

## I. EXECUTIVE SUMMARY

### A. Introduction

Puget Sound Energy (PSE) establishes and periodically updates a Least Cost Plan as part of its long-term resource acquisition and management strategy development. This document satisfies Washington state requirements regarding least cost planning as described in WAC 480-100-238 and WAC 480-90-238 and provides an update of the results of the electric and gas Least Cost Plan analysis process and long-term resource strategic direction. PSE believes its Least Cost Plan meets applicable statutory requirements and seeks a letter from the Washington Utilities and Transportation Commission (WUTC) accepting this Least Cost Plan filing.

#### *Acknowledgement*

PSE maintains its commitment to actively encourage public involvement in this process. As of April 29, 2005, PSE has hosted ten formal Least Cost Plan meetings. In addition, dozens of informal meetings and communications have taken place. PSE would like to thank the members of the Least Cost Plan Advisory Group for their continuing commitment to this process.

### B. Electric Least Cost Plan

#### B.1. Overview and Key Findings

This Least Cost Plan emphasizes PSE's commitment to developing an executable electric resource acquisition strategy. As detailed in this document, PSE has undertaken a thorough least cost analysis including all of the traditional considerations of demand, existing resources, new generation and demand resource alternatives, and the risks and uncertainties for each.

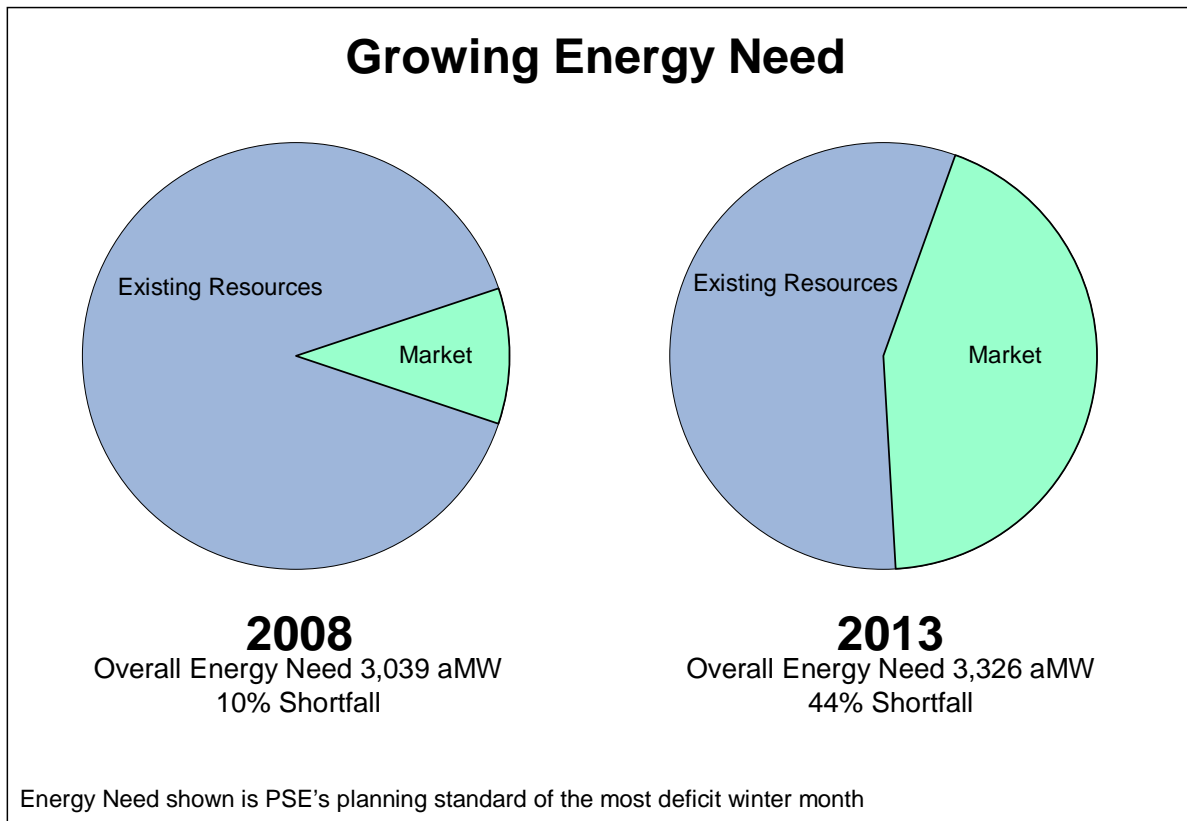
As part of PSE's focus on developing an executable strategy, this Plan also includes an expanded identification of key real-world challenges and uncertainties to electric resource acquisition. Key issues include timely transmission availability and costs, environmental initiatives such as potential greenhouse gas regulation and taxation, natural gas market changes, and corporate financial and credit considerations. By speaking plainly about such issues, PSE seeks to educate stakeholders about the "realities on the ground" that may well

preclude PSE and the region from acquisition of the theoretical least cost resources suggested by the analysis.

*Energy Resource Situation*

As shown in Exhibit I-1, absent acquisition of new long-term firm resources, PSE is facing a growing reliance on short-term market purchases.

