

**2011 Integrated Resource Plan
Washington Utilities and Transportation Commission
October 17, 2011**

NW Natural
Integrated Resource Planning
Steven Simmons

Today's Discussion



1. Overview
2. Principal Conclusions
3. Demand Forecast
4. Supply
5. Demand Side Management
6. Resource Modeling & Results
7. Questions

Forward Looking Statement



- This presentation contains forward-looking statements. Forward-looking statements include statements concerning plans, objectives, goals, strategies, future events and other statements that are other than statements of historical facts. NW Natural's expectations, beliefs and projections are expressed in good faith and are believed to have a reasonable basis. However, each such forward-looking statement involves uncertainties that could cause the actual results to differ materially from those projected in such forward-looking statements.
- All subsequent forward-looking statements, whether written or oral and whether made by or on behalf of NW Natural also are expressly qualified by these cautionary statements. Any forward-looking statement speaks only as of the date on which such statement is made. New factors emerge from time to time and it is not possible for NW Natural to predict all such factors, nor can it assess the impact of each such factor or the extent to which any factor, or combination of factors, may cause results to differ materially from those contained in any forward-looking statements.
- The forecasts and projections included in this presentation have been developed for the purposes of integrated resource planning and should not be used for investment decisions. Disclosure of this information or use of the information for investment purposes could constitute a violation of federal securities laws.

NW Natural



NW Natural is a 151 year old natural gas local distribution and storage company headquartered in Portland Oregon.

The Company serves over 670,000 customers in Oregon and Washington – roughly 90% are Residential, 9% Commercial and 1% Industrial

The Washington demand region, which includes Vancouver and sections of the Gorge, is the 3rd largest in terms of customers following Portland and Salem, and comprises roughly 10% of the customer base.

Integrated Resource Planning



Integrated Resource Planning is unique to regulated utilities. Oregon and Washington regulators require seven key components. The IRP must:

1. Examine a range of demand forecasts
2. Examine all feasible means of meeting demand
3. Treat supply side and demand side resources equally
4. Describe the Company's long term plan for meeting expected load growth
5. Describe its plan for resource acquisitions between planning cycles
6. Take uncertainties in planning into account
7. Involve the public in the planning process

2011 IRP



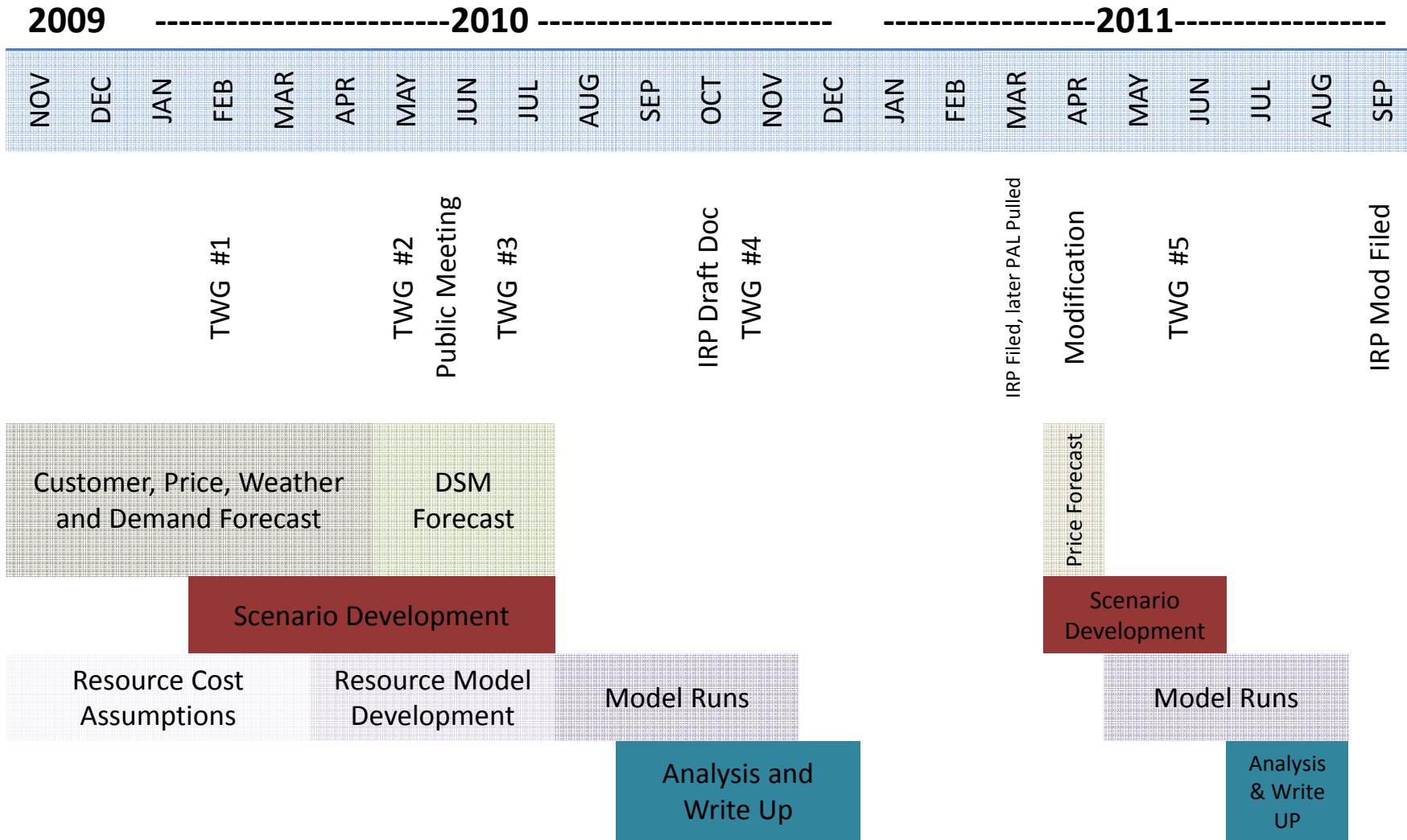
Technical Working Group

This IRP was developed with the guidance and oversight of the Technical Working Group (TWG), which included representatives from Citizen Utility Board, Energy Trust, Northwest Gas Association, Northwest Power and Conservation Council, Northwest Industrial Gas Users, Northwest Pipeline Corp, TransCanada Gas Transmission, OPUC Staff, and WUTC Staff. NW Natural held 5 TWG meetings and 1 public meeting during the course of the planning cycle.

