

**EXHIBIT NO. \_\_\_(RG-7HC)  
DOCKET NO. UE-07\_\_\_/UG-07\_\_\_  
2007 PSE GENERAL RATE CASE  
WITNESS: ROGER GARRATT**

**BEFORE THE  
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION**

**WASHINGTON UTILITIES AND  
TRANSPORTATION COMMISSION,**

**Complainant,**

**v.**

**PUGET SOUND ENERGY, INC.,**

**Respondent.**

**Docket No. UE-07\_\_\_  
Docket No. UG-07\_\_\_**

**SIXTH EXHIBIT (HIGHLY CONFIDENTIAL) TO THE  
PREFILED DIRECT TESTIMONY OF  
ROGER GARRATT  
ON BEHALF OF PUGET SOUND ENERGY, INC.**

**REDACTED  
VERSION**

**DECEMBER 3, 2007**

# 2005 All-Source RFP Evaluation

## Phase II

Puget Sound Energy  
Resource Planning and Acquisition

September 29, 2006

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**I. Phase I Conclusion: Candidate Short List Selected**

PSE completed Phase I of its 2005 RFP evaluation at the end of April 2006 with the selection of thirteen projects and three short-term Power Purchase Agreements (PPAs) for the candidate short list. For a complete list of selected proposals, refer to Attachment 7 of the Phase I evaluation document.

Proposals were selected based on the highest qualitative and quantitative rankings for each of the projects by technology. Such projects were determined to be economically attractive based on their portfolio benefit ratio, and whether they were feasible from a permitting and development standpoint, commercially viable and financeable. The projects and PPAs selected allowed PSE to test a mix of portfolios in Phase II to ultimately determine the best options to meet PSE's need.

Projects that were not selected exhibited the following deficiencies: 1) immature development; 2) economically less competitive; 3) uncertainty surrounding the feasibility of the project and project schedule; 4) no transmission solution or a greater uncertainty of obtaining transmission (e.g., based on queue position); and 5) technology risk. For a list of projects that were not selected for the candidate shortlist, along with the reasons each project was not selected, refer to Attachment 8 of the Phase I evaluation document.

**Revised Candidate Short List**

During the early stages of Phase II, PSE was notified separately by three respondents that their project conditions had changed. One of the selected wind projects was being sold to another utility. A second wind proposal was withdrawn due to redeployment of turbines originally earmarked for the proposed project. The third wind project indicated a schedule delay until at least 2008 due to recent permitting challenges, thereby imposing significant project, cost and PTC risk on the proposal's evaluation. These changes in circumstance reduced the number of short listed projects to thirteen.

Additionally, PSE was also notified by the geothermal project sponsor that PSE's portion of the proposed geothermal plant would be reduced to roughly one half of the project output and that the other half was in the process of being sold to another counterparty.

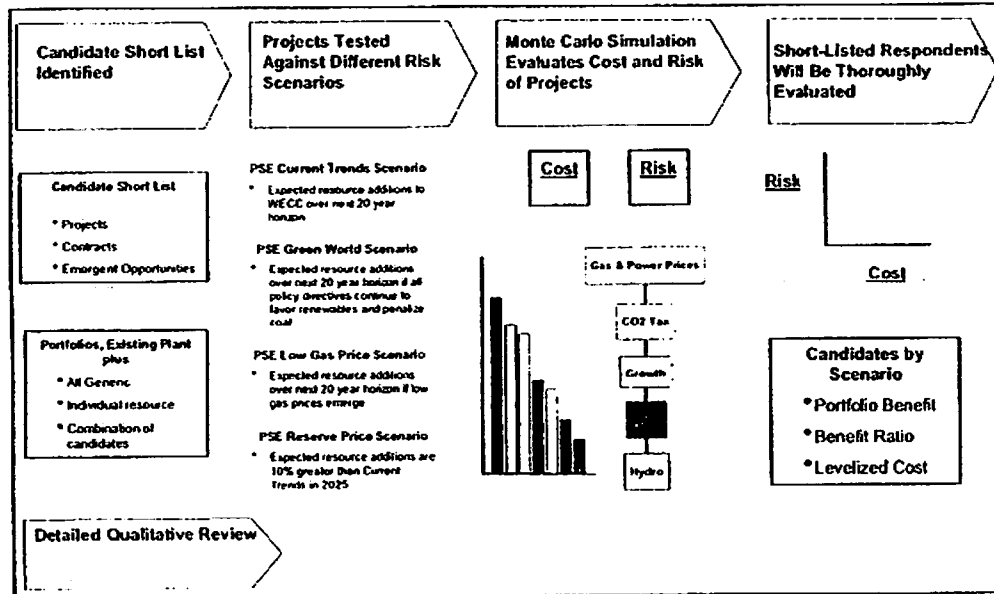
**II. Phase II**

**A. Phase II Overview**

PSE began Phase II of its 2005 RFP process in May 2006, following the selection of the candidate short list. As depicted in figure 1, during this phase PSE conducted further quantitative evaluation as well as a more in-depth qualitative review of each selected project.

Four all-team evaluation meetings and numerous smaller working group meetings were held. Senior management was kept informed with an officer update and a presentation to the Energy Management Committee. Additionally, the Senior Vice President of Energy Resources was updated with periodic progress reports. At the end of Phase II, an all-team working group meeting was held to review team ratings for each project and to select a final short list. Further details about the selection process are provided in part II, section E of this document.

Figure 1 Phase II: Qualitative and Quantitative Review



**B. Phase II - Qualitative Review Process**

The Phase II qualitative process built on the review effort of Phase I with a more robust team evaluation of each proposal and greater interaction with respondents. Evaluation teams identified next steps for each project during Phase I, to be pursued should the project advance to the candidate short list. These next steps generally identified areas requiring further detailed analyses and investigation.

At the beginning of Phase II, data requests were submitted to each of the respondents to obtain the detail necessary for more in-depth consideration. Further data requests were thereafter generated and submitted on an as-needed basis.

In one example of a data request, PSE asked for and obtained more detailed information about a complicated transmission solution to deliver SE Alaska hydro power to the US/BC border. Ultimately, the proposed solution proved difficult and uncertain requiring a solution that would involve multiple parties at the federal, state, local, provincial and ministerial levels. At the conclusion of the evaluation process, PSE determined that it would select the project to the "continuing investigation" list and would continue to monitor the transmission dialogue. (see Section Continuing Investigation List Selections)

Permitting issues were another area of concern that generated data requests. In one particular case, a wind project encountered local permitting issues. PSE was notified that the project would look at the potential of preempting the local county process. By doing so, the possibility of delay added additional PTC risk rendering the project less certain economically.

PSE's concern for potential mercury and greenhouse gas regulation impacted the two coal proposals included on the Phase I Candidate Short List. Although both projects were reasonably attractive, the uncertainty of future environmental regulation and the fact that PSE would be at risk for resulting costs, made it difficult for these projects to move forward.

During the months of May and June 2006, respondents were invited to present their projects to our evaluation team and to participate directly in a Q&A discussion with reviewers. Presenters generally included the project sponsor as well as their technical experts, who addressed plant technology, operations, transmission, and all other aspects of the project in greater detail. Respondents also had the opportunity to update project costs, at that time. Additionally, several site tours were conducted during the months of June and July 2006.

During Phase II, PSE's credit team became more engaged in the evaluation process and evaluated each proposal for any collateral requirements or credit terms that would adversely impact PSE's financial position. Likewise, the accounting team examined the impacts, for example, of FAS 133 for potential derivative accounting, FIN46R for potential consolidation on to PSE's balance sheet, as well as EITF 01-08 for potential capital or operating lease accounting treatment.

Short-term PPA prices were not refreshed during Phase II. Because of the quick turn around on repricing PPAs, greater attention was given to ensuring that the terms and conditions of the offer were satisfactory to PSE, including any provision for credit support or credit obligations or accounting impacts.

Upon completion of their qualitative review, each team was responsible for providing a written summary of their findings, a ranking of High, Medium or Low for each proposal and comments in support of those rankings. For a list of review teams and criteria refer to part two, section A of the Phase 1 evaluation document. For further details regarding the Phase II selection process and findings, refer to part II, section E of this document.

### C. Phase II Quantitative Review

The Phase II Quantitative Analysis measured the cost and risk of projects on the "Candidate" Short List. The individual projects and portfolios of projects were analyzed both statically and dynamically using Monte Carlo simulation analysis across four different scenarios.

**Analysis Tools** - The analytical tools used in Phase II were the same as those used during Phase I. A list of the updates to PSM has been provided as Attachment 7.

**Static Analysis** - Each project on the Candidate Short List and the seven portfolios of projects were analyzed in four different scenarios. These scenarios were:

- "Current Trends" (PSE's base case) includes a moderate carbon tax, PSE's current outlook for load growth and forward gas prices.
- "Green World" includes a high carbon tax, high gas prices and low growth
- "Low Gas" - Moderate carbon tax, PSE's current outlook for growth and low gas prices
- "Reserve" - A moderate carbon tax, PSE's current outlook for growth, the current forward look for gas prices and a significant increase in the amount of capacity in the region.

The scenarios are described in greater detail in Attachment 8.

To judge the results of the scenario analysis, PSE used the same three key metrics as in Phase I, namely Portfolio Benefit, Portfolio Ratio and Levelized Price. In addition however, PSE was also able to understand a degree of risk by seeing performance across all four scenarios. Example results are presented below. See Attachment 10 for complete tables and graphs of the static analysis results.

#### C.1. Static Analysis by Individual Resource.

The static quantitative analysis for individual projects is shown in the below graph. On the x axis is the portfolio benefit ratio, and on the y axis is the total portfolio benefit. Ideally, a project would have both a high portfolio benefit and a high portfolio benefit ratio, and thus be located in the upper right portion of the graph. Individual projects are represented by a specific shape while the four scenarios are represented by a specific color.

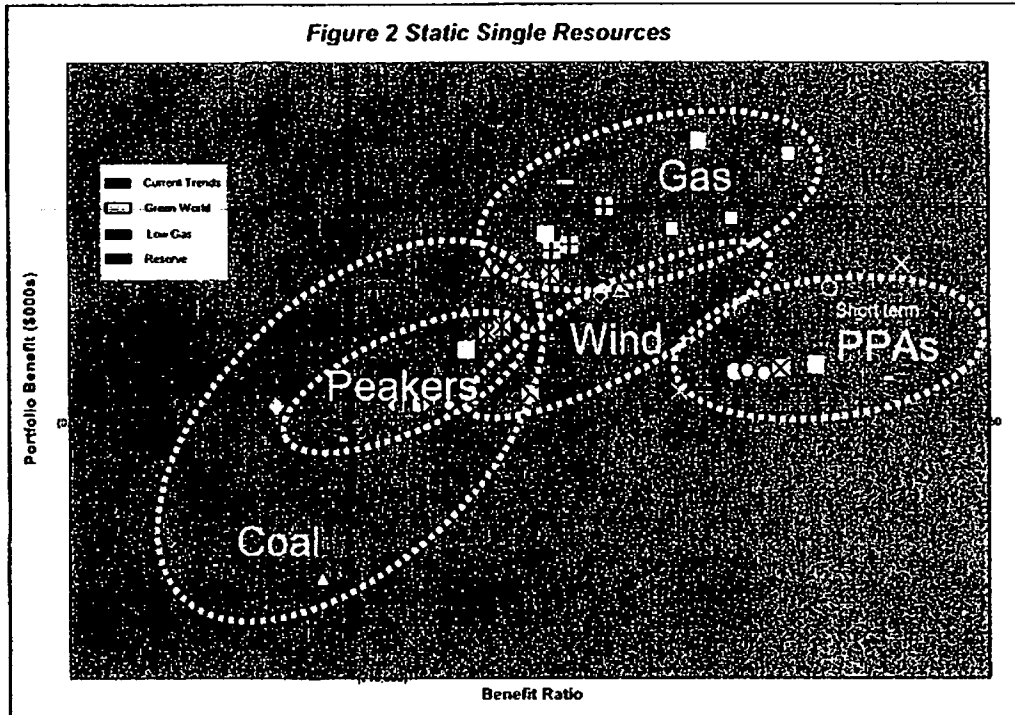


Figure 2 indicates that, in general, gas appears to be more favorable than other fuel types.

The combined cycle gas projects (shown on the graph as "Gas") show both a strong portfolio benefit and benefit ratio. The ability to shape generation to high load or periods of high market prices enables PSE to avoid expensive market purchases. In addition, several proposals were offered for projects that were already built but were economically distressed. This reduced capital costs, reduced or eliminated interest during construction and avoided the payment of Washington state's carbon mitigation costs. These benefits largely held even in a "Green World" scenario, in which gas prices are high and carbon emissions costs are increased. This is because the avoided market prices in a Green World also substantially rose and gas projects still avoid these expensive market purchases.

Wind projects generally had lower levelized costs than gas projects, but did not have as high a portfolio benefit ratio due to the off-peak timing of generation and a reduced capacity value. PSE has also reached our tax appetite limit for PTCs and must either engage in a PPA or a hybrid-ownership structure in order to utilize the PTCs, thus reducing their value.

Short-term PPAs had a high benefit-ratio and were among the most favorable projects quantitatively. Due to their short duration (3-5 years) however, they did not have as a large an impact on the 20-year portfolio cost.

Coal projects were not as attractive due to high capital costs, high carbon emission penalties, extended build times resulting in high AFUDC and expensive transmission solutions. In addition, the portfolio benefit and benefit ratio of coal projects changed significantly between various scenarios as the price of carbon increased and decreased, showing the larger risk.

**C.2 Static Analysis by Portfolio.**

The results for the static portfolio analyses are presented in a graph similar to the one above. Rather than analyzing a single resource however, entire sets or "portfolios" of projects have been examined here. The axis are the same as above, with portfolios represented by a specific shape while the four scenarios are represented by a specific color.

**Portfolio Definitions**

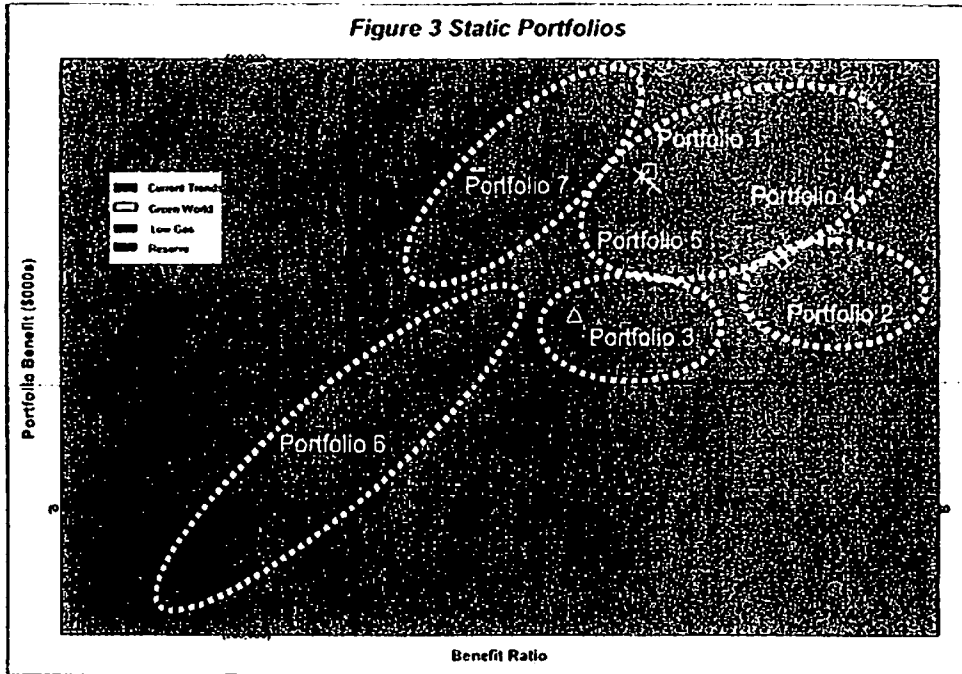
Portfolios were guided by the following six criteria.

- 1 Sufficient energy to meet, or come close to meeting, B2 Standard for energy need as adopted by PSE's board of directors in 2001
- 2 Meet Potential Renewable Portfolio Standard as proposed by WA. 9% 2016 15% 2020
- 3 Test portfolio cost and risk of owning new gas plant versus contracting via PPAs
- 4 Test incremental benefit of short listed resources by adding and subtracting from portfolios.
- 5 Test portfolio cost and risk of short list projects that most closely approximate the 50:50 mix of coal and gas from the 2005 LCP.
- 6 Test portfolio cost and risk of choosing long lead projects with bridge PPA.

From the limited number of reasonable combinations and modeling restrictions, the following seven portfolios of projects were ultimately established.

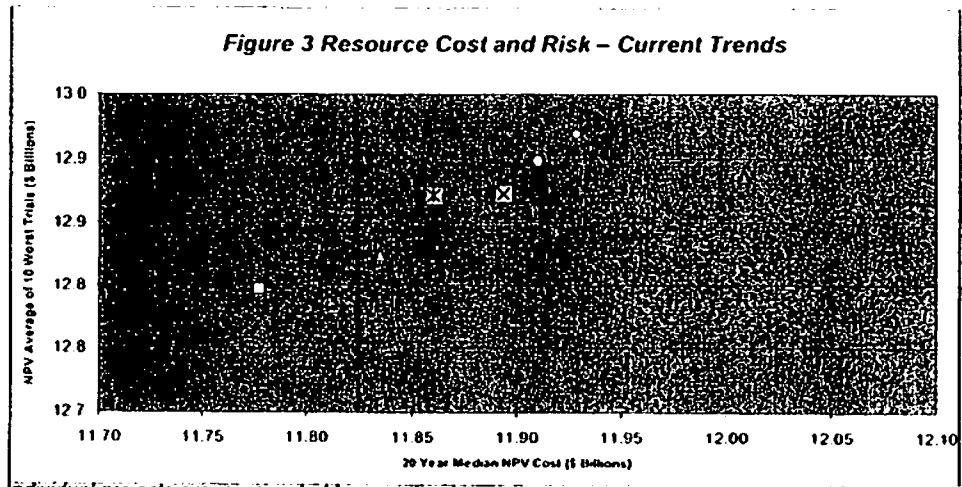
Portfolio	General Description
1	Geothermal, Wind PPA, CCCT A, CCCT B
2	Geothermal, Wind PPA, CCCT A, System PPA
3	Geothermal, Wind PPA, CCCT B
4	Geothermal, Wind PPA, CCCT A, CCCT C
5	Geothermal, Wind Ownership, CCCT B
6	New Hydro, Wind PPA, Coal, System PPA
7	Wind PPA, Coal, CCCT A, CCCT B





Portfolio 7, roughly representing PSE's 2005 LCP strategy, shows the highest portfolio benefit to PSE as well as a reasonable benefit ratio. Portfolios 1, 4 and 5 however show a higher portfolio benefit, reflective of their exclusion of the relatively low ranked coal plant.

**(Monte Carlo) Analysis** - To better understand risk within each scenario, PSE performed Monte Carlo analysis in which power prices, gas prices, wind conditions and hydro conditions were varied over one hundred trials. PSE examined the ten worst results from these trials as a measure of risk as shown in the figure 3. Example results are presented below. See Attachment Error! Reference source not found. for complete tables and graphs of the dynamic analysis results.



*Results*

In examining the risk of individual projects, there was not an "efficient frontier" curve found, as one could otherwise have expected in the balance between risk and reward. Instead, there seemed to be a general rise in risk with the larger, more expensive projects and fell with the smaller ones. The optionality of gas was also evident, as gas projects tended to have lower risk.

**D. Decision-Making Environment**

The market continues to experience significantly higher capital costs across all technologies. Many operating costs have also risen significantly. PSE's resource cost comparison of the 20-year levelized "all-in" resource costs from its 2003 RFP versus the 2005 RFP showed increases as high as 60 to 80 percent for some technologies. These higher capital costs are due, in large part, to global competition for key commodities such as concrete, copper, and steel, driven predominately by the burgeoning economies of China and India. Skilled labor shortages and rising engineering, procurement and construction ("EPC") contract margins have further exacerbated these costs across all technologies. For example, PSE has seen coal costs rise from a range of \$1,600 to \$1,800 per kW for a conventional coal project to an all-in capital cost of \$2670 per kW.

The global and US wind turbine market has tightened considerably. Turbine manufacturers are sold out through 2007. In addition to commodity cost increases that drive suppliers' costs up, the weakening of the dollar in the foreign exchange markets has also contributed to rising prices in the US market for equipment of foreign manufacture. All-in 2007 wind project costs are in the range of \$1,800 to \$2,000 per kW, up from \$1,340 per kW for the Hopkins Ridge Project, which PSE committed to in March 2005. Of the ten projects bid into the RFP only half of the projects had wind turbines secured.

Climate change has become an important part of the international dialogue as public policy makers and business leaders address the challenges and solutions for global warming. In the absence of federal policy, states and regions are taking the lead on developing policies and programs to address global warming. States are adopting emission reduction targets through policies and programs, including increasing renewable generation and energy efficiency goals.

The potential for a carbon tax or for GHG emission caps at the state level appears to be increasing. Consequently, interest is growing in IGCC (coal gasification to power) as a baseload technology alternative that could mitigate further dependence on natural gas for power generation. PSE received one IGCC proposal in this RFP. There was much cost uncertainty that required further study of costs and risk quantification. As indicated by the RFP respondent, the proposal was intended to be more of an indicative proposal.

Twenty-two states have adopted renewable portfolio standards ("RPS"). Mandatory renewable resource use has increased demand for relatively scarce executable renewable resources, thus increasing upward price pressure through the value chain for these resources. With California's proposed RPS of 20% by 2010, buyers in the Pacific Northwest have found themselves in direct competition with California's investor owned and public utilities for Northwest renewables and with Washington state's proposed Initiative 937, which would call for a 15% RPS by 2020, competition is certain to intensify. In addition, the ongoing uncertainty of the extension of the federal production tax credit beyond 2007 will again result in project delays and costlier projects for the investor, developer, and ultimately the customer.

Further, BPA is making little apparent progress in identifying, funding, and constructing the billion dollar plus transmission facilities that will be required to bring new coal and wind resources from the interior Pacific Northwest to the markets in the I-5 corridor.

**E. Final Short List**

PSE completed Phase II of its evaluation process in mid-August 2006. An all-team working group meeting was held in early August to review the qualitative and quantitative rankings, and to select

a final short list. PSE's selection process resulted in three possible designations: selected to the short list, selected to the continuing investigation list or not selected.