**Exhibit I-1**



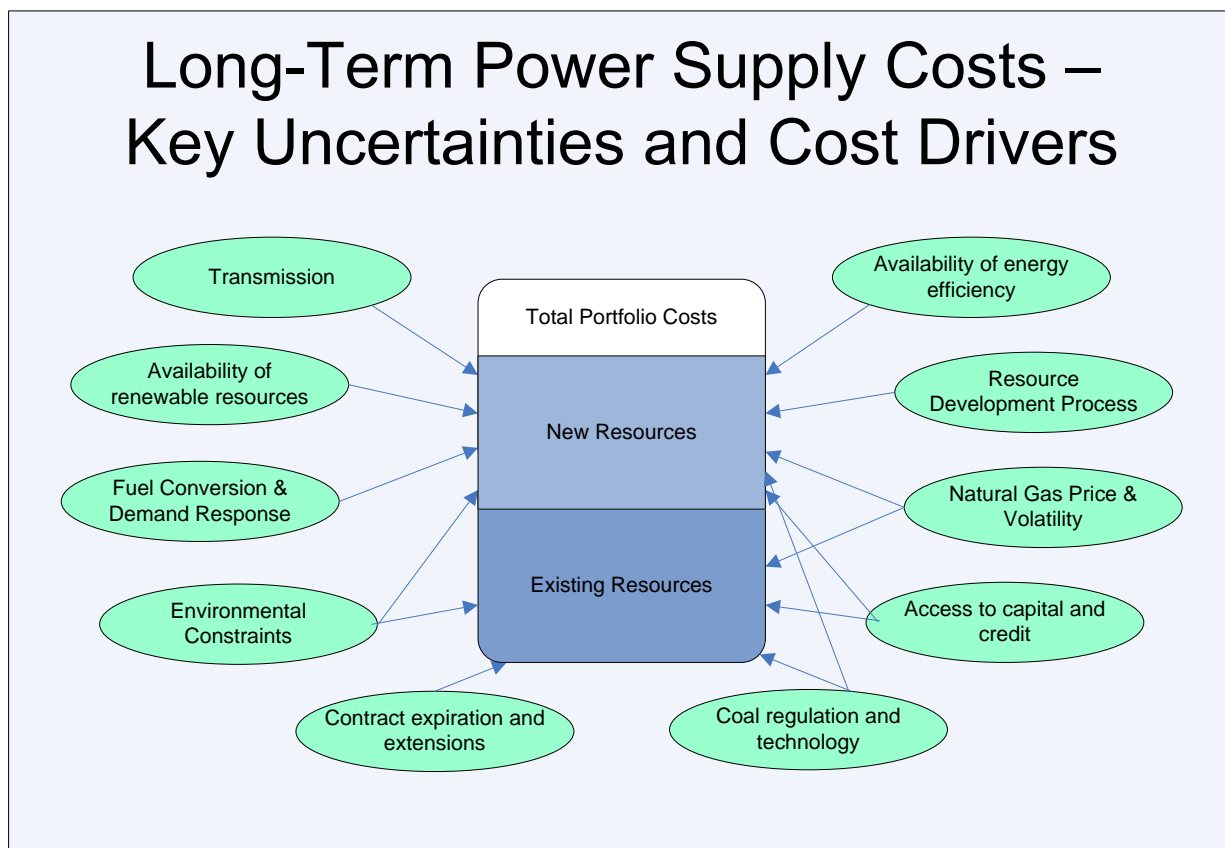
While PSE has a moderate near-term need for new electric resources, several existing power purchase contracts expire between 2011 and 2012, raising expected energy need to approximately 1500 aMW. Developing an understanding of resource options to meet this growing shortfall is the objective of this plan.

*Resource Acquisition Challenges*

This Least Cost Plan confirms the strategy developed in the 2003 Least Cost Plan to meet needs with a diverse portfolio of demand and supply resources. However, PSE is acutely aware

that public policy initiatives, legacy institutional roles, emerging market forces, and commercial considerations will challenge the Company’s ability to achieve an economically optimal mix. Exhibit I-2 illustrates the key uncertainties that impact PSE’s long-term power costs and resource acquisition strategy.

**Exhibit I-2**



The following summaries provide detail about each of these key issues.

**Natural Gas Price and Volatility:** Since 2003, the natural gas market has experienced a fundamental upward price shift. A tighter North American supply situation, coupled with global energy demand growth exceeding productive capacity, puts upward pressure on natural gas prices. The prospects for future gas price moderation depend upon potential supply increases from expanded liquefied natural gas import facilities and the construction of new pipelines to access the McKenzie Delta and Alaska supply basins. Both of these supply solutions face significant political and environmental challenges.

Tighter supplies have also led to increased price volatility and to the need for expanded price risk management. Higher prices place greater financial burdens and credit requirements on market participants.

**Transmission:** The key to establishing access to a diverse range of resources is to address uncertainties about the cost and availability of transmission. Currently, the regional transmission system is heavily constrained in its ability to move new power resources from likely new supply locations such as eastern Washington and Montana to PSE's service area.

Efforts to establish a cooperative regional transmission planning and development entity have encountered objections related to, among other reasons, cost and control. Currently, there is no clear path or timetable for resolving diverse regional views about transmission or for constructing needed transmission infrastructure.

**Environmental Constraints:** All resource types face environmental siting and operational issues, including those that are generally considered environmentally desirable. Potential future regulation of emissions adds cost and operational uncertainty to existing and potential resources, especially coal-fueled generation.

**Energy Efficiency:** PSE has a long and successful history of implementing energy efficiency. The Company's current resource strategy continues to take an aggressive approach to conservation acquisition. However, energy efficiency is a limited resource and many of the most cost-effective opportunities are found in retrofitting older end-uses. As new building codes and equipment standards have emphasized energy efficiency, PSE's overall use per customer is dropping and the pool of inefficient end-uses is decreasing over time. New technology is expected to provide some new opportunities.

**Fuel Conversion and Demand Response:** PSE conducted expanded evaluations of fuel conversion and demand response potential for this Least Cost Plan. However, while energy efficiency is a proven resource with established regulatory mechanisms for cost recovery, implementation processes, and evaluation methodology, such processes are not established for fuel conversion and demand response. The development of such processes will require collaborative discussions with regulators and key stakeholders.

**Contract Expirations and Extensions:** A large driver of PSE's rapidly growing resource need over 2011-2012 is the expiration of power purchase contracts with three large natural gas cogeneration projects built in the early 1990s. Over time, generation technology has advanced, making some of these resources relatively inefficient compared to new plants. The approaching expiration of these contracts may provide an opportunity for renegotiated terms, acquisition at attractive prices or replacement with lower-cost resources.

Over this same time period, PSE is also facing the expiration of low-cost hydroelectric purchase contracts with a mid-Columbia Public Utility District. PSE is pursuing contract renewal discussions.

**Renewable Resources:** Several years of dialogue with market developers and two formal rounds of resource solicitation have confirmed that viable renewable energy projects with available transmission are limited in number, and relatively small in size. While the Company has successfully acquired two new wind resources, additional wind projects will likely encounter significant transmission constraints and higher costs.