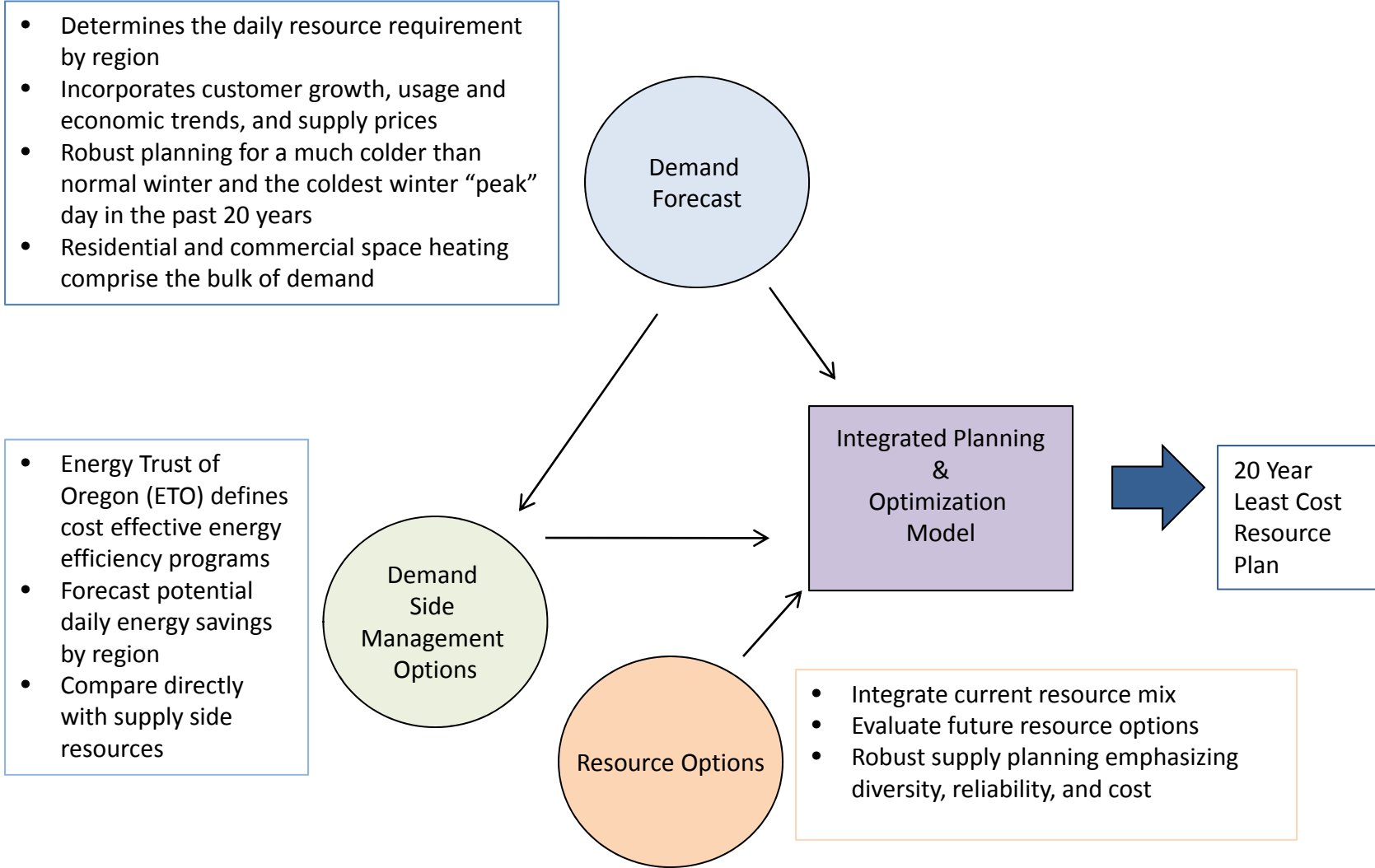
IRP Modification

The 2011 IRP was filed with the state of Oregon on January 12, 2011, and with Washington on March 31, 2011. The proposed Palomar East Cross-Cascades Pipeline was a component of the plan. On March 23, 2011, Palomar Gas Transmission LLC withdrew its application with the Federal Energy Regulatory Commission (FERC) for the pipeline and simultaneously stated its expectation of re-filing for an application at a later date. In addition, new estimates of pipeline rates and service dates for a modified pipeline project called Palomar/Blue Bridge were presented at a public workshop jointly sponsored by the Public Utility Commission of Oregon and the Washington Utility and Transportation Commission on February 3, 2011. In April, NW Natural proposed modifying the 2011 IRP in order to evaluate the proposed Cross-Cascades Pipeline with the rate and service date changes, and to perform further resource analysis should the pipeline not materialize in the future at all. Additional resource modeling was performed and the results were presented and discussed at the 5th Technical Working Group Meeting on June 22, 2011.

2011 IRP



NW Natural Integrated Resource Planning Components



2011 IRP Principal Conclusions



1. The continued economic downturn has impacted demand and resulted in slow customer growth across NW Natural's service area. New construction in the residential and commercial sectors remains sluggish and industrial natural gas usage has dropped. The average annual customer growth rate for the entire planning horizon is projected to be 1.84%, while load is expected to grow annually by an average of 0.61%.
2. Natural gas supply costs are forecast to remain lower than the previous Plan's forecast. The demand dampening effects of the economic slump coupled with plentiful gas supply from increased shale production continue to keep prices low.
3. The Company's existing resources are not sufficient to fully satisfy forecast annual and peak day demand over the 20 year horizon.
4. NW Natural's Base Case resource plan addresses the forecasted gap in service with a mixture of incremental supply-side and demand-side resources. This Base Case plan was developed without the inclusion of a new Cross-Cascades Gas Pipeline, such as the proposed Palomar/Blue Bridge project. The key future resources include DSM, Mist Storage Recall, and some sort of new storage or pipeline capacity in the Southern Willamette Valley of Oregon.
5. An alternative planning pathway was developed which incorporates a future with the proposed Palomar/Blue Bridge Pipeline beginning service in 2017. Palomar would provide parallel capacity across the Cascades. The resource decisions leading up to the year 2017 are identical for the Base Case and this preferred path. As a result, no decision needs to be made right now as to which path to take. Initial modeling and analysis has shown that a future which includes a new Cross-Cascades Pipeline such as the proposed Palomar/Blue Bridge project would increase both reliability and diversity of supply but at an additional overall cost ranging from 0.3% to 0.6% over the Base Case.

Demand Forecast



1. Customer Usage Model

- Recent customer usage data was collected and analyzed for each of the 8 demand regions, including Vancouver, and the 8 customer categories (including Residential, Commercial, Industrial). A non-linear statistical model with independent variables of heating degree day and delivered natural gas rate was fit to the data.
- Use per customer for residential and commercial customers has been dropping between 1 and 2 % per year. This decline is expected to continue.

2. Customer Forecast

- NW Natural relies on internal business intelligence as well as information from outside sources such as the NW Power & Conservation Council to project customer counts across the 20 year planning horizon.
- Economic forces such as regional employment and housing starts drive the growth estimates.
- The Residential and Commercial customer categories are expected to pick up customers due to new construction and conversions. The Industrial sector is expected to remain flat.
- Customer growth has been declining in recent years. Annual growth was over 3% in 2006 and was less than 1% in 2009. Going forward, the expected average annual customer growth rate for NW Natural's service area is 1.84%, with the Washington region growing at 2.7%.

3. Weather Pattern & Peak Day

- Temperature is the key driver of NW Natural's daily load.
- NW Natural analyzed 20 years of weather data from the 8 demand regions and has designed an annual heating degree day pattern for each region which will significantly stress the supply system on both a yearly and peak day basis.

4. Gas Price Forecast

- The natural gas price forecast impacts the load forecast, the least cost resource planning model, and the avoided cost calculations
- NW Natural relies on a proprietary forecast developed by a 3rd party - IHS CERA.
- The glut of shale gas combined with the drop in demand resulting from economic conditions continue to keep prices historically low

5. Demand Scenarios

- The base case forecast represents NW Natural's best estimate of future demand over the next 20 years.
- In addition to the base case, several other potential demand scenarios were developed and evaluated in the planning model

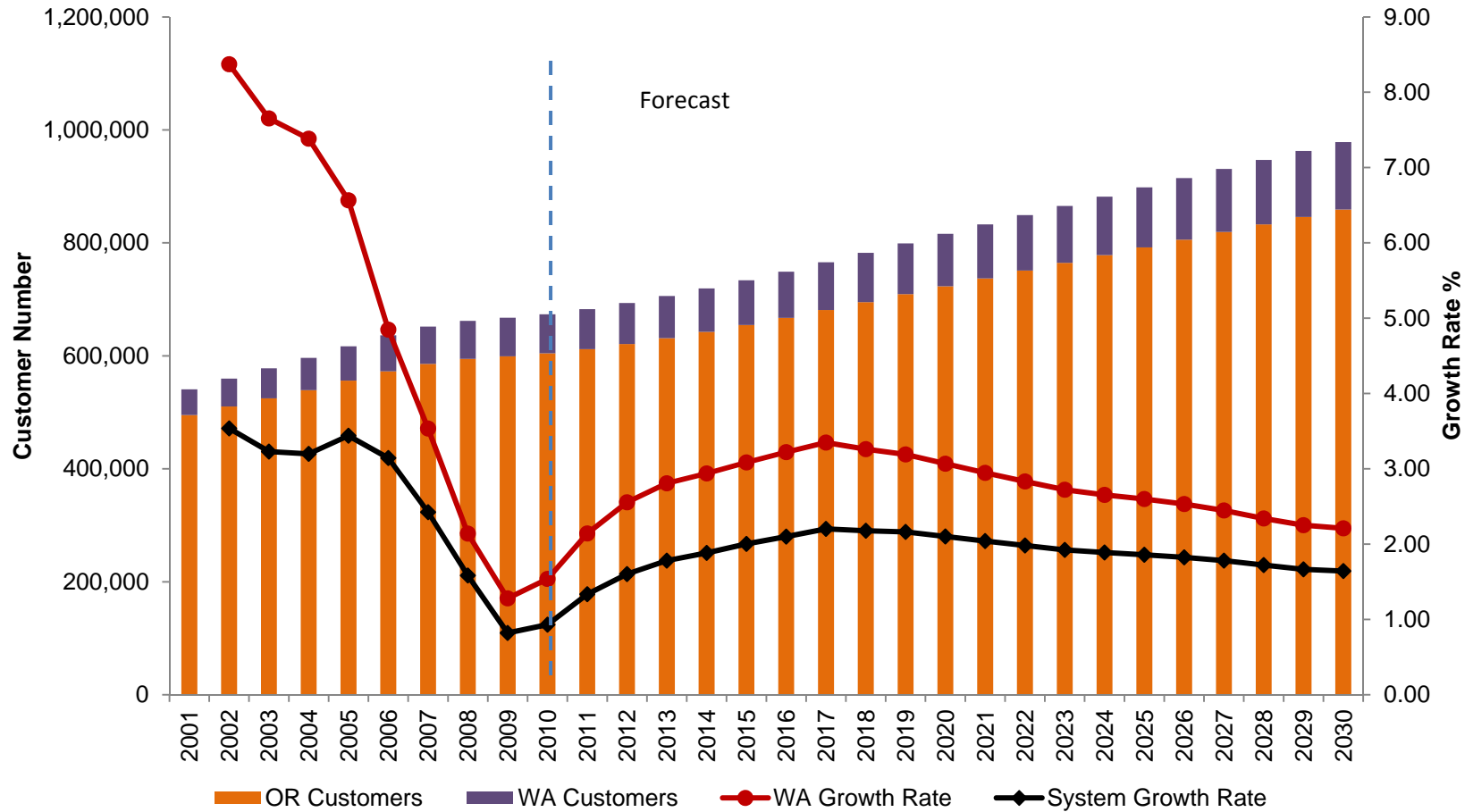
6. Forecast Accuracy

- The load forecast model was tested for accuracy by performing a "backcast" with two relatively recent cold weather events
- For January 2004, the model under predicted demand by 3.0 % while for December 2009 the model overshot true demand by 3.5 %

