

EXHIBIT NO. ___(WJE-14HC)
DOCKET NO. _____
2005 POWER COST ONLY RATE CASE
WITNESS: W. JAMES ELSEA

**BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION**

**WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION,**

Complainant,

v.

PUGET SOUND ENERGY, INC.,

Respondent.

Docket No. UE-_____

**THIRTEENTH EXHIBIT TO THE PREFILED DIRECT TESTIMONY OF
W. JAMES ELSEA (HIGHLY CONFIDENTIAL)
ON BEHALF OF PUGET SOUND ENERGY, INC.**

REDACTED VERSION

JUNE 7, 2005

Acquisition Modeling Quantitative Evaluation “All Source” Resource Bids

PSE meeting with WUTC Staff
September 30, 2004

Prologue - Quantitative Evaluation Process

- Process is natural progression of modeling from 2003 LCP and Frederickson analysis
- Process and Model Improvement Sources:
 - ◆ External coordination - meetings with WUTC Staff to review Portfolio and Acquisition screening models and assumptions
 - ◆ Internal coordination – examples: wind integration cost analysis, variability of power and gas prices, analysis PPAs, credit, etc.

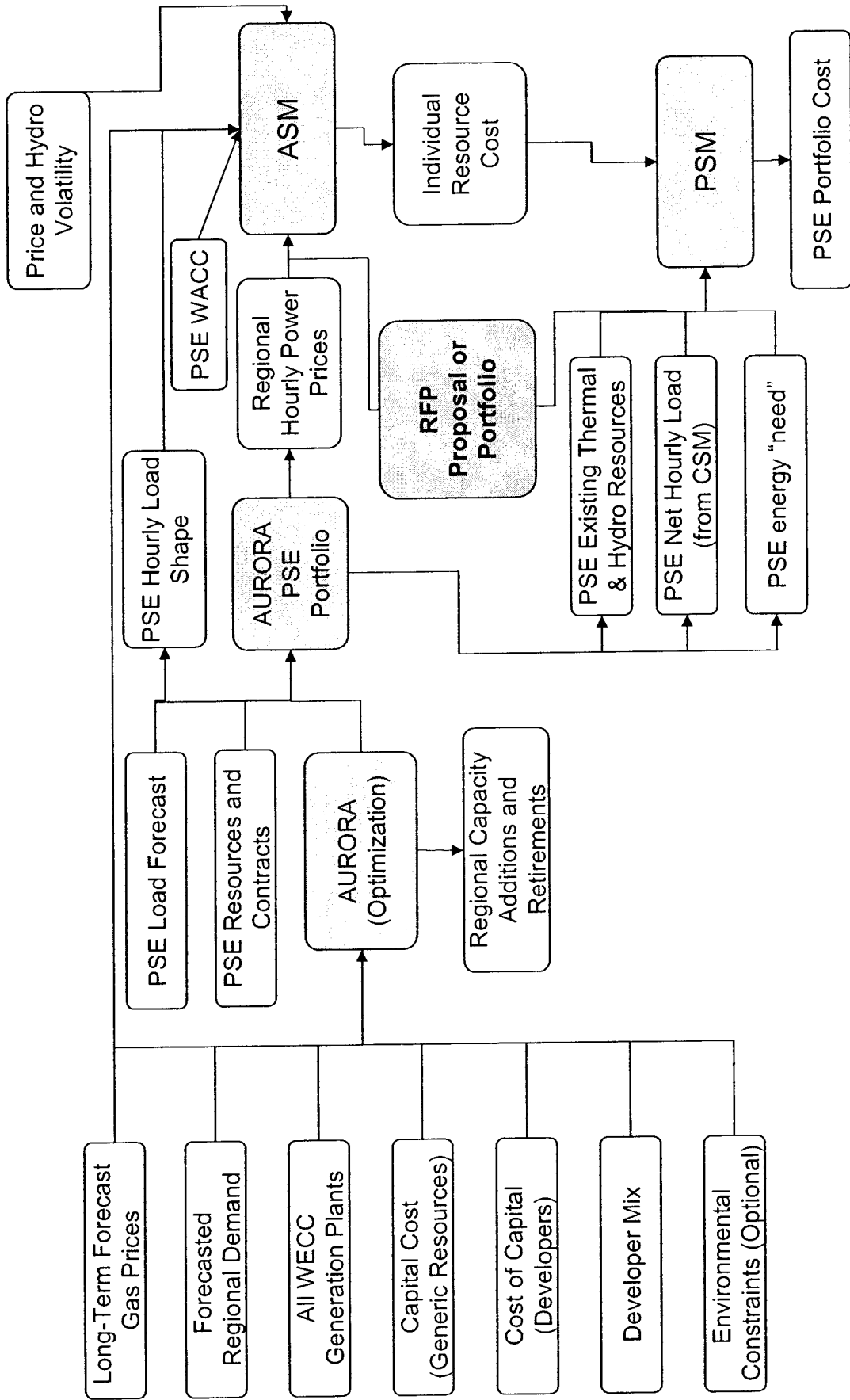
Presentation Objectives

- Review modeling tools, improvements and process
- Four scenario approach
- Portfolios
- Draft Results
- Developing issues regarding analysis

Models and Applications

- AURORA
 - ◆ Least Cost Plan
 - ◆ Resource Acquisition
 - ◆ Power Costs for Rate Case
 - ◆ 5 Year Financial Plan
- Acquisition Screening Model (ASM)
 - ◆ Resource Acquisition
- Portfolio Screening Model (PSM)
 - ◆ Resource Acquisition
 - ◆ Least Cost Plan

Models and Data Flows



Screening Model Evolution

Original PSM PSM in Frederickson Analysis — August 2003 LCP gas price
forecast

◀ --- -- **Wind RFP Stage 1**

ASM1 **ASM1** — for individual project evaluation
strip out PSE portfolio, move start date to 2005, add wind acquisition input tab,
input '05 '06 forward market power and gas prices from December 2003

ASM2 – ASM4 **ASM2** - 4 minor logic and data format changes.

ASM5 ◀ --- -- **Wind RFP Stage 2**
ASM5W created capability to evaluate inter-annual wind variability

PSM2 **PSM2** run with 30% S&P risk factor on imputed debt calculation

ASM / PSM Evolution – continued

PSM2
ASM5
Models used in Stage 2 of Wind RFP

◀ - - - - All Source RFP Stage 1

ASM6 –
ASM8W
ASM – PTC \$18 flat, S&P Risk Factor 30%, updated gas and electric prices based upon AURORA run using CERA “rear view mirror” gas dated Oct 2003 (as used in GRC).

◀ - - - - All Source RFP Stage 2

PSM6 –
Re-optimized Aurora with CERA “rear view mirror” gas, capped power prices at \$250 / mwh following review of on- to off-peak price spreads
Revisited LCP portfolios updated with generic costs based upon experience gained from RFP bids. Capacity costs based upon call options. Wind capacity credits.
Updated annual power and gas volatility inputs to PSM

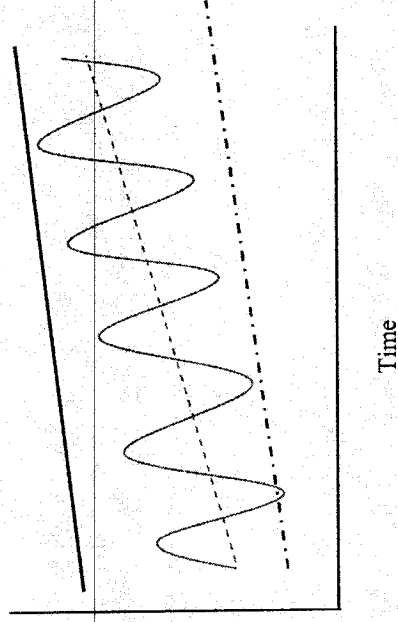
PSM6
Scenarios
4 Scenarios – 1) PSM6 Base, 2) PSM6 no price cap, 3) Low Gas (CERA “world in turmoil”), and 4) Reserve Scenario where Aurora was run with a required 6% planning reserve margin.