The year-to-year uncertainty of continuing federal production tax credits has greatly complicated project development and financing, slowing the construction of wind projects nationwide. Currently, wind projects starting production in calendar year 2005 are eligible for 10 years of tax credits but, as of the date of this report, tax credits have not been renewed for projects starting in 2006 and beyond. As a result, project developers cannot commit to projects with uncertain economics, and manufacturers cannot commit to increased production with uncertain future demand.

**Coal Regulation and Technology:** The potential regulation of greenhouse gasses and other emissions impacts coal generation costs and availability to a greater degree than other resources. Promising new technology, such as integrated gasification combined cycle (IGCC), has the potential to effectively address most environmental concerns. IGCC technology cost, performance, and vendor warranties are improving. Constructing an IGCC plant near PSE's service area would greatly reduce the transmission construction challenge.

**Resource Development Process:** Potential new resources face a gauntlet of local, state, and federal siting and permitting processes which often are misaligned. Resources that require new transmission facilities face combined transmission and resource development risks.

**Access to Capital and Credit:** An increasingly challenging investment environment means that corporate financial strategy and corporate resource strategy are inter-dependent. PSE considers credit requirements, imputed debt costs and financing requirements when making future resource decisions.

### *Meeting the Challenges*

The resource acquisition strategy has two key objectives: 1) acquiring the least cost mix of readily available resources to meet near-term needs and 2) addressing uncertainties and barriers to acquiring the least cost mix of resources for the long term. PSE will use multiple tactics in order to meet the challenges enumerated above and to acquire resources to serve its customers at the least cost. PSE's actions will include the following:

- Establish and implement new programs to achieve energy efficiency goals.
- Acquire cost-effective renewable resources to achieve PSE's target of 10 percent by 2013.
- Initiate competitive acquisition process (RFP) for new long-term resources.
- Initiate competitive acquisition process for bridging power purchase agreements.
- Evaluate self-build and joint ownership opportunities.
- Initiate discussions regarding contract extensions for existing resources.
- Explore feasibility and pursue partnering opportunities and transmission alternatives for remote-located coal and renewable generation.
- Work to be a constructive voice in the federal, regional, and state dialogue about transmission investment, operation, and control.

In the near-term, PSE expects to select resources from a mix of energy efficiency, small to medium-scale local renewable generation, wind generation or project expansion (provided reasonably-priced transmission solutions are available), ownership or contract shares of existing

resources, and possibly natural gas-fueled resources currently existing or under development. Recognizing that near-term resource availability may be limited and that market purchases are expected to be competitive with project-specific resources, PSE may execute a limited number of “power bridging agreements” to cover a portion of the shortfall until long-term resources are available.

For the long term, PSE expects to select resources from a mix of energy efficiency, renewable energy resources, natural gas-fueled resources, and new conventional or IGCC coal projects.

## B.2. Electric Resource Need

### *Accomplishments since 2003 Least Cost Plan*

A number of strategies identified in the April 2003 Least Cost Plan have been successfully implemented. This was accomplished through a variety of actions, including the competitive solicitation and resource acquisition process. As shown in Exhibit I-3 below, PSE has reduced its resource needs through the acquisition of conservation, wind energy and generating resources.

**Exhibit I-3**

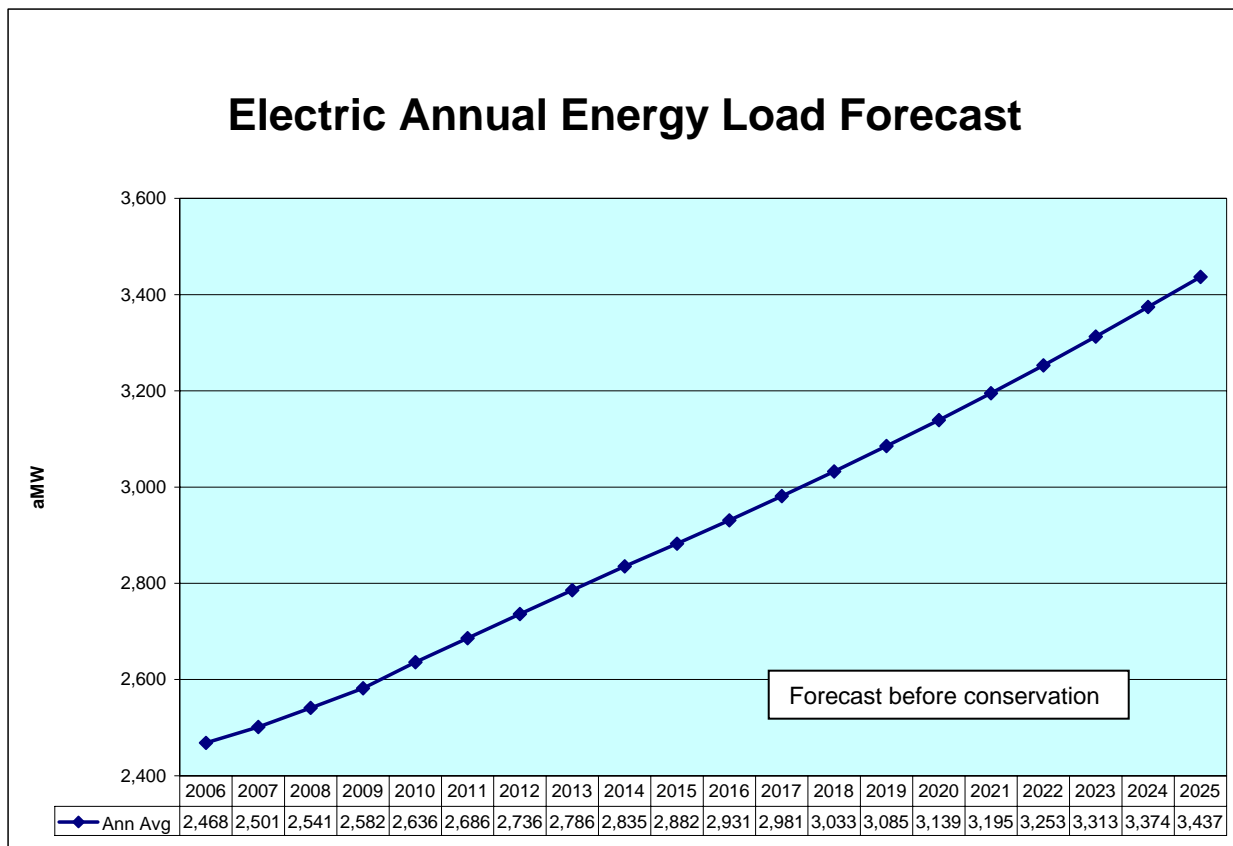
<b>ACQUISITIONS SINCE APRIL 2003 LEAST COST PLAN</b>		
<b>PROJECT</b>	<b>CAPACITY</b>	<b>ENERGY</b>
Frederickson 1 Combustion Turbine	125 MW	123 aMW
Hopkins Ridge Wind	150 MW	52 aMW
Wild Horse Wind	229 MW	77 aMW
APS Purchase Contract	85 MW	85 aMW
Ormat Recovered Energy	5 MW	5 aMW
Colstrip Turbine Upgrade	28 MW	23 aMW
Energy Efficiency <sup>1</sup>	79 MW	38 aMW
<b>TOTAL</b>	<b>701 MW</b>	<b>403 aMW</b>
1. Savings for 2003-04 calendar years		