Customer Forecast



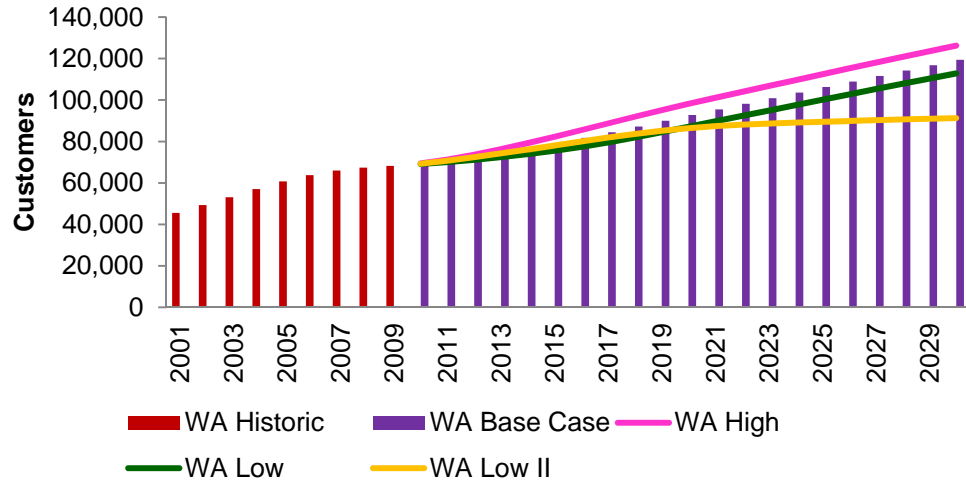
Historic and Forecast Customers & Growth Rates



