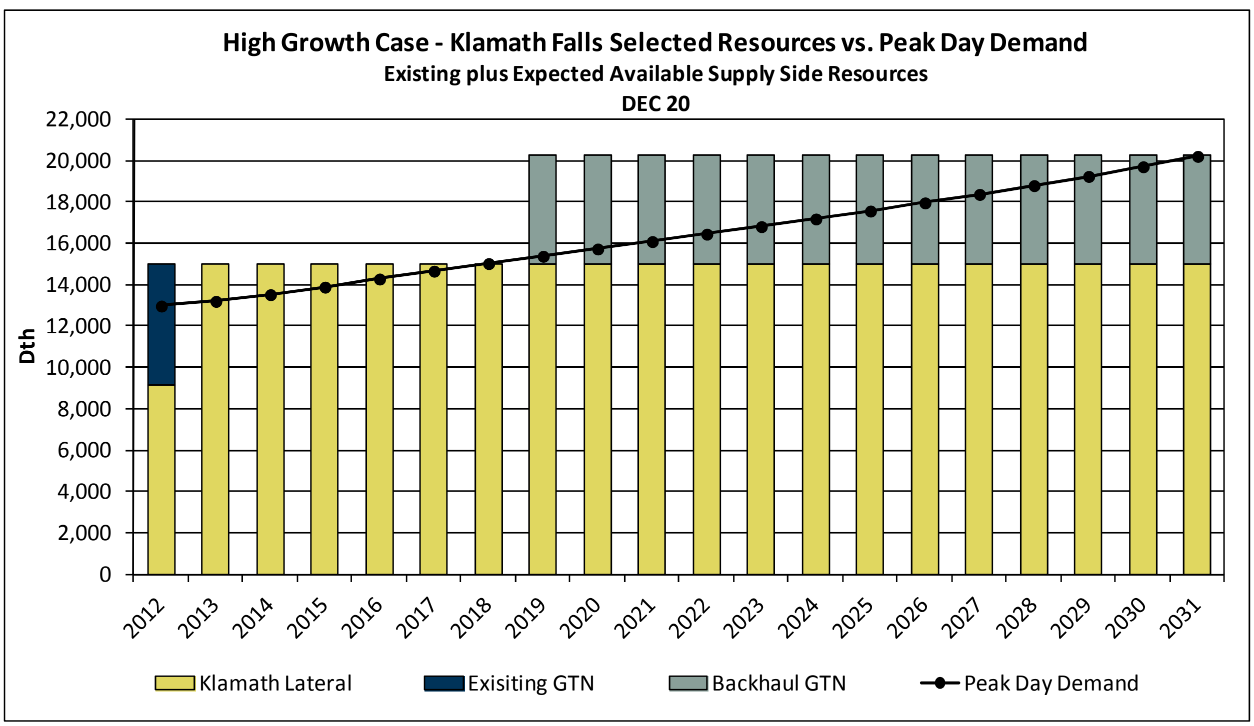
# APPENDIX 7.1 ‖ HIGH GROWTH CASES
# SELECTED RESOURCES VS. PEAK DAY DEMAND
# EXISTING PLUS EXPECTED AVAILABLE