#### *Final Short List Selections*

PSE selected one geothermal, one wind, three natural gas and two non-specific PPA offers for the final short list. Overall, selected projects were determined to provide the greatest benefit to PSE's portfolio with the lowest reasonable cost and risk. More specifically, these projects exhibited the following benefits.

The geothermal PPA proposal was the most attractive non-wind renewable resource. This is a baseload resource (approximately 93% capacity factor) located on a former Department of Ecology (DOE) test site that is a known geothermal resource. The seasonal nature of the power purchase agreement matches PSE's resource need and the fuel type offers resource diversity to PSE's overall portfolio.

The selected wind project is an expansion of an existing project. With a 35% capacity factor and delivery to PSE's system, it is the strongest quantitative performer among the wind proposals. The location of the project offers PSE diversity in its wind resources and the counterparty is sound.

The economics of the natural gas PPA are attractive due to the timing of the offer and the fact that it has lower fixed costs. The unit is already connected to PSE's transmission system and there are no interstate pipeline charges for fuel delivery.

PSE also selected an natural gas combined cycle project that was initially considered by PSE in 2005. The project is a potential opportunistic purchase for PSE from a distressed seller. This plant has a low capital cost and PSE's quantitative analysis indicates that it has the lowest cost and risk in the Phase II Current Trends scenario. Additionally, there is the potential to redirect transmission for this project to PSE's system.

A second natural gas ownership offer provided the most attractive capacity resource. The units can be online within 10 minutes. They have a lower heat rate and are connected to PSE's system. PSE has the potential to purchase these units at a reduced capital cost.

Finally, two non-specific power purchase agreement (PPA) proposals were selected. The first, a 4-year fixed price non-specific PPA would deliver December through February on-peak energy. It offers west side delivery, provides reliability and reduces PSE's portfolio exposure. The second, a 5-year fixed price PPA proposal would provide annual on-peak energy. This energy would be delivered to the Mid-C. It also reduces PSE's portfolio exposure.

Figure 4 illustrates PSE's final short list selections. While further discussion and negotiation will determine the actual number of new resources that PSE will purchase, this short list represents the potential acquisition of up to seven new resources with a combined total of approximately 1,100 megawatts (MW) of long-term power supply.

## All-Source RFP Evaluation, Phase II

August 31, 2006

Fuel	Project	Owner/Developer	MW	Status	Offer	COD/Firm
Geothermal			15	Development	25-year PPA	12/1/2008 - 11/30/2032
Wind			225	Development	ownership (or PPA)	Dec-07
Natural Gas			280	Operating	15 year tolling PPA	1/1/2012-12/31/2025
Natural Gas			277	Operating	ownership	Mar-07
Natural Gas			8	Installed	ownership	Mar-07
PPA			150	System Supply	4 year PPA	2007-2010
PPA			100-300	System Supply	5 year PPA	2007-2012

Figure 4 Final Short List

The final short list was submitted for senior officer level review and approved in mid-August 2006. Upon receipt of this approval, respondents were notified of their status by both letter and email. These projects advanced to the negotiation process. For further details regarding the projects selected to PSE's final short list, refer to Attachment 1.

*Continuing Investigation List Selections*

PSE selected one hydro and one natural gas project to the continuing investigation list. Projects selected to this list are those that PSE is interested in continuing to monitor. The decision to place these projects on the continuing investigation list was influenced by the following benefits and concerns.

The hydro project is a zero emissions project that could meet a future renewable portfolio standard (RPS) that includes hydro. Areas of concern include a high capital cost and the fact that transmission remains a challenge requiring a multi-party solution.

The selected natural gas project evaluates as the next best gas plant to Goldendale. Remaining issues include an unresolved transmission situation.

These projects indicate a potential to be beneficial to PSE's power portfolio in the future; however, at present they continue to face challenges, particularly with respect to transmission. For specifics about the projects selected to the continuing investigation list, refer to Attachment 2.

*Non-Selected Proposals*

Of the projects evaluated during Phase II, three wind, one natural gas, two coal and one PPA were not selected for either the final short list or the continuing investigation list. PSE's decision not to proceed with these projects at this time was based upon the following factors.

Two of the wind offers that were initially selected for evaluation during Phase II were rescinded by the respondents, one as the result of a sale to an alternative entity and the other as the result of turbine availability issues. A third wind offer faced significant permitting challenges, which could delay the project and impose significant project, cost and PTC risk on the proposal.

The coal ownership project faces significant development challenges and project uncertainty. There were issues with permitting and uncertainty around Mercury regulation. Further, PSE has concerns about the fundamental difficulty of building coal in the Pacific Northwest.

The coal power purchase agreement (PPA) would impose environmental risk on PSE. This PPA requires PSE to post credit and results in a negative portfolio benefit and ratio.

The non-specific power purchase agreement (PPA) for winter on-peak energy would result in an unfavorable FAS 149 accounting designation, which requires mark to market treatment.

In general, these projects involved higher cost and greater risk than those selected, as well as a lower benefit to PSE when matched with the Company's existing power portfolio. For a complete list of projects that were not selected to either the short list or the continuing investigation list, see Attachment 3.

**F. Self Build Option**

At the conclusion of Phase I, PSE selected four "self-build" projects (as defined in the Phase I write up) for the candidate short list. Those selected included a coal project, a hydro project, a wind project, and a gas project. Of these four projects, none was a more attractive option than those ultimately selected to the final short list.

However, in parallel with this process, PSE did consider the potential expansion of its Hopkins Ridge project. This would involve a 7.2 MW expansion on the existing Hopkins Ridge site. The initial economic evaluation of this expansion appears attractive. PSE is continuing to pursue this project which could be in service by 2008. Expansion projects can provide power at a lower cost than a stand-alone project of the same size because existing infrastructure and staff can be utilized. This process could prove a valuable primer for similar opportunities at existing or future projects in PSE's portfolio.

The proposed expansion includes four turbine sites within PSE's existing leasehold area. The turbines were not installed because the land rights were not perfected at the closing of the project.

The sites were included in the Hopkins Ridge permit, wind layout and civil designs, but were not included in the electrical design. PSE commissioned a feasibility study from an electrical engineering firm that indicated the output from the turbines could be integrated without difficulty. A final design for the electrical layout will follow.

PSE is pursuing bids from contractors for roads and foundations, electrical works, and turbine erection. A number of wind projects in the area are either under construction now or will be under construction in the near future. Such projects could provide synergies for availability of equipment and personnel.

PSE is working directly with a top tier turbine supplier for procurement and delivery of the wind turbines. These turbines would match the model used in the existing project, V80 1.8 MW units.

Because the Hopkins Ridge interconnect agreement with BPA is limited to 150 MW, the output of the entire project will be limited once the additional turbines are installed. Site wind data indicates only a small amount of foregone generation as a result of this limitation.

Conservative analysis indicates that the levelized cost of power from this expansion compares favorably with other short listed resources.

### III. Next Steps

#### Negotiations

PSE has initiated discussions with respondents whose projects have been selected to the final short list. These discussions may result in the negotiation of terms and conditions of Definitive Agreements. PSE anticipates that the negotiations phase of our Acquisition process will continue through 2007.

### IV. Lessons Learned

#### 1. PSE must be nimble in the acquisition of resources, in particular renewable resources.

Acquiring low cost electric resources continues to be increasingly more challenging as the commercial landscape continues to become increasingly more complex. In this particular RFP cycle, there were a number of significant external factors that impacted PSE's resource acquisition process. For example, in November 2006, Washington state passed a Renewable Portfolio Standard (RPS). As discussed, PSE saw three of the four wind projects selected for the candidate short list withdraw from the process. Two of the cases reflect the growing competition for renewable resources by utilities. And as the higher capacity projects are acquired, it will continue to become even more competitive as capacity factors drop and the need will likely grow.

As PSE has tried to assimilate what the potential impacts and ongoing challenges may be to acquire renewable resources, PSE has recognized that it must be more nimble and has launched an initiative to acquire more wind looking at opportunities now and on an ongoing basis rather than waiting for the next RFP solicitation. By leveraging PSE wind experience with Hopkins Ridge and Wild Horse, PSE is considering projects that may be in the very early stages of development to acquire. By moving further up the development chain, PSE may be able to complete the development and construction at a lower cost to its customers given its lower cost of capital versus independent project developers.

PSE has also observed a shift in commercial offers from renewable developers in general. Many are interested in securing PPAs rather than selling their projects. This too presents a number of challenges to PSE with regard to credit and accounting impacts. PSE is exploring a hybrid financing structure which may be a reasonable compromise between a PPA and ownership option. At its most basic level, the hybrid financing allows for the investor to take the benefits of the PTCs up front and allows PSE ownership of the project after a ten year period.

#### 2. Coal builds are uncertain given the increased environmental regulation for carbon and mercury regulation.

In this RFP cycle, PSE received more coal offers than in its previous 2003 solicitation. In PSE's 2005 LCP the analysis indicated that coal and gas resources were in PSE's long term future for resource acquisition. Coal is an abundant, stable, low cost resource. However, of the four coal development projects that were proposed, two of the projects suspended further development due to intense public opposition resulting in one state imposing a moratorium on coal builds for the next two years. Proposed mercury regulation, as well made the remaining two projects equally uncertain.

The potential of a carbon tax or cap and trade system will result in additional costs to coal-fired projects that are not quantifiable. In addition, as states seek to pass more restrictive policies to

reduce greenhouse gas emissions and mercury regulation, it would appear the projects that have the ability to capture and sequester the carbon are far from being commercial.

**3. The need for transmission remains critical to PSE's ability to purchase remotely located resources such as wind to bring to its service territory.**

Most of the wind project development is in BPA's service territory, specifically in the Columbia River Gorge area. These projects will require interconnection to BPA's system which may require significant improvements, upgrades, new substations and transmission lines.





**IV. Attachments**

1. Final Short List with Comments
2. Continuing Investigation List with Comments
3. Non-selected Proposals with Comments
4. Phase II Evaluation Summary Sheet
5. 8.14.06 Report to Senior Management
6. 8.17.06 EMC Update
7. Phase II PSM Updates
8. Scenario Matrix
9. Portfolio descriptions
10. Quantitative Results - Static
11. Quantitative Results - Dynamic

3/15/2007

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2005 RFP, Phase II

2005 PSE ALL-SOURCE RFP  
Final Short List with Comments

Source	Portfolio	Benefit	Cost	Portfolio	Comments
	(\$/yr)	(\$/MWh)	(\$/MWh)	Benefit (\$/yr)	
G		0.18		8,139	
W		0.19		95,499	
		0.22		106,292	
NG		0.23		133,084	
NG	Goldendale	0.16	277	179,820	Distressed asset - low capital cost; opportunistic purchase; potential to redirect transmission to PSE's system; requires participation in bankruptcy auction process; project shows lowest cost and risk in Phase II Current Trends scenario
NG		0.01		40	
PPA		0.42		21,039	
PPA		0.28		69,041	

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Per WAC 480-07-160

3/15/2007

2005 PSE ALL-SOURCE RFP  
Continuing Investigation List (Phase II)

File #	Project/offer	MW	Benefit Ratio	Cost \$/MWh	Portfolio Benefit \$000	Comments
H			(0.025)		(6,274)	
NG			0.119		116,959	

\* 20-year levelized cost

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Per WAC 480-07-160

**2005 PSE ALL-SOURCE RFP  
Non-Selected Proposals (Phase II)**

Fuel	Project/Offer	Owner/Developer	MW	Benefit Ratio	Levelized Cost\$/MWh	Portfolio Benefit \$/000	Comments
W				0.17		42,744	
W				(0.099)		(25,673)	
W				0.06		16,443	
NG				0.063		54,928	
C				0.061		101,961	
C				(0.054)		(15,936)	
PPA				0.318		n/a	

<sup>1</sup> Benefit ratio is the primary quantitative selection metric.  
<sup>2</sup> These are short term offers ranging from 3-5 year terms and were evaluated using both KWI and PSM; portfolio benefit is determined by strategic fit, impact to EPS.

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2005 RFP  
Phase II Project Ratings

3/15/2007

Item	Value	Weight	Weighted Value	High	High-Med	High	High	Med-High	Med-Low	High	High	Med	Severe (1)
536-539	(0.214)	(0.072)											
<b>GEOTECHNICAL</b>													
547(a)	6,139	0.177											
<b>WIND</b>													
502-b													
524(e-c)													
530a	95,489	0.187											
530b	106,262	0.216											
653 (669)													
<b>NATURE</b>													
501 (e-d)	133,084	0.225											
504 capacity	40	0.0032											
516	54,928	0.065											
525a	116,959	0.111											
532	179,820	0.159											
<b>GOAL</b>													
506b	101,981	0.081											
520c													

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S22-C				
S22-D				
S11-a			0.316	
S11-b				
S11-c				
S11-d			0.421	
S22-A			0.280	
S22-B				
S34e			0.282	

(1) From an accounting perspective, it is impossible to provide a rating without seeing an actual contract. The specific terms of a contract and the net position when it is signed will have a large impact on the accounting. Refer to the accounting tab for details/comments about each project.

High = Most Favorable / Least Risks  
 Med = Fairly  
 Low = Least Favorable / Most Risks

\* proposed shortest selection  
 \* proposed continuing investigation selection

Redacted

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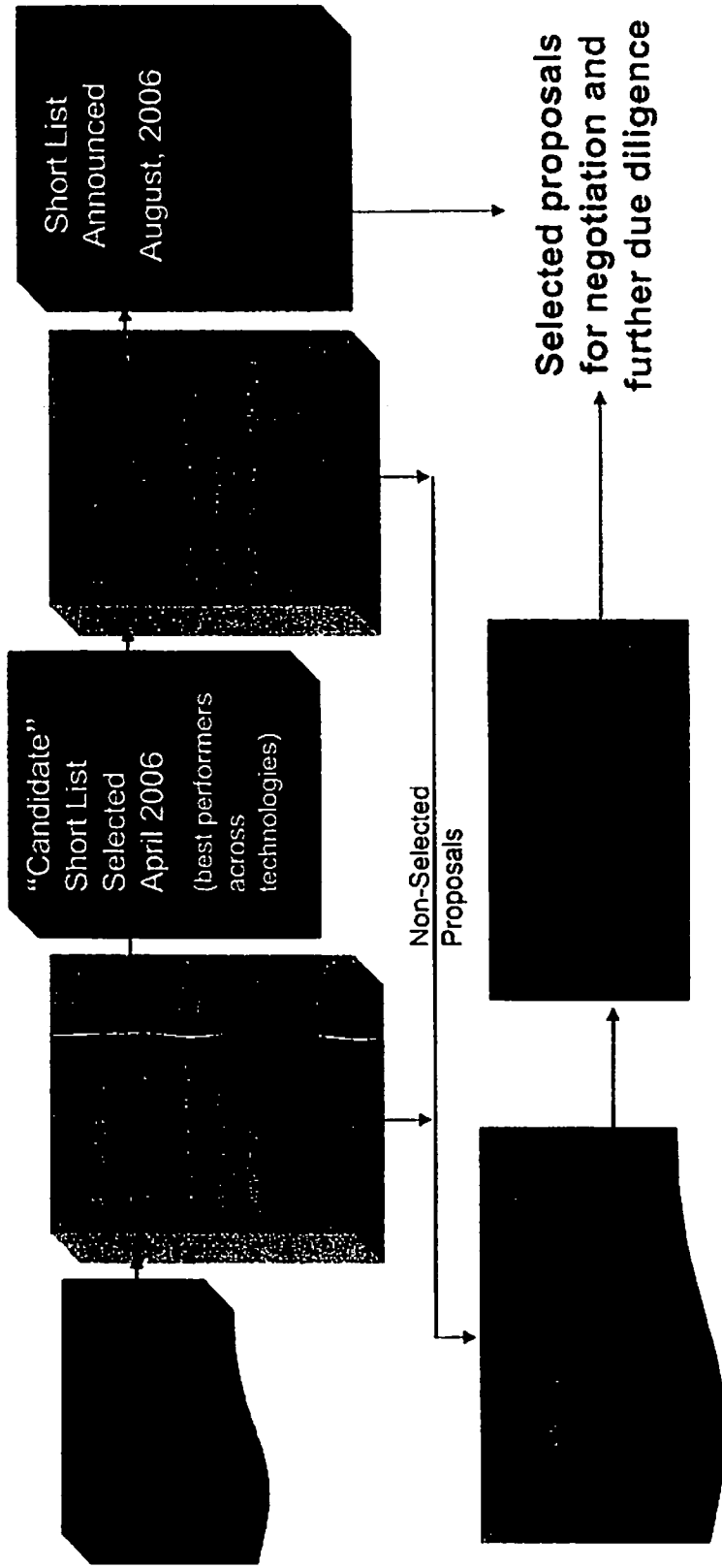


# Resource Acquisition Update All-Source RFP Short List Selections

Progress Report to Senior Management

Eric Markell, Senior Vice President, Energy Resources  
August 14, 2006

# Phase II Completed... Final Short List Selected





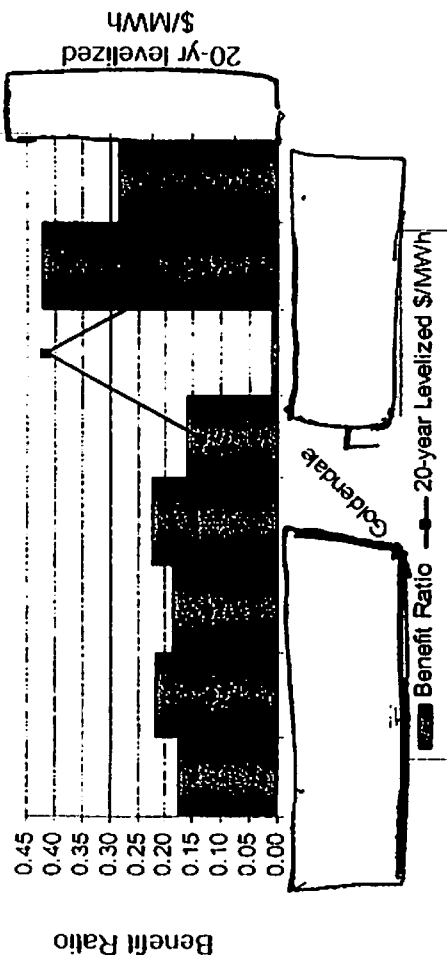
# Final Short List

Fuel	Project/Offer	Owner/Developer	MW	Status	Commercial Operation Date
Geothermal					
Wind					
Natural Gas					
Natural Gas	Goldendale (ownership)	Calpine	277	Operating	Sep-04
Natural Gas (Capacity)					
System Power Purchase Agmt					
System Power Purchase Agmt					

Redacted

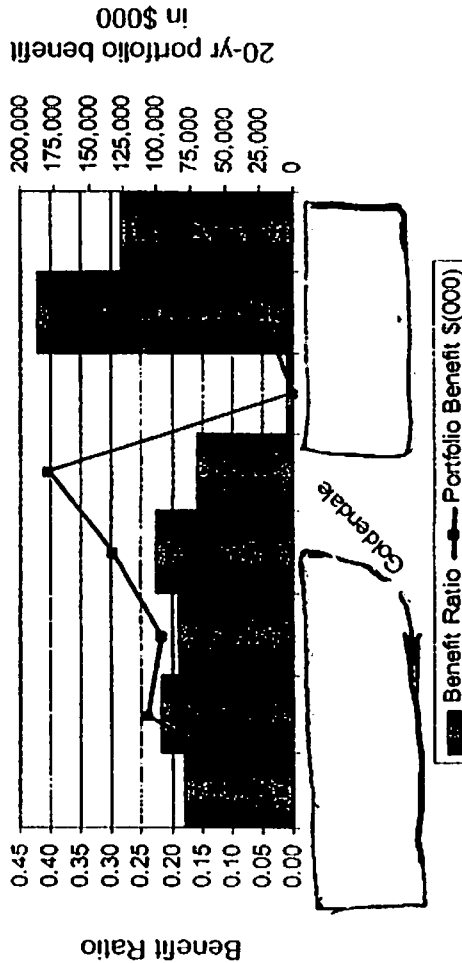


# Portfolio benefit ratio is balanced with levelized cost and portfolio benefit



Levelized cost is the average annual cost per MWh produced during a 20-year period for each project.

Portfolio benefit is the 20-year present value of all portfolio benefits derived from each project in comparison to the 2005 LCP generic portfolio.