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Scenarios for PSM

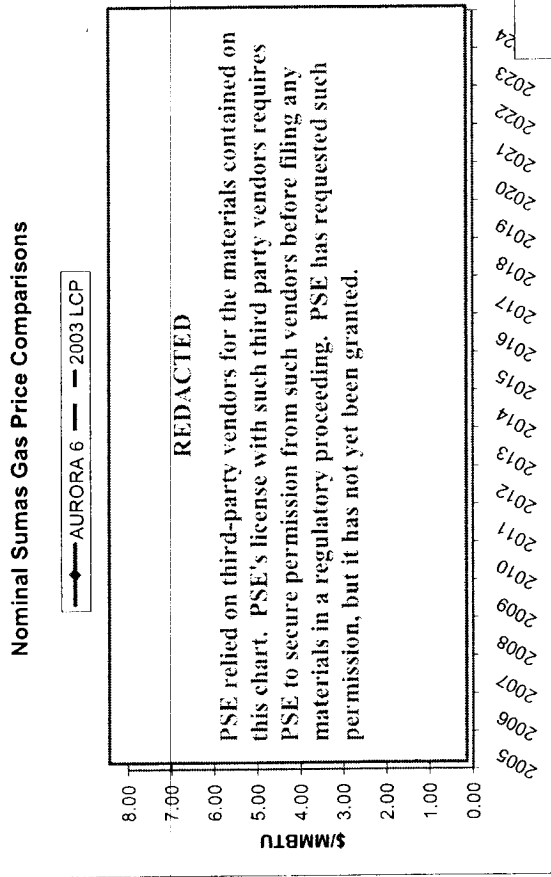
Base scenario =
AURORA 6 gas and
electric prices with
\$250 / MWh price
cap.



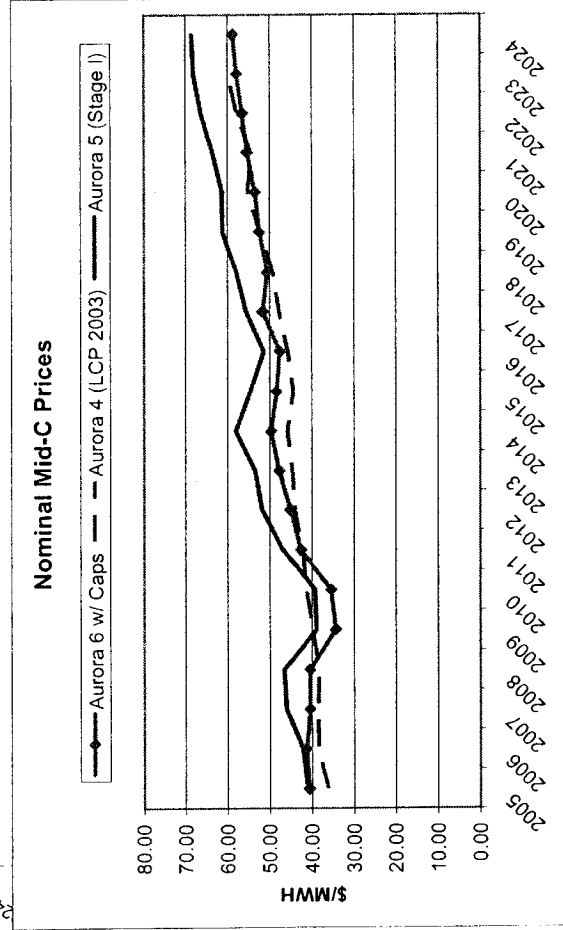
But what is the sensitivity of base assumptions? Other Scenarios:

- Aurora 6 Base without Price Cap
- Low Gas Scenario - Aurora 6 re-optimized with CERA "World in Turmoil" gas forecast.
- Reserve Margin Scenario. Aurora 6 re-optimized with 6% increase in load. Attempt to model FERC reliability NOPR.

Aurora 6 Prices – Base Scenario



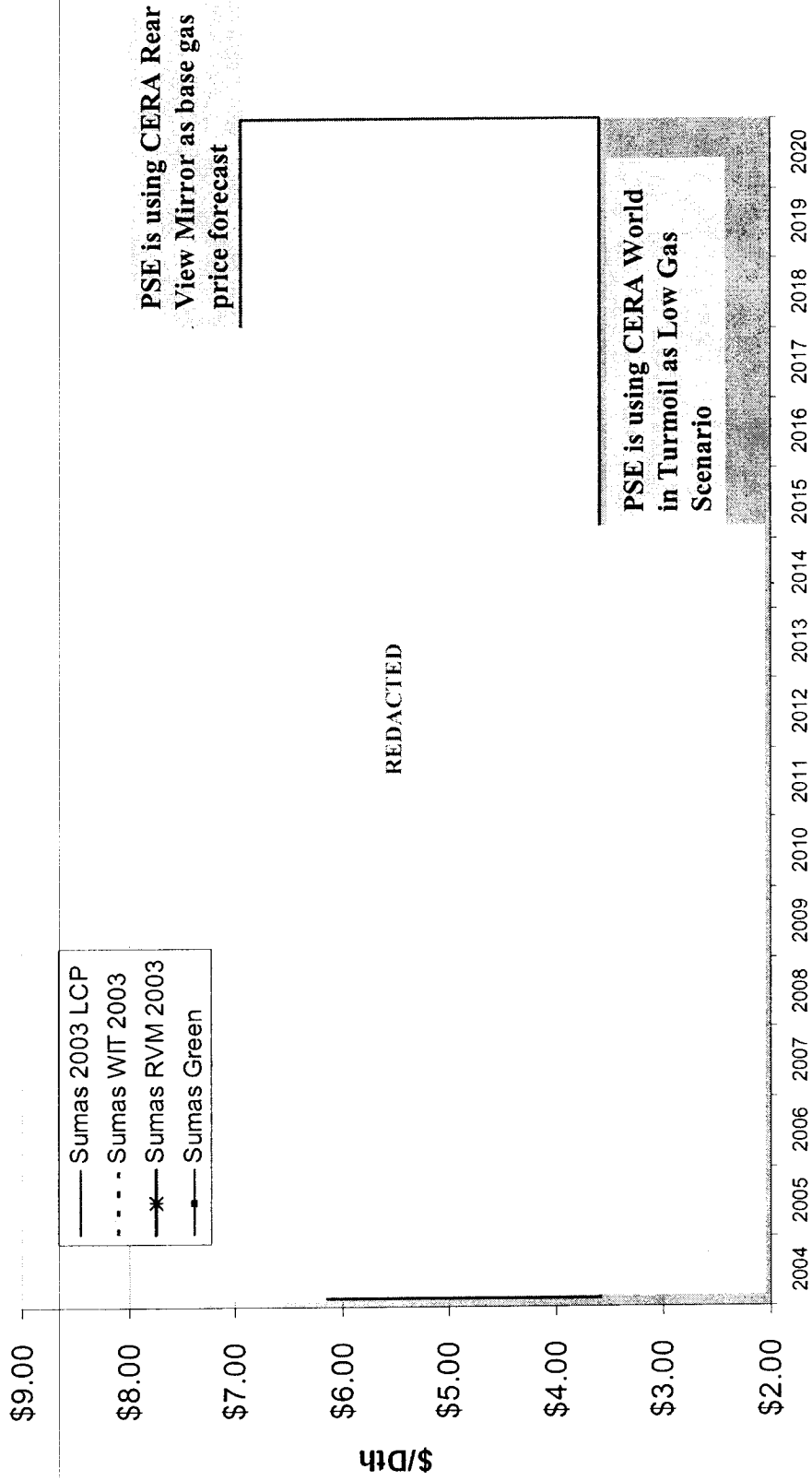
- Aurora 6 gas prices average 19% higher (levelized 16% higher)
- Aurora 6 gas based on forward markets in 2005-2006 and CERA "rear view mirror" Oct. 2003
- LCP gas forecast an average of ___ forecasts from ___