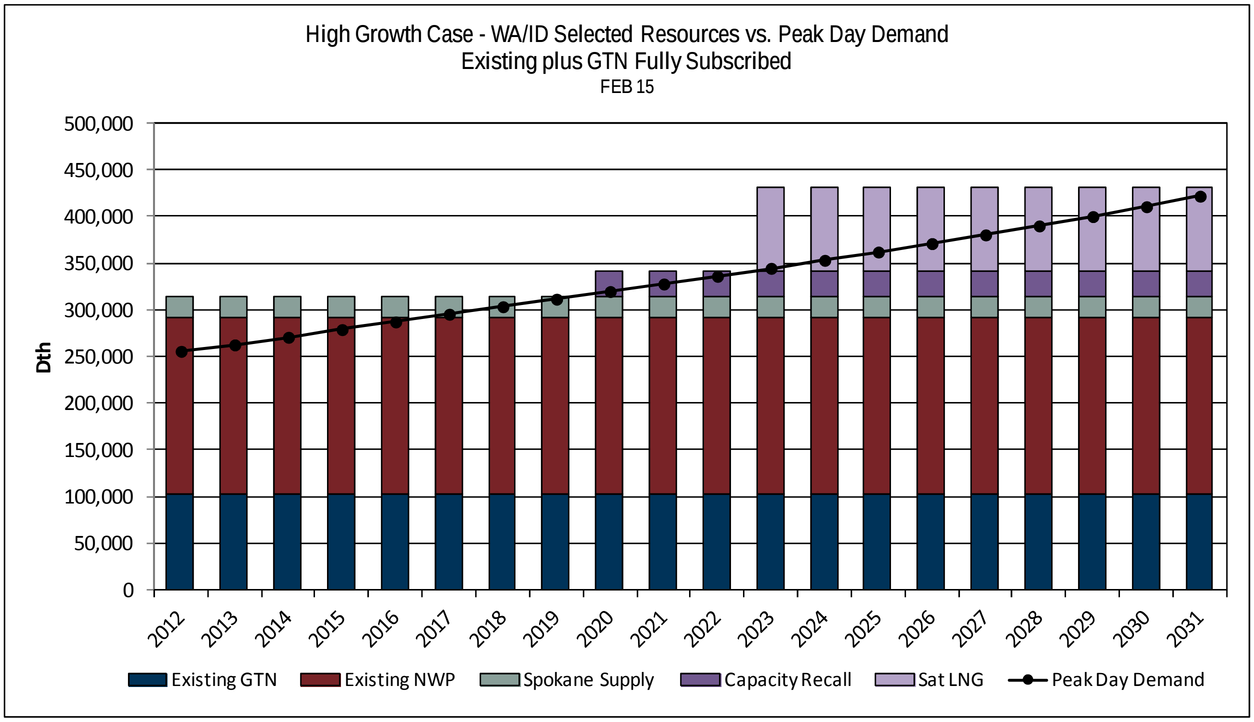



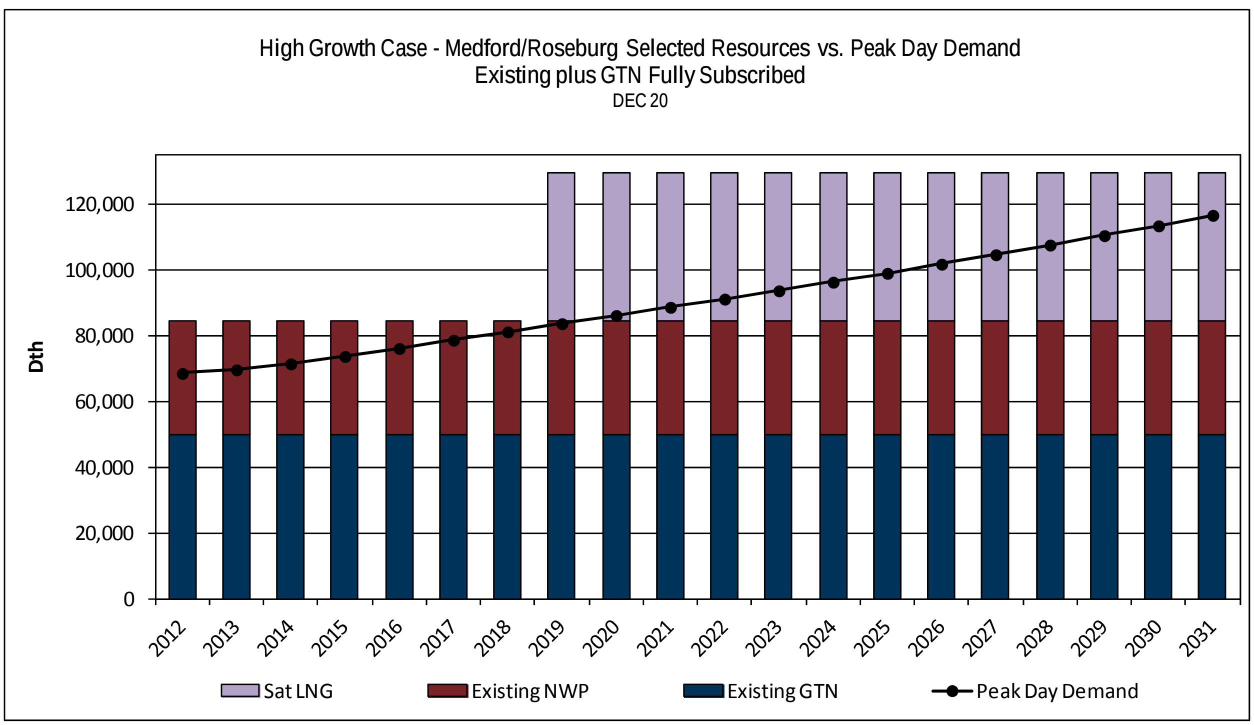
# APPENDIX 7.1 II HIGH GROWTH CASES
## SELECTED RESOURCES VS. PEAK DAY DEMAND
## EXISTING PLUS EXPECTED AVAILABLE