Portfolio benefit ratio is the present value of portfolio benefits divided by the present value of the project revenue requirements

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Redacted

# Evaluation Summary

Case	Proposed/Other	MW	Benefit Ratio	Cost \$/MWh	Portfolio Benefit \$/MWh	Comments
G			0.18		8,139	Redacted
W			0.19		95,499	
			0.22		106,292	
NG			0.23		133,084	
NG	Goldendale	277	0.16		179,820	Distressed asset - low capital cost; opportunistic purchase; potential to redirect transmission to PSE's system; requires participation in bankruptcy auction process; project shows lowest cost and risk in Phase II Current Trends scenario
NG			0.01		40	
PPA			0.42		21,039	
PPA			0.28		69,041	

\* 20-year levelized cost

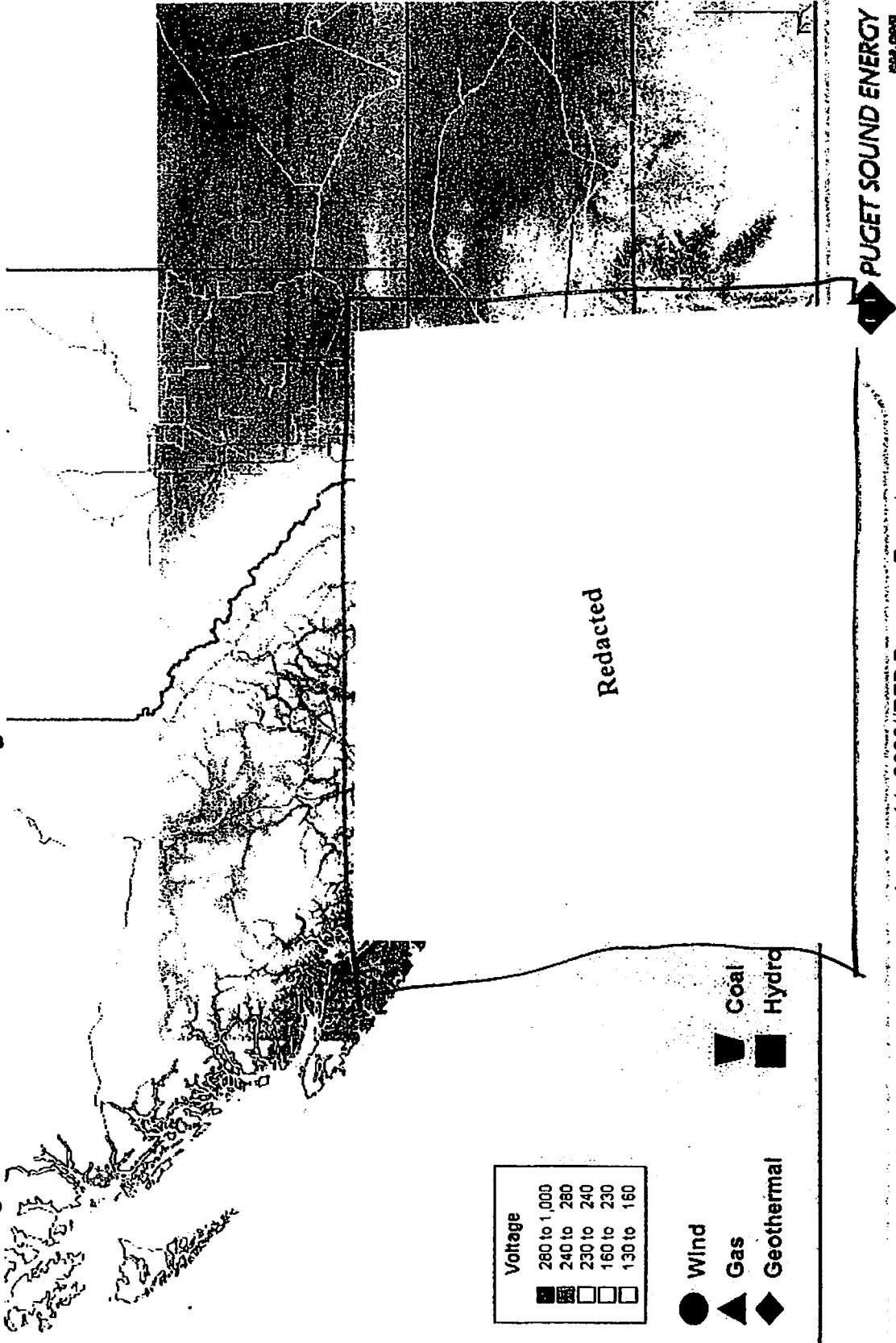


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# Project Short List by Location



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# “Continuing Investigation”

- [Redacted]
- ♦ Pros: [Redacted]
- ♦ Cons: [Redacted]
- [Redacted]

Redacted

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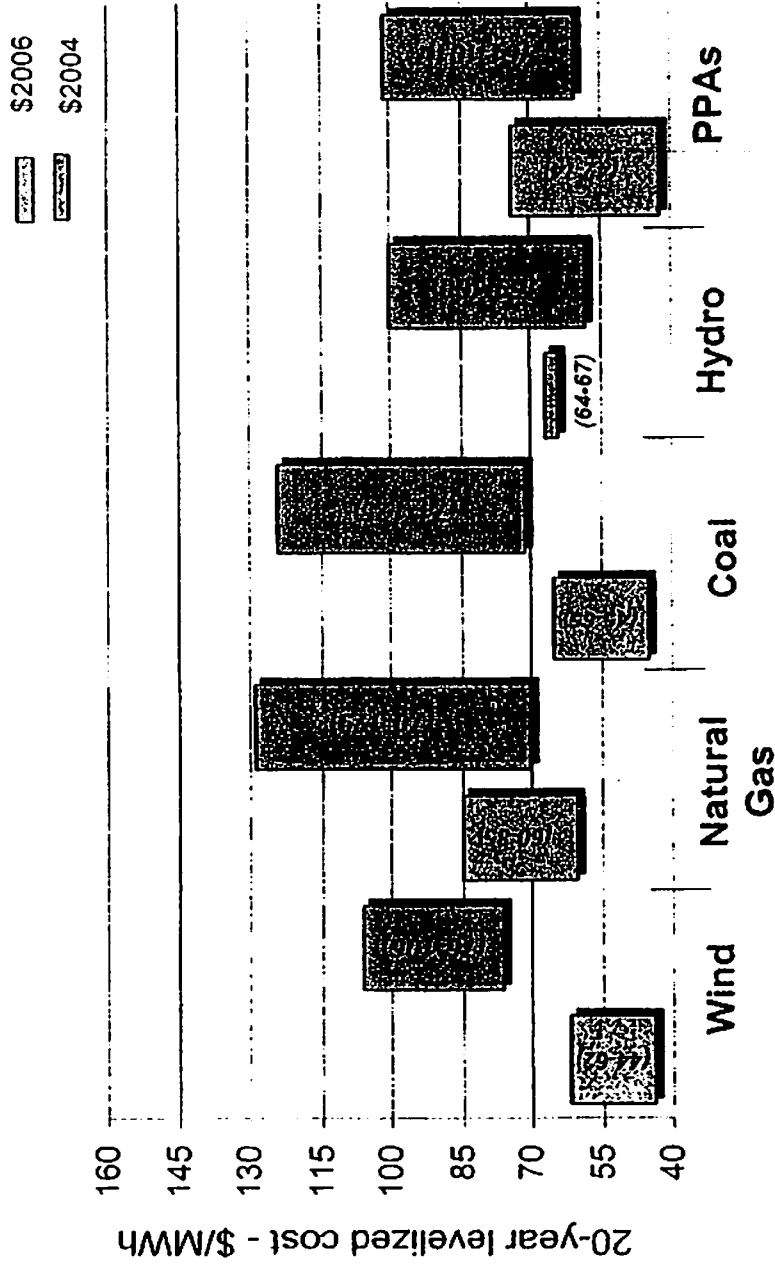


# APPENDIX

## *Phase II Analysis & Non-Selected Proposals*



# Significant increase in resource costs since 2004 RFP



1. PPA range represents fixed price offers only and is inclusive of imputed debt and exclusive of credit  
 2. 2004 levelized costs do not include transmission from Mid-C to PSE's system



# Table of Contents

- Phase I Candidate Short List
- Phase II Quantitative Analysis Process
  - Data Flows
  - Four Scenarios and Price Assumptions
  - 16 Resource Alternatives Evaluated
  - 7 Portfolios
- Phase II Results Static (by price scenario)
- Phase II Results Dynamic (Monte Carlo)
- Phase II Non-Selected Proposals with Comments



# Phase I Candidate Short List – 13 projects / 3 PPAs

Fuel	Project/Owner	Owner/Developer	MW	Status	Commercial Operation Date
	Redacted				
Natural Gas	Goldendale (ownership)	Calpine	277	Operating	Sep-04
	Redacted				

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# Phase II evaluation tested variety of portfolios under 4 different scenarios

Candidate Short List Identified

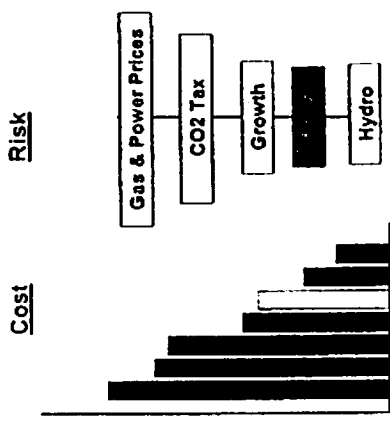
- Candidate Short List
- Projects
  - Contracts
  - Emergent Opportunities

- Portfolios, Existing Plant plus
- All Generic
  - Individual resource
  - Combination of candidates

Portfolios Tested Against Different Risk Scenarios

- PSE Current Trends Scenario**
- Expected resource additions to WECC over next 20 year horizon
- PSE Green World Scenario**
- Expected resource additions over next 20 year horizon if all policy directives continue to favor renewables and penalize coal
- PSE Low Gas Price Scenario**
- Expected resource additions over next 20 year horizon if low gas prices emerge
- PSE Reserve Price Scenario**
- Expected resource additions are 10% greater than Current Trends in 2025.

Monte Carlo Simulation Evaluates Cost and Risk of Each Candidate and Several Combinations



Short-Listed Respondents Will Be Thoroughly Evaluated

- Candidates by Scenario
- Portfolio Benefit
  - Benefit Ratio
  - Levelized Cost

Detailed Qualitative Review



# Four Scenarios

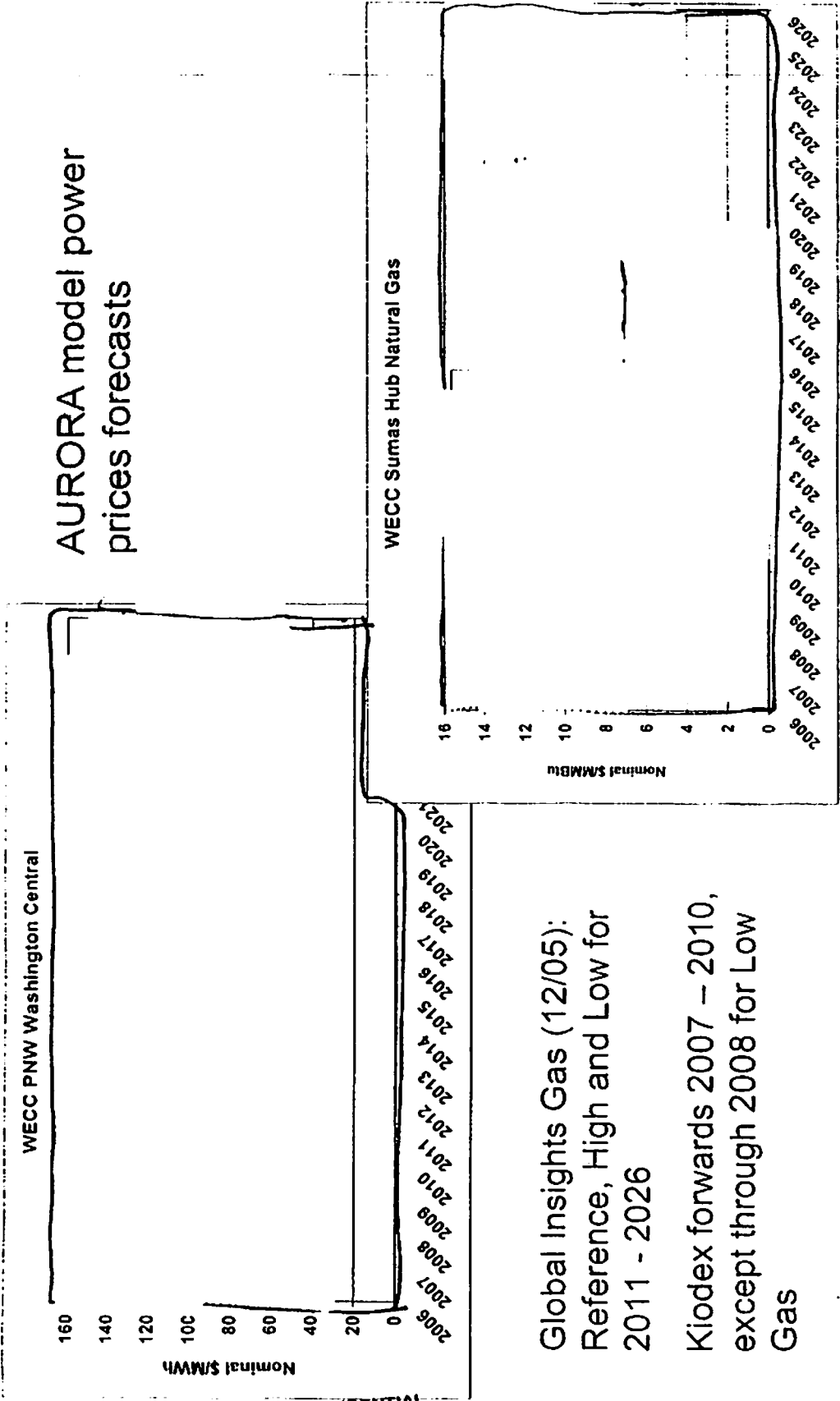
Scenario	Reference Current Trends	Reserve/Overbuild	High Price/Green World	Low Gas Price	Notes
WECC Demand (AURORA)	Reference (from EPIS) WECC Average Growth Rate 1.8%	Reference (from EPIS) WECC Average Growth Rate 1.8%	Low WECC Average Growth Rate 1.1%	Reference WECC Average Growth Rate 1.8%	Low Growth Rate is 60% of Reference Growth Rate for each area
Gas Price (Nominal S Levelized for 2007-2026)	Global Insights Reference; Levelized, plus Kiorderx forwards 2007 - 2010 \$ [REDACTED] MMBTU	Global Insights Reference; Levelized, plus Kiorderx forwards 2007 - 2010 \$ [REDACTED] MMBTU	Global Insights High Price; Levelized, plus Kiorderx forwards 2007 - 2010 \$ [REDACTED] MMBTU	Global Insights Low Economic Growth; Levelized; Kiorderx forwards 2007 - 2008 \$ [REDACTED] MMBTU	Global Insights (12/05) and Kiorderx forwards (2007-2010) as of 12/19/2005
PSE Demand (PSM)	Reference	Reference	Low	Reference	Most recent PSE load forecast.
Carbon Costs (AURORA)	NCEP Nominal S/ton by year: 2010: \$5.00 2015: \$6.38 2020: \$8.14	NCEP Nominal S/ton by year: 2010: \$5.00 2015: \$6.38 2020: \$8.14	Clean Power (Jeffords) Nominal S/ton by year: 2010: \$21.00 2015: \$31.17 2020: \$45.35	NCEP Nominal S/ton by year: 2010: \$5.00 2015: \$6.38 2020: \$8.14	NCEP increases 2.5% real per year. Clean Power increases about 4% per year real over 20 years
Overbuild	No	Net Additions are approx. 30% greater in 2015 and 10% greater in 2025	No	No	



Redacted

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# Scenario Power and Gas Prices



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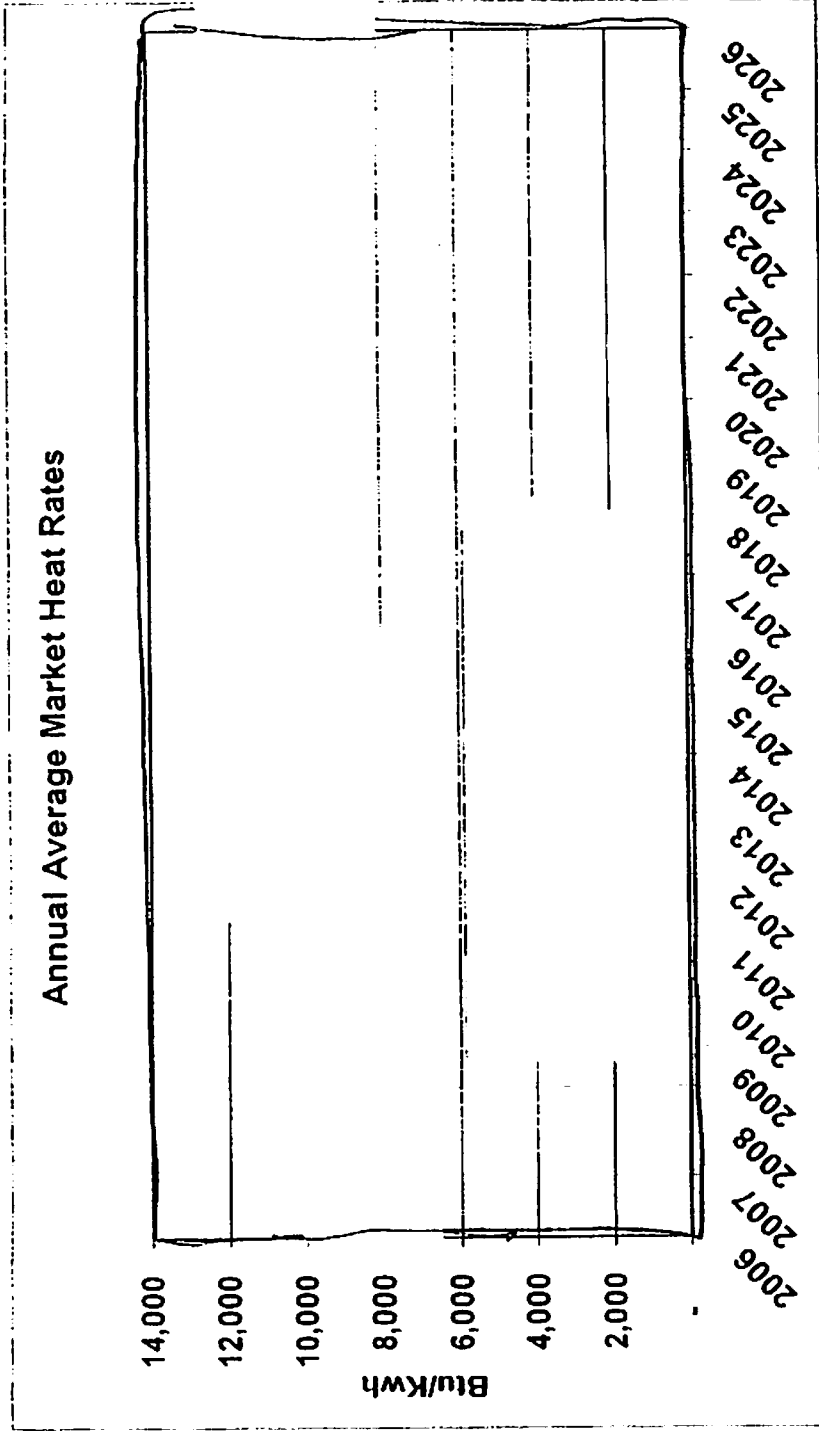
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# Scenario Heat Rates



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# Phase II - 16 Resource Evaluations

0	000 Generic Portfolio of wind, PPA, Gas and Coal
1	Redacted
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	552 Goldendale (Own) - 277 MW CCCT
16	



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# Reconcile # Projects Analyzed

16 13 projects plus 3 PPAs

+ 1	[Redacted]
+ 1	
+ 1	
- 1	
- 1	
- 1	
<b>+ 16</b>	

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# Portfolio Design Criteria

Portfolios will be designed to:

- Add resources to meet, or come close to meeting, B2 Standard for energy need. Because PSE will have another RFP at the end of 2007, filling need for future years not as critical.
- Meet Renewable Portfolio Standard as proposed by WA (Initiative 937). 9% 2016 15% 2020
- Test portfolio cost and risk of owning new gas plant(s) versus contracting via PPAs
- Test incremental benefit of short listed resources by adding and subtracting from portfolios.
- Test portfolio cost and risk of short list projects that most closely approximate the 10% wind plus approximately equal mix of coal and gas from the 2005 LCP.
- Test portfolio cost and risk of choosing long lead projects with bridge PPA.



# Phase II - 7 Portfolios Evaluated in addition to the All Generic Portfolio

Port 1	[Redacted] and Goldendale (OWN)
Port 2	Like Portfolio 1, with substitute of [Redacted] for Goldendale, i.e., all PPA
Port 3	Like Portfolio 1, but without [Redacted] a [Redacted]
Port 4	Like Portfolio 1 with substitute of [Redacted] for Goldendale
Port 5	Like Portfolio 1 with substitute [Redacted]
Port 6	Long Lead Hydro and Coal with bridge PPA [Redacted]
Port 7	Similar to LCP strategy of 10% wind, 45% coal, 45% gas [Redacted]

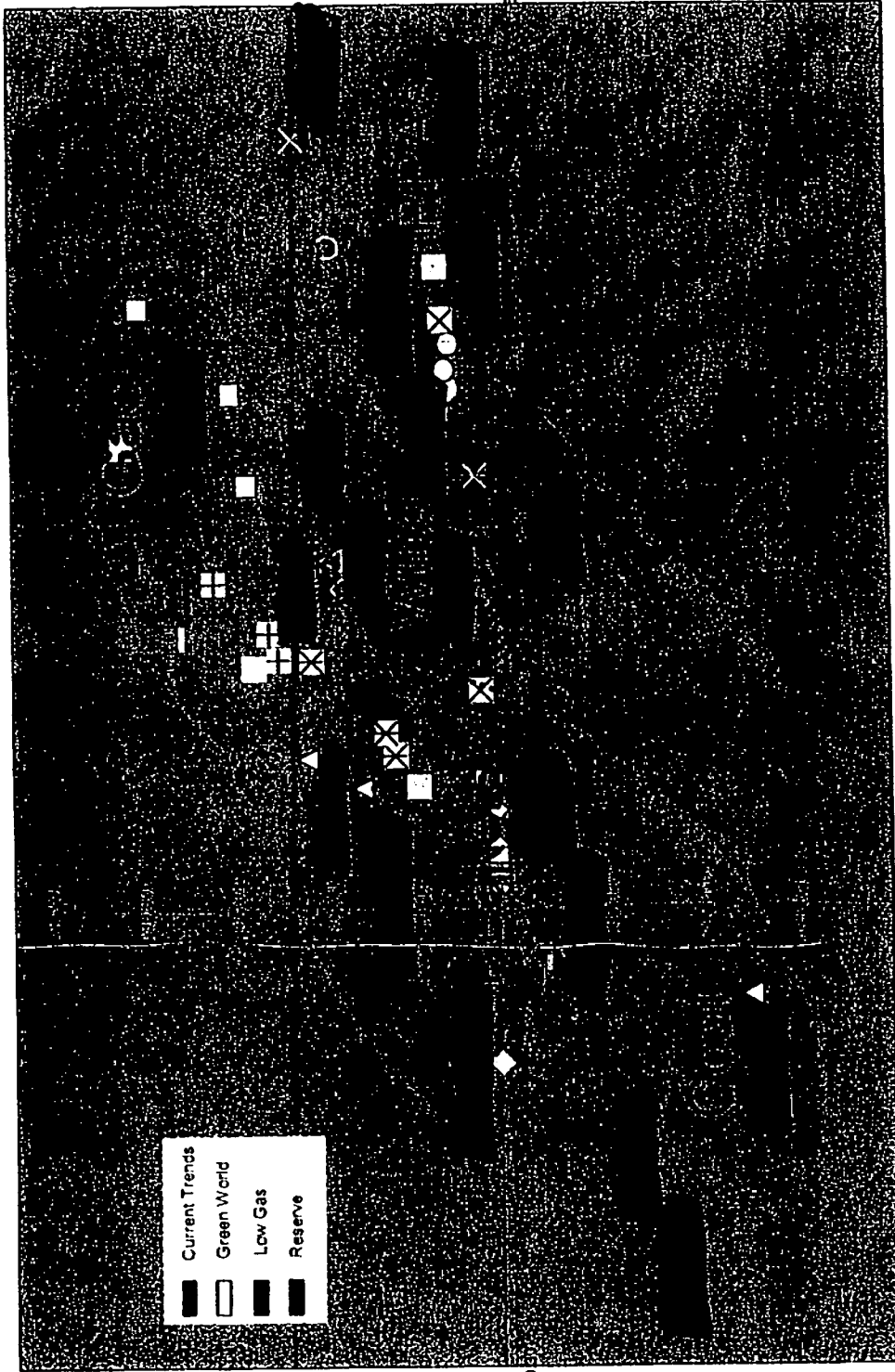
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# Phase II – Individual Resources