- Aurora 5 was our All source Stage 1 curve.
- Aurora 6 contains re-optimized new mix of coal and gas resources.
- Price cap \$250 / MWh adjusts model bias for on/off peak spreads of over \$80 in August

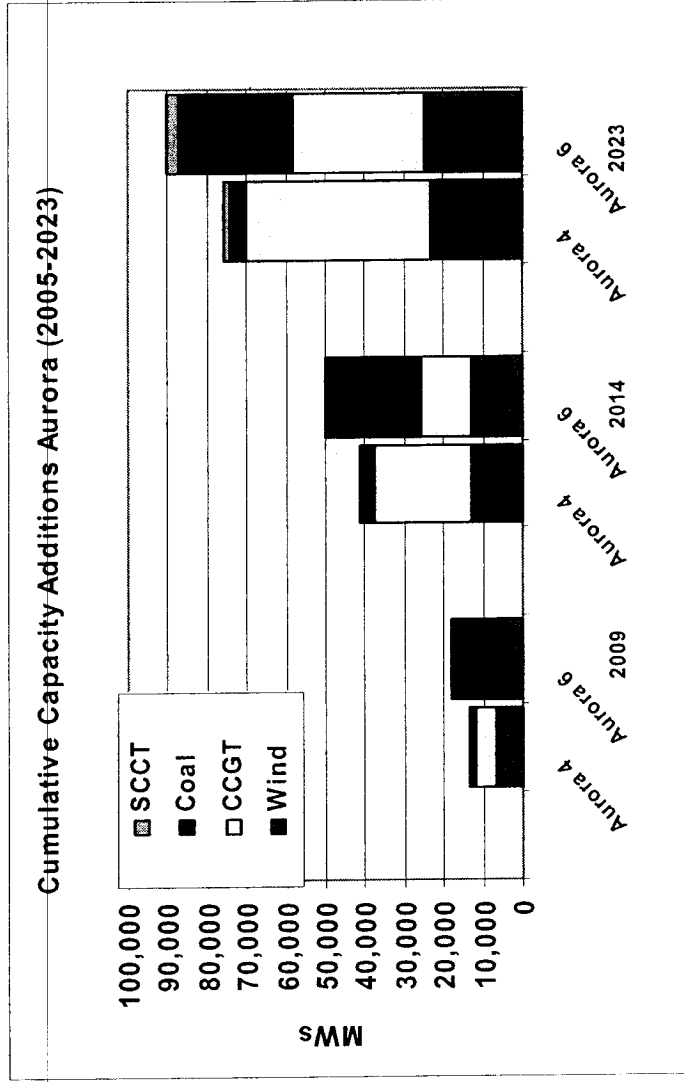
Gas Forecasts -> Potential Scenarios

Natural Gas Forecast Price Comparisons - CERA 2003



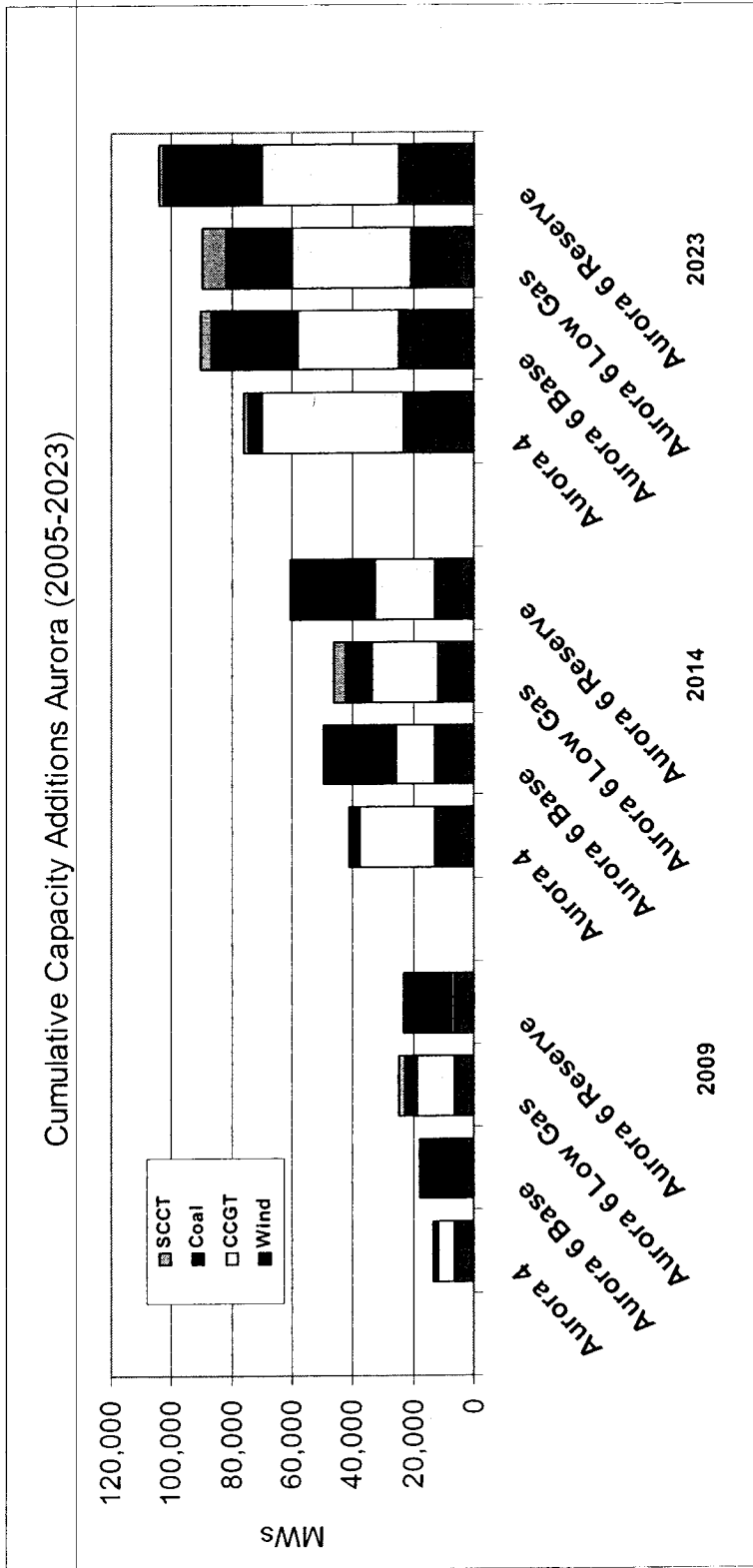
Aurora 6 – WECC New Resource Additions and Replacements

- With higher gas prices AURORA 6 optimization selected a higher percentage of coal plants to meet need
- EIA Annual Energy Outlook 2004 Base Case shows ~40 GW of coal addition by 2023
- PacifiCorp Planning Assumptions. "There are 9,000 MW of new coal plants that are in the planning process, and we assume that any coal plants that retire will be replaced by new ones over time."