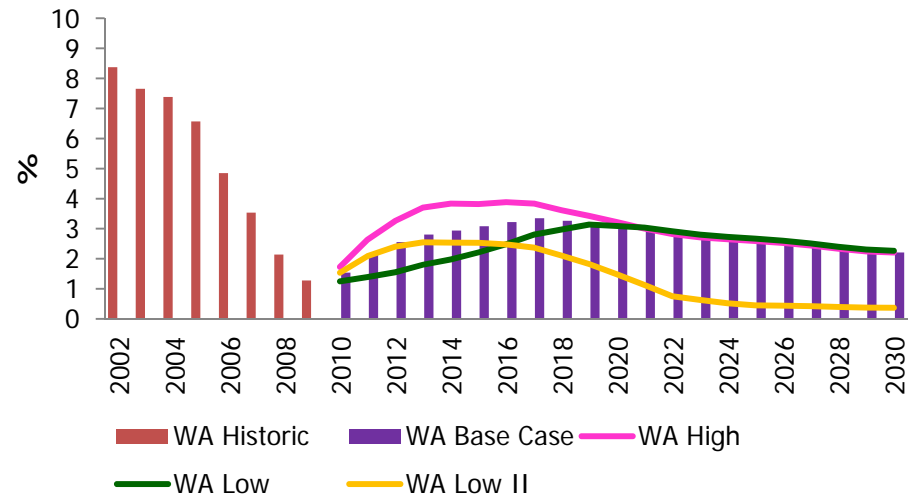
Customer Forecast



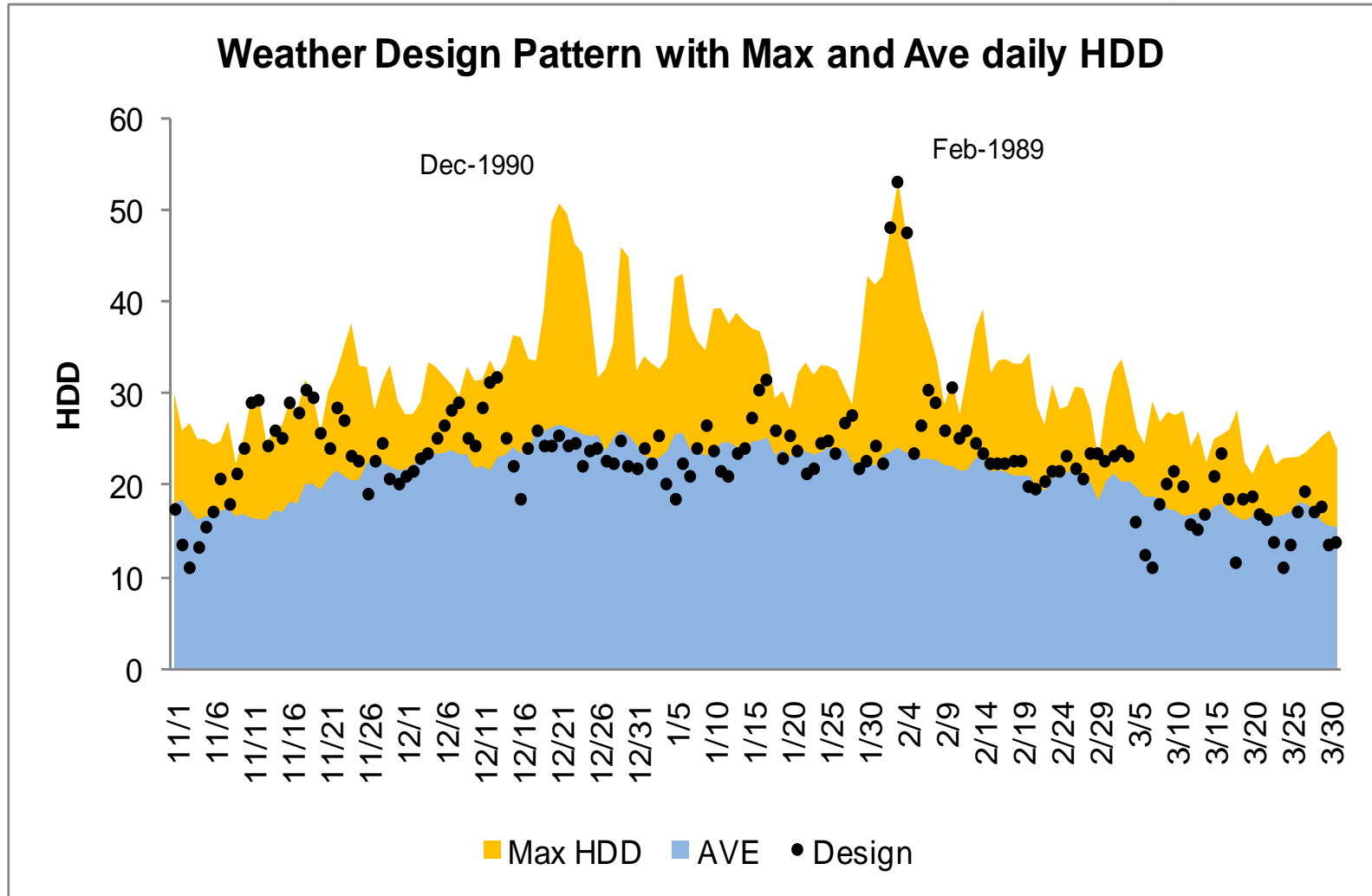
WA Customer Scenarios



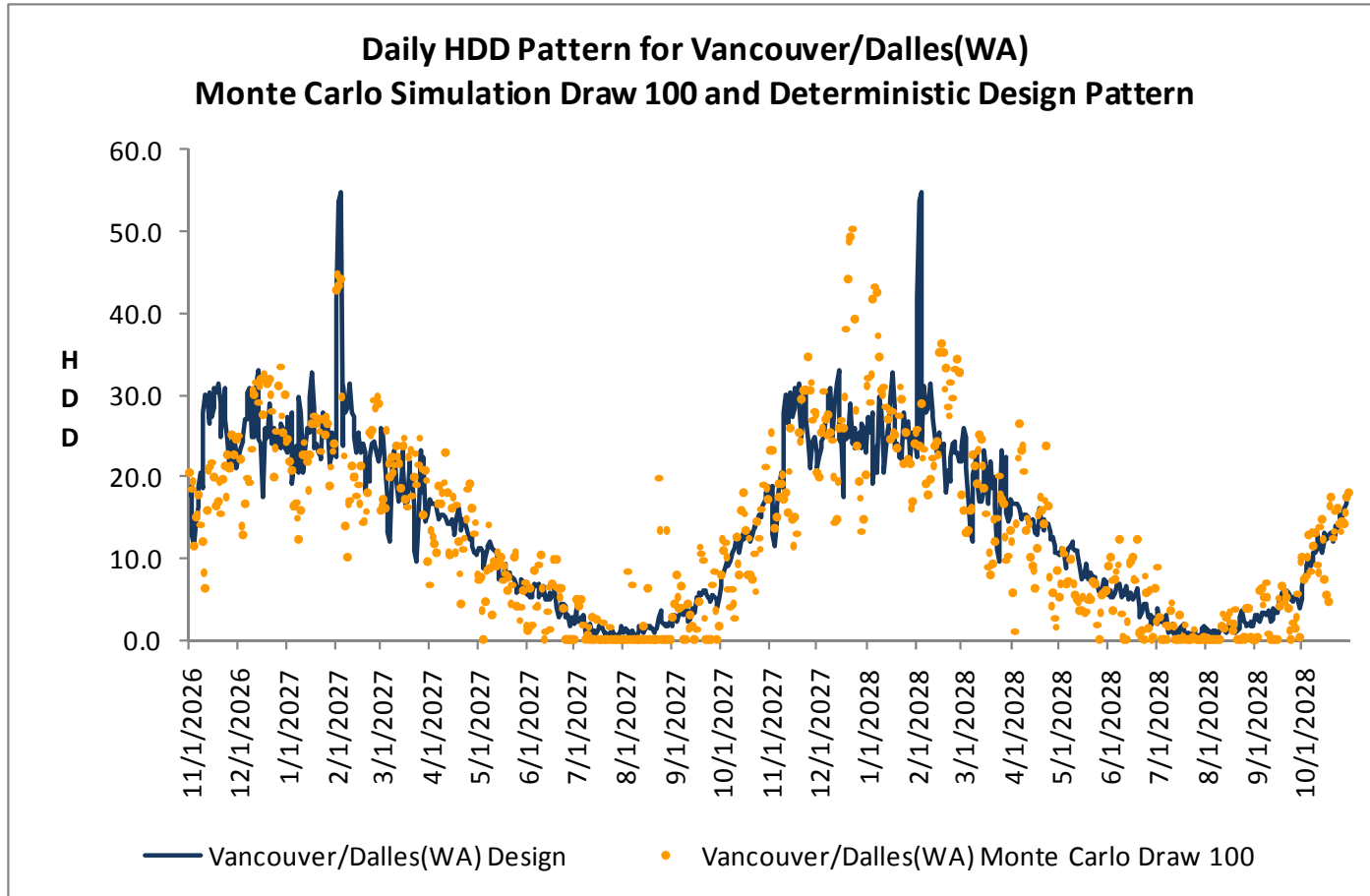
WA Customer Growth Rate % Scenarios



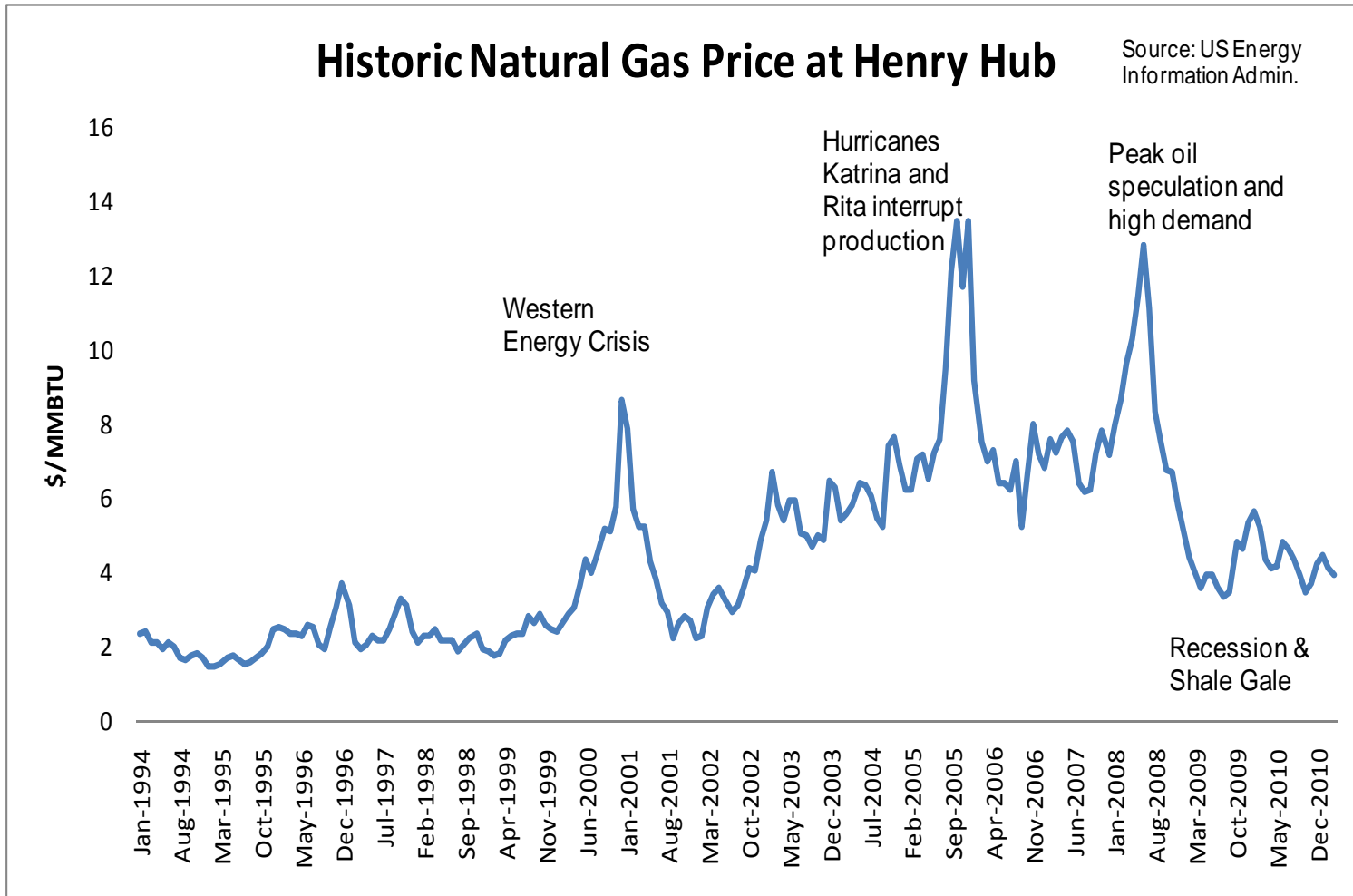
Weather Pattern



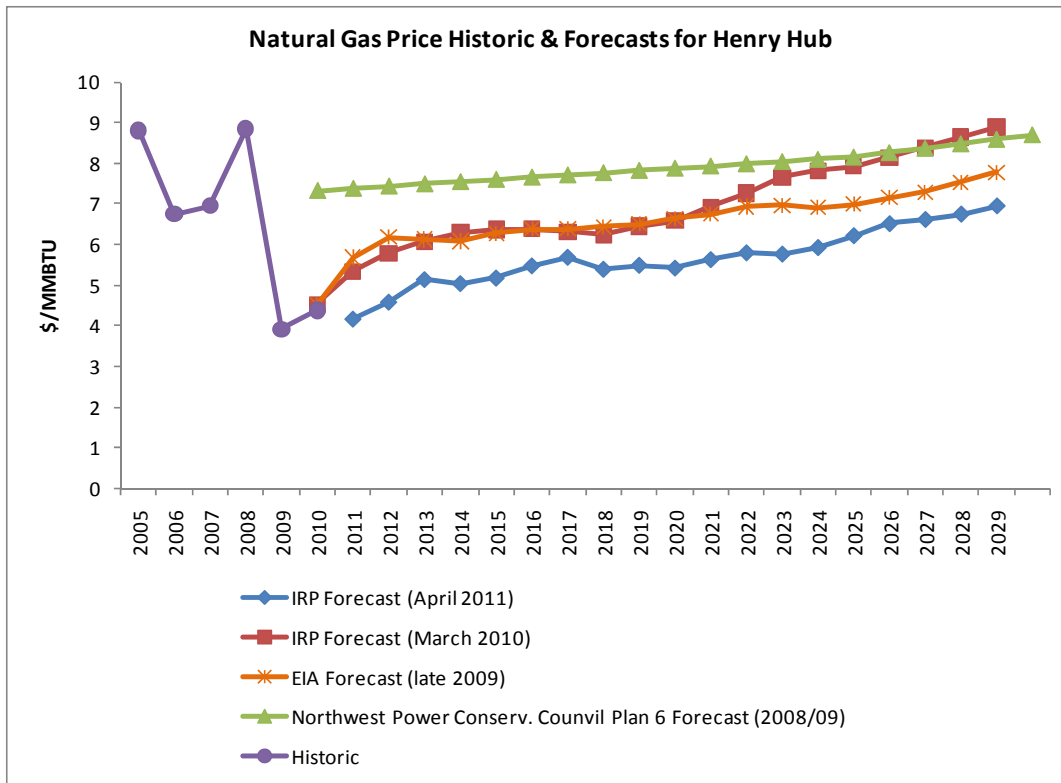
Weather – Monte Carlo Simulation



Natural Gas Price

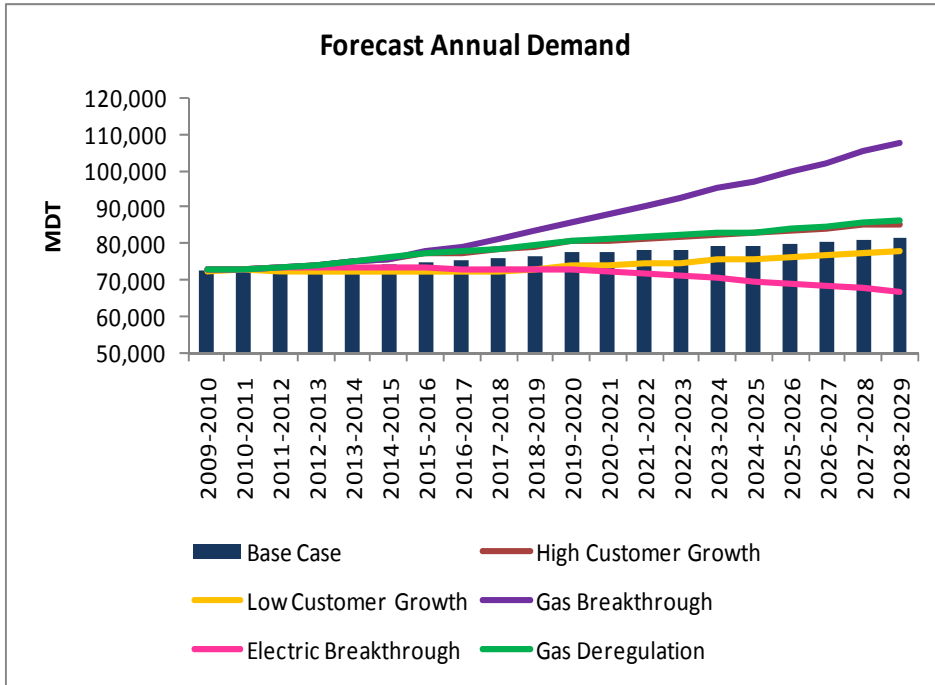


Natural Gas Price Forecast



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Demand Scenarios