Improvements to PSE’s in-house ability to analyze and acquire conservation and generating resources have contributed significantly to these accomplishments.

*Future Demand Forecast*

While individual electric use per customer continues to decline, demand as a whole is forecast to increase due to population growth in the service territory. PSE forecasts that the electric load, absent conservation, will grow at 1.8 percent annually over the 20-year planning period. This equates to a load growth of approximately 970 average annual megawatts. Exhibit I-4 shows PSE’s annual energy load forecast through the year 2025.

**Exhibit I-4**



*Resource Need*

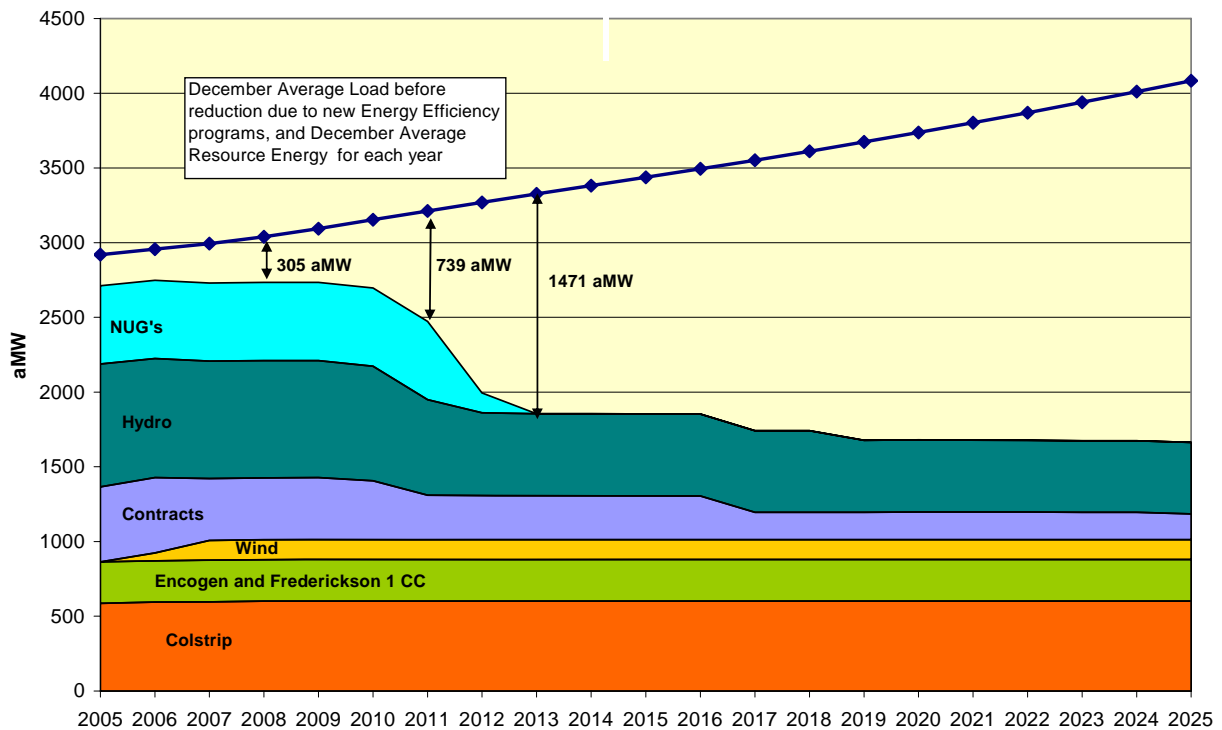
Even more than load growth, expiring power purchase agreements create a need for new resources. Between 2011 and 2013, three major non-utility generator contracts will expire, removing 523 aMW from PSE’s portfolio. At the same time, some of PSE’s long-term purchase agreements with the mid-Columbia Public Utility Districts (PUDs) also expire. Negotiating extensions of the mid-Columbia purchase contracts is a priority in this plan in order to ensure continuing access to these valuable resources.



In its 2003 Least Cost Plan analysis, PSE conducted extensive quantitative studies of various electric resource planning standards. Based upon those studies, PSE calculates its energy need to be the resources required to meet average monthly load during the heating season month with the greatest demand.

As shown in Exhibit I-5, PSE has a moderate near-term need, and a much greater need in the future, primarily due to the expiration of significant resource contracts between 2011-2012. As a result, the resource need increases dramatically within the time frame of the plan.

**Exhibit I-5  
Long Run Load-Resource Balance**



### B.3. Electric Planning Considerations

The 2005 Least Cost Plan identifies several major electric industry and Company issues that create risk and uncertainty related to resource decisions. Much of the analysis and forecasting used to develop this plan was created to explore the impact of these issues. Key planning considerations were identified in section B.1 and include regional transmission system capacity, environmental issues, corporate financial condition and financial market uncertainties, access to

capital and credit, natural gas prices and volatility, and the development process for new resources.