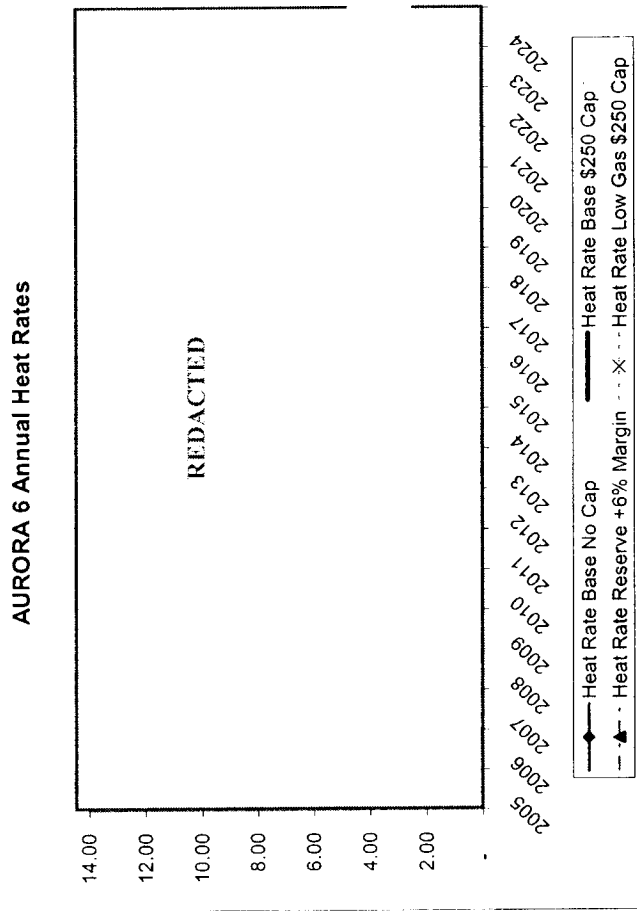
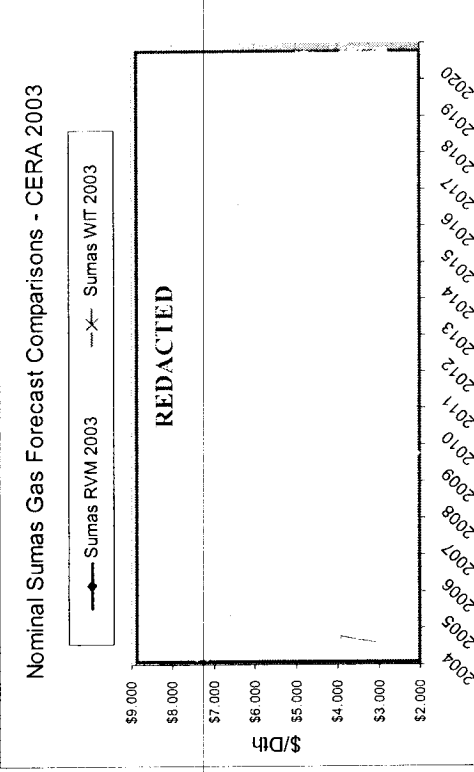
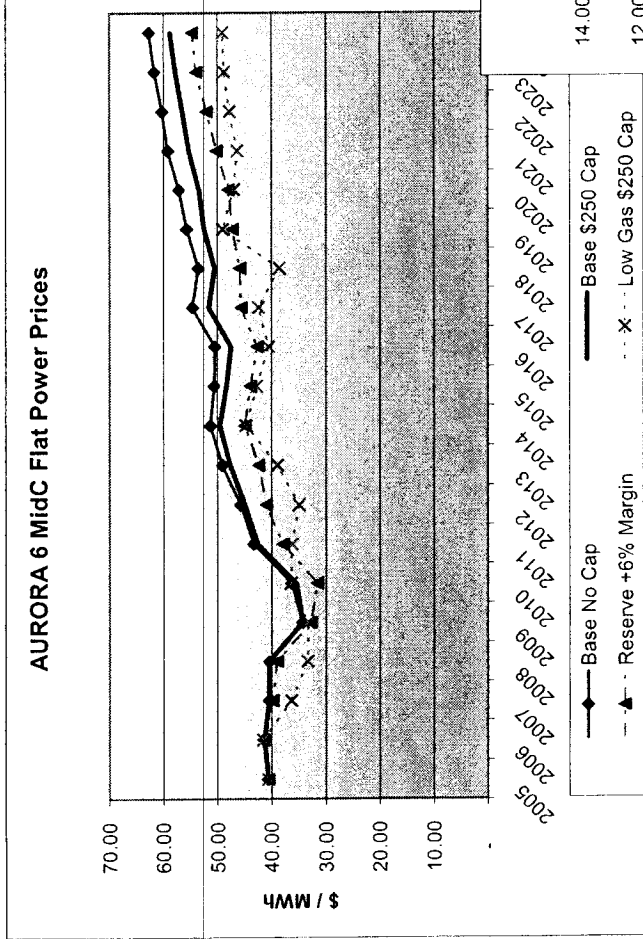
Note: Higher level of capacity additions in AURORA 6 resulted from higher retirement levels of inefficient generation plants. No change in demand forecast.

New Resource Additions and Replacements – Other Scenarios



Note: Higher level of capacity additions in AUORA 6 Reserve resulted from assumed 6% higher load forecast – an attempt to model FERC reliability notice of proposed rulemaking.

Scenario Prices



- Two gas price forecasts
- Four power price forecasts
- Four heat rate scenario combinations

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Preliminary PSM Portfolios

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- Identified 30+ portfolios
- Selected 11 representative portfolios for evaluation

REDACTED

Portfolio #1 is deferral of acquisition to 2009, assuming market through 2008. Portfolio #1 does not begin to meet the planning standard until 2009.

2. Three PPAs APS, [REDACTED], 17. One PPA (APS) and [REDACTED]
5. Three PPAs and one wind Wildhorse 23. Strategic Plan Scen. #1. Two PPAs APS & [REDACTED] two wind 2006 2007, ORMAT, and Coal in 2010
7. Entire Short List 25. APS, [REDACTED] and Wildhorse
11. Three PPAs two wind [REDACTED] and Wildhorse 29. APS, [REDACTED] and [REDACTED]
14. APS and [REDACTED] Gas Plant with 10-yr PPA 30. APS, [REDACTED] and Wild Horse

Sample Portfolios vs. Need

Portfolio	Project	2005	2006	2007	2008	2009	
1	Deferral to 2009						
	Market through 2008	Market through 2008, then generics					
	Sum of Acquisitions			generic start 2009 ->		423.0	
	Relative to Need (Short) Long	(299.0)	(351.0)	(370.0)	(382.0)	423.0	
2	Three PPAs						
	19 APS - Centralia 2-yr PPA						
	24b 10-yr PPA						
	30 22-yr Seasonal On-Peak PPA						
	Sum of Acquisitions	233.9	325.6	320.6	320.6	423.0	
	Relative to Need (Short) Long	(65.1)	(25.4)	(49.4)	(61.4)	-	
5	3 PPAs + Wildhorse						
	19 APS - Centralia 2-yr PPA						
	24b 10-yr PPA						
	30 22-yr Seasonal On-Peak PPA						
2 Wild Horse 100% Own							
	Sum of Acquisitions	233.9	351.6	346.6	346.6	423.0	
	Relative to Need (Short) Long	(65.1)	0.6	(23.4)	(35.4)	-	
7	Whole Short List						
	19 APS - Centralia 2-yr PPA						
	24b 10-yr PPA						
	30 22-yr Seasonal On-Peak PPA						
	3 Hopkins Ridge 100% Own						
	6 100% Own						
	2 Wild Horse 100% Own						
39 ORMAT - Sumas Recovered Heat							
	Sum of Acquisitions	233.9	442.1	437.1	437.1	437.1	
	Relative to Need (Short) Long	(65.1)	91.1	67.1	55.1	14.1	

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REDACTED

Example:
Portfolio 5
supplies 346 MW,
but is 35 MW less
than forecast
planning standard
need of 382 MW in
January 2008