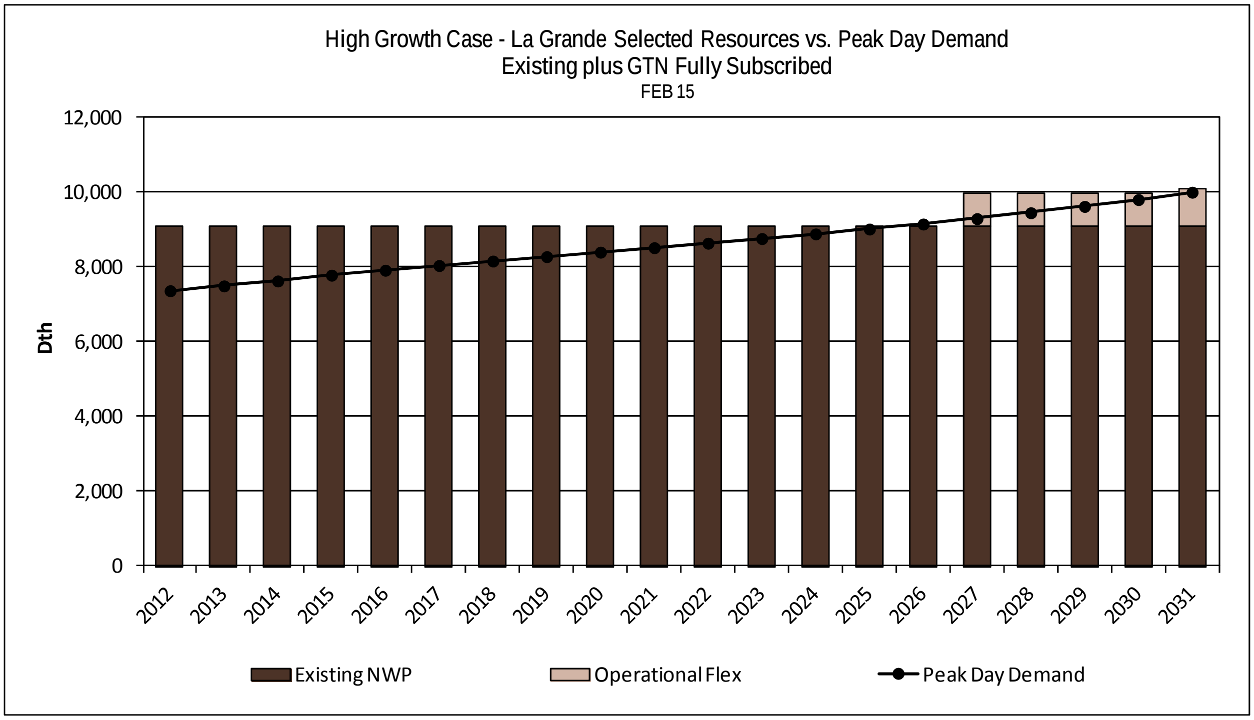



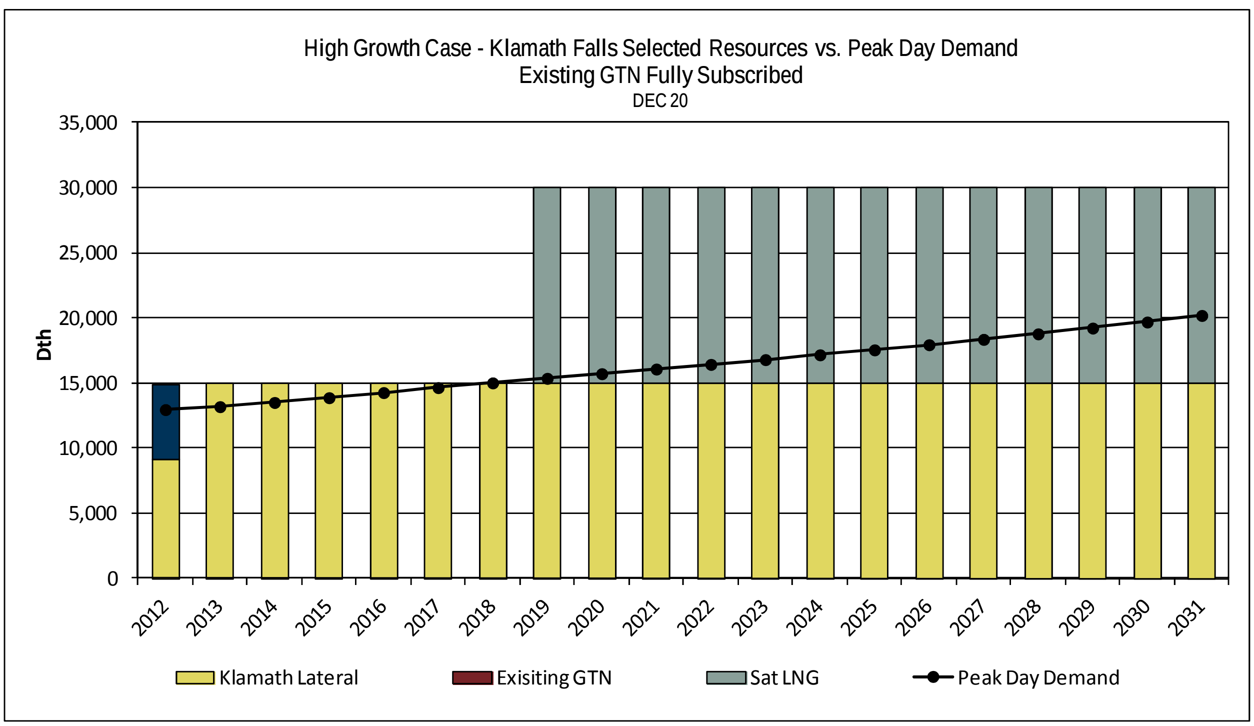
# APPENDIX 7.1 ǁ HIGH GROWTH CASES SELECTED RESOURCES VS. PEAK DAY DEMAND EXISTING PLUS GTN FULLY SUBSCRIBED