Current Trends  
Green World  
Low Gas  
Reserve

Portfolio Benefit (\$000s)

Benefit Ratio



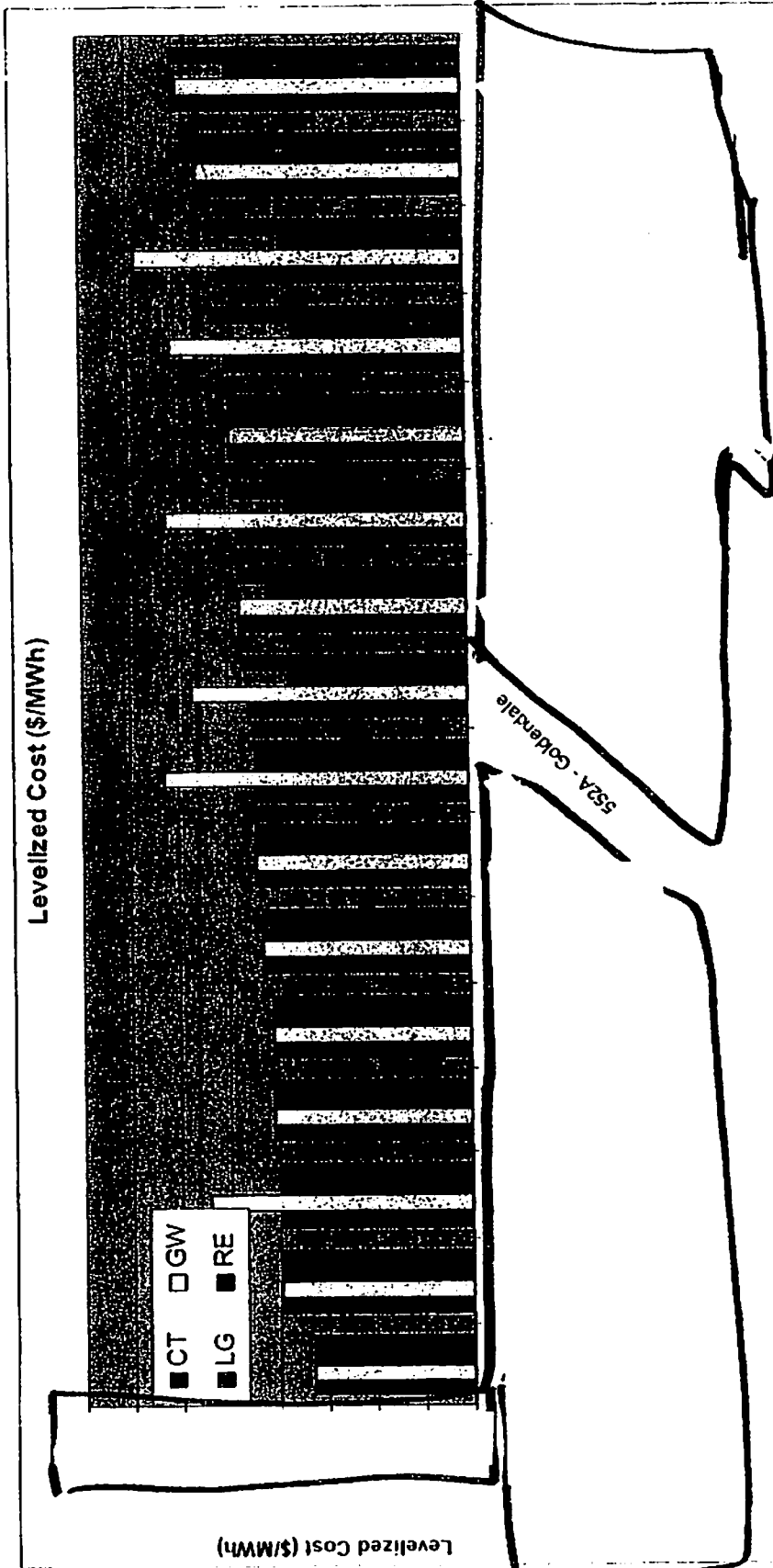
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# Levelized Cost of Individual Resources



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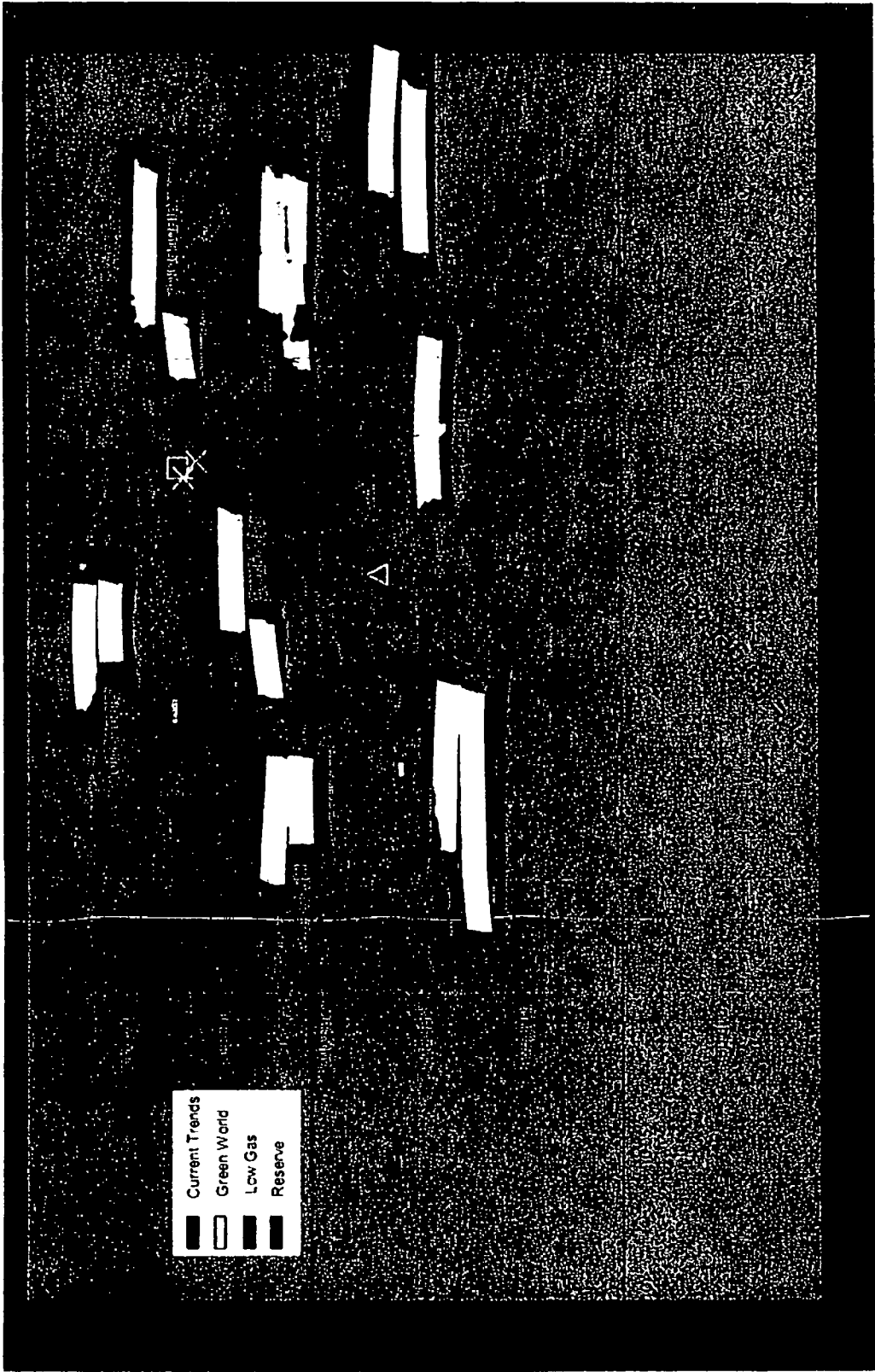
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# Phase II – Portfolios

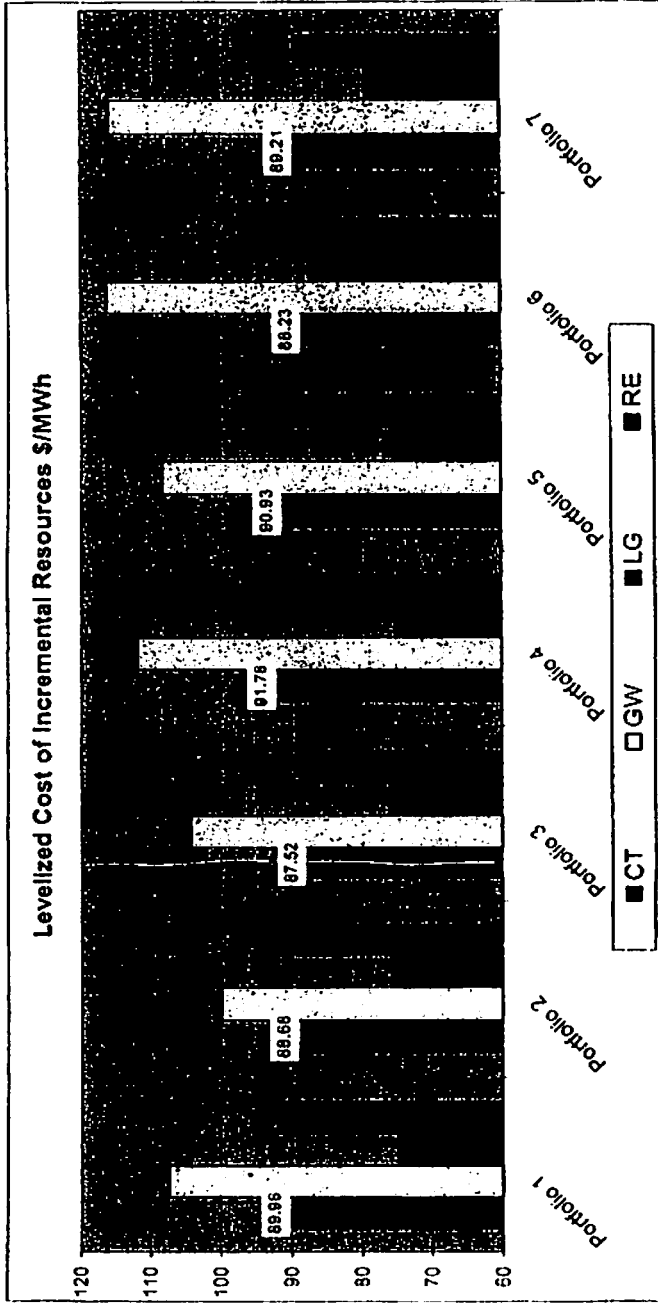


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# Levelized Cost of Portfolio Additions



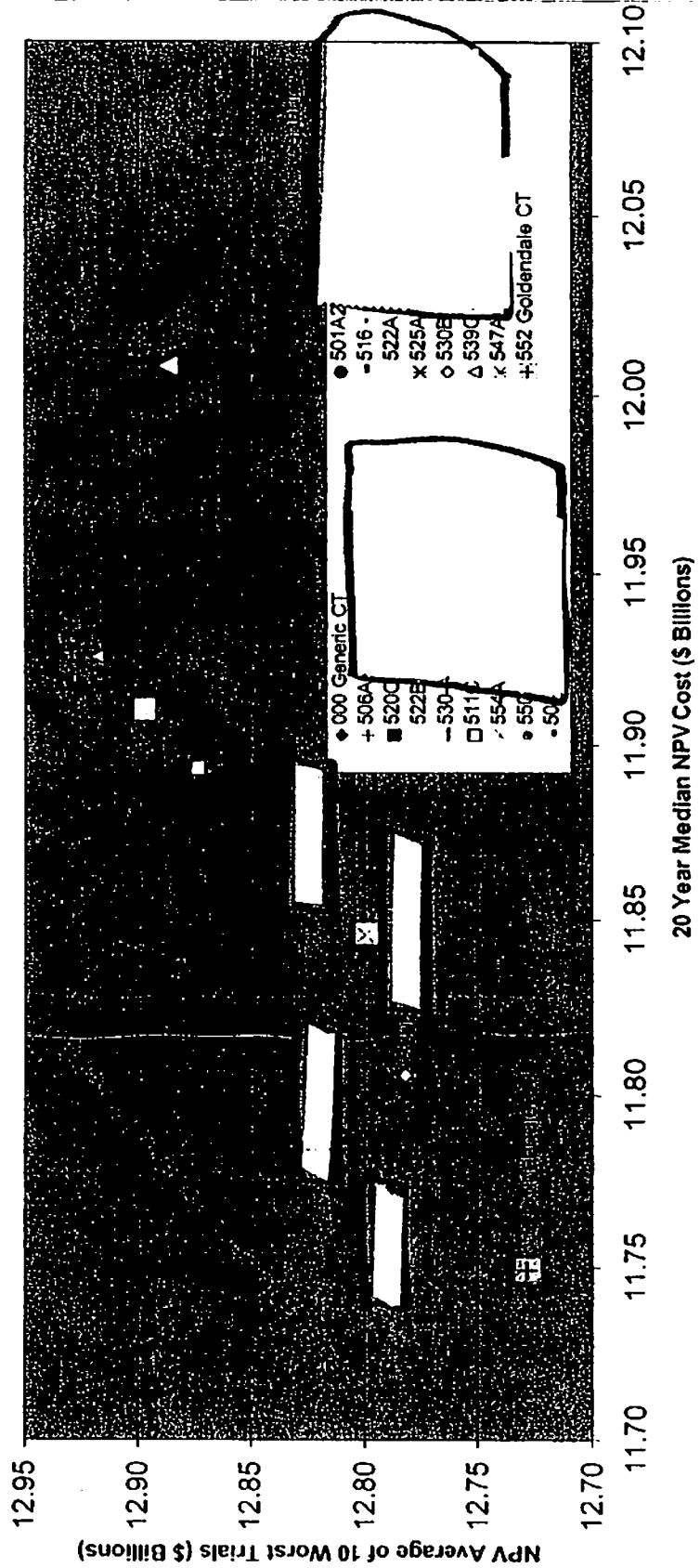
Levelized cost (20 year)  
of resource additions in  
\$/MWh

	CT	GW	LG	RE
Portfolio 1	89.96	107.45	74.76	91.96
Portfolio 2	88.68	100.08	75.76	90.44
Portfolio 3	87.52	104.33	76.07	88.77
Portfolio 4	91.78	111.86	75.08	94.27
Portfolio 5	90.93	108.34	75.42	93.22
Portfolio 6	88.23	116.30	86.99	87.11
Portfolio 7	89.21	115.97	79.40	89.28



# Goldendale shows lowest cost and risk in the Current Trends price scenario

Resource Cost and Risk - Current Trends



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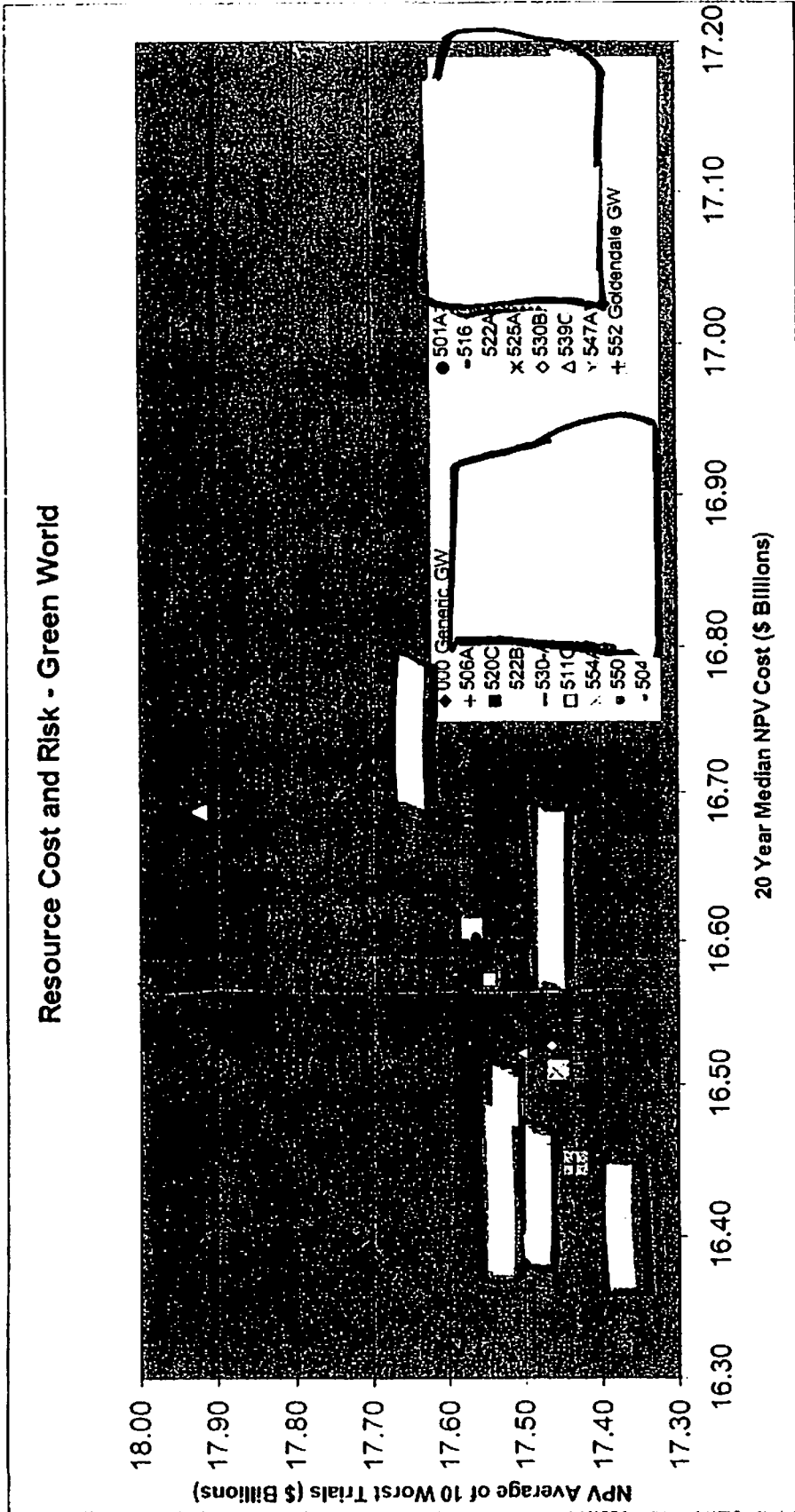
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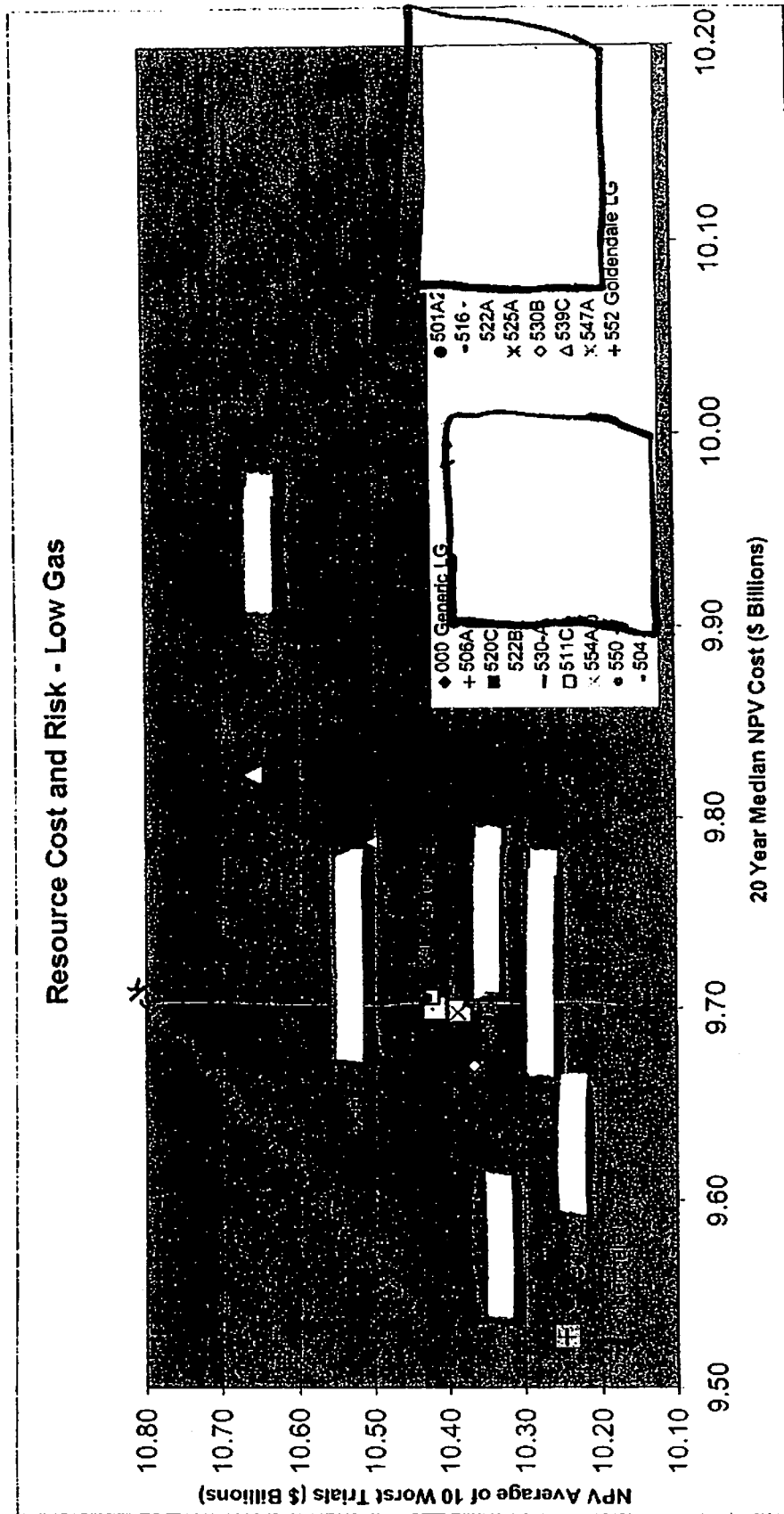
# Tenaska PPA show lowest cost and risk in Green World Scenario