Portfolios continued

Portfolio	Project	2005	2006	2007	2008	2009
11	Three PPAs - [REDACTED] and Wildhorse					
	19 APS - Centralia 2-yr PPA					
	24b [REDACTED] 10-yr PPA					
	30 [REDACTED] 22-yr Seasonal On-Peak PPA					
	6 [REDACTED] 100% Own					
2 Wild Horse 100% Own						
	Sum of Acquisitions	233.9	364.6	359.6	359.6	423.0
	Relative to Need (Short) Long	(65.1)	13.6	(10.4)	(22.4)	-
14	APS and [REDACTED] incl 10 yr flat					
	19 APS - Centralia 2-yr PPA					
	24a [REDACTED] Own 242 MW PPA Flat 100 MW					
	Sum of Acquisitions	85.0	418.8	333.8	333.8	423.0
	Relative to Need (Short) Long	(214.0)	67.8	(36.3)	(48.3)	-
17	APS and [REDACTED]					
	19 APS - Centralia 2-yr PPA					
	32 [REDACTED] Power Plant - Progressive					
	Sum of Acquisitions	345.0	345.0	260.0	520.0	520.0
	Relative to Need (Short) Long	46.0	(6.0)	(110.0)	138.0	97.0
23	Strategic Plan Seen I					
	19 APS - Centralia 2-yr PPA					
	24b [REDACTED] 10-yr PPA					
	2 Wild Horse 100% Own					
	3 Hopkins Ridge 100% Own					
	39 ORMAT - Sumas Recovered Heat					
	PPA 3-year, priced at market					
PPA 1-yr, priced at market						
20 [REDACTED] Coal Project - 100% Own						
	Sum of Acquisitions	176.8	299.0	287.0	287.0	136.0
	Relative to Need (Short) Long	(122.3)	(52.0)	(83.0)	(95.0)	-

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REDACTED

Portfolios continued

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REDACTED

Portfolio	Project	2005	2006	2007	2008	2009
25	APS [redacted] and Wildhorse					
	19 APS - Centralia 2-yr PPA					
	24b [redacted] 10-yr PPA					
	2 Wild Horse 100% Own					
	Sum of Acquisitions	176.8	294.5	209.5	209.5	423.0
	Relative to Need (Short) Long	(122.3)	(56.5)	(160.5)	(172.5)	-
29	APS [redacted] and [redacted]					
	19 APS - Centralia 2-yr PPA					
	24b [redacted] 10-yr PPA					
	29 [redacted] & BPA delivery					
	Sum of Acquisitions	176.8	537.5	452.5	452.5	452.5
	Relative to Need (Short) Long	(122.3)	186.5	82.5	70.5	29.5
30	APS [redacted] and Wildhorse					
	19 APS - Centralia 2-yr PPA					
	30 [redacted] 22-yr Seasonal On-Peak PPA					
	2 Wild Horse 100% Own					
	Sum of Acquisitions	142.1	168.1	163.1	163.1	423.0
	Relative to Need (Short) Long	(156.9)	(182.9)	(206.9)	(218.9)	-

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Stage 2 Evaluation* Short List Summary

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PROPOSAL						ASM8
Code	Type	Owner/Developer Project Name	Proposal Option	Location	Status	Levelized Cost (\$/MWh)
WIND						
A03	W	RES - Hopkins Ridge	100% Ownership	Columbia Co, WA	Development	150
A02b	W	Zikha - Wild Horse	100% Ownership	Kittitas Co, WA	Development	150
A06	W		100% Ownership w/ Royalty		Development	
ALTERNATE FUEL						
A39	A	ORMAT - Sumas Recovered Heat	100% Ownership	Sumas, WA	Development	4.5
POWER PURCHASE AGREEMENTS						
A19	C	APS PPA	2-yr Centralia PPA	Centralia, WA	Operating	85
A24b	C	PPA	10-yr PPA		Operating	200
A30	H	PPA	22-yr Seasonal On-Peak PPA		Operating / Development	240

Notes:

- (1) Using mid-year MACRS instead of 1st quarter MACRS to compare with non-wind bids.
- (2) In addition to mid-year MACRS, corrected a PTC error in year 10 that moved the price down.
- (3) Based on \$59 flat price for on-peak power September through March

***Note: Credit costs for PPAs and gas purchases not included.**

REDACTED

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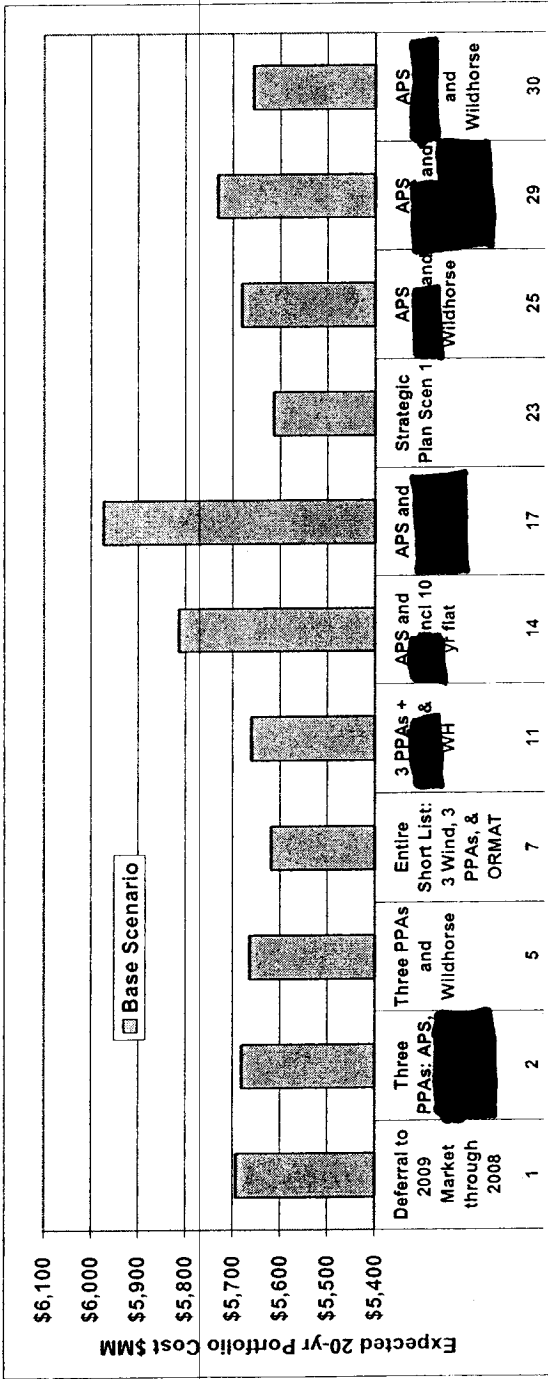
Stage 2 Evaluation* Continuing Investigation Summary

PROPOSAL		Owner/Developer Project Name	Proposal Option	Location	Status	MW	COB	ASM8 Levelized Cost (\$/MWh)
WIND								
A07	W		100% Ownership		Development		Oct-05	
A08	W		30-yr PPA + 50% Ownership		Development		Dec-05	
A01	W		100% Ownership		Development		Dec-05	
COG								
A20	C		100% Ownership		Development		late 2008	
CCGT								
A24a	G		100% Ownership + PPA		Operating		Aug-02	
A29	G		50.2% Ownership		Development		Dec-05	
A26	G		100% Ownership		Suspended		Nov-05	
A35	G		100% Ownership		Suspended		late 2005	
A28	G		70% Ownership		Development		Sep-07	
A32a	G		100% Ownership		Operating		Oct-03	
ALTERNATE/PEJ								
A15	A		Joint Venture w/ PSE		Development		May-06	

*Note: Credit costs for PPAs and gas purchases not included.

(1) Using mid-year MACRS instead of 1st quarter MACRS to compare with non-wind bids.