# Appendix 7.1 II High Growth Cases
# Selected Resources vs. Peak Day Demand
# Existing plus GTN Fully Subscribed



# APPENDIX 7.2 ‖ PEAK DAY DEMAND TABLE
# HIGH GROWTH

**Peak Day Demand - Served and Unserved (MDth/d)**
**Before Resource Additions & Net of DSM Savings**

| Case | Gas Year | La Grande Served | La Grande Unserved | La Grande Total | La Grande % of Peak Day Served | WA/ID Served | WA/ID Unserved | WA/ID Total | WA/ID % of Peak Day Served |
|---|---|---|---|---|---|---|---|---|---|
| High Growth | 2012 | 7.36 | - | 7.36 | 100% | 255.74 | - | 255.74 | 100% |
| High Growth | 2013 | 7.49 | - | 7.49 | 100% | 262.63 | - | 262.63 | 100% |
| High Growth | 2014 | 7.62 | - | 7.62 | 100% | 270.77 | - | 270.77 | 100% |
| High Growth | 2015 | 7.78 | - | 7.78 | 100% | 279.05 | - | 279.05 | 100% |
| High Growth | 2016 | 7.91 | - | 7.91 | 100% | 287.20 | - | 287.20 | 100% |
| High Growth | 2017 | 8.04 | - | 8.04 | 100% | 295.46 | - | 295.46 | 100% |
| High Growth | 2018 | 8.16 | - | 8.16 | 100% | 303.56 | - | 303.56 | 100% |
| High Growth | 2019 | 8.28 | - | 8.28 | 100% | 311.65 | - | 311.65 | 100% |
| High Growth | 2020 | 8.40 | - | 8.40 | 100% | 314.09 | 5.68 | 319.78 | 98% |
| High Growth | 2021 | 8.52 | - | 8.52 | 100% | 314.09 | 13.84 | 327.93 | 96% |
| High Growth | 2022 | 8.64 | - | 8.64 | 100% | 314.09 | 22.08 | 336.17 | 93% |
| High Growth | 2023 | 8.76 | - | 8.76 | 100% | 314.09 | 30.57 | 344.66 | 91% |
| High Growth | 2024 | 8.88 | - | 8.88 | 100% | 314.09 | 39.18 | 353.27 | 89% |
| High Growth | 2025 | 9.01 | - | 9.01 | 100% | 314.09 | 48.05 | 362.15 | 87% |
| High Growth | 2026 | 9.10 | 0.05 | 9.15 | 99% | 314.09 | 57.11 | 371.20 | 85% |
| High Growth | 2027 | 9.10 | 0.19 | 9.29 | 98% | 314.09 | 66.41 | 380.51 | 83% |
| High Growth | 2028 | 9.10 | 0.35 | 9.45 | 96% | 314.09 | 76.03 | 390.12 | 81% |
| High Growth | 2029 | 9.10 | 0.52 | 9.62 | 95% | 314.09 | 86.07 | 400.17 | 78% |
| High Growth | 2030 | 9.10 | 0.70 | 9.80 | 93% | 314.09 | 96.63 | 410.72 | 76% |
| High Growth | 2031 | 9.10 | 0.90 | 10.00 | 91% | 314.09 | 107.92 | 422.01 | 74% |

| Case | Gas Year | Klamath Falls Served | Klamath Falls Unserved | Klamath Falls Total | Klamath Falls % of Peak Day Served | Medford/ Roseburg Served | Medford/ Roseburg Unserved | Medford/ Roseburg Total | Medford/ Roseburg % of Peak Day Served |
|---|---|---|---|---|---|---|---|---|---|
| High Growth | 2012 | 12.97 | - | 12.97 | 100% | 68.57 | - | 68.57 | 100% |
| High Growth | 2013 | 13.20 | - | 13.20 | 100% | 69.66 | - | 69.66 | 100% |
| High Growth | 2014 | 13.52 | - | 13.52 | 100% | 71.48 | - | 71.48 | 100% |
| High Growth | 2015 | 13.89 | - | 13.89 | 100% | 73.71 | - | 73.71 | 100% |
| High Growth | 2016 | 14.28 | - | 14.28 | 100% | 76.14 | - | 76.14 | 100% |
| High Growth | 2017 | 14.66 | - | 14.66 | 100% | 78.67 | - | 78.67 | 100% |
| High Growth | 2018 | 15.00 | 0.02 | 15.02 | 100% | 81.19 | - | 81.19 | 100% |
| High Growth | 2019 | 15.00 | 0.38 | 15.38 | 98% | 83.69 | - | 83.69 | 100% |
| High Growth | 2020 | 15.00 | 0.73 | 15.73 | 95% | 84.12 | 2.05 | 86.17 | 98% |
| High Growth | 2021 | 15.00 | 1.09 | 16.09 | 93% | 84.12 | 4.55 | 88.66 | 95% |
| High Growth | 2022 | 15.00 | 1.45 | 16.45 | 91% | 84.12 | 7.04 | 91.15 | 92% |
| High Growth | 2023 | 15.00 | 1.81 | 16.81 | 89% | 84.12 | 9.56 | 93.68 | 90% |
| High Growth | 2024 | 15.00 | 2.18 | 17.18 | 87% | 84.12 | 12.19 | 96.30 | 87% |
| High Growth | 2025 | 15.00 | 2.56 | 17.56 | 85% | 84.12 | 14.87 | 98.98 | 85% |
| High Growth | 2026 | 15.00 | 2.96 | 17.96 | 84% | 84.12 | 17.65 | 101.77 | 83% |
| High Growth | 2027 | 15.00 | 3.37 | 18.37 | 82% | 84.12 | 20.53 | 104.64 | 80% |
| High Growth | 2028 | 15.00 | 3.79 | 18.79 | 80% | 84.12 | 23.45 | 107.57 | 78% |
| High Growth | 2029 | 15.00 | 4.23 | 19.23 | 78% | 84.12 | 26.32 | 110.44 | 76% |
| High Growth | 2030 | 15.00 | 4.70 | 19.70 | 76% | 84.12 | 29.30 | 113.42 | 74% |
| High Growth | 2031 | 15.00 | 5.20 | 20.20 | 74% | 84.12 | 32.50 | 116.61 | 72% |