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# Gas Plants show lowest cost and risk in Low Gas Price Scenario



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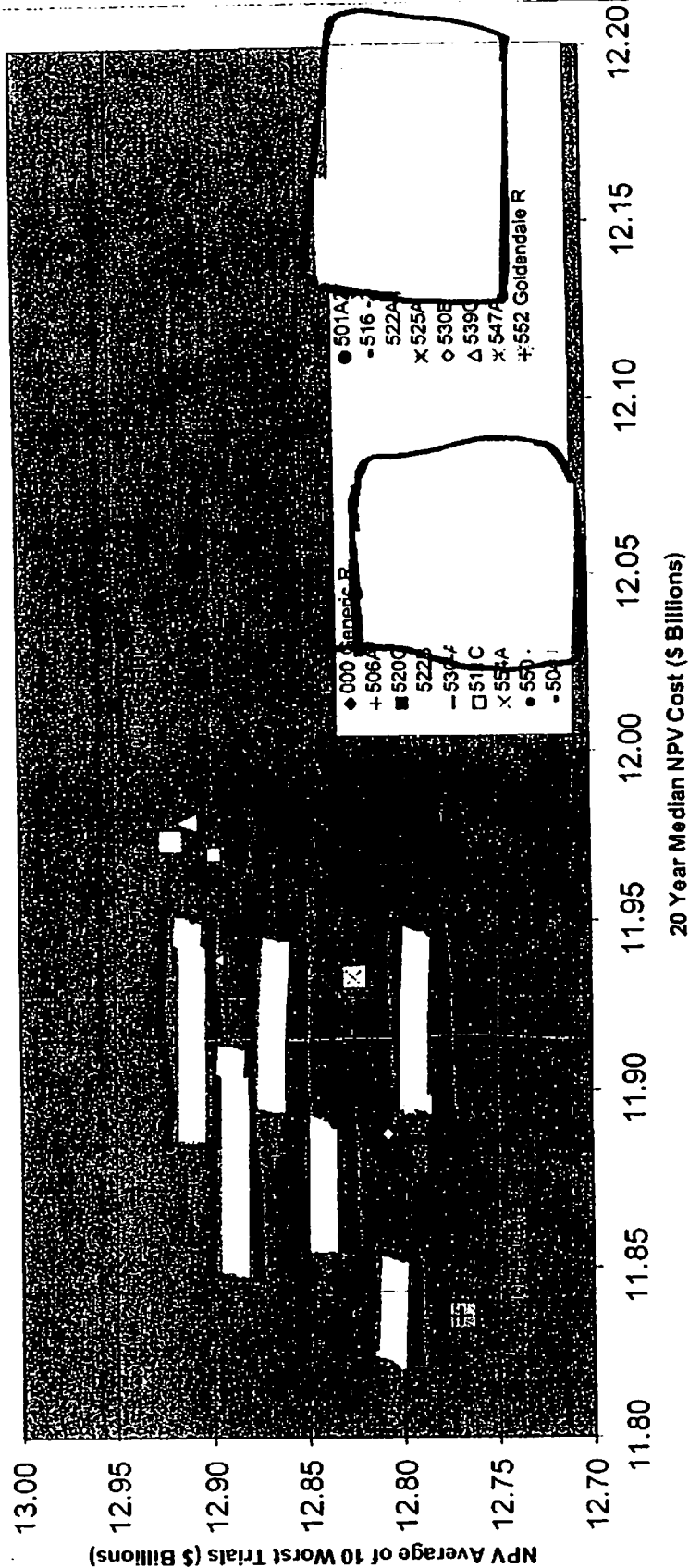
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# Cost and Risk in Reserve Price Scenario Similar to Current Trends Price Scenario

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Resource Cost and Risk - Reserve



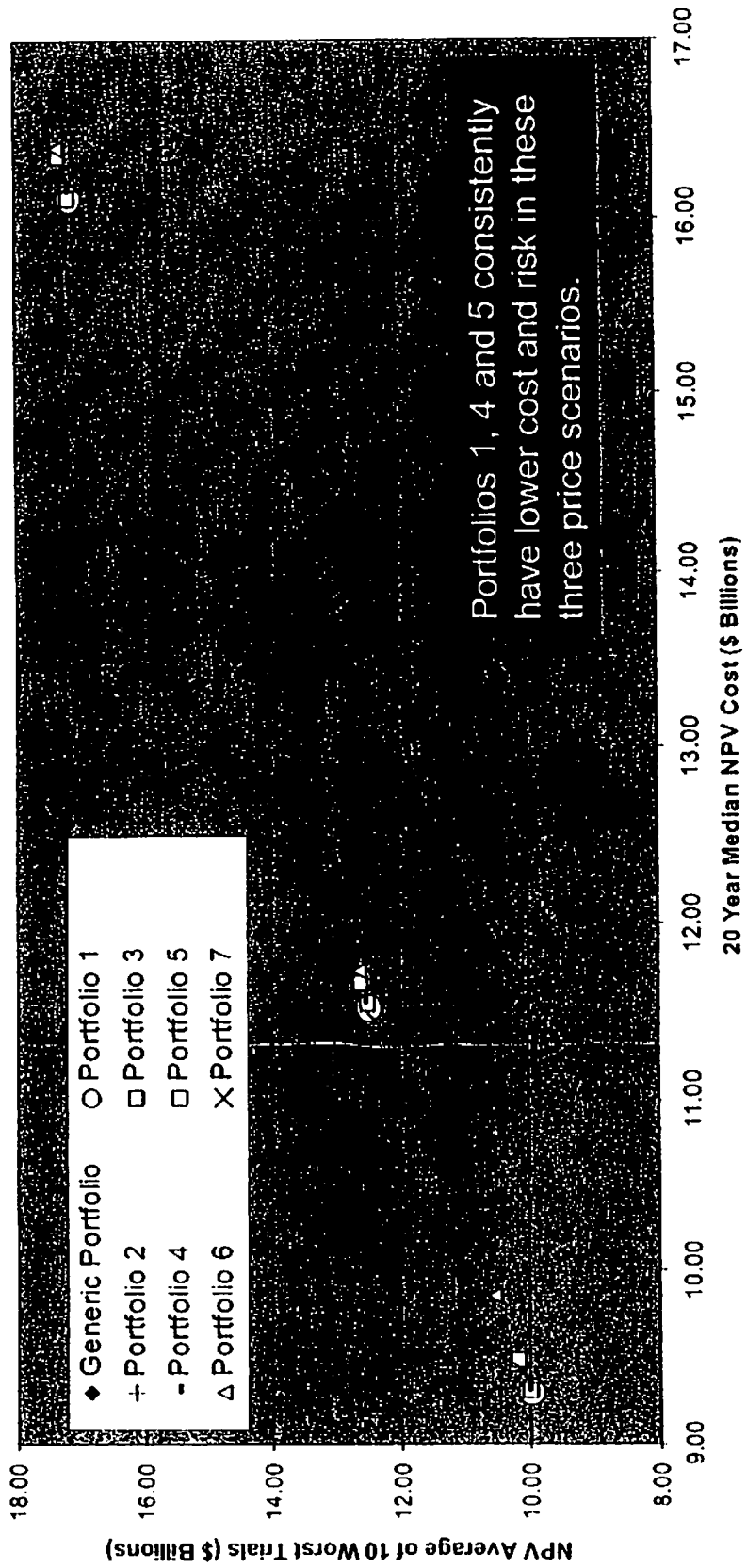
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# Portfolio Cost & Risk

Portfolio Cost and Risk



# Phase II Non-Selected Proposals

Fuel	Project/Offer	Owner /Developer	MW	Benefit Ratio	Levelized Cost \$/MWh	Portfolio Benefit \$000	Comments
W	Redacted	Redacted	Redacted	0.17	Redacted	42,744	Redacted
W	Redacted	Redacted	Redacted	(0.099)	Redacted	(25,673)	Redacted
W	Redacted	Redacted	Redacted	0.06	Redacted	16,443	Redacted
NG	Redacted	Redacted	Redacted	0.063	Redacted	54,928	Redacted
C	Redacted	Redacted	Redacted	0.067	Redacted	101,961	Redacted
C	Redacted	Redacted	Redacted	(0.051)	Redacted	(15,936)	Redacted
PPA	Redacted	Redacted	Redacted	0.318	Redacted	n/a	Redacted

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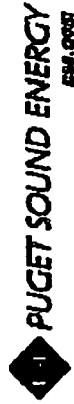


# Resource Acquisition Update

Energy Management Committee

Roger Garratt

August 17, 2006



# Resource Acquisition Update

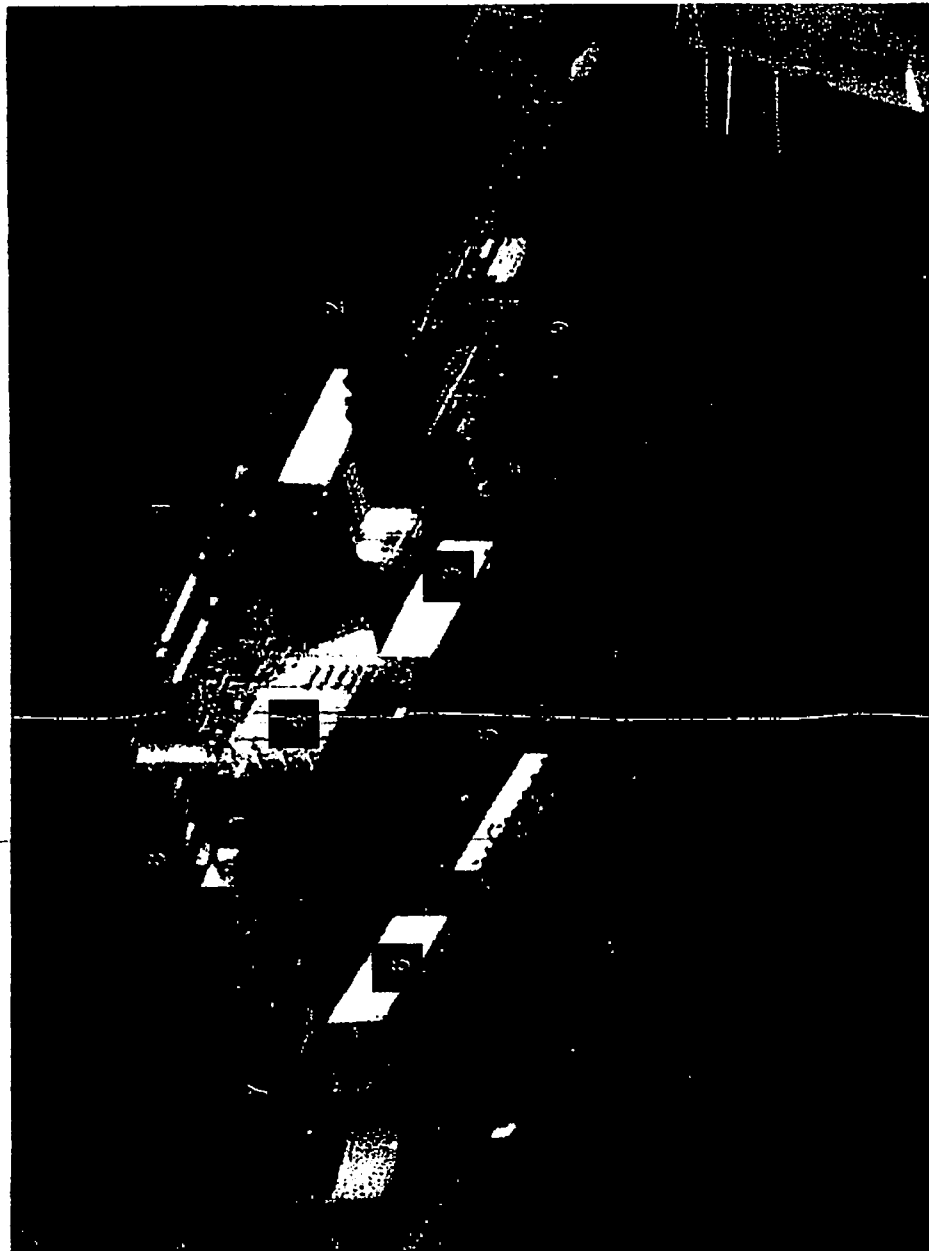
- Goldendale
- Whitehorn #2 & #3



# Goldendale

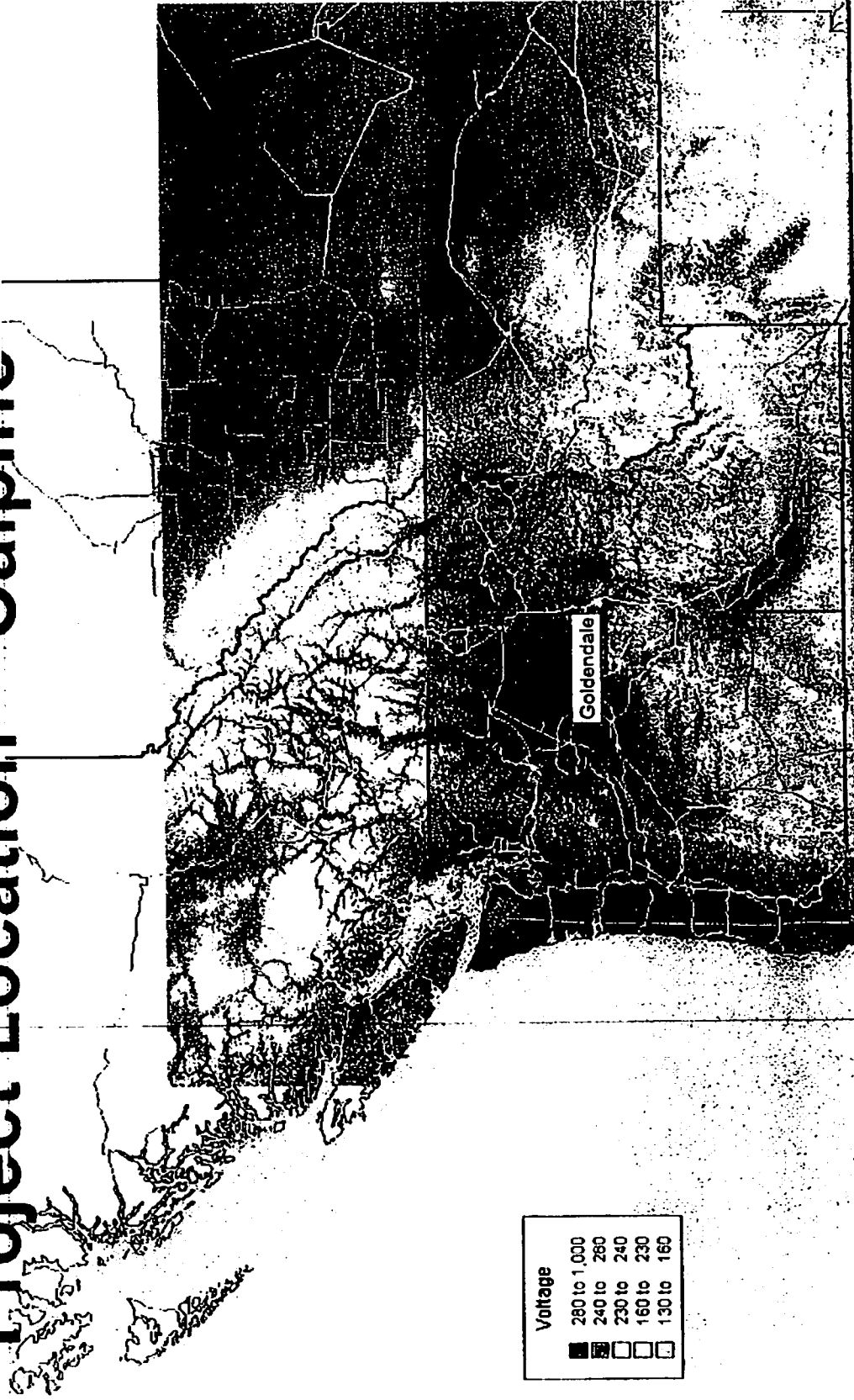
- Project overview
- RFP evaluation
- Bankruptcy process
- Acquisition plans
- Next steps

# 277 MW Natural Gas-Fired CCCT



1. Air-Cooled Condenser
2. Steam Turbine and Generator
3. Gas Turbine and Generator
4. HRSG
5. Administration Building
6. Water Treatment Building
7. (2) 2.5 million gallon water tanks
8. Wet Cooling Tower
9. Transformers & Switchyard

# Project Location - Calpine

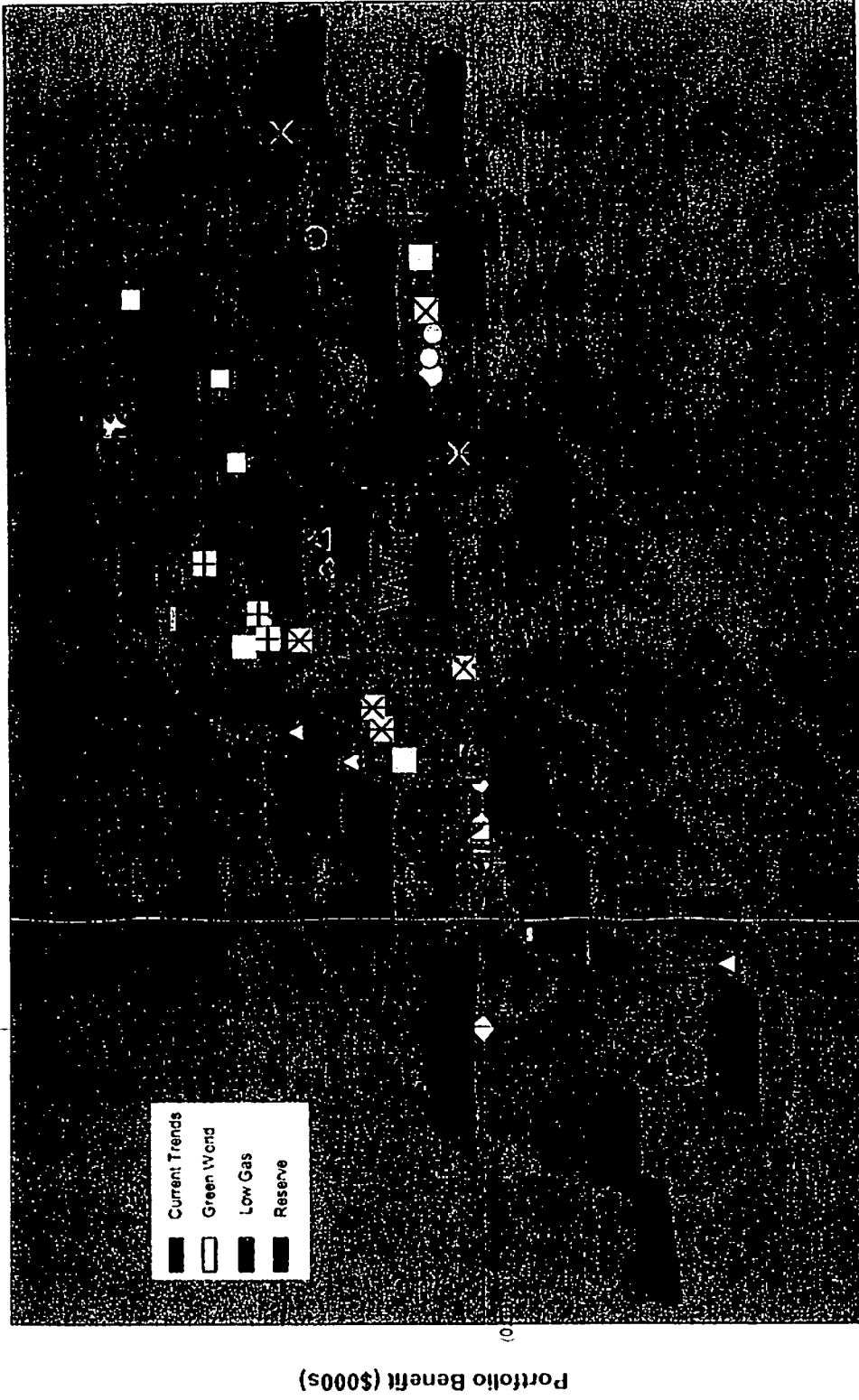


Voltage	
■	280 to 1,000
■	240 to 260
■	230 to 240
■	160 to 230
■	130 to 160





# RFP Evaluation – Calpine



Benefit Ratio

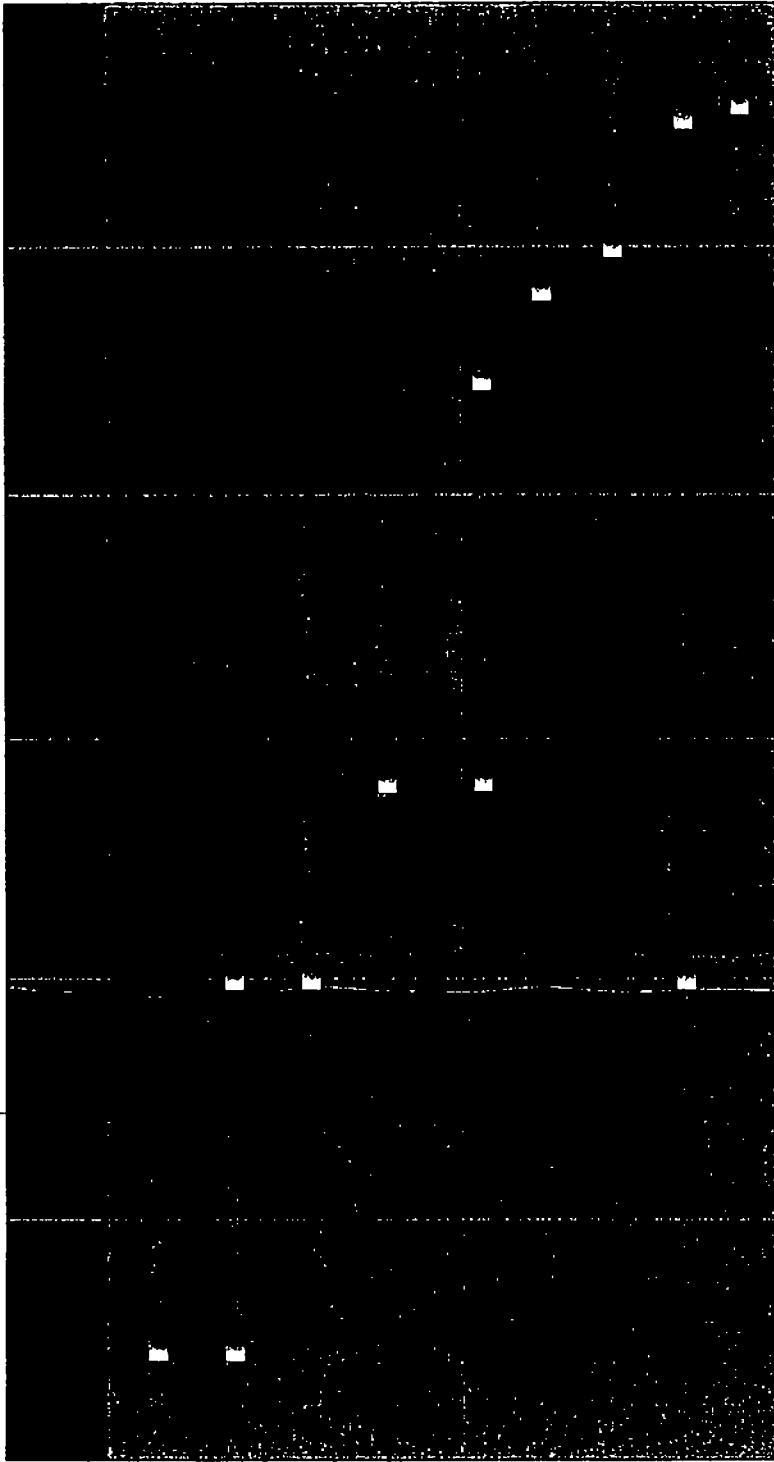


Related

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# Bankruptcy Process – Calpine



Note: Timing shown for illustrative purposes.