PSM - Portfolio Costs Base*

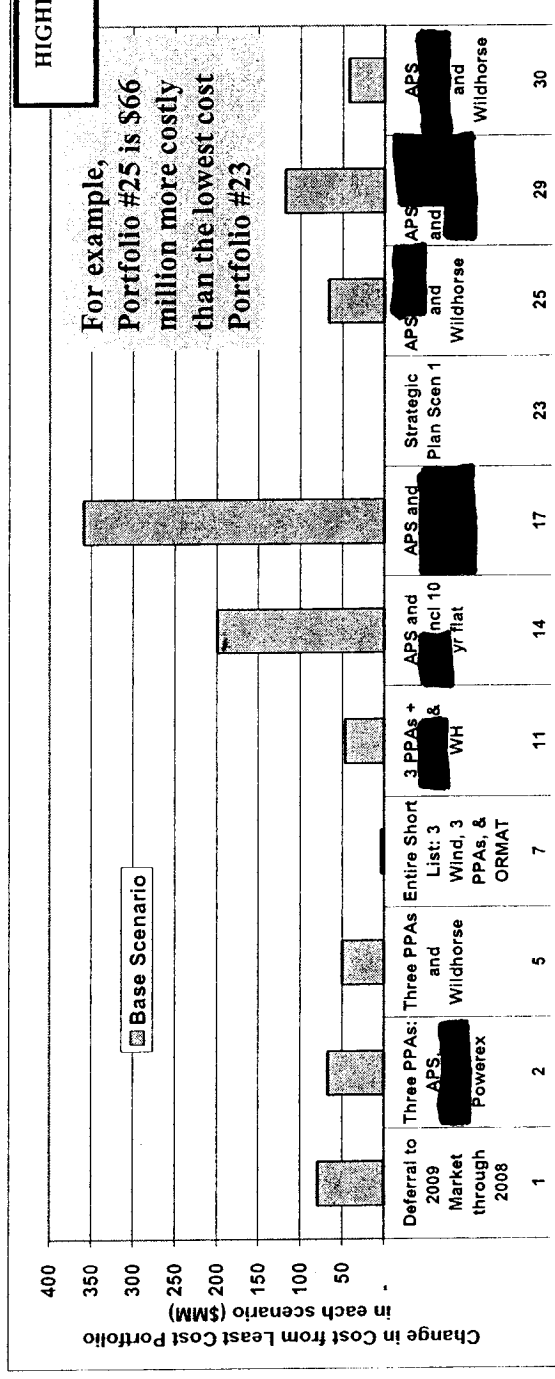


*Note:

Preliminary Results

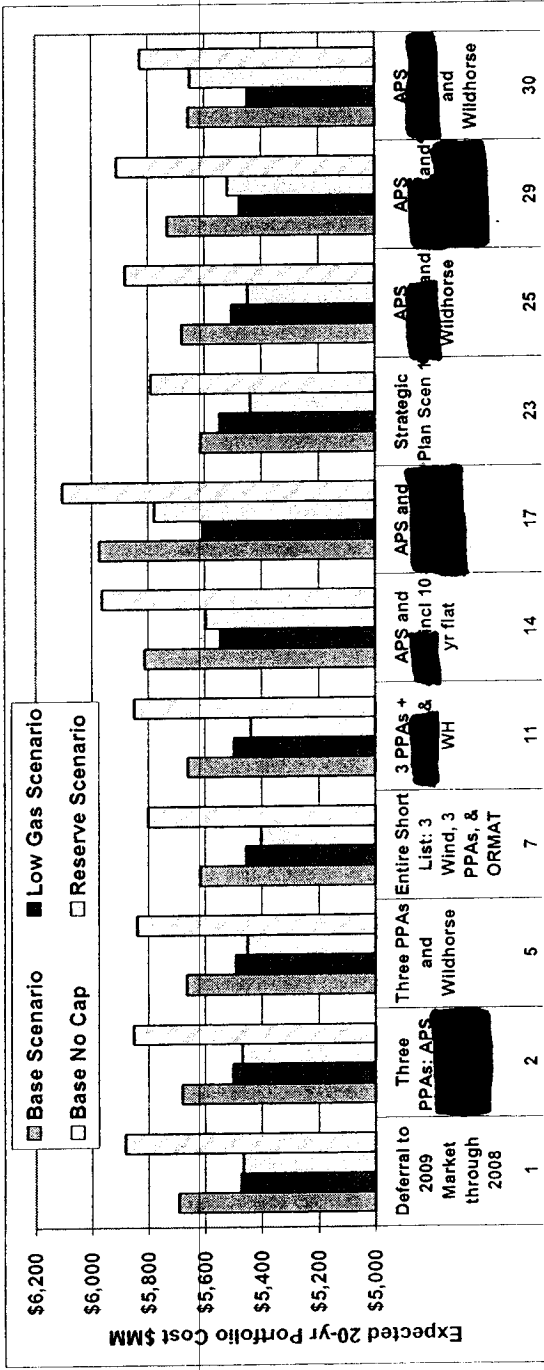
Credit costs for PPAs and gas purchases not included.

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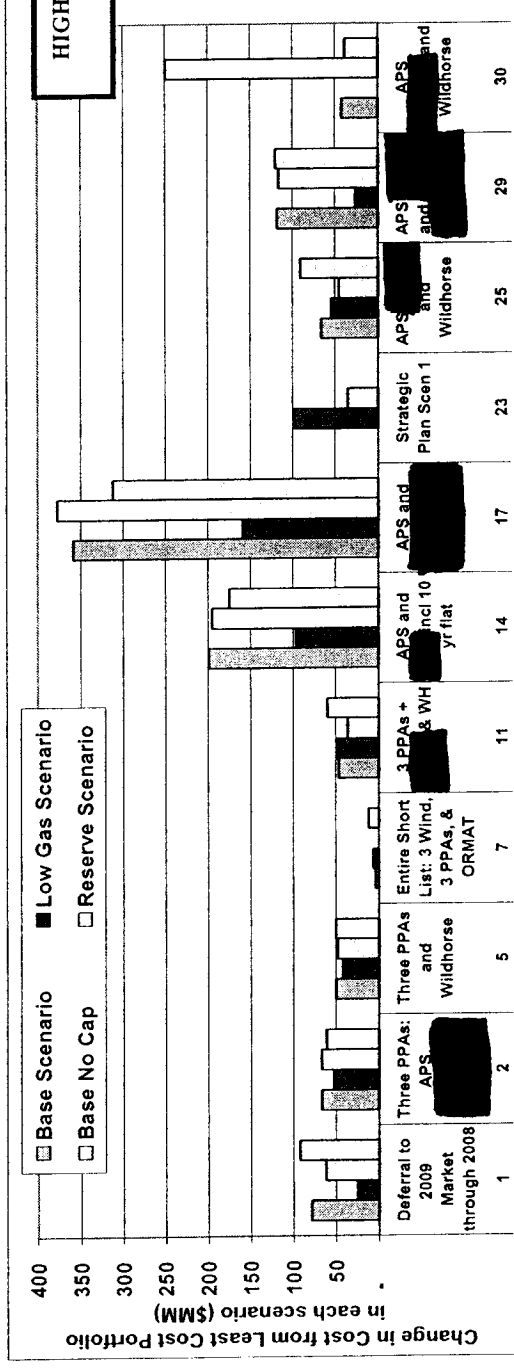
Portfolio Costs* - 4 Scenarios



*Note:

Preliminary Results

Credit costs for PPAs and gas purchases and gas not included.