# APPENDIX 7.2 ‖ PEAK DAY DEMAND TABLE
# LOW GROWTH

**Peak Day Demand - Served and Unserved (MDth/d)**
**Before Resource Additions & Net of DSM Savings**

| Case | Gas Year | La Grande Served | La Grande Unserved | La Grande Total | La Grande % of Peak Day Served | WA/ID Served | WA/ID Unserved | WA/ID Total | WA/ID % of Peak Day Served |
|---|---|---|---|---|---|---|---|---|---|
| Low Growth | 2012 | 7.23 | - | 7.23 | 100% | 254.74 | - | 254.74 | 100% |
| Low Growth | 2013 | 7.28 | - | 7.28 | 100% | 257.33 | - | 257.33 | 100% |
| Low Growth | 2014 | 7.33 | - | 7.33 | 100% | 260.42 | - | 260.42 | 100% |
| Low Growth | 2015 | 7.39 | - | 7.39 | 100% | 263.55 | - | 263.55 | 100% |
| Low Growth | 2016 | 7.44 | - | 7.44 | 100% | 266.63 | - | 266.63 | 100% |
| Low Growth | 2017 | 7.48 | - | 7.48 | 100% | 269.67 | - | 269.67 | 100% |
| Low Growth | 2018 | 7.52 | - | 7.52 | 100% | 272.62 | - | 272.62 | 100% |
| Low Growth | 2019 | 7.56 | - | 7.56 | 100% | 275.55 | - | 275.55 | 100% |
| Low Growth | 2020 | 7.61 | - | 7.61 | 100% | 278.45 | - | 278.45 | 100% |
| Low Growth | 2021 | 7.65 | - | 7.65 | 100% | 281.36 | - | 281.36 | 100% |
| Low Growth | 2022 | 7.69 | - | 7.69 | 100% | 284.23 | - | 284.23 | 100% |
| Low Growth | 2023 | 7.72 | - | 7.72 | 100% | 287.17 | - | 287.17 | 100% |
| Low Growth | 2024 | 7.76 | - | 7.76 | 100% | 290.09 | - | 290.09 | 100% |
| Low Growth | 2025 | 7.80 | - | 7.80 | 100% | 293.06 | - | 293.06 | 100% |
| Low Growth | 2026 | 7.84 | - | 7.84 | 100% | 295.98 | - | 295.98 | 100% |
| Low Growth | 2027 | 7.88 | - | 7.88 | 100% | 298.91 | - | 298.91 | 100% |
| Low Growth | 2028 | 7.92 | - | 7.92 | 100% | 301.81 | - | 301.81 | 100% |
| Low Growth | 2029 | 7.97 | - | 7.97 | 100% | 304.74 | - | 304.74 | 100% |
| Low Growth | 2030 | 8.01 | - | 8.01 | 100% | 307.63 | - | 307.63 | 100% |
| Low Growth | 2031 | 8.05 | - | 8.05 | 100% | 310.55 | - | 310.55 | 100% |

| Case | Gas Year | Klamath Falls Served | Klamath Falls Unserved | Klamath Falls Total | Klamath Falls % of Peak Day Served | Medford/ Roseburg Served | Medford/ Roseburg Unserved | Medford/ Roseburg Total | Medford/ Roseburg % of Peak Day Served |
|---|---|---|---|---|---|---|---|---|---|
| Low Growth | 2012 | 9.51 | - | 9.51 | 100% | 68.19 | - | 68.19 | 100% |
| Low Growth | 2013 | 9.58 | - | 9.58 | 100% | 68.60 | - | 68.60 | 100% |
| Low Growth | 2014 | 9.68 | - | 9.68 | 100% | 69.28 | - | 69.28 | 100% |
| Low Growth | 2015 | 9.79 | - | 9.79 | 100% | 70.12 | - | 70.12 | 100% |
| Low Growth | 2016 | 9.90 | - | 9.90 | 100% | 71.04 | - | 71.04 | 100% |
| Low Growth | 2017 | 9.99 | - | 9.99 | 100% | 71.97 | - | 71.97 | 100% |
| Low Growth | 2018 | 10.08 | - | 10.08 | 100% | 72.90 | - | 72.90 | 100% |
| Low Growth | 2019 | 10.17 | - | 10.17 | 100% | 73.80 | - | 73.80 | 100% |
| Low Growth | 2020 | 10.26 | - | 10.26 | 100% | 74.70 | - | 74.70 | 100% |
| Low Growth | 2021 | 10.35 | - | 10.35 | 100% | 75.58 | - | 75.58 | 100% |
| Low Growth | 2022 | 10.44 | - | 10.44 | 100% | 76.46 | - | 76.46 | 100% |
| Low Growth | 2023 | 10.53 | - | 10.53 | 100% | 77.33 | - | 77.33 | 100% |
| Low Growth | 2024 | 10.62 | - | 10.62 | 100% | 78.23 | - | 78.23 | 100% |
| Low Growth | 2025 | 10.71 | - | 10.71 | 100% | 79.12 | - | 79.12 | 100% |
| Low Growth | 2026 | 10.80 | - | 10.80 | 100% | 80.03 | - | 80.03 | 100% |
| Low Growth | 2027 | 10.89 | - | 10.89 | 100% | 80.94 | - | 80.94 | 100% |
| Low Growth | 2028 | 10.98 | - | 10.98 | 100% | 81.83 | - | 81.83 | 100% |
| Low Growth | 2029 | 11.07 | - | 11.07 | 100% | 82.65 | - | 82.65 | 100% |
| Low Growth | 2030 | 11.15 | - | 11.15 | 100% | 83.45 | - | 83.45 | 100% |
| Low Growth | 2031 | 11.24 | - | 11.24 | 100% | 84.09 | - | 84.09 | 100% |