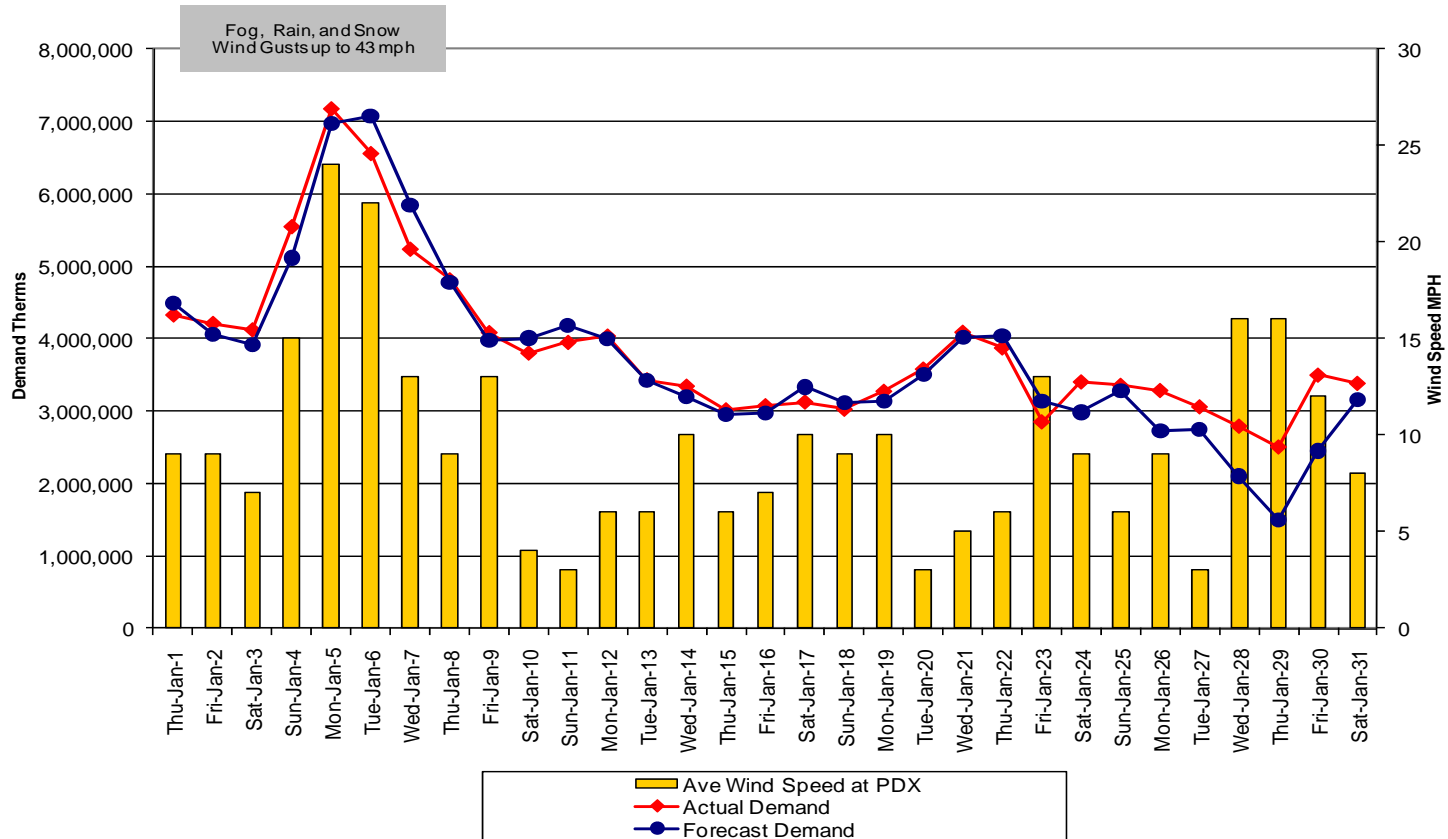


CASE	Ave. Annual Growth Rates - % PRE-DSM		Ave. Annual Growth Rates - % POST-DSM	
	WA	SYSTEM	WA	SYSTEM
Base Case	2.22	1.28	1.74	0.61
Gas Breakthrough	3.71	2.64	3.33	2.10
Gas Dereg.	2.59	1.57	2.13	0.91
Electric Breakthrough	0.90	0.25	0.40	-0.42
Low Customer Growth	1.89	1.03	1.41	0.36
High Customer Growth	2.53	1.52	2.06	0.85
Low Gas Price	2.28	1.33	1.80	0.66
High Gas Price	2.19	1.25	1.71	0.58