# Acquisition Plan – Goldendale

- Transmission – utilize portion of 540 MW of cross-Cascade transmission offered by BPA, when dispatched
- Redacted
- Gas Supply - manage as part of the aggregate power portfolio consistent with PSE's existing hedge strategies.
- Regulatory – recovery in next PCORC or GRC
  - ◆ Assumed to be 2007
  - ◆ Seek accounting order to defer expenses until next rate case

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## Next Steps – Calpine

- Confirm PSE selection as stalking horse bidder
- Negotiate definitive purchase agreements
- Determine the highest price PSE would be willing to pay in auction phase
- Determine asset management plan
- Complete due diligence
- Obtain senior management and Board approval
- File FERC 203 application

# Whitehorn #2 & #3

- Project overview
- Alleged default
- Proposed purchase
- Regulatory strategy
- Next steps

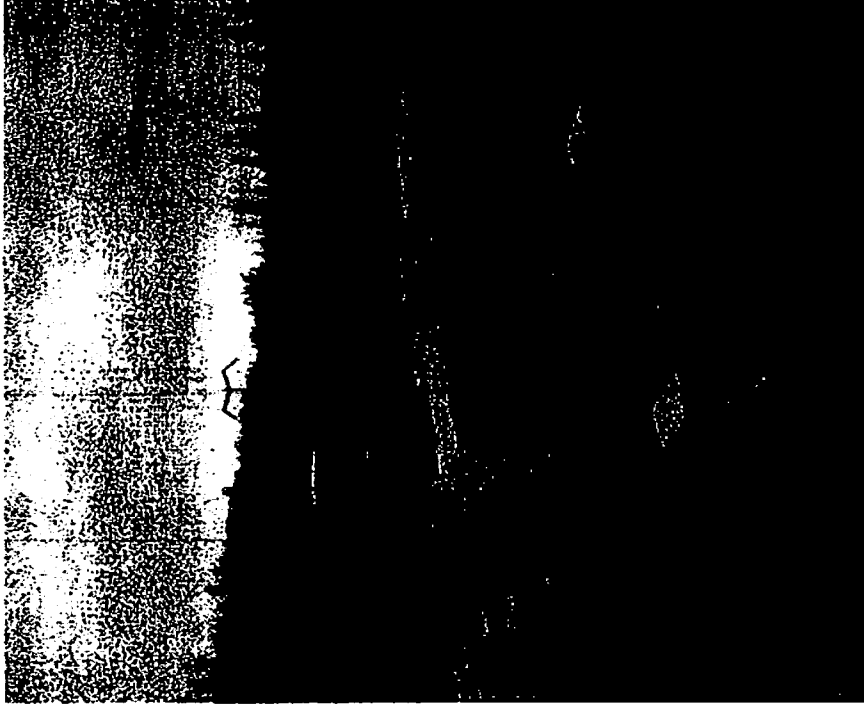
# Overview – Whitehorn

- Location
  - ◆ Adjacent to the BP Cherry Point Refinery
  - ◆ Northwest corner of Whatcom County, 2 miles from Birch Bay
  - ◆ 10 miles south of Canadian border
- Currently leased from Public Service Resources Corporation (PSRC)
  - ◆ Annual lease payments of [Redacted] payments made every 6 months in arrears
  - ◆ Units are GE MS7001Es peakers, rated at 75 MW each and installed in early 1980s
  - ◆ Unit #2 recently experienced force outage requiring an overhaul, at PSE cost
  - ◆ Lease terminates on February 2, 2009

Redacted

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## **Alleged Default – Whitehorn**

- PSRC has alleged that PSE has defaulted under the lease
- PSE disagrees that a default has occurred and believes that PSRC has alleged default as leverage to get PSE to purchase units.
  - ◆ PSRC appears to want to get out of leasing business by year-end 2006.
  - ◆ PSRC would sell lease and purchase agreement upon FERC approval.
- Regardless of default contentions, units remain valuable and cost-effective for PSE capacity and peaking uses.

# Proposed Purchase – Whitehorn

- PSE has agreed, in principle, to purchase units from PSRC at end of lease for [redacted]
  - ◆ plus the real estate excise tax and transaction costs for both PSE and PSRC (capped at [redacted])
- Analysis indicates that purchase under these terms has a lower cost to PSE customers than complying with the lease and purchasing alternative capacity when the lease is completed
  - ◆ Analysis takes estimated future cost of maintenance and other associated costs of lease and ownership into account.
  - ◆ Purchase also independently cost-effective in comparison to resources offered in RFP process.
  - ◆ PSE estimates that, with prudent maintenance, units would have a useful life through 2016.
- Purchase agreement will provide PSE with a general release under the lease that would significantly restrict PSRC's ability to claim defaults against PSE for the remainder of the lease term.

Redacted

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# Regulatory Strategy – Whitehorn

- Sale would be conditioned on FERC 203 approval, which would be sought later this year
  - ◆ Application would be filed prospectively, in early September
  - ◆ Since units are currently leased and serving PSE load, FERC approval is expected to be easily obtained.
- WUTC prudence determination would be sought in next rate filing, which may be PCORC filed in early 2007, depending on acquisition of other resources.
- Will need to seek Acquisition Adjustment accounting treatment with FERC, which may increase risk of regulatory disallowance
  - ◆ Strategy to address any acquisition adjustment issues being developed. Focus on demonstrating value to customers from this alternative.



# Next Steps – Whitehorn

- File FERC 203 application
- Negotiate definitive purchase agreements
- Obtain appropriate PSE internal approval

# Appendix



# Goldendale Profile

**COD:** September 2004

**Location:** West of the City of Goldendale, WA; Goldendale Industrial Park

**Size:** 250-MW combined cycle plant; incremental 27 MW duct fire capability

**Technology:** 1x1; GE 7FA turbine (Model 7241); Hitachi HRSG w/duct burner; 90-MW Hitachi steam turbine; 115-MW Siemens generator; hybrid wet/dry cooling

**Heat Rate:** [redacted] Btu/kWh

**Fuel:** [redacted] MMBtu/d; [redacted] MMBtu/d (w/duct fire)

**Gas Transport:** NWPL 5.1 mile lateral (50,350 Dth/d); no NWPL mainline transportation

**Transmission:** 315 MW Klickitat PUD to BPA Harvalum Substation (term through 2031)  
250 MW from BPA Harvalum to Mid-C (contract term 2001-2023)

**Water Supply:** 30-year agreement with the City of Goldendale. Sanitary and wastewater discharged to City of Goldendale sewer system; stormwater is directed to drainage ditch across the facility to 2 detention ponds

**Operation:** 125 starts (Sept04-Aug05); 4000 hours of operation

**O&M:** No LTSA (O&M provided by Calpine Services)

**Levelized Cost** [redacted] capacity factor



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# Goldendale Gas Transport Plan

Redacted



# Goldendale Gas Supply Strategy

- Plant will require  dth/day of natural gas to generate 250MW.
- Assuming a 45% capacity factor the recommended hedge would be:
  - ◆ long-term fixed price Sumas or Station 2 based upon the probabilistic estimate of average gas demand (currently estimated at 20,000 dth/day). NOTE: Timing of executing this hedge to be decided based upon market fundamentals; or
  - ◆ long-term index purchase at Sumas or Station 2 purchase of approx 15,000 dth/day.
- Hedging the plant's gas supply will be managed as part of the aggregate power portfolio consistent with PSE's existing hedge strategies.

Redacted

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2005 RFP PSM Updates from Phase I to Phase II

1	Updated gas and power prices in Current Trends based on the latest forecast
2	Corrected PTC from a mid-year to a beginning of the year convention (resulted in slight increase in PTC value)
3	Updated Volatility DJ history for prices and KWI for hydro and correlation with prices
4	Increased the price of generic "duct firing" to 65% of CCCT
5	Changed MACRS on CCCT and Duct Fire to 20-yr from 15 yr
6	Supply calculator updated to reflect RPS requirements (i.e. 9% in 2016, 15% in 2020). The logic was modified also so that renewable resource acquisitions first subtract wind from early years, rather than later years.
7	Based on Phase I results, increased the cost of generic wind from \$1.693/kW to \$1.850/kW
8	No generics, except for capacity, will be built before 2013
9	Minor logic corrections within PSM

**Aurora and PSM Phase 2 Analysis (4/14/2006)**

Gas price correction noted 7-19-06

**Table 1. PSE Scenario Values Referenced on Global Insights Natural Gas Scenarios**

Scenario	Reference Current Trends	Reserve/Overbuild	High Price/Green World	Low Gas Price	Notes
WECC Demand (AURORA)	Reference (from EPIS) WECC Average Growth Rate  1.8%	Reference (from EPIS) WECC Average Growth Rate  1.8%	Low WECC Average Growth Rate  1.1%	Reference WECC Average Growth Rate  1.8%	Low Growth Rate is 60% of Reference Growth Rate for each area
Gas Price (Nominal \$ Levelized for 2007-2026)	Global Insights Reference; Levelized, plus Kiorderx forwards 2007 - 2010  \$ [redacted] MMBTU	Global Insights Reference; Levelized, plus Kiorderx forwards 2007 - 2010  \$ [redacted] MMBTU	Global Insights High Price; Levelized, plus Kiorderx forwards 2007 - 2010  \$ [redacted] MMBTU	Global Insights Low Economic Growth; Levelized; Kiorderx forwards 2007 - 2008  \$ [redacted] MMBTU	Global Insights (12/05) and Kiorderx forwards (2007-2010) as of 12/19/2005
Coal Price (\$2004/mmBtu)	\$0.90 - PRB \$1.00 - Rockies \$1.10 - NW \$1.25 - SW	\$0.90 - PRB \$1.00 - Rockies \$1.10 - NW \$1.25 - SW	Reference	Reference	Source: Platts 2004 Coal Market Research and M. Jones. Price increases 0.75% real per year.
PSE Demand (PSM)	Reference	Reference	Low	Reference	Most recent PSE load forecast.
Generic Resource Costs	PSE	PSE	PSE	PSE	
Carbon Costs (AURORA)	NCEP Nominal \$/ton by year:  2010: \$5.00 2015: \$6.38 2020: \$8.14	NCEP Nominal \$/ton by year:  2010: \$5.00 2015: \$6.38 2020: \$8.14	Clean Power (Jeffords) Nominal \$/ton by year:  2010: \$21.00 2015: \$31.17 2020: \$45.35	NCEP Nominal \$/ton by year:  2010: \$5.00 2015: \$6.38 2020: \$8.14	NCEP increases 2.5% real per year. Clean Power increases about 4% per year real over 20 years
SO2 (PSM)	Clear Skies Nominal \$/ton by year:  2010: \$978 2015: \$1435 2020: \$2105	Clear Skies Nominal \$/ton by year:  2010: \$978 2015: \$1435 2020: \$2105	Clean Air (Carper) Nominal \$/ton by year:  2010: \$1481 2015: \$2175 2020: \$3191	Clear Skies Nominal \$/ton by year:  2010: \$978 2015: \$1435 2020: \$2105	



Scenario	Reference Current Trends	Reserve/Overbuild	High Price/Green World	Low Gas Price	Notes
NOX (PSM)	Clear Skies Nominal \$/ton by year:  2010: \$297 2015: \$436 2020: \$640	Clear Skies Nominal \$/ton by year:  2010: \$297 2015: \$436 2020: \$640	Clean Air (Carper) Nominal \$/ton by year:  2010: \$5742 2015: \$2012 2020: \$1522	Clear Skies Nominal \$/ton by year:  2010: \$297 2015: \$436 2020: \$640	
RPS (AURORA)	Meet all WECC RPS by 2026.  Wind 20,901 MW Solar 500 MW Geo 1014 MW Bio 375 MW  Mkt. Builds Wind 2,200 MW	Meet all WECC RPS by 2026.  Wind 20,901 MW Solar 500 MW Geo 1014 MW Bio 375 MW  Mkt. Builds Wind 2,200 MW	Meet all non-wind RPS by 2026.  Solar 500 MW Geo 1014 MW Bio 375 MW  Mkt. Builds Wind 28,800 MW	Meet all RPS through 2011.  Wind 7,615 MW Solar 241 MW Geo 558 MW Bio 263 MW  Mkt. Builds No More	Only Wind renewables in builds.
PTC For Wind	2007-2009: \$19 2010-2011: \$10 2012-2026: \$0	2007-2009: \$19 2010-2011: \$10 2012-2026: \$0	2007-2009: \$19 2010-2011: \$10 2012-2026: \$0	2007-2009: \$19 2010-2011: \$10 2012-2026: \$0	Credit in nominal \$/MWh.
Overbuild	No	Yes; Net Additions are approx. 30% greater in 2015 and 10% greater in 2025	No	No	

**Table 2. Optimization Build Limits for WECC**

Resource	Reference	Reserve/ Overbuild	High Price/Green World	Low Gas Price	Notes
Coal	Builds can start in 2010 and are limited to 9 areas in the WECC. Coal builds are limited to meet load growth only within each area.	Reference	Reference	Reference	See Table 3 for limits by year and by area by 2007-2026.
IGCC	Builds can start in 2014 for 10 areas in the WECC. Coal builds are limited to meet load growth only within each area.	Reference	Reference	Reference	See Table 4 for limits by year and by area by 2007-2026.
CCCT	Builds can start in 2007.	Reference	Reference	Reference	See Table 5 for limits by year and by area by 2007-2026.
SCCT	Builds can start in 2007	Reference	Reference	Reference	See Table 6 for limits by year and by area by 2007-2026.
Wind	Builds start in 2007	Reference	Reference	Reference	See Table 7 for limits by year and by area by 2007-2026.
Unretires	All	All	All Non-Coal	All	Unretire keeps uneconomic plants available for peaking capacity.
Overbuild	No	Yes Model builds 9 GW more WECC supply resources by 2015 than in the reference case.	No	No	In the reserve case, the demand in the WECC is increased approximately 1 % per year over the reference demand for 6 years. The model is optimized to this demand level and then the hourly run uses this build result with the reference demand.

Table 3. Assumptions for Scrubbed Sub-Critical Pulverized Coal  
Source: R:\Acquisition\2005 RFP Prep\Quantitative Analysis Preparation\Model Assumptions\Coal\Update Coal Limits V8.xls

Unit Name	ID#	Year	Capacity (MW)	Start Date	End Date	Annual Build Limits by Area
44	OR-Ea	0	0			
45	PG&EN	0	0			
46	SCE-	0	0			
47	BC	0	0			
48	ID-So	1/1/2012	0			
49	MT	1/1/2012	NA	2	1	1
50	WY	1/1/2013	NA	2	1	1
51	CO	1/1/2010	NA	3	1	1
52	NM	1/1/2010	NA	2	1	1
53	AZ	1/1/2013	NA	3	1	1
54	UT	1/1/2012	NA	2	1	1
55	NVNo	1/1/2011	NA	1	1	1
56	AB	1/1/2011	NA	2	1	1
59	BalaN	0	0			
60	NVSo	1/1/2011	NA	2	1	1
78	IID	0	0			
79	LDWP-	0	0			
80	SF	0	0			
81	ZP26+	0	0			
82	SDGE-	0	0			
83	SMUD	0	0			
90	ID-Ea	0	0			
91	OR-We	0	0			
92	WA-Cr	0	0			
93	On	0	0			
94	PACW	0	0			
95	PSNo	0	0			
96	SeaTac	0	0			
97	Spok	0	0			
Total	Units		10	19		
	MW			11,400		

Note: Plant size is 600 MW.

Table 4. Assumptions for IGCC

Source: R:\Acquisition\2005 RFP Prep\Quantitative Analysis Preparation\Model Assumptions\Coal\Update Coal Limits V8.xls  
Annual Build Limits by Area

44	OR-Ea	0	0	0	0	0
45	PG&E	0	0	0	0	0
46	SCE	0	0	0	0	0
47	BC	0	0	0	0	0
48	ID-Sg	2014	NA	NA	NA	1
49	WY	2014	NA	NA	NA	1
50	WY	2014	NA	NA	NA	1
51	CO	2014	NA	NA	NA	1
52	NM	2014	NA	NA	NA	1
53	PAZ	2014	NA	NA	NA	1
54	UT	2014	NA	NA	NA	1
55	ND/NE	2014	NA	NA	NA	1
56	WV	2014	NA	NA	NA	1
59	Bjain	0	0	0	0	0
60	WV	2014	NA	NA	NA	1
78	ID	0	0	0	0	0
79	LDWP+	0	0	0	0	0
80	SF	0	0	0	0	0
81	ZP26+	0	0	0	0	0
82	SDGE+	0	0	0	0	0
83	SMUD	0	0	0	0	0
90	ID-Ea	0	0	0	0	0
91	OR-We	0	0	0	0	0
92	WA-Ctr	0	0	0	0	0
93	Oh	0	0	0	0	0
94	PACW	0	0	0	0	0
95	PSNe	0	0	0	0	0
96	SeaTac	0	0	0	0	0
97	Spok	0	0	0	0	0
Total	Units	10	10	23	23	23
	MW			5,750	5,750	5,750

Note: Plant size is 250 MW.

**Table 5. Assumptions for CCCT gas/oil Adv**

Source: R:\Acquisition\2005 RFP Prep\Quantitative Analysis Preparation\Model Assumptions\  
Coal\Update Coal Limits V8.xls

44	OR-Ea	2007	5	50	
45	PG&EN	2007	10	100	
46	SCE+	2007	20	150	
47	BC	2007	5	50	
48	ID-So	2007	5	50	
49	MT	2007	5	50	
50	WY	2007	5	50	
51	CO	2007	10	100	
52	NM	2007	10	100	
53	AZ	2007	10	100	
54	UT	2007	10	100	
55	NVNo	2007	5	50	
56	AB	2007	10	50	
59	BajaN	2007	5	50	
60	NVSo	2007	4	50	
78	IID	2007	10	50	
79	LDWP+	2007	10	50	
80	SF	2007	10	50	
81	ZP26+	2007	10	50	
82	SDGE+	2007	10	50	
83	SMUD	2007	10	50	
90	ID-Ea	2007	10	50	
91	OR-We	2007	10	50	
92	WA-Ctr	2007	10	50	
93	Oly	2007	10	50	
94	PACW	2007	10	50	
95	PSNo	2007	10	50	
96	SeaTac	2007	10	50	
97	Spok	2007	10	50	
Total	Units		259	1800	
	MW			990,000	Plant size is 400 MW.