# APPENDIX 7.2 ▌▌ PEAK DAY DEMAND TABLE
# COLDEST IN 20 YEARS

**Peak Day Demand - Served and Unserved (MDth/d)**
**Before Resource Additions & Net of DSM Savings**

| Case | Gas Year | La Grande Served | La Grande Unserved | La Grande Total | La Grande % of Peak Day Served | WA/ID Served | WA/ID Unserved | WA/ID Total | WA/ID % of Peak Day Served |
|---|---|---|---|---|---|---|---|---|---|
| Coldest in 20 | 2012 | 7.23 | - | 7.23 | 100% | 230.63 | - | 230.63 | 100% |
| Coldest in 20 | 2013 | 7.31 | - | 7.31 | 100% | 234.53 | - | 234.53 | 100% |
| Coldest in 20 | 2014 | 7.20 | - | 7.20 | 100% | 232.87 | - | 232.87 | 100% |
| Coldest in 20 | 2015 | 7.23 | - | 7.23 | 100% | 235.45 | - | 235.45 | 100% |
| Coldest in 20 | 2016 | 7.29 | - | 7.29 | 100% | 239.40 | - | 239.40 | 100% |
| Coldest in 20 | 2017 | 7.36 | - | 7.36 | 100% | 243.63 | - | 243.63 | 100% |
| Coldest in 20 | 2018 | 7.42 | - | 7.42 | 100% | 247.71 | - | 247.71 | 100% |
| Coldest in 20 | 2019 | 7.46 | - | 7.46 | 100% | 250.95 | - | 250.95 | 100% |
| Coldest in 20 | 2020 | 7.50 | - | 7.50 | 100% | 254.42 | - | 254.42 | 100% |
| Coldest in 20 | 2021 | 7.56 | - | 7.56 | 100% | 258.24 | - | 258.24 | 100% |
| Coldest in 20 | 2022 | 7.58 | - | 7.58 | 100% | 261.16 | - | 261.16 | 100% |
| Coldest in 20 | 2023 | 7.61 | - | 7.61 | 100% | 264.03 | - | 264.03 | 100% |
| Coldest in 20 | 2024 | 7.64 | - | 7.64 | 100% | 267.26 | - | 267.26 | 100% |
| Coldest in 20 | 2025 | 7.67 | - | 7.67 | 100% | 270.30 | - | 270.30 | 100% |
| Coldest in 20 | 2026 | 7.70 | - | 7.70 | 100% | 273.64 | - | 273.64 | 100% |
| Coldest in 20 | 2027 | 7.73 | - | 7.73 | 100% | 276.33 | - | 276.33 | 100% |
| Coldest in 20 | 2028 | 7.76 | - | 7.76 | 100% | 279.33 | - | 279.33 | 100% |
| Coldest in 20 | 2029 | 7.80 | - | 7.80 | 100% | 282.24 | - | 282.24 | 100% |
| Coldest in 20 | 2030 | 7.83 | - | 7.83 | 100% | 285.11 | - | 285.11 | 100% |
| Coldest in 20 | 2031 | 7.86 | - | 7.86 | 100% | 287.97 | - | 287.97 | 100% |