#### **B.4. Electric Resource Options: Demand Side and Generating Resources**

##### *Demand Side Resources*

As part of the 2005 Least Cost Plan development process, PSE hired Quantec, LLC, a leading demand-side technical consultant, to develop updated supply potential estimates for energy efficiency, fuel conversion, and demand management. The 20-year estimate of cost-effective conservation, 13 aMW per year, is similar to the value from the 2003 Least Cost Plan and is consistent with the regional estimate by the Northwest Power and Conservation Council. The new estimate was informed by data from PSE's residential end-use survey completed in 2004.

Quantec's fuel conversion supply analysis indicates that much of the current cost-effective fuel conversion is taking place without a utility incentive program driven by economic considerations. The 20-year estimate of residential fuel conversion potential is 3 aMW per year. The electric savings and costs for a potential utility fuel conversion program are modeled as an energy efficiency measure in the electric analytics. The additional gas usage for converted end-uses is modeled as a load increase in the gas analytics.

The demand management analysis looked at the cost and resource contribution of a variety of voluntary (incentive-based) and utility-controlled programs. Quantec's analysis was based upon PSE's customer data and the program performance history of other utilities. While the analysis indicates some potentially cost-effective resources, there remain many program design and regulatory issues regarding demand management. PSE views the Quantec analysis as a technical base for further discussions.

##### *Generating Resource Alternatives*

The generating resources modeled in the Least Cost Plan represent generic resources that could reasonably be included in PSE's portfolio. Supply side resources include natural gas-fueled combined cycle combustion turbines (CCCTs); coal-fuel thermal plants; renewable energy resources including wind and biomass; power bridging agreements and a winter call option contract to cover the winter peak energy needs.

A primary source for generic generating resource information was the U.S. Department of Energy's, Energy Information Agency's (EIA) table of "Cost and Performance Characteristics of New Central Station Electricity Generating Technologies" from the Annual Energy Outlook, 2004. The EIA provides basic information about plant characteristics at the national level, such as plant capacity, heat rates, capital costs, variable costs and fixed costs. This information was augmented with cost data gleaned from PSE's recent resource acquisition process for capital costs, power transmission development and gas fuel transportation, among others. PSE evaluated but did not model emerging technologies for which the costs and performance are less certain because the data would not support an accurate cost tradeoff analysis.

While generic plant information is available from a number of sources including the Energy Information Administration and the Northwest Power and Conservation Council, general industry transmission information is much harder to develop. The nature of the transmission system requires a specific resource location and a transmission study to develop the scope and costs of transmission from that specific location to the customer base. PSE produced two transmission cost scenarios - one assuming regional pricing (wherein the costs for transmission system upgrades are recovered through rolled-in rates charged to all system users) and one assuming direct participant funding (wherein the costs for necessary transmission upgrades are added to the cost of the resource regardless of the regional benefits to the transmission system).

## **B.5. Electric Analytic Approach**

### *Improvements from Previous Plan*

PSE's 2003 Least Cost Plan introduced new modeling tools and established a solid analytical base for this 2005 plan. Like the 2003 plan, this plan developed its analytical approach to fully explore (i) demand and factors influencing demand, (ii) supply options, (iii) natural gas and electric market prices and volatility, (iv) demand-side and renewable generating resources, and (v) mixes of potential resources in integrated supply and demand portfolios. PSE continues to develop its resource strategy using updated versions of the same process tools: AURORA, the Portfolio Screening Model and the Conservation Screening Model.

For this plan, one of the most important improvements for the quantitative analysis is the inclusion of scenarios. A scenario is a consistent set of data assumptions to define a specific future. The Least Cost Plan scenarios are designed to answer "what if" questions regarding the key issues.

The shift to scenarios reflects current uncertainty about energy policy, environmental issues and the macro economy. In the 2003 Least Cost Plan, PSE analyzed uncertainty using Monte Carlo analyses that covered a range of possible prices, shaped around a mean or expected level. Monte Carlo uncertainty is based on quantifiable variability found in historical statistics for which a distribution can be derived. The 2005 Least Cost Plan continues the Monte Carlo analysis and adds an additional level of uncertainty analysis with scenarios.

One important aspect to scenario analysis is that it takes a holistic approach to the important variables. For example, rather than looking only at the impact of an exogenous CO2 charge on portfolio resource selection, the process includes a long-term analysis for power prices based on optimal regional new resource construction which takes the charge into account.

#### *Scenario Analysis*

In order to meet the complex and varying range of potential outcomes related to future demand and capacity, PSE developed six scenarios to explore the uncertainties around a number of key issues. The six scenarios include varying assumptions regarding gas price forecasts, carbon emission costs, transmission availability and costs, load forecasts, and renewable energy policy.

The scenario assumptions were first used to develop regional electric price forecasts using the AURORA electric market simulation model for the western region. PSE selected gas price scenarios from CERA that were consistent with the overall scenario description. The energy price forecasts and detailed scenario descriptions are detailed in the plan.

#### *Portfolio Performance*

PSE analyzed resource options against the six scenarios to determine portfolio performance across the range of futures. PSE used its Portfolio Screening Model to examine the present value costs and the cost variability of each portfolio against a wide array of anticipated market and technical developments.