**Table 6. Assumptions for SCCT Adv**

Source: R:\Acquisition\2005 RFP Prep\Quantitative Analysis Preparation\Model Assumptions\  
Coal\Update Coal Limits V8.xls

44	OR-Fa	2007	10	100	
45	PG&EN	2007	20	150	
46	SCE+	2007	20	150	
47	BC	2007	5	50	
48	ID-So	2007	5	50	
49	MT	2007	5	50	
50	WY	2007	5	50	
51	CO	2007	10	100	
52	NM	2007	10	100	
53	AZ	2007	20	150	
54	UT	2007	5	50	
55	NVNo	2007	10	100	
56	AB	2007	10	50	
59	BajaN	2007	5	50	
60	NVSo	2007	5	50	
78	IID	2007	10	50	
79	LDWP+	2007	10	50	
80	SF	2007	10	50	
81	ZP26+	2007	10	50	
82	SDGE+	2007	10	50	
83	SMUD	2007	10	50	
90	ID-Ea	2007	10	50	
91	OR-We	2007	10	50	
92	WA-Ctr	2007	10	50	
93	Oly	2007	10	50	
94	PACW	2007	10	50	
95	PSNo	2007	10	50	
96	SeaTac	2007	10	50	
97	Spok	2007	10	50	
Total	Units		285	1950	
	MW			448,500	Plant size is 230 MW

**Table 7. Assumptions for Wind**

Source: R:\Acquisition\2005 RFP Prep\Quantitative Analysis Preparation\Model Assumptions\  
Coal\Update Coal Limits V8.xls

44	OR-Ea	1/1/2007	1	20	
45	PG&EN	1/1/2007	1	20	
46	SCE+	1/1/2007	1	20	
47	BC	1/1/2007	1	10	
48	ID-So	1/1/2007	1	10	
49	MT	1/1/2007	1	20	
50	WY	1/1/2007	1	20	
51	CO	1/1/2007	1	20	
52	NM	1/1/2007	1	10	
53	AZ	1/1/2007	1	10	
54	UT	1/1/2007	1	10	
55	NVNo	1/1/2007	1	10	
56	AB	1/1/2007	1	10	
59	BajaN	1/1/2007	0	0	
60	NVSo	1/1/2007	1	10	
78	IID	1/1/2007	1	10	
79	LDWP+	1/1/2007	1	10	
80	SF	1/1/2007	0	0	
81	ZP26+	1/1/2007	0	0	
82	SDGE+	1/1/2007	0	0	
83	SMUD	1/1/2007	0	0	
90	ID-Ea	1/1/2007	1	10	
91	OR-We	1/1/2007	1	20	
92	WA-Ctr	1/1/2007	1	20	
93	Oly	1/1/2007	0	0	
94	PACW	1/1/2007	1	20	
95	PSNo	1/1/2007	0	0	
96	ScaTac	1/1/2007	0	0	
97	Spok	1/1/2007	1	20	
<b>Total</b>	<b>Units</b>		<b>21</b>	<b>310</b>	<b>New limit of 2 plants per year.</b>
	<b>MW</b>			<b>31,000</b>	<b>Plant size is 100 MW.</b>

1	Geothermal, Wind PPA, CCCT A, CCCT B
2	Geothermal, Wind PPA, CCCT A, System PPA
3	Geothermal, Wind PPA, CCCT B
4	Geothermal, Wind PPA, CCCT A, CCCT C
5	Geothermal, Wind Ownership, CCCT B
6	New Hydro, Wind PPA, Coal, System PPA
7	Wind PPA, Coal, CCCT A, CCCT B

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BP#s	The Scenario	Fuel Type	Scenario Sample	Time Sample	Sub-Description	Revenue from Power Sale	PPA Rev. NPV	PPA Rev. NPV	Req. NPV	Req. NPV	End Effects	Expected Cost	All Costs	Deficit Queue (MWh)	Benefit Ratio	Acquisition Level	PPA Levelized Cost (\$/MWh)	Masterized Cost	
002A																			
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002C																			
002D																			
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Period 3/15/2007

REF No	Scenario	This Scenario	Sub-Scenario	Revenue from Cost of Power Purchase	Acquisition Rev. Req. NPV	PPA Rev. Req. NPV	Output Rev. Req. NPV	Vegetation Cost of Existing Forest	Enj. Effects	Expend. Cost	AS. Change	Perfor. Benefit (USD)	Benef. Ratio	Acquisition Levelized Cost at (Standard) Conditions	PPA Leasing W/Letterbox Cost
517A	PSW Bas Current Trends (Pres Cap. 2,000)	Gas	C1	1,218,200	1,831,723	1,339,351	1,403,272	2,183,848	477,267	12,033,833	12,213,653	178,825	0.138		
517B	PSW Bas Green Works (Pres Cap. 2,000)	Gas	C1	1,820,481	2,831,471	1,788,390	6,541,742	5,833,848	249,104	17,024,168	17,183,304	159,136	0.131		
517C	PSW Bas Low Ona Price (Pres Cap. 2,000)	Gas	L0	1,827,842	938,843	672,033	6,175,204	2,807,718	558,495	9,385,454	9,052,555	332,899	0.181		
517D	Reserve Scenario (Pres Cap. 2,000)	Gas	RE	185,180	2,533,726	1,068,751	8,715,128	2,873,232	543,420	12,108,103	12,273,818	165,715	0.138		

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Printed 3/15/2007

Site No.	Title	Scenario	Fuel Type	Scenario	Sub-Description	Revenue For Power Purchase	PPA Rev. Req. NPV	Gen. Rev. Req. NPV	Variable Cost of Existing Plant	End Date	Expected Cost	Benefit (Cost)	Benefit Ratio	Acquisition Leverage	Cost PPA Leverage Multiplier	CO <sub>2</sub> Contribution
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Comments and Emergency/Contingency for Generation in Area UP  
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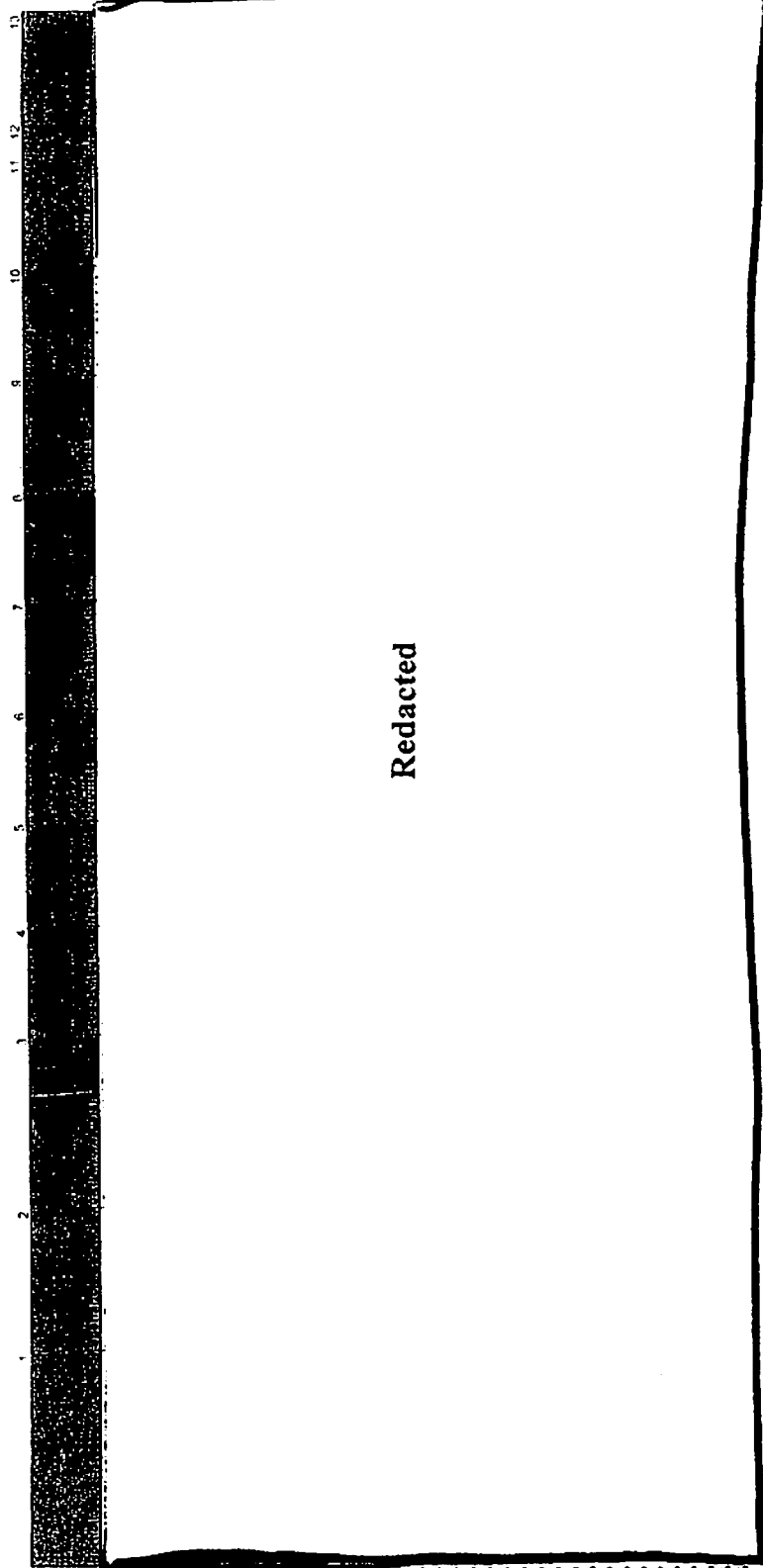
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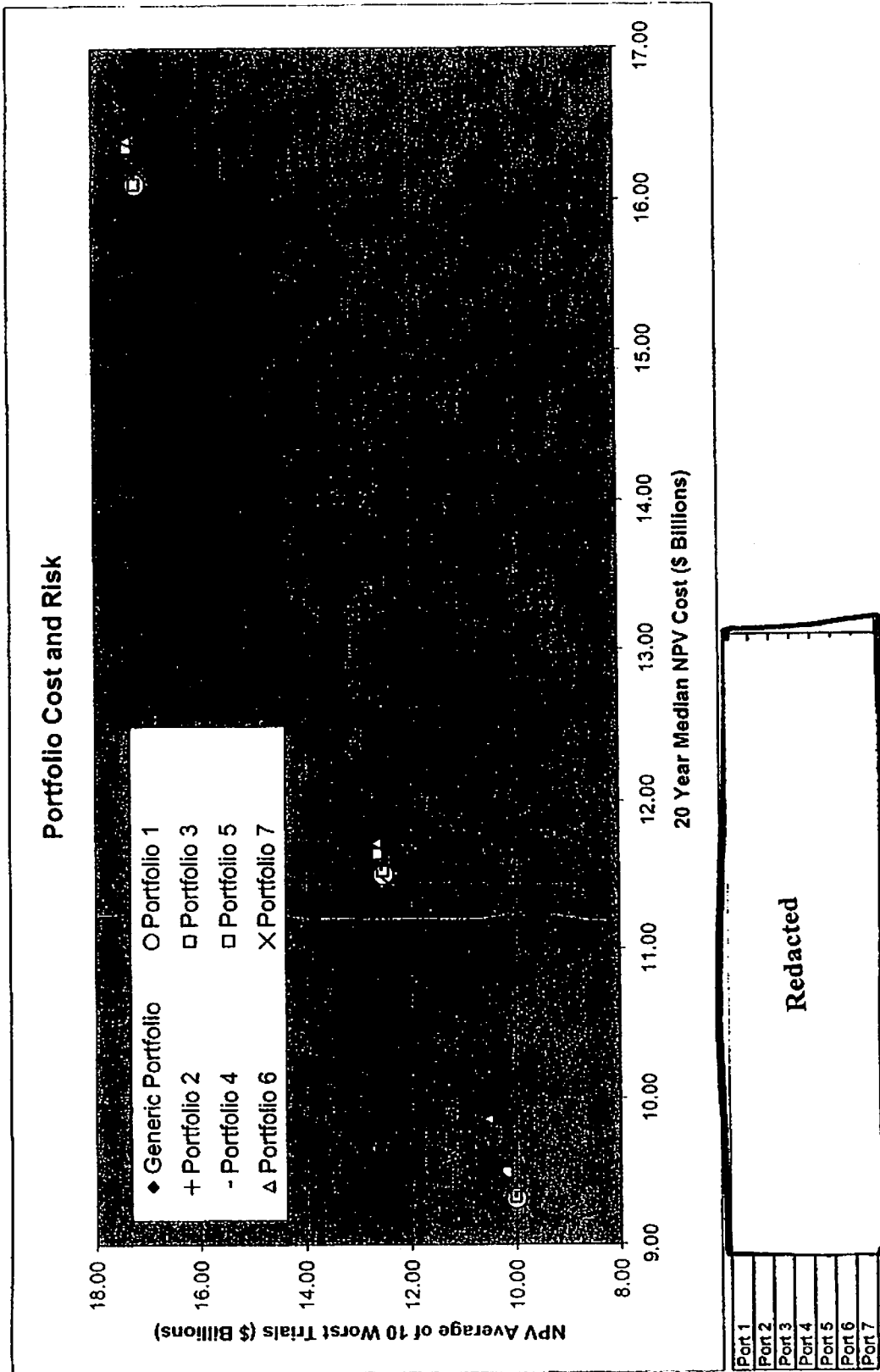


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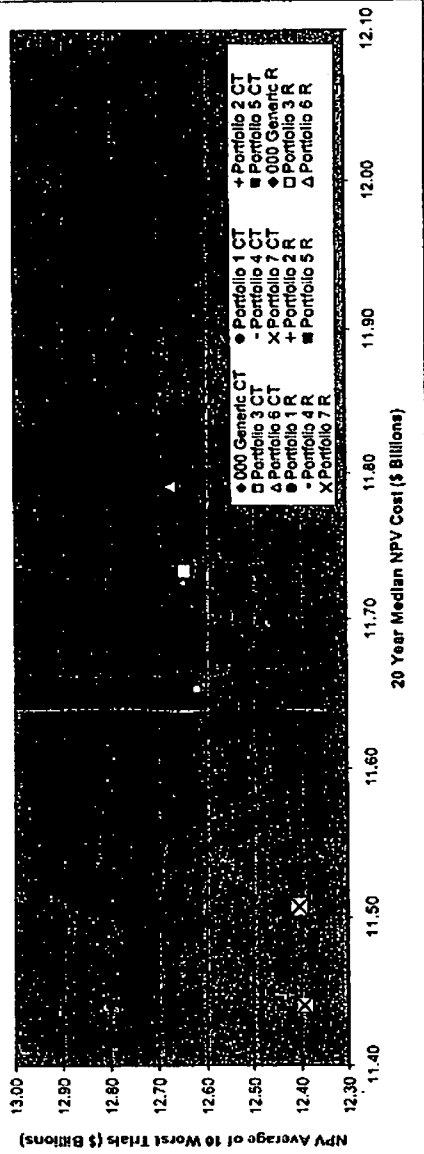
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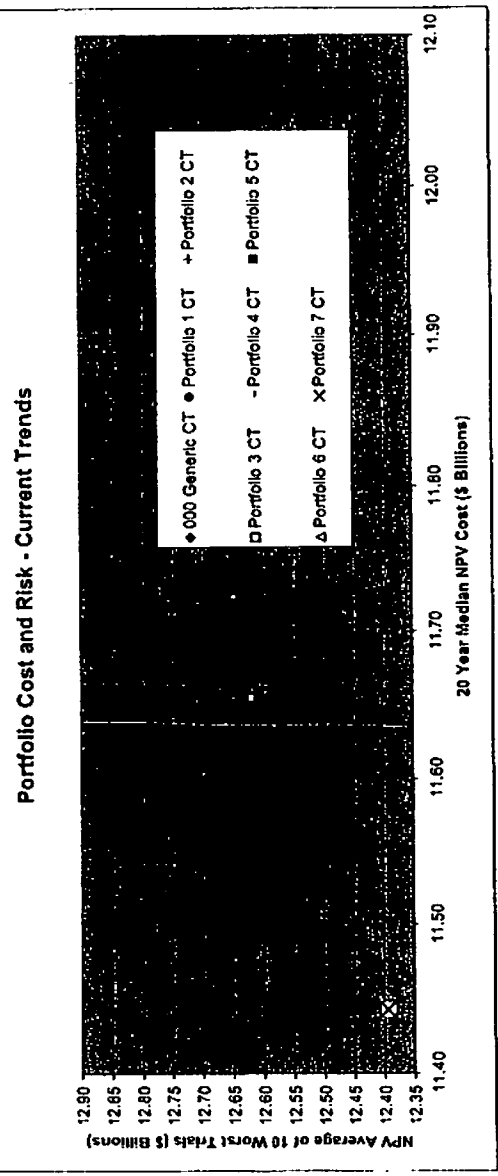
	3	4	5	6	7	8	9	10	11	12	13
6.5% 000 Generic CT	\$ 12,832,848	\$ 12,049,110	\$ (1,875,055)	\$ 2,129,878	\$ -	\$ -	\$ 6,274,244	\$ 2,906,817	\$ 520,547	\$ -	\$ 12,008,364
6.6% Portfolio 1 CT	\$ 12,500,873	\$ 11,512,603	\$ (2,033,047)	\$ 1,899,125	\$ 1,108,889	\$ 1,116,473	\$ 6,105,490	\$ 2,950,893	\$ 406,054	\$ -	\$ 11,553,977
8.5% Portfolio 2 CT	\$ 12,618,298	\$ 11,629,584	\$ (1,922,951)	\$ 2,019,235	\$ -	\$ 1,186,413	\$ 7,041,688	\$ 2,950,893	\$ 425,647	\$ -	\$ 11,661,210
8.3% Portfolio 3 CT	\$ 12,618,484	\$ 11,654,641	\$ (2,121,051)	\$ 1,501,709	\$ 1,106,888	\$ 537,628	\$ 6,880,617	\$ 2,950,893	\$ 432,500	\$ -	\$ 11,691,257
8.6% Portfolio 4 CT	\$ 12,536,774	\$ 11,544,166	\$ (1,960,252)	\$ 2,007,397	\$ 840,638	\$ 1,236,348	\$ 6,089,848	\$ 2,950,893	\$ 411,780	\$ -	\$ 11,578,281
8.4% Portfolio 5 CT	\$ 12,609,688	\$ 11,537,518	\$ (2,033,047)	\$ 1,999,125	\$ 1,619,157	\$ 624,835	\$ 6,105,490	\$ 2,950,893	\$ 388,188	\$ -	\$ 11,564,751
7.9% Portfolio 6 CT	\$ 12,448,553	\$ 11,724,853	\$ (2,137,180)	\$ 1,686,999	\$ 1,917,415	\$ 541,579	\$ 6,500,191	\$ 2,950,893	\$ 324,727	\$ -	\$ 11,764,715
8.3% Portfolio 7 CT	\$ 12,383,728	\$ 11,442,130	\$ (2,111,538)	\$ 1,650,211	\$ 2,719,478	\$ 1,125,478	\$ 4,819,724	\$ 2,950,893	\$ 320,032	\$ -	\$ 11,484,308

Portfolio Cost and Risk - Low Gas Prices



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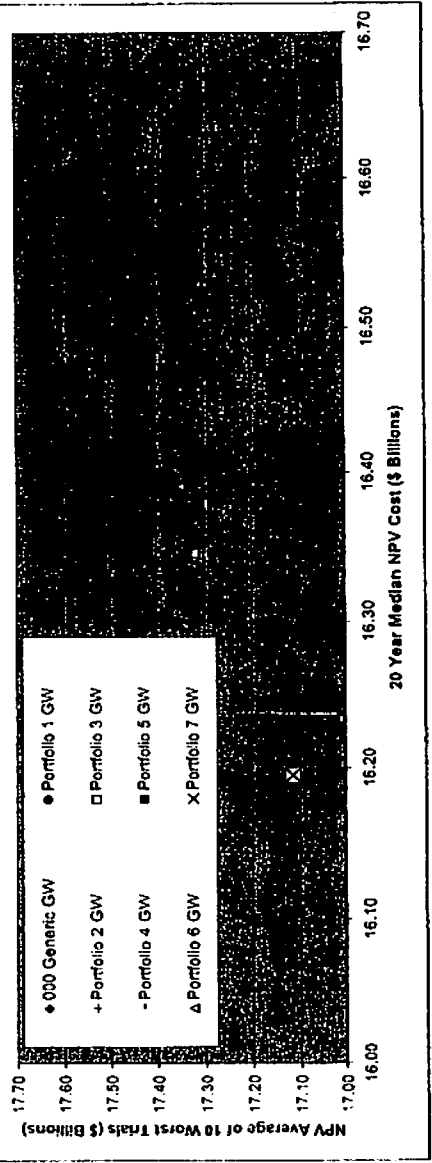
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6.5% 000 Generic CT	12,632,849	12,049,110	(1,875,053)	2,129,829	1,108,889	1,118,473	6,324,244	2,808,817	570,547		\$ 12,006,394
6.5% Portfolio 1 CT	12,600,873	11,512,803	(2,033,047)	1,890,125	1,108,889	1,118,473	6,105,480	2,850,893	496,054		\$ 11,553,977
6.5% Portfolio 2 CT	12,818,295	11,528,864	(1,922,856)	2,011,225	1,108,889	1,118,473	7,041,888	2,950,893	475,647		\$ 11,681,210
6.3% Portfolio 3 CT	12,818,295	11,554,441	(1,921,051)	1,801,708	1,028,889	1,234,348	6,089,817	2,950,893	432,500		\$ 11,681,257
6.6% Portfolio 4 CT	12,559,776	11,524,158	(1,950,752)	2,007,397	840,838	1,234,348	6,089,817	2,950,893	411,780		\$ 11,578,281
7.8% Portfolio 5 CT	12,649,593	11,657,433	(2,033,047)	1,899,125	1,108,889	1,118,473	6,105,480	2,850,893	388,188		\$ 11,584,761
8.3% Portfolio 6 CT	12,383,728	11,424,730	(2,111,533)	1,680,271	2,719,479	1,123,476	4,818,724	2,850,893	324,723		\$ 11,784,716
8.3% Portfolio 7 CT	12,383,728	11,424,730	(2,111,533)	1,680,271	2,719,479	1,123,476	4,818,724	2,850,893	320,802		\$ 11,484,308



Column Index →

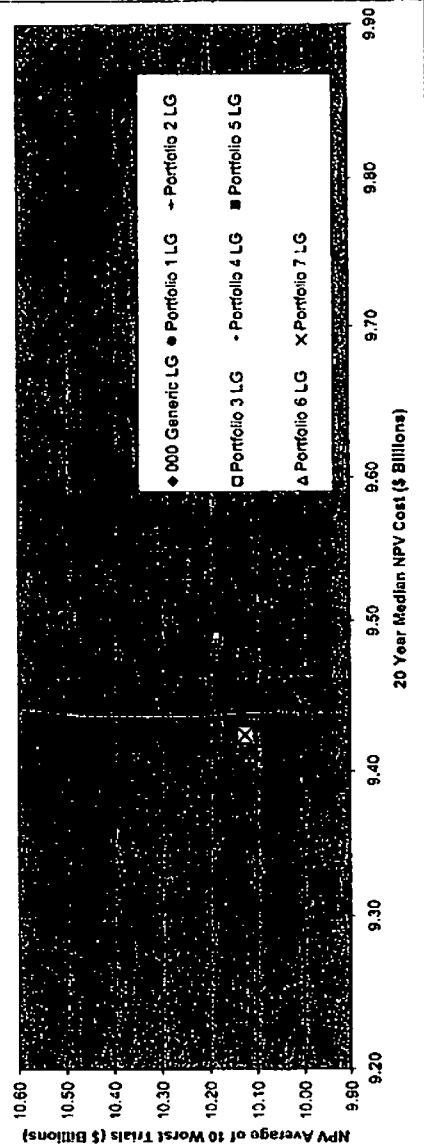
	3	4	5	6	7	8	9	10	11	12	13
5.9% 000 Genatc GW	\$ 17,450,933	\$ 16,617,401	\$ (2,434,844)	\$ 3,489,861	\$ -	\$ -	\$ 9,733,530	\$ 5,489,205	\$ 172,842	\$ -	\$ 16,430,994
5.4% Portfolio 1 GW	\$ 17,150,520	\$ 16,111,881	\$ (2,487,742)	\$ 3,229,192	\$ 1,249,935	\$ 3,326,778	\$ 7,049,351	\$ 5,489,205	\$ 149,935	\$ -	\$ 15,656,654
6.0% Portfolio 2 GW	\$ 17,247,833	\$ 16,271,166	\$ (2,394,074)	\$ 3,299,257	\$ -	\$ 3,376,718	\$ 6,185,245	\$ 5,489,205	\$ 167,545	\$ -	\$ 16,113,095
6.5% Portfolio 3 GW	\$ 17,325,089	\$ 16,345,531	\$ (2,551,719)	\$ 3,184,461	\$ 1,249,935	\$ 537,839	\$ 6,128,322	\$ 5,489,205	\$ 172,382	\$ -	\$ 16,035,014
6.4% Portfolio 4 GW	\$ 17,125,317	\$ 16,145,585	\$ (2,410,570)	\$ 3,335,442	\$ 991,462	\$ 1,447,791	\$ 7,017,675	\$ 5,489,205	\$ 152,892	\$ -	\$ 15,992,188
6.3% Portfolio 5 GW	\$ 17,184,714	\$ 16,110,743	\$ (2,497,742)	\$ 3,229,192	\$ 1,249,935	\$ 535,140	\$ 7,049,351	\$ 5,489,205	\$ 136,820	\$ -	\$ 15,271,241
5.9% Portfolio 6 GW	\$ 17,350,869	\$ 16,399,229	\$ (2,607,850)	\$ 2,711,349	\$ 2,633,408	\$ 541,878	\$ 7,474,792	\$ 5,489,205	\$ 58,559	\$ -	\$ 16,032,646
5.7% Portfolio 7 GW	\$ 17,118,947	\$ 16,195,177	\$ (2,572,358)	\$ 2,719,893	\$ 3,564,422	\$ 1,337,953	\$ 5,414,530	\$ 5,489,205	\$ 99,171	\$ -	\$ -