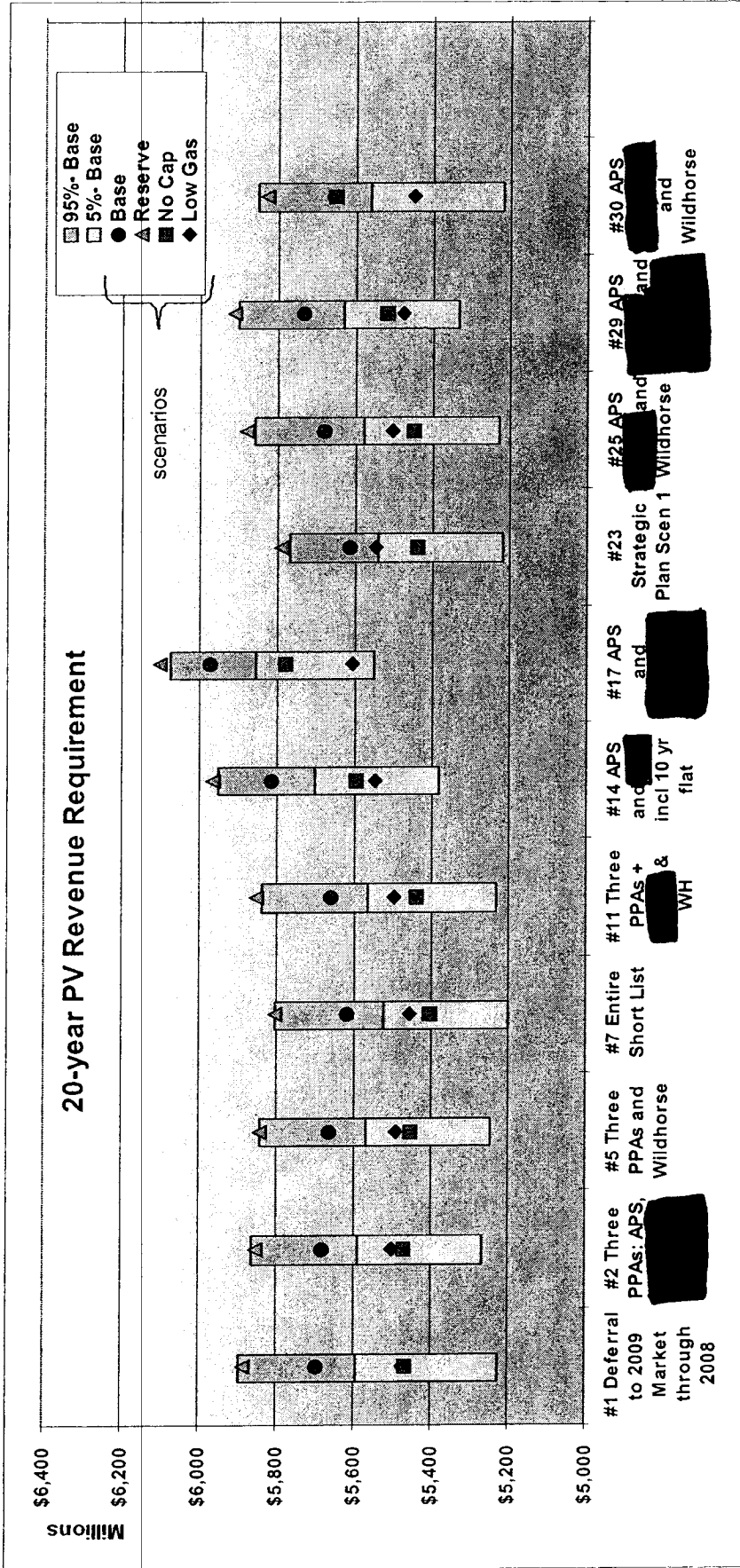


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Other Views of Portfolio Costs

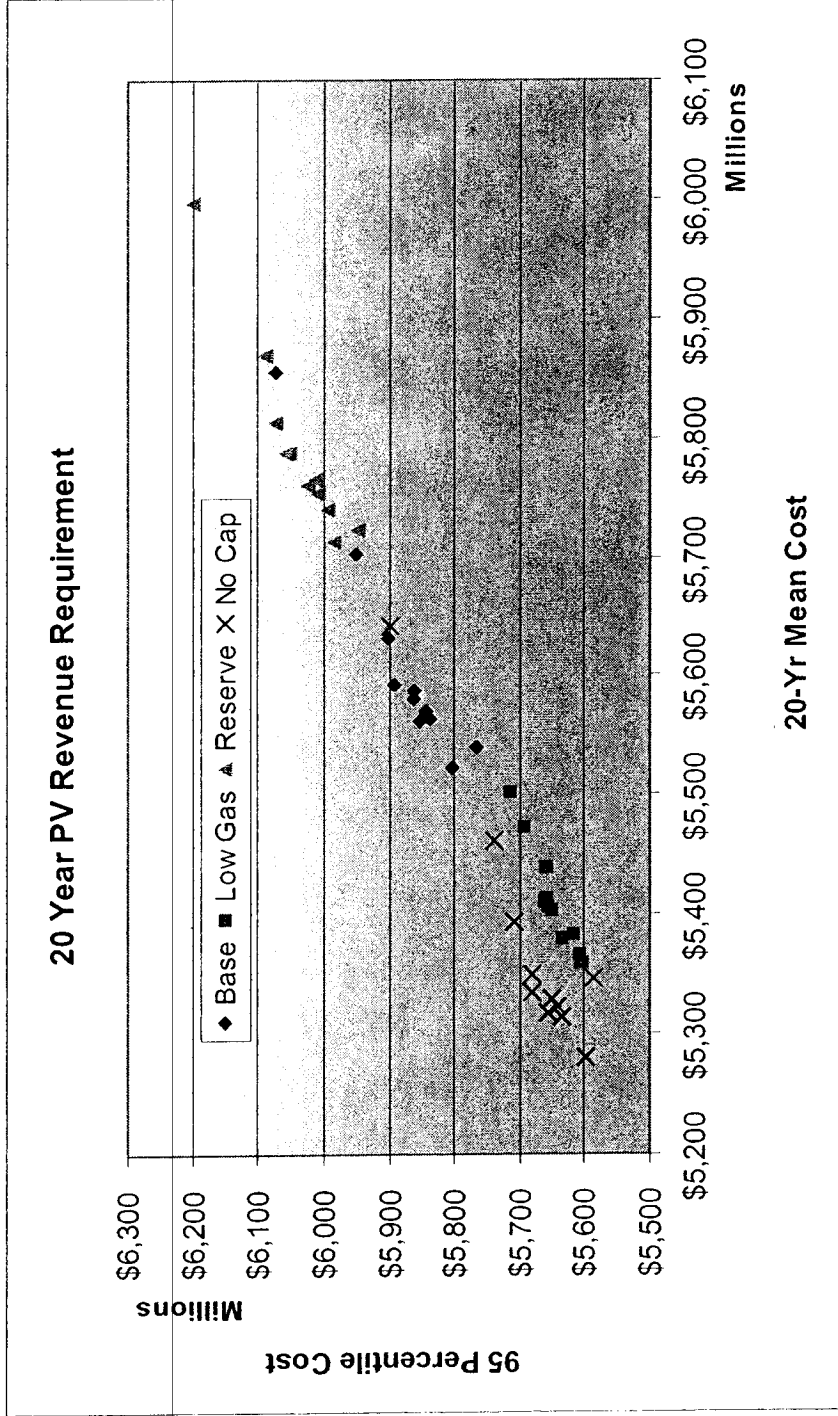


Both the Low Gas and No Price Cap scenarios have higher heat rates, thus margin sales are higher and overall portfolio costs are lower.

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REDACTED

Other Views of Portfolio Costs



Both the Low Gas and No Price Cap scenarios have higher heat rates, thus margin sales are higher and overall portfolio costs are lower.