## **B.6. Electric Findings: Results of Analysis**

This Least Cost Plan concludes that PSE should acquire a diverse mix of generating and demand-side resources. Key analytical findings include:

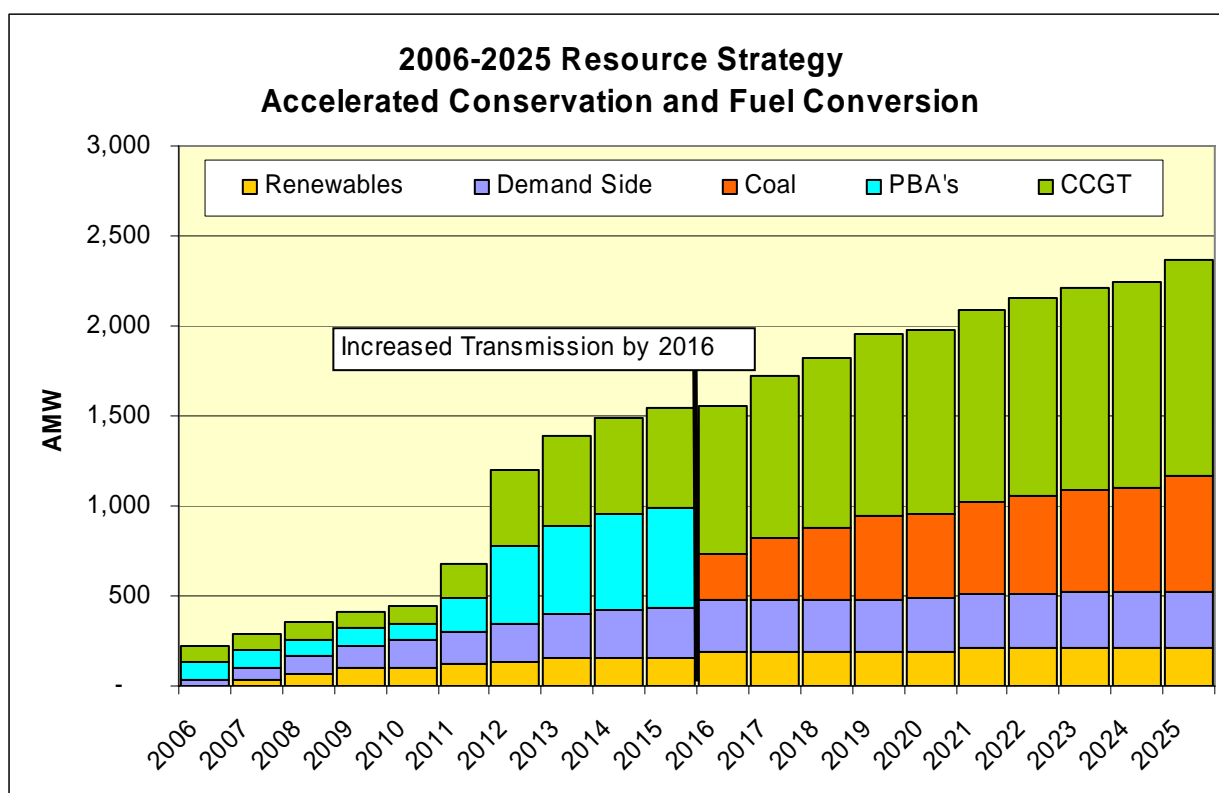
- With a regional transmission solution, portfolios with coal resources reduce portfolio costs.
- Absent a regional transmission solution, portfolio costs are generally higher but, despite high transmission costs, portfolios with coal resources remain cost competitive in many scenarios.
- Scenarios with quantified carbon dioxide emissions costs cause portfolios that include gas resources to be cost-competitive with portfolios that include coal resources.
- Accelerated energy efficiency provides more benefit to the portfolio than a constant rate of energy efficiency.
- Considering all scenarios, the lowest risk (but not necessarily the lowest cost) incremental portfolio is the 15 percent Renewable and 50/50 Coal & Gas.
- Under current market price assumptions, near-term power bridging agreements reduce portfolio cost compared to gas resources. However, the market availability of power bridging agreements needs to be confirmed.
- Under the Least Cost Plan assumptions, early fuel conversion could provide more benefit to the portfolio than normal fuel conversion.
- Overall, considering both cost and risk, the analysis supports the selection of a portfolio including accelerated energy efficiency, early fuel conversion, 10 percent renewable generation, and 50/50 gas and coal. This portfolio performs well across all the scenarios.

The least cost portfolio mix varies across scenarios, reflecting the differing assumptions behind each potential range of outcomes. As the scenario changes, and thus assumptions such as transmission capacity, so does the most advantageous plan for operating in that environment. By examining a range of scenarios, the plan's analysis yields a portfolio mix that is able to accommodate a variety of scenarios.

Transmission availability and cost is a significant factor, with high transmission costs favoring local natural gas generation and low transmission costs allowing for a wider range of generation options. Potential carbon emissions costs also factor into the long-term difference between gas and coal resources, but have a lesser impact than transmission considerations.

Exhibit I-6 shows how the long-term energy need could be theoretically filled in a least cost manner given the assumptions described throughout this Least Cost Plan. The chart shows the least cost mix of additional resources to meet the planning standard under the base energy forecast. The portfolio includes renewable resource additions to achieve 10 percent of load by 2013. Also included are accelerated energy efficiency and early fuel conversion.

**Exhibit I-6**



**C. Natural Gas Least Cost Plan**

Overview and Key Findings

PSE's gas resource planning generally focuses on ensuring the Company can meet the needs of our firm gas sales customers in a way that minimizes costs over the long-term. By the

2007/08 winter heating season, PSE's capacity will fall short of its design-peak day demand forecast. Thus, PSE is entering a period where the Company will need to acquire resources to meet the growing needs of its customers. The following summarizes key findings from this plan.

### **C.1. Adequacy of Gas Supply**

Physical gas supply is expected to be adequate to meet growing demand in the Pacific Northwest and North America generally. To meet growing demands for end-use and generation fuel, many industry experts predict imports of liquefied natural gas (LNG) will be needed, and will be developed, on a nation-wide basis to allow supply to keep pace with growing demand. Additionally, many experts anticipate that a pipeline to bring Alaskan gas into the North American market will also be completed within the Company's planning period. While there does appear to be sufficient supply to meet growing demands, long-term gas prices are expected to be higher than prior long-term forecasts, and prices are expected to continue to be quite volatile. Higher prices provide the financial incentive for development of new North American sources and imported LNG.

### **C.2. Access to Upstream Canadian Supply**

PSE currently acquires roughly 40 percent of its gas supply on Northwest Pipeline via the Sumas, Wa. interconnect point at the Canadian border, though that ratio could increase in the future. There has generally been a liquid market for natural gas at the Sumas, Wa. market hub. However, capacity held by Canadian marketers and producers to move gas south in British Columbia from the producing fields to the market on Duke Energy Gas Transmission (Westcoast Pipeline) has been diminishing. This decline in contracted capacity is expected to continue as producers seek more flexibility in order to move gas supplies east to the very liquid Alberta (AECO) market from the production zone.