Forecast Accuracy – Backcast



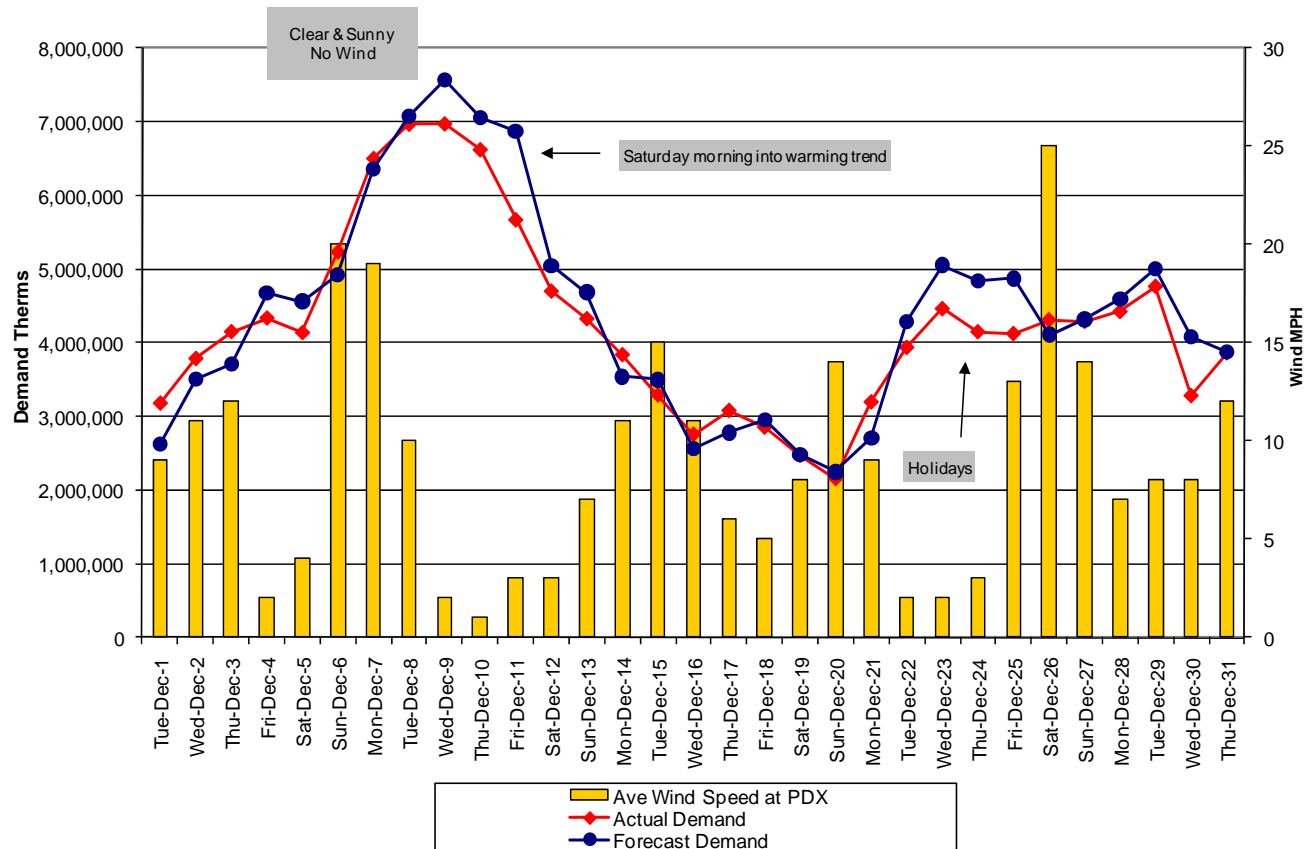
January 2004



Forecast Accuracy – Backcast



December 2009

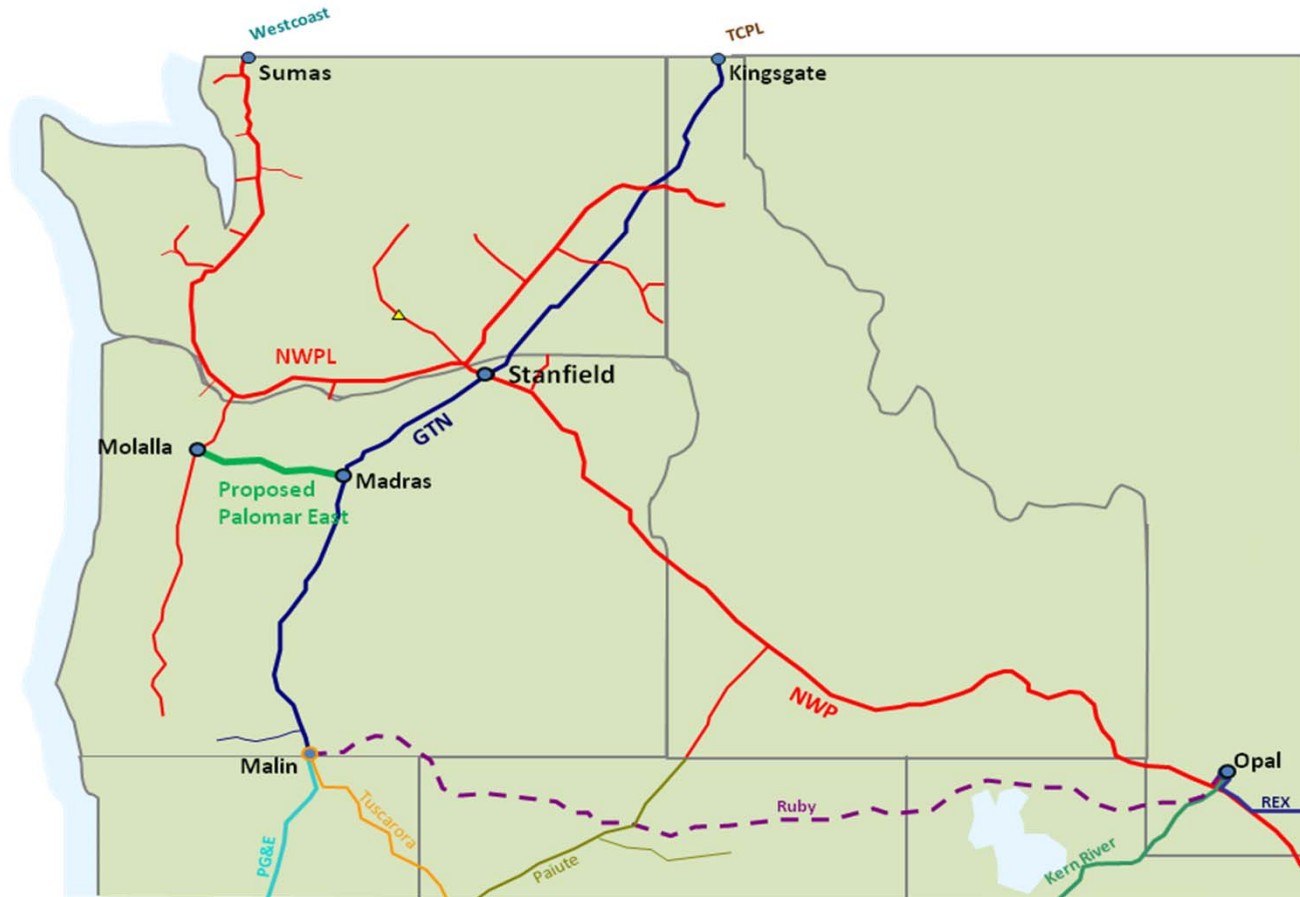


Gas Supply



- NW Natural's current supply portfolio consists of contracted natural gas supplies which are transported year-round on the interstate pipeline system, and storage supplies both underground and in LNG tanks.
- The Company holds firm transportation contracts for capacity on the Northwest Pipeline Corporation (NWPL) system – nearly 100% of supply must flow on this system.
- NW Natural also holds transport contracts on upstream pipeline systems including GTN, TCPL-BC, TCPL-Alberta, Westcoast Energy Inc, and Southern Crossing Pipeline.
- Firm storage resources include Mist, GASCO LNG, Newport LNG, Jackson Prairie and Plymouth LNG
- Gas Reserves: In April of 2011 NW Natural entered into a joint venture with Encana Oil & Gas to develop gas reserves in the Green River Basin of Wyoming. NW Natural has the option to take the physical gas at the Opal Hub or have Encana market the gas and NW Natural purchase at another location.
- NW Natural's continued supply strategy is to maintain a diversity of supplies from Alberta, British Columbia and the Rockies.
- NW Natural has partnered with TransCanada Corp to form Palomar Gas Transmission LLC in order to develop the proposed Palomar East pipeline project. In December of 2008 Palomar filed an application with FERC to build and operate the pipeline. On March 23, 2011 the application was withdrawn. Information for a new Cross-Cascades pipeline project called Palomar/Blue Bridge was presented on February 2011 at a public workshop jointly sponsored by the Public Utility Commission of Oregon and the Washington Utility and Transportation Commission. The information presented included new estimates for pipeline rates and service dates.
- From NW Natural's perspective the primary benefit from a Palomar/Blue Bridge project would be to manage risks associated with delivery of gas into the region. NWPL is currently the sole provider. Palomar would serve as parallel capacity.

Gas Supply - Pipelines

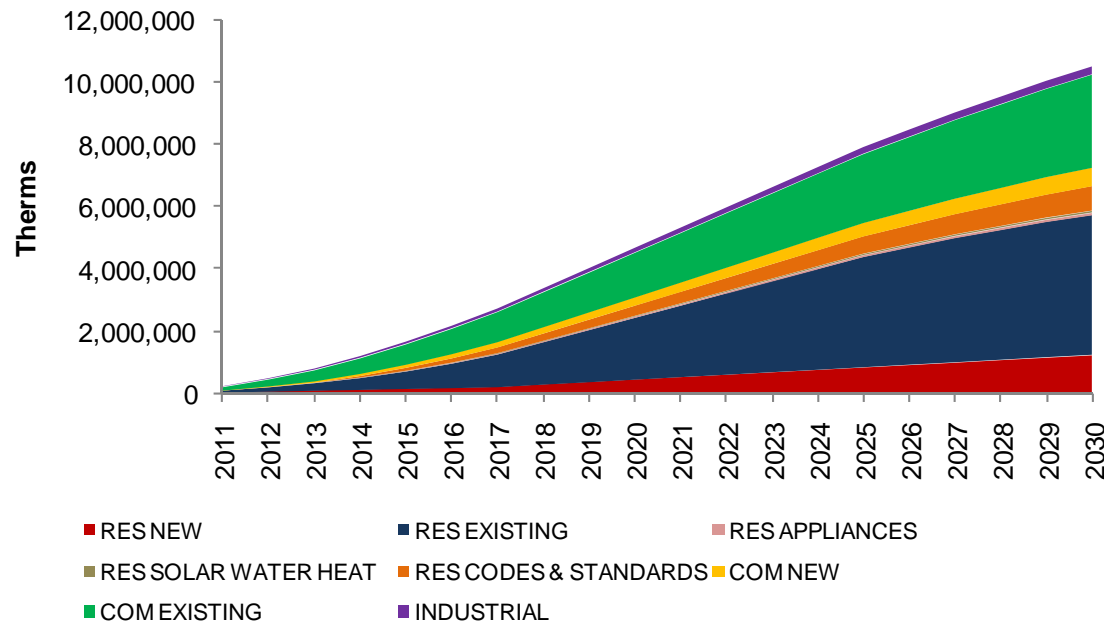


Demand Side Management



- NW Natural worked with the Energy Trust of Oregon to forecast the 20-year DSM potential for NW Natural's service territory, including Washington.
- The gas savings forecast was evaluated as a resource on par with other supply side resources in NW Natural's resource planning model SENDOUT®. Nearly all the DSM was selected as cost effective in the planning model, resulting in a reduction in demand by as much as 10% by the end of the planning horizon.
- In Washington, it is estimated that the Company could save nearly 10 million therms by 2030.
- High and low DSM forecast savings scenarios were also evaluated in the resource planning model.