| Case | Gas Year | Klamath Falls Served | Klamath Falls Unserved | Klamath Falls Total | Klamath Falls % of Peak Day Served | Medford/ Roseburg Served | Medford/ Roseburg Unserved | Medford/ Roseburg Total | Medford/ Roseburg % of Peak Day Served |
|---|---|---|---|---|---|---|---|---|---|
| Coldest in 20 | 2012 | 12.69 | - | 12.69 | 100% | 59.07 | - | 59.07 | 100% |
| Coldest in 20 | 2013 | 12.83 | - | 12.83 | 100% | 59.66 | - | 59.66 | 100% |
| Coldest in 20 | 2014 | 12.68 | - | 12.68 | 100% | 59.08 | - | 59.08 | 100% |
| Coldest in 20 | 2015 | 12.79 | - | 12.79 | 100% | 59.75 | - | 59.75 | 100% |
| Coldest in 20 | 2016 | 13.00 | - | 13.00 | 100% | 60.91 | - | 60.91 | 100% |
| Coldest in 20 | 2017 | 13.21 | - | 13.21 | 100% | 62.15 | - | 62.15 | 100% |
| Coldest in 20 | 2018 | 13.40 | - | 13.40 | 100% | 63.38 | - | 63.38 | 100% |
| Coldest in 20 | 2019 | 13.55 | - | 13.55 | 100% | 64.38 | - | 64.38 | 100% |
| Coldest in 20 | 2020 | 13.70 | - | 13.70 | 100% | 65.42 | - | 65.42 | 100% |
| Coldest in 20 | 2021 | 13.88 | - | 13.88 | 100% | 66.55 | - | 66.55 | 100% |
| Coldest in 20 | 2022 | 14.01 | - | 14.01 | 100% | 67.53 | - | 67.53 | 100% |
| Coldest in 20 | 2023 | 14.13 | - | 14.13 | 100% | 68.38 | - | 68.38 | 100% |
| Coldest in 20 | 2024 | 14.27 | - | 14.27 | 100% | 69.35 | - | 69.35 | 100% |
| Coldest in 20 | 2025 | 14.40 | - | 14.40 | 100% | 70.28 | - | 70.28 | 100% |
| Coldest in 20 | 2026 | 14.54 | - | 14.54 | 100% | 71.28 | - | 71.28 | 100% |
| Coldest in 20 | 2027 | 14.65 | - | 14.65 | 100% | 72.13 | - | 72.13 | 100% |
| Coldest in 20 | 2028 | 14.78 | - | 14.78 | 100% | 73.04 | - | 73.04 | 100% |
| Coldest in 20 | 2029 | 14.91 | - | 14.91 | 100% | 73.83 | - | 73.83 | 100% |
| Coldest in 20 | 2030 | 15.02 | - | 15.02 | 100% | 74.59 | - | 74.59 | 100% |
| Coldest in 20 | 2031 | 15.14 | - | 15.14 | 100% | 75.44 | - | 75.44 | 100% |

# APPENDIX 8.1 ‖ DISTRIBUTION SYSTEM MODELING

## OVERVIEW

The primary goal of distribution system planning is to design for present needs and to plan for future expansion to serve demand growth. This allows Avista to satisfy current demand-serving requirements while taking steps toward meeting future needs. Distribution system planning identifies potential problems and areas of the distribution system that require reinforcement. By knowing when and where pressure problems may occur, the necessary reinforcements can be incorporated into normal maintenance. Thus, more costly reactive and emergency solutions can be avoided.

## COMPUTER MODELING

When designing new main extensions, computer modeling can help determine the optimum size facilities for present and future needs. Undersized facilities are costly to replace, and oversized facilities incur unnecessary expenses to Avista and its customers.

## THEORY AND APPLICATION OF STUDY

Natural gas network load studies have evolved in the last decade to become a highly technical and useful means of analyzing the operation of a distribution system. Using a pipeline fluid flow formula, a specified parameter of each pipe element can be simultaneously solved. Through years of research, pipeline equations have been refined to the point where solutions obtained closely represent actual system behavior.

Avista conducts network load studies using GL Noble Denton’s SynerGEE® 4.6.0 software. This computer-based modeling tool runs on a Windows operating system and allows users to analyze and interpret solutions graphically.

## CREATING A MODEL

To properly study the distribution system, all natural gas main information is entered (length, pipe roughness and ID) into the model. "Main" refers to all pipelines supplying services.

Nodes are placed at all pipe intersections, beginnings and ends of mains, changes in pipe diameter/material and to identify all large customers. A model element connects two nodes together. Therefore, a "to node" and a "from node" will represent an element between those two nodes. Almost all of the elements in a model are pipes.

Regulators are treated like adjustable valves in which the downstream pressure is set to a known value. Although specific regulator types can be entered for realistic behavior, the expected flow passing through the actual regulator is determined and the modeled regulator is forced to accommodate such flows.

## FLUID MECHANICS OF THE MODEL

Pipe flow equations are used to determine the relationships between flow, pressure drop, diameter and pipe length. For all models, the Fundamental Flow equation (FM) is used due to its demonstrated reliability.

Efficiency factors are used to account for the equivalent resistance of valves, fittings and angle changes within the distribution system. Starting with a 95 percent factor, the efficiency can be changed to fine tune the model to match field results.

Pipe roughness along with flow conditions creates a friction factor for all pipes within a system. Thus, each pipe may have a unique friction factor, minimizing computational errors associated with generalized friction values.

## LOAD DATA

All studies are considered steady state; all natural gas entering the distribution system must equal the natural gas exiting the distribution system at any given time.

Customer loads are obtained from Avista's customer billing system and converted to an algebraic format so loads can be generated for various conditions. Customer Management Module (CMM), a new add-on application for SynerGEE processes customer usage history and generates a base load (non-temperature dependent) and heat load (varying with temperature) for each customer.

In the event of a peak day or an extremely cold weather condition, it is assumed that all curtailable loads are interrupted. Therefore, the models will be conducted with only core loads.

## DETERMINING NATURAL GAS CUSTOMERS' MAXIMUM HOURLY USAGE

### DETERMINING DESIGN PEAK HOURLY LOAD

The design peak hourly load for a customer is estimated by adding the hourly base load and the hourly heat load for a design temperature. This estimate reflects highest system hourly demands, as shown in Table 1:

**Table 1 - Determining Peak* Hourly Load**

| | | | | |
|---|---|---|---|---|
| **Peak Hourly Base Load** | + | **Peak Hourly Heat Load** | = | **Peak Hourly Load** |

This method differs from the approach that we use for IRP peak day load planning. The primary reason for this difference is due to the importance of responding to hourly peaking in the distribution system, while IRP resource planning focuses on peak day requirements to the city gate.