As a result, PSE will consider acquiring additional long-term transportation capacity on upstream pipelines to ensure access to firm supplies at liquid markets. Acquiring additional capacity on Westcoast Pipeline from Station 2 in Northeast British Columbia to access British Columbia gas supply basins is an example. Additionally, PSE also has an opportunity to diversify its supply risk by accessing Alberta gas (AECO) supplies via Terasen Gas's Southern Crossing Pipeline. This pipeline can move gas from AECO via TransCanada's Alberta Natural Gas (ANG) and Nova systems (See Gas Resources and Transportation Map in Chapter II.).

While this alternative is not currently a least cost solution, it may be an important means of enhancing geographical diversity and minimizing risk.

### **C.3. Load-Resource Balance**

During this planning cycle, PSE re-examined both its loads and resources to update its long-term projected load-resource balance position. The design-day planning criterion was updated from 51 to 52 heating degree days<sup>1</sup> (from 14 degrees Fahrenheit to 13 degrees Fahrenheit) and design day demand forecasting methodology was tested and modified. PSE also updated assumptions on availability of resources to meet its customers' firm demand under design day conditions. Based on this analysis, PSE's long-term gas supply portfolio is projected to become deficit by the 2007-08 heating season.

### **C.4. Analytical Methods**

PSE has enhanced its ability to model gas resources for long-term planning and long-term gas resource acquisition activities since the 2003 Least Cost Plan and Update were filed. The Company acquired SENDOUT<sup>®</sup> and VectorGas<sup>™</sup> from New Energy Associates in August of 2004. SENDOUT<sup>®</sup> is a widely used model that helps identify the long-term least cost combination of resources to meet stated loads using a linear programming model. The model determines the optimal portfolio of resources that will minimize costs over the planning horizon, based on a set of assumptions regarding resource alternatives, resource costs, demand growth, and gas prices. SENDOUT<sup>®</sup> has the capability to integrate demand side resources alongside supply side resources in determining the optimal resource portfolio.

Because decisions must be made in the context of uncertainty about the future, PSE acquired VectorGas<sup>™</sup> along with SENDOUT<sup>®</sup>. VectorGas<sup>™</sup> is an add-in product that facilitates the ability to model gas price and load (driven by weather) uncertainty into the future, using a Monte Carlo approach in combination with the linear programming approach in SENDOUT<sup>®</sup>. This increased modeling capability will provide additional information to decision-makers under conditions of uncertainty. VectorGas<sup>™</sup> was used in this plan to test the physical and financial risks associated with the optimal portfolio from the Base Case planning scenario and to test the sensitivity of optimal resource additions in deriving the optimal Base Case portfolio. These new

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<sup>1</sup> See Appendix I for a detailed discussion of the design-day planning criterion update.



tools provide valuable enhancements to the robustness of the Company's long-term resource planning and acquisition activities.

### **C.5. Generic Resources**

One purpose of the Least Cost Plan is to identify an illustrative resource portfolio to help guide specific resource acquisitions. In this planning cycle, the Company considered a host of resource alternatives that can be added to its resource portfolio, including additional energy efficiency programs, Jackson Prairie storage deliverability expansion, additional transportation capacity, LNG imports with transportation capacity, satellite LNG storage, and on-system LNG storage including liquefaction facilities. Generally, utility infrastructure projects are "lumpy," while demand grows annually at a small percentage rate, capacity is typically added on a project by project basis. Gas utilities often have surplus supply and "grow into" their new pipeline capacity, because it is more cost effective for pipelines to build for several years' worth of load growth at one time than to make small additions each year. For the purposes of this plan, however, the Company determined a theoretical cost-minimizing portfolio that is not constrained by this lumpiness issue. While it is anticipated that actual capacity acquisitions will be lumpy, this theoretically ideal portfolio provides a reasonable basis from which the Company can consider specific resource acquisitions.

### **C.6. Analytical Frameworks**

Traditional gas least cost plans would include analysis targeted at identifying the optimal long-term resource portfolio to meet the demands of the gas utility's customers across a few customer growth and gas price scenarios. In this plan, PSE's gas resource analysis includes four different scenarios that focus solely on gas utility operations and a fifth analysis to support decisions regarding electric-to-gas fuel conversions. In addition to scenario analysis, PSE performed two different kinds of Monte Carlo analysis to examine a variety of risks (as noted above).

For this plan, PSE's gas resource analysis goes beyond the analysis of a gas Local Distribution Company ("LDC"). PSE used the same gas resource planning tools in its analysis of optimal resources to supply gas as electric generation fuel, based on results from the electric plan. Additionally, the Company analyzed whether cost savings via economies of scale and scope could be captured by planning to meet growing gas LDC needs and growing gas for electric generation fuel supply needs on a combined basis. This analysis determined the long-term cost

of the optimal portfolio designed to meet the joint demands of gas LDC sales and gas generation fuel. It then compared that long-term optimal portfolio cost to the combined costs of the stand-alone optimal portfolios for the gas LDC, and to the gas for generation fuel, separately.

## **C.7 Summary of Key Findings**

### *Summary of Key Analytical Results—LDC Analysis*

- Higher gas prices relative to the last Least Cost Plan indicate PSE should consider expanding its level of natural gas energy efficiency programs.
- PSE should work with Jackson Prairie co-owners to expand deliverability and work with Northwest Pipeline to obtain seasonal delivery rights similar to today's TF-2 service.
- PSE should consider acquiring upstream capacity on Westcoast from Station 2, though maintaining diversity of supply from AECO is an important qualitative factor for consideration.
- Additional load from a fuel conversion program does not appear to put upward pressure on average gas costs to existing customers.
- Monte Carlo analysis to examine physical supply risk indicates that a portfolio designed to meet PSE's design-day peak forecast in an otherwise normal temperature winter is sufficient to meet its obligations under a variety of possible winter conditions.
- With regard to cost risk, the 20-year Monte Carlo analysis demonstrates that viewing risk over a 20-year horizon tends to mute the effects of price and volumetric variability. Shorter time periods, such as annual variability, should be considered when examining the impact of different resources on cost variability.
- Monte Carlo analysis on optimal portfolio construction highlights that timing of certain resource additions are highly sensitive to Base Case assumptions.