Washington Cumulative DSM Savings Projections



Resource Modeling



1. NW Natural employs analytic and modeling software SENDOUT® to integrate all the planning components and to generate optimal long term resource plans.
 - The resource planning model utilizes Linear Programming (LP) to generate the least cost plans for serving demand across the 20 year horizon.
 - LP is a mathematical optimization technique which solves the general problem of allocating limited resources among competing activities in the best possible way. The objective function of the LP engine seeks to minimize system costs while meeting all daily load.
 - The LP model acts as a tool to guide NW Natural's resource decisions, it is not the final answer. The deterministic model makes resource decisions based on a perfect knowledge of the 20 year planning horizon, including weather, supply prices, and resource availability.
 - LP modeling also allows for various combinations of resources to be evaluated under assorted demand scenarios and ranked by cost.
2. Monte Carlo modeling provides risk analysis for planning around hundreds of potential price and weather futures. The method is to use deterministic modeling to set a resource plan, and then to test the plan under Monte Carlo simulation to determine the risk of un-served demand, and to calculate expected costs under hundreds of price and weather combinations.
3. DSM is evaluated directly with supply side resources on a cost basis through time. Savings which are selected are then deducted from the demand forecast and the remaining demand is met by supply-side resources.
4. In addition to existing resource levels, the model may select future resource options through time. The model decides which resources to select, as well as the optimal timing and capacity levels.

Resource Mix Summary



The resource mix optimization module within SENDOUT® evaluates and optimizes resources to meet load based on estimates for the associated fixed and variable costs. A summary of the most important resources evaluated in this IRP follow.

1. DSM

2. Supply

- 1) OPAL – Rockies 2) AECO – Alberta 3) Station2/Sumas – British Columbia
- Malin – Rockies (assumes Palomar/Blue Bridge & GTN Backhaul)
- Recall Agreements

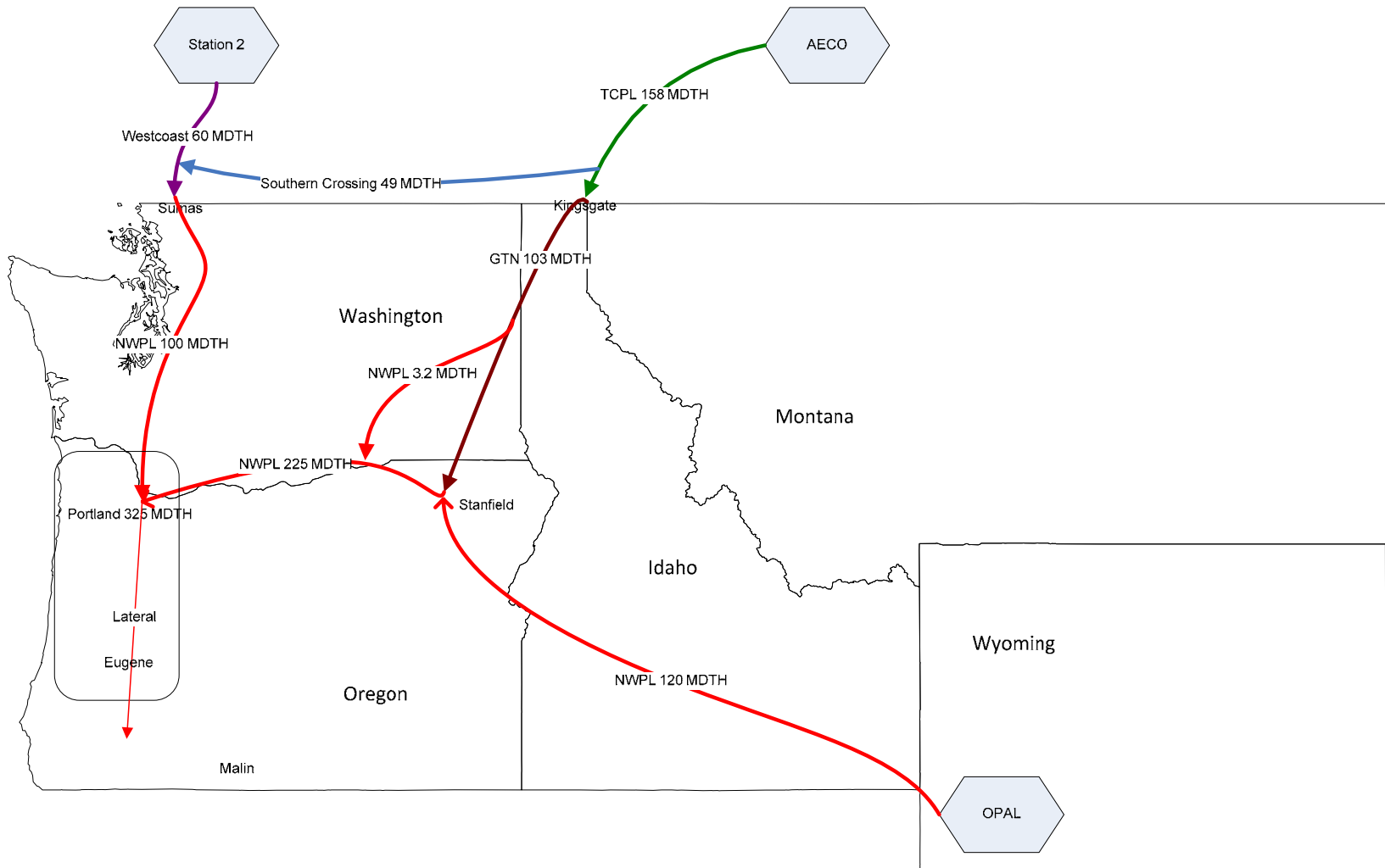
3. Pipeline

- Incremental CD on TCPL/GTN systems for Canadian supplies
- New CD on Palomar/Blue Bridge: Beginning in 2017, minimum 100 MDT/day with turn-back on NWPL
- Incremental CD on Grants Pass Lateral in Willamette Valley
- NW Natural could build a Compressor Station near Perrydale Oregon to boost Newport LNG take-away capability.
- NW Natural could build the Mid and/or South sections of the Willamette Valley Feeder to boost system reliability and serve demand.

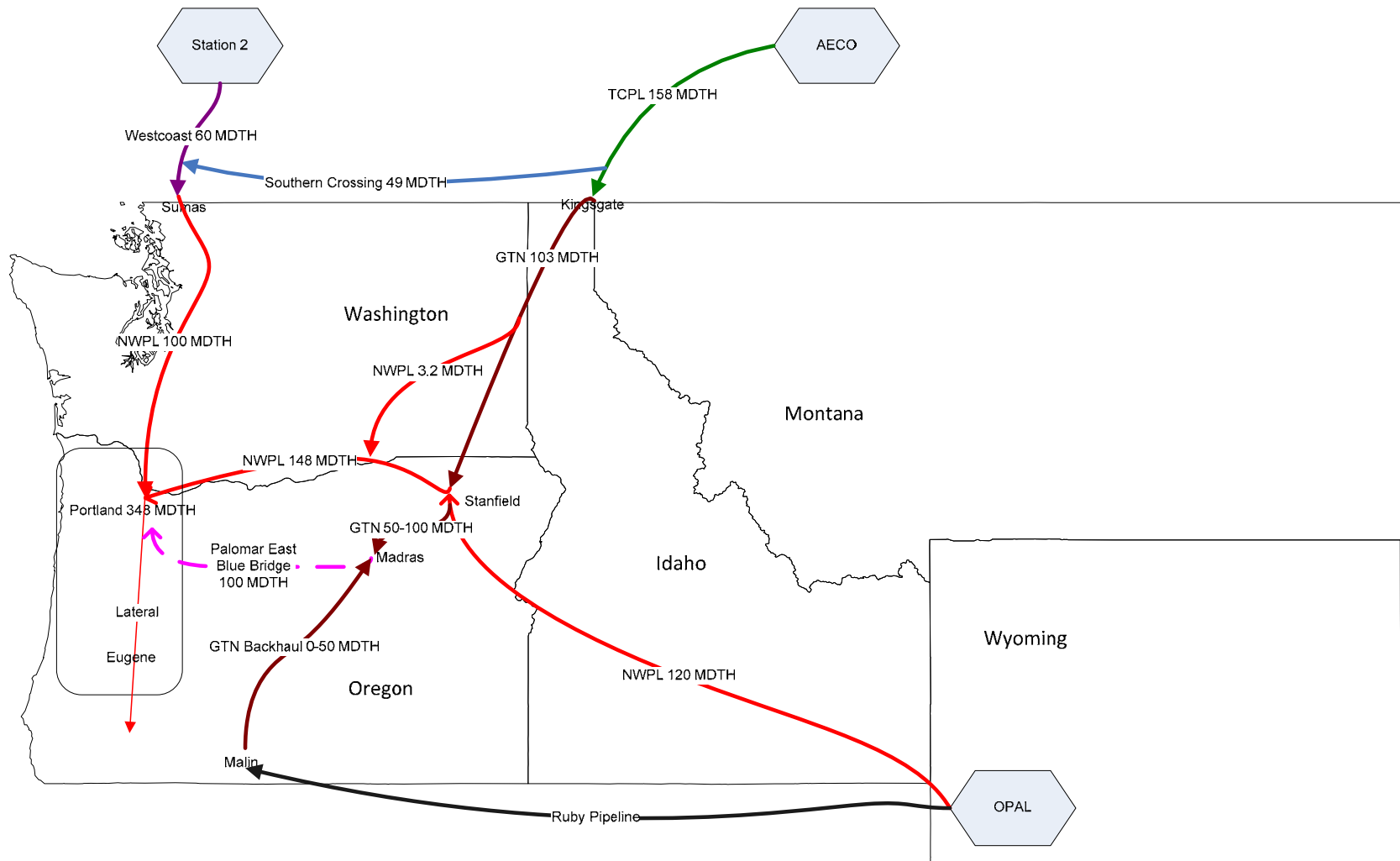
4. Storage

- Mist Storage Recall
- Satellite Storage Facilities in the Willamette Valley
- Newport LNG modeled to be closed for 2 years