Portfolio Cost and Risk - Green World



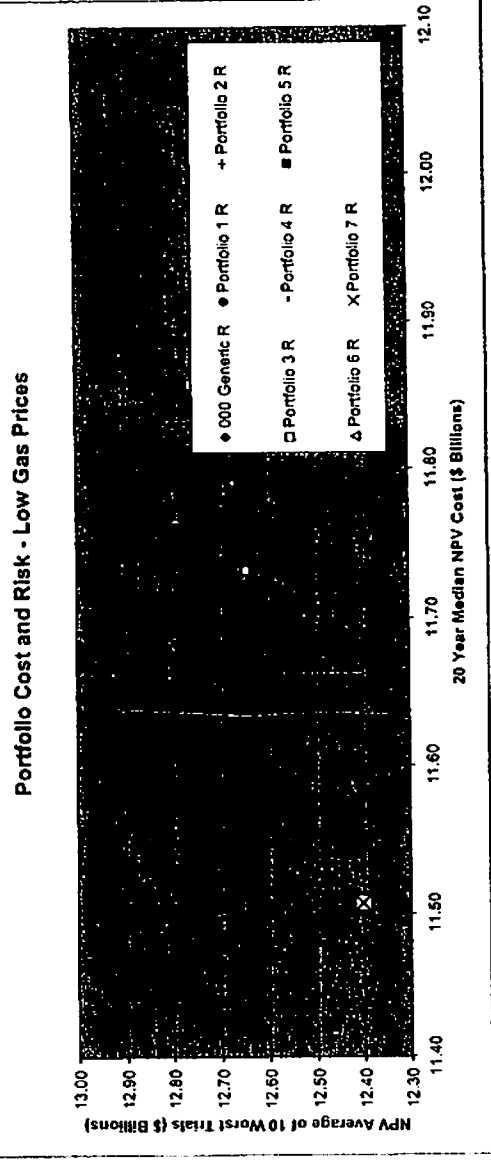
Column Index -->	1	2	3	4	5	6	7	8	9	10	11	12	13				
7.6% 000 Generals LG	10,444,799	\$	9,700,859	\$	(2,184,917)	\$	1,284,307	\$	-	\$	7,097,858	\$	2,976,272	\$	550,252	\$	9,747,553
7.3% Portfolio 1 LG	9,893,127	\$	9,310,056	\$	(2,259,396)	\$	1,084,142	\$	1,095,788	\$	4,868,431	\$	2,976,272	\$	458,002	\$	9,332,052
7.0% Portfolio 2 LG	10,143,844	\$	9,478,011	\$	(2,122,840)	\$	1,169,932	\$	1,145,728	\$	5,834,380	\$	2,976,272	\$	488,817	\$	9,482,510
7.3% Portfolio 3 LG	10,184,823	\$	9,480,082	\$	(2,325,418)	\$	1,028,050	\$	1,033,733	\$	537,820	\$	2,976,272	\$	485,693	\$	9,514,932
7.5% Portfolio 4 LG	10,013,856	\$	9,317,844	\$	(2,173,311)	\$	1,155,747	\$	1,205,925	\$	4,954,587	\$	2,976,272	\$	459,580	\$	9,353,237
7.3% Portfolio 5 LG	10,008,931	\$	9,312,843	\$	(2,268,396)	\$	1,084,142	\$	1,544,001	\$	604,150	\$	2,976,272	\$	449,531	\$	9,344,130
7.1% Portfolio 6 LG	10,457,355	\$	9,483,457	\$	(2,280,739)	\$	989,270	\$	1,822,048	\$	541,579	\$	2,976,272	\$	500,255	\$	9,483,576
7.4% Portfolio 7 LG	10,124,222	\$	9,424,328	\$	(2,316,034)	\$	919,099	\$	1,003,974	\$	3,691,254	\$	2,976,272	\$	428,531	\$	9,453,218

Portfolio Cost and Risk - Low Gas Prices



Column Index →

	3	4	5	6	7	8	9	10	11	12	13
7.9% 000 Generic R Reserve	\$ 12,942,308	\$ 11,895,402	\$ 10,855,077	\$ 9,818,823	\$ 8,793,988	\$ 7,778,651	\$ 6,772,831	\$ 5,777,631	\$ 4,793,053	\$ 3,819,081	\$ 2,855,727
9.1% Portfolio 1 R Reserve	\$ 12,519,633	\$ 11,568,554	\$ 10,623,426	\$ 9,683,251	\$ 8,748,021	\$ 7,817,737	\$ 6,892,401	\$ 5,972,011	\$ 5,056,573	\$ 4,145,083	\$ 3,242,543
9.0% Portfolio 2 R Reserve	\$ 12,537,565	\$ 11,705,544	\$ 10,866,521	\$ 10,028,498	\$ 9,192,475	\$ 8,359,452	\$ 7,529,429	\$ 6,702,406	\$ 5,879,383	\$ 5,060,360	\$ 4,247,337
7.8% Portfolio 3 R Reserve	\$ 12,643,778	\$ 11,732,878	\$ 10,821,978	\$ 9,911,078	\$ 9,000,178	\$ 8,089,278	\$ 7,178,378	\$ 6,267,478	\$ 5,356,578	\$ 4,445,678	\$ 3,534,778
8.1% Portfolio 4 R Reserve	\$ 12,655,041	\$ 11,612,255	\$ 10,569,469	\$ 9,526,683	\$ 8,483,897	\$ 7,441,111	\$ 6,398,325	\$ 5,355,539	\$ 4,312,753	\$ 3,270,000	\$ 2,227,250
7.9% Portfolio 5 R Reserve	\$ 12,532,884	\$ 11,611,837	\$ 10,690,790	\$ 9,769,743	\$ 8,848,696	\$ 7,927,649	\$ 7,006,602	\$ 6,085,555	\$ 5,164,508	\$ 4,243,461	\$ 3,322,414
7.5% Portfolio 6 R Reserve	\$ 12,674,314	\$ 11,760,947	\$ 10,847,580	\$ 9,934,213	\$ 9,020,846	\$ 8,107,479	\$ 7,194,112	\$ 6,280,745	\$ 5,367,378	\$ 4,454,011	\$ 3,540,644
7.8% Portfolio 7 R Reserve	\$ 12,404,001	\$ 11,507,229	\$ 10,610,457	\$ 9,713,685	\$ 8,816,913	\$ 7,920,141	\$ 7,023,369	\$ 6,126,597	\$ 5,229,825	\$ 4,333,053	\$ 3,436,281

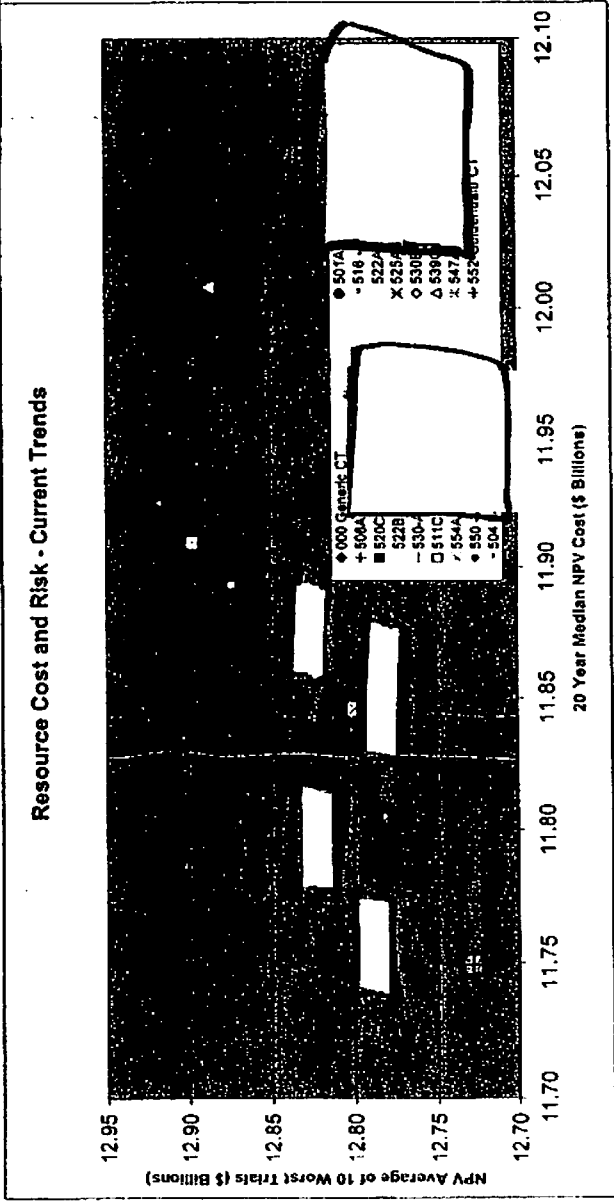


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6.5V  
6.7V  
8.3V  
8.4V  
8.2V  
8.5V  
8.2V  
7.3V  
8.3V  
8.5V  
8.2V  
8.3V  
8.3V  
8.3V  
8.4V  
8.3V  
8.1V

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7,385,739 \$ 2,950,995 \$ 11,723,527

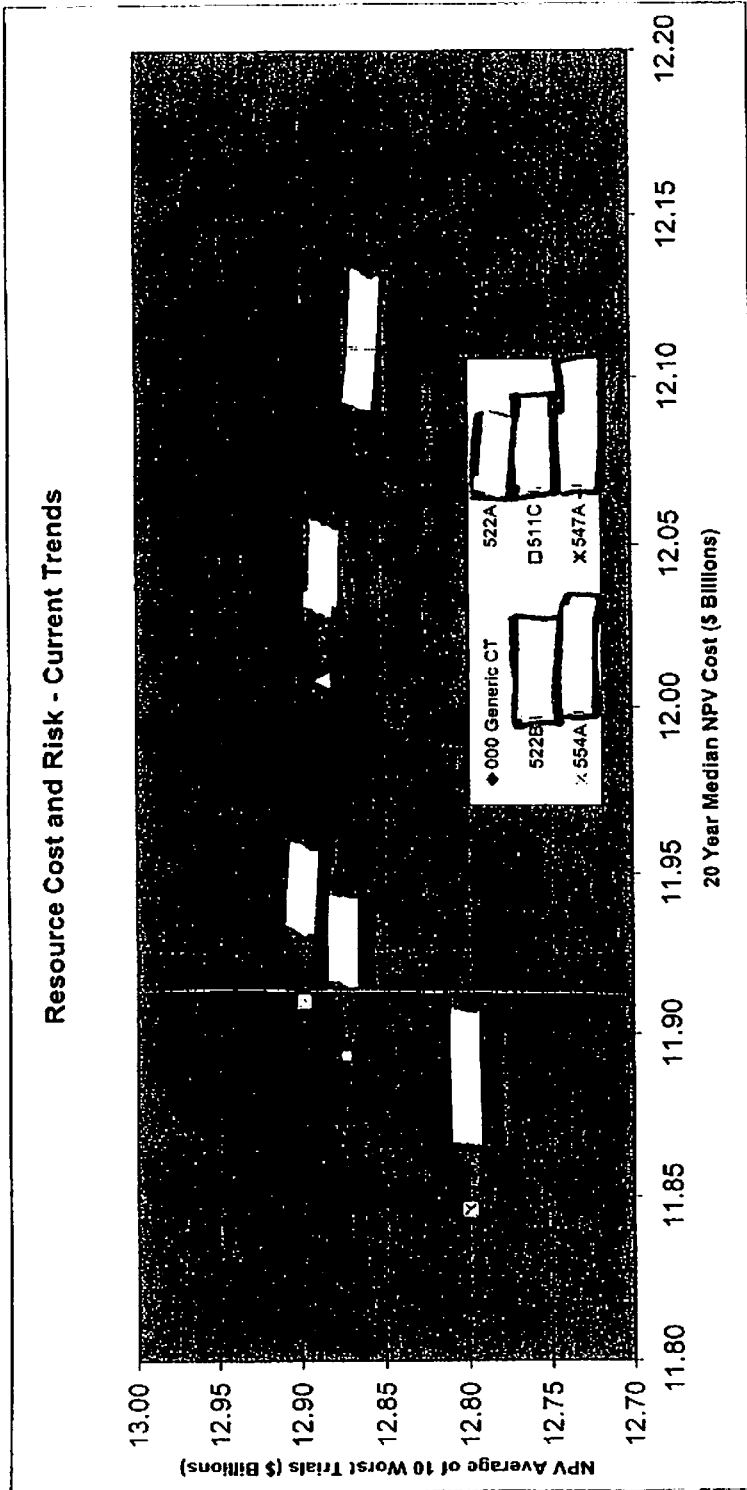


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Per WAC 480-07-160

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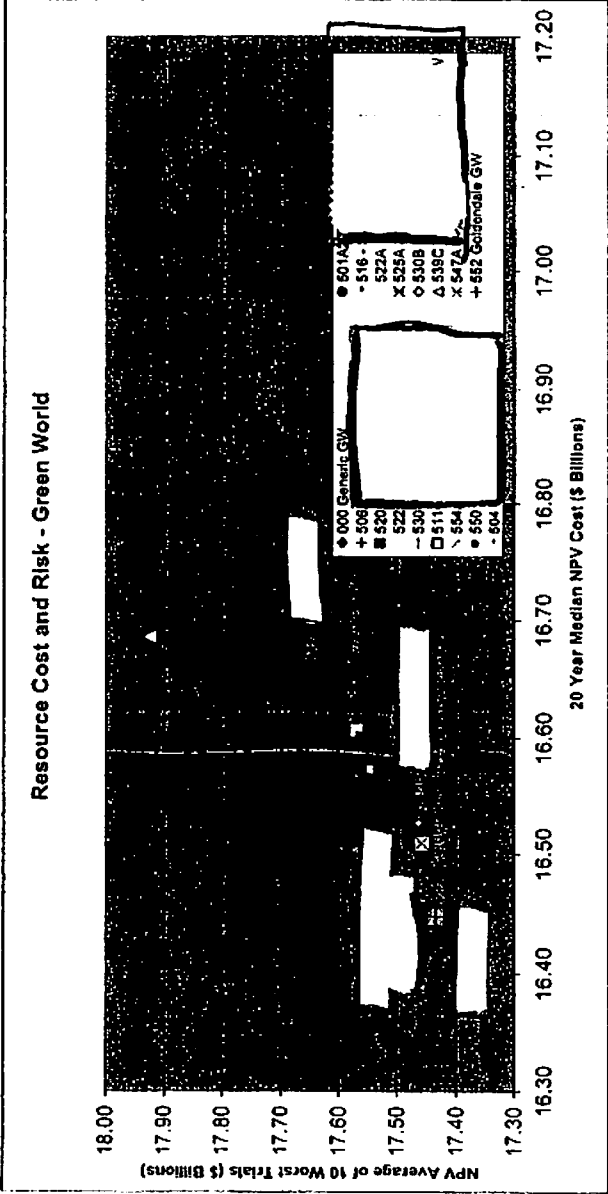
Text in box is Highly Confidential

Highly Confidential  
Per WAC 480-07-160

Column Index -->

5.9% 000 Generic GW	Green World	\$ 17,590,693	\$ 16,617,601	\$ 2,434,644	\$ 3,489,061	\$	\$	\$ 9,733,630	\$ 5,468,203	\$ 173,842	\$	\$ 16,430,994
6.0%												
5.9%												
5.8%												
5.9%												
6.1%												
5.9%												
7.4%												
5.8%												
6.0%												
5.7%												
5.7%												
6.0%												
8.0%												
5.8%												
6.0%	552 Goldendale GW	Green World	\$ 42,426,842	\$ 16,447,400	\$ 12,811,919	\$ 12,811,919	\$ 12,811,919	\$ 12,811,919	\$ 12,811,919	\$ 12,811,919	\$ 12,811,919	\$ 12,811,919
5.8%												
5.8%												

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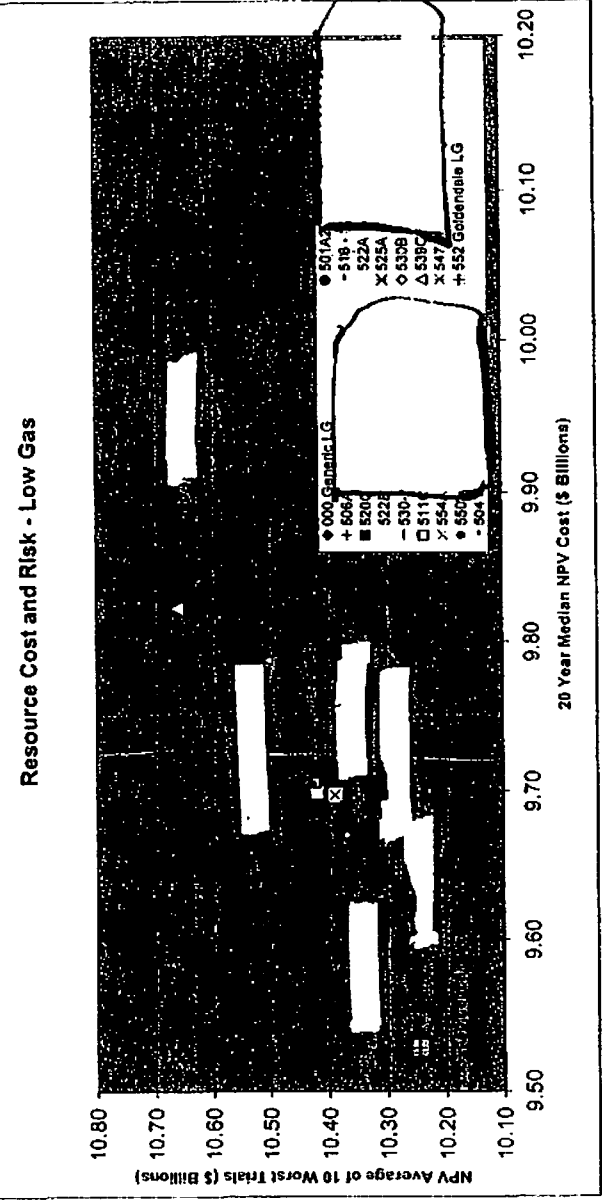


Column Index ->

7.6%	0000	Generic LG	Low Gas	\$ 10,444,789	\$ 9,708,689	\$ 2,164,817	\$ 1,288,307	\$	\$	\$ 7,097,658	\$ 2,878,272	\$ 552,232	\$	\$ 9,747,833
7.6%	552	Goldendale LG	Low Gas	\$ 10,246,604	\$ 9,527,846	\$ 2,242,809	\$ 1,119,151	\$ 1,055,750	\$	\$ 6,160,454	\$ 2,876,272	\$ 510,726	\$	\$ 8,552,578

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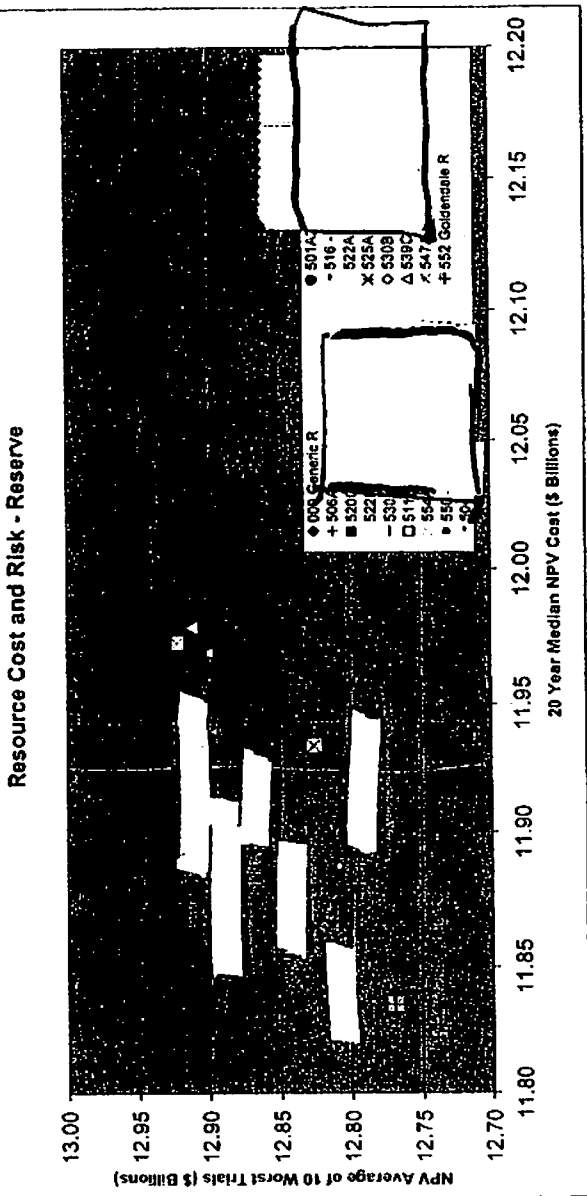


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Column Index →

Reserve	\$ 12,942,398	\$ 11,995,402	\$ 11,565,037	\$ 2,318,621	\$ 7,943,993	\$ 2,797,951	\$ 843,705	\$ 12,039,441
008 Generic R								
506A								
516								
522A								
522								
525A								
530								
531								
539C								
554								
556								
56								
552 Goldentale R								
Reserve	\$ 12,899,528	\$ 11,952,771	\$ 11,522,418	\$ 2,137,715	\$ 7,899,211	\$ 2,750,951	\$ 843,705	\$ 11,889,035

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