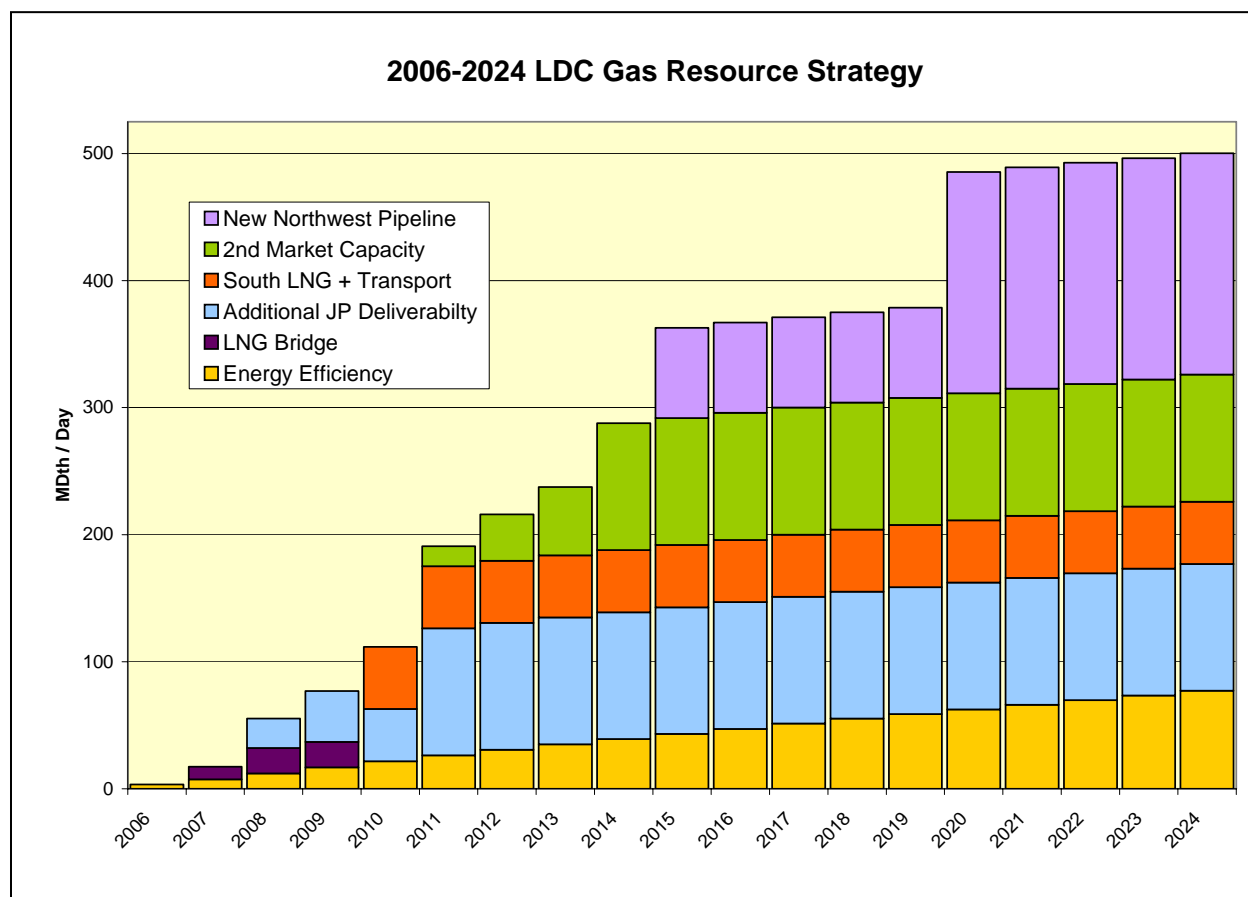
### *Key Results from Generation Fuel Analysis*

- Based on the electric Business as Usual gas-fired generation resources, PSE's gas portfolio for power generation appears to have sufficient firm Northwest Pipeline capacity through 2009.
- Like the sales portfolio, additional upstream transportation capacity to Station 2 may need to be acquired as gas producers and marketers hold less capacity on Westcoast to move gas south to Sumas.

### Key Results from Joint LDC and Generation Fuel Analysis

- Analysis showed potential savings of approximately 1 percent per year on an annualized basis relative to the combined stand-alone portfolio costs, a large portion of which would be achievable through short-term optimization without significant changes in long-term planning.

Exhibit I-7



## D. Public Involvement and Use of Plan

### Public Involvement

PSE maintains an open commitment to actively encouraging public involvement in this process. As of April 29, 2005, ten formal Least Cost Plan meetings, in addition to dozens of informal meetings and communications have taken place. A number of stakeholders including WUTC Staff, the Public Counsel, consumer advocates, individual customers from industrial, commercial and residential classes, conservation and renewable resource advocates, the

Northwest Power and Conservation Council, Northwest Industrial Gas Users (NWIGU), Industrial Customers of Northwest Utilities (ICNU), project developers, capital market participants and Washington state's Department of Community, Trade and Economic Development have actively participated in these meetings. The stakeholder meetings provide an avenue for constructive feedback and useful information to guide the Least Cost Plan process. Stakeholder suggestions and practical information were invaluable in developing this Least Cost Plan. PSE thanks all those who attended the Least Cost Plan meetings for their time and energy. PSE encourages the continuation of this active participation as the Company's planning process proceeds.

#### *Use and Relevance of PSE's Least Cost Plan*

PSE's Least Cost Plan provides the strategic direction guiding the Company's long-term resource acquisition process. The Least Cost Plan does not commit PSE to the acquisition of a specific resource type or facility, nor does it preclude PSE from pursuing a particular resource or technology. Rather, the Least Cost Plan identifies key factors related to resource decisions and provides a method for evaluating resources in terms of their cost and risk. PSE recognizes that least cost planning is a dynamic process reflecting changing market forces and a changing regulatory environment.