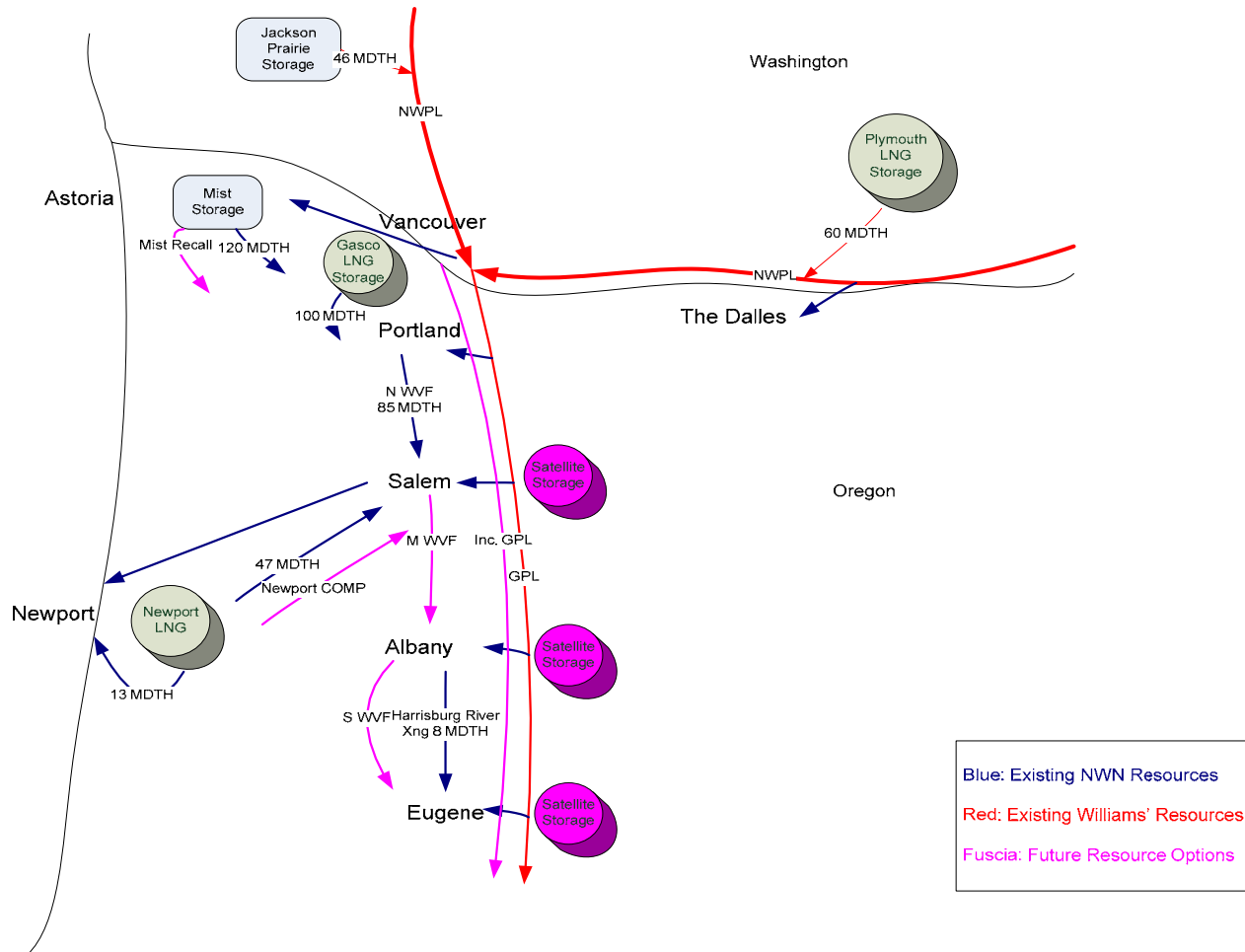
Pipeline and Supply Modeling Diagram



Pipeline and Supply Modeling Diagram with the proposed Palomar/Blue Bridge project



Storage & Service Area Modeling Diagram



Modification Model Results ranked by Cost



Run #	Name	Cost \$(000) NPV	Palomar/Blue Bridge	Mist Recall	Newport LNG Compressor Project	Satellite Storage	Grants Pass Lateral Expansion
17	1417-2011 IRP Mod Low Gas Fcst	5,974,021	N/A	X	X	X	X
16	1416-2011 IRP Mod Low Gas Fcst PAL BB 50	6,016,177	Palomar 50 MDTH Blue Bridge 50 MDTH	X	X	-	X
4	1402-2011 IRP Mod Gas Dereg	6,118,711	N/A	X	X	X	X
2	1397-2011 IRP Mod Low Customer Growth	6,585,860	N/A	X	X	-	-
8	1406-2011 IRP Mod 30% More DSM	6,672,066	N/A	X	X	-	X
1	1411-2011 IRP Mod Base Case	6,772,580	N/A	X	X	X	-
9	1410-2011 IRP Mod Newport LNG Closed	6,777,854	N/A	X	-	X	-
13	1412-2011 IRP Mod SUMAS Exp	6,789,728	N/A	X	X	-	X
11	1392-2011 IRP Mod PAL 100	6,792,363	Palomar 100 MDTH	X	X	-	X
15	1415-2011 IRP Mod SUMAS Exp PAL	6,795,878	Palomar 100 MDTH	X	X	-	X
10	1391-2011 IRP Mod PAL BB 50	6,813,487	Palomar 50 MDTH Blue Bridge 50 MDTH	X	X	-	X
7	1408-2011 IRP Mod 15% Less DSM	6,823,538	N/A	X	X	X	X
3	1400-2011 IRP Mod High Customer Growth	6,947,103	N/A	X	X	X	X
12	1413-2011 IRP Mod Canada Exp	7,089,115	N/A	X	X	X	-
14	1414-2011 IRP Mod Canada Exp PAL	7,128,853	Palomar 100 MDTH	X	X	-	X
6	1405-2011 IRP Mod Electric Breakthrough	7,916,437	N/A	X	-	-	-
5	1404-2011 IRP Mod Gas Breakthrough	9,086,125	N/A	X	X	X	-

Resource Modeling Results



1. Base Case (1411-2011 IRP Mod Base Case)

- The least cost plan with the base case inputs
- Relies on Mist Storage Recall into the core utility, Newport Compressor Project, and additional capacity in the Southern Willamette Valley
- Assumes that the Palomar/Blue Bridge Cross Cascades Pipeline is not built

2. With reserved capacity on Palomar/Blue Bridge

- 1392-2011 IRP Mod Pal 100 represents the least cost approach, assumes a minimum of 100 MDT at the Palomar rate - \$19.8 million more expensive overall than the base case, a 0.3 % increase
- 1391-2011 IRP Mod Pal BB 50 represents the high case, assumes a 50/50 mix of Palomar and Blue Bridge rates – \$40.9 million more expensive than the base case, a 0.6 % increase
- The cost difference with Palomar is narrowed further under a high Sumas gas price scenario (SUMAS EXP). This scenario assumes a rising cost differential for the Sumas pricing point as a result of the proposed gas export facility in Kitimat BC.

Monte Carlo Simulation Results

- The Monte Carlo simulation modeling runs were performed in the original IRP modeling phase which included an earlier in-service date for Palomar, and lower pipeline rate estimates.
- Simulations around weather and gas price were run with a resource portfolio that included Palomar, and one that did not.
- Both resulted in a high degree of reliability, the case with Palomar served demand 98.3% of the time, and the case without the pipeline was 97.9% reliable

Resource Modeling Results



Key points to remember about Palomar & the IRP:

1. Palomar would essentially provide parallel pipeline capacity to NW Natural's service area, which would enhance service reliability. NW Natural would reserve capacity on the pipeline and turn back capacity on NWPL; maintaining capacity on both pipelines.
2. The pipeline could also open up a new supply source at Malin.
3. The model wants to purchase and transport more AECO supply, which is forecast to be the lowest cost price point. Should prices at Sumas increase relative to the other sources, the pipeline could open a path to more future AECO supplies.
4. Increased cost – new infrastructure.
5. As of today, planning decisions are similar with or without Palomar in the picture. The following planning chart illustrates this fact

Planning Pathways