## APPLYING LOADS

Having estimated the peak loads for all customers in a particular service area, the model can be loaded. The first step is to assign each load to the respective node or element.

## GENERATING LOADS

Temperature-based and non-temperature-based loads are established for each node or element, thus loads can be varied based on any temperature (HDD). Such a tool is necessary to evaluate the difference in flow and pressure due to different weather conditions.

## GEOGRAPHIC INFORMATION SYSTEM (GIS)

Several years ago we converted our natural gas facility maps to GIS. While the GIS can provide a variety of map products, its power lies in its analytical capability. A GIS consists of three components: spatial operations, data association and map representation.

A GIS allows analysts to conduct spatial operations (relating a feature or facility to another geographically). A spatial operation is possible if a facility displayed on a map maintains a relationship to other facilities. Spatial relationships allow analysts to perform a multitude of queries, including:

- Identify electric customers adjacent to natural gas mains who are not currently using natural gas
- Display the ratio of customers to length of pipe in Emergency Operating Procedure zones (geographical areas defined by the number of customers and their safety in the event of an emergency)
- Classify high-pressure pipeline proximity criteria

The second component of the GIS is data association. This allows analysts to model relationships between facilities displayed on a map to tabular information in a database. Databases store facility information such as pipe size, pipe material, pressure rating, or related information (e.g., customer databases, equipment databases and work management systems). Data association allows interactive queries within a map-like environment.

Finally, the GIS provides a means to create maps of existing facilities in different scales, projections and displays. In addition, the results of a comparative or spatial analysis can be presented pictorially. This allows users to present complex analyses rapidly and in an easy-to-understand method.

## BUILDING SYNERGEE® MODELS FROM A GIS

The GIS can provide additional benefits through the ease of creation and maintenance of load studies. Avista can create load studies from the GIS based on tabular data (attributes) installed during the mapping process.

## MAINTENANCE USING A GIS

The GIS helps maintain the existing distribution facility by allowing a design to be initiated on a GIS. Currently, design jobs for the company's natural gas system are managed through Avista's Facility Management (AFM) tool. Once jobs are completed, the as-built information is automatically updated on GIS, eliminating the need to convert physical maps to a GIS at a later date. Because the facility is updated , load studies can remain current by refreshing the analysis.

## DEVELOPING A PRESENT CASE LOAD STUDY

In order for any model to have accuracy, a present case model has to be developed that reflects what the system was doing when downstream pressures and flows are known. To establish the present case, pressure charts located throughout the distribution system are used.

Pressure charts plot pressure (some include temperature) versus time over several days. Various locations recording simultaneously are used to validate the model. Customer loads on SynerGEE® are generated to correspond with actual temperatures recorded on the pressure charts. An accurate model's downstream pressures will match the corresponding location's field pressure chart. Efficiency factors are fine-tuned to further refine the model's pressures.

Since telemetry at the gate stations record hourly flow, temperature and pressure, these values are used to validate the model. All loads are representative of the average daily temperature and are defined as hourly flows. If the load generating method is truly accurate, all natural gas entering the actual system (physical) equals total natural gas demand solved by the simulated system (model).

## DEVELOPING A PEAK CASE LOAD STUDY

Using the calculated peak loads, a model can be analyzed to identify the behavior during a peak day. The efficiency factors established in the present case are used throughout subsequent models.

## ANALYZING RESULTS

After a model has been balanced, several features within the SynerGEE® model are used to translate results. Color plots are generated to depict flow direction, pressure, pipe diameter and gradient with specific break points. Reinforcements can be identified by visual inspection. When user edits are completed and the model is re-balanced, pressure changes can be visually displayed, helping identify optimum reinforcements.

An optimum reinforcement will have the largest pressure increase per unit length. Reinforcements can also be deferred and occasionally eliminated through load mitigation of DSM efforts.

## PLANNING CRITERIA

In most instances, models resulting in node pressures below 15 psig indicate a likelihood of distribution low pressure and therefore necessitate reinforcements. For most Avista distribution systems, a minimum of 15 psig will ensure deliverability as natural gas exits the distribution mains and travels through service pipelines to a customer's meter. Some Avista distribution areas operate at lower pressures and are assigned a minimum pressure of 5 psig for model results. Given a lower operating pressure, service pipelines in such areas are sized accordingly to maintain reliability.

## DETERMINING MAXIMUM CAPACITY FOR A SYSTEM

Using a peak day model, loads can be prorated at intervals until area pressures drop to 15 psig. At that point, the total amount of natural gas entering the system equals the maximum capacity before new construction is necessary. The difference between natural gas entering the system in this scenario and a peak day model is the maximum additional capacity that can be added to the system.

Since the approximate natural gas usage for the average customer is known, it can be determined how many new customers can be added to the distribution system before necessitating system reinforcements. The above models and procedures are utilized with new construction proposals or pipe reinforcements to determine the potential increase in capacity.

## FIVE-YEAR FORECASTING

The intent of our load study forecasting is to predict the system's behavior and reinforcements necessary within the next five years. Various Avista personnel provide information to determine where and why certain areas may experience growth.

By combining information from Avista's demand forecast, IRP planning efforts, regional growth plans and area developments, proposals for pipeline reinforcements and expansions can be evaluated with SynerGEE®.