Use of PSM for Specific Project Evaluation - PPA

REDACTED

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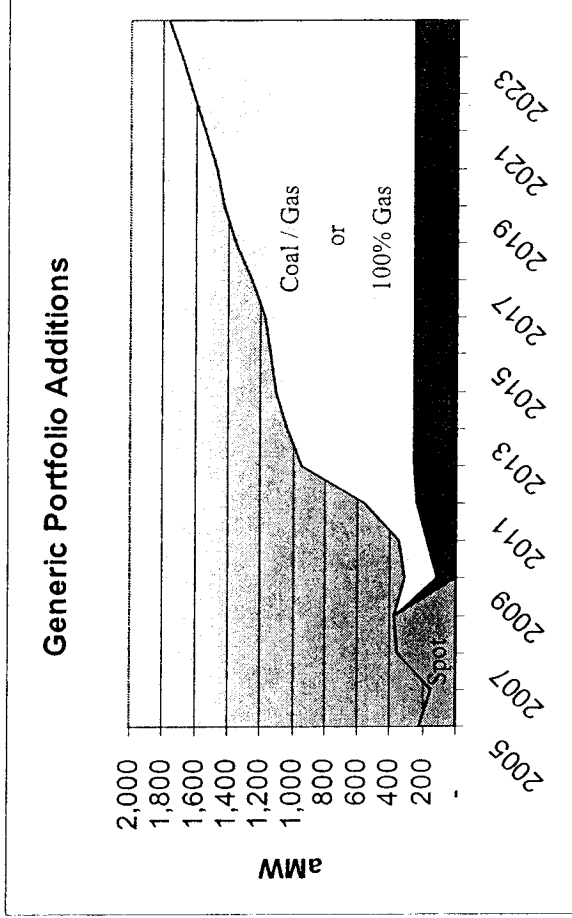
Price Assumptions	50:50 Coal:Gas Future		100% Gas Only Future	
	Portfolio Cost (\$000)	(Benefit) Cost of (\$000)	Portfolio Cost (\$000)	(Benefit) Cost of (\$000)
No	\$5,674,557		\$6,497,268	
@1%	\$5,641,721	(\$32,836)	\$6,383,692	(\$113,576)
1.0%	\$5,655,144	(\$19,413)	\$6,397,115	(\$100,153)
1.5%	\$5,668,362	(\$6,195)	\$6,410,332	(\$86,935)

Compared with generic portfolios, reduced portfolio costs

Higher PPA price means lower portfolio benefit

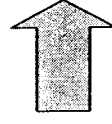
Generic Portfolio →

Given transmission constraints, looked at 100% gas as a possible future benefits under 100% Gas assumption significantly greater than 50:50 Coal:Gas assumption



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 Developing analysis issues

Imputed Debt on PPA Obligations included in ASM / PSM modeling

S&P Methodology

- ◆ Demand charge or 50% of contract payment
 - ◆ Discount at 10% to PV
 - ◆ Multiply by 30% risk factor
 - ◆ Calculate equity offset
 - ◆ = equity ratio * (imputed debt / (debt ratio))
 - ◆ Cost penalty
 - ◆ = equity offset * 16.92% (Pre-tax 11% ROE)
- ◆ Declines each year of forecast as current year of contract payment rolls off

Credit Support PPAs & Gas Supply

- Interest cost on Letter of Credit
 - ◆ Shared credit facility could save
- Existing PSE credit facilities not enough to cover long-term contracts
- Possibility of imputed debt on synthetic letter of credit
 - ◆ What will be S&P methodology? Risk factor? MTM limit or LOC amount?
- Gas purchases
 - ◆ Power and gas positions would determine optimal hedge quantities

Credit Cost - [REDACTED] 10-yr PPA preliminary analysis

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	Nominal \$000	XPV \$000	Levelized \$/MWh
A Contract Payments (no transmission)	633,446	414,510	43.50
B Transmission	11,348	7,353	0.77
C Imputed Debt Equity Offset	41,831	32,276	\$3.39
SUBTOTAL			\$47.66
D LoC Interest - PSE	14,375	9,718	\$1.02
E LoC Interest - [REDACTED] includes in PPA	14,375	9,718	\$1.02
F LoC Imputed Debt Equity Offset	190,385	124,156	\$13.03
SUBTOTAL Credit			\$15.07
TOTAL Levelized Cost			\$62.73

Synthetic LOC Assumptions: **REDACTED**

- ◆ Rate = 1.15%
- ◆ Amount = \$125 million
- ◆ S&P = 100% risk
- ◆ S&P imputes debt first year

given:	2005 Debt start year S&P Assigned Risk			given:	100% S&P Risk		
	25%	50%	100%		Start Year	S&P	Imputed LoC Debt
\$65,000	\$2.75	\$4.45	\$7.84	\$65,000	\$7.84	\$6.93	\$6.10
\$85,000	\$3.60	\$5.82	\$10.25	\$85,000	\$10.25	\$9.06	\$7.97
\$105,000	\$4.45	\$7.19	\$12.66	\$105,000	\$12.66	\$11.19	\$9.85
\$125,000	\$5.30	\$8.55	\$15.07	\$125,000	\$15.07	\$13.33	\$11.73
\$145,000	\$6.14	\$9.92	\$17.48	\$145,000	\$17.48	\$15.46	\$13.60
TOTAL Levelized Cost				TOTAL Levelized Cost			
\$65,000	\$0.41	\$2.11	\$5.49	\$65,000	\$5.49	\$4.59	\$3.76
\$85,000	\$1.26	\$3.48	\$7.91	\$85,000	\$7.91	\$6.72	\$5.63
\$105,000	\$2.11	\$4.84	\$10.32	\$105,000	\$10.32	\$8.85	\$7.51
\$125,000	\$2.96	\$6.21	\$12.73	\$125,000	\$12.73	\$10.99	\$9.38
\$145,000	\$3.80	\$7.58	\$15.14	\$145,000	\$15.14	\$13.12	\$11.26

Sensitivity
Of credit cost →

Recovery of Equity Offset Costs resulting from LOC imputed debt

Approximate...

LoC Imputed Debt Equity Offset							
Key Assumptions:							
LoC Posted Amount	\$ 125,000						
Yr LoC put on Balance Sheet	2005	or year S&P imputes debt on Letter of Credit					
S&P Risk Factor	100%						
	2005 GRC Year-end Estimate \$ 000		S&P LoC Imputed Equity Offset				
Debt	\$2,440,398	55.0%	\$2,440,398	53.8%			
Equity	\$1,996,690	45.0%	\$ 102,273	46.2%	1.2% incremental equity ratio		
	\$4,437,088	100.0%	\$4,539,361	100.0%			

This increase in allowed equity ratio is in addition to the increase needed to recover the equity offset for the imputed debt related to PPA payments.

Gas Hedge – Equity Offset Cost

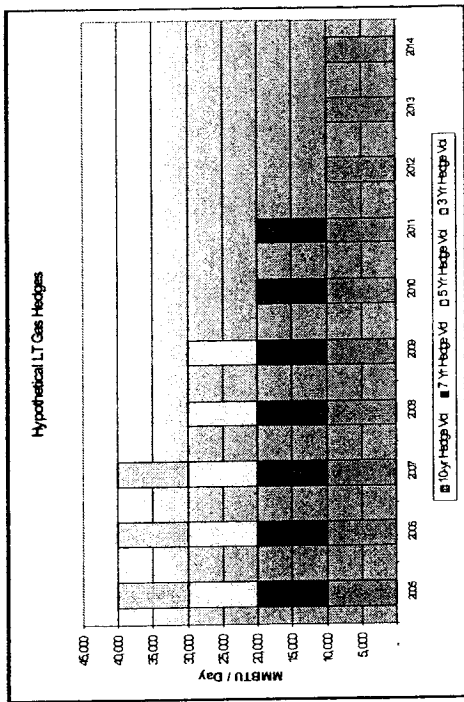
hypothetical example

	Year	% Price Stress	Stress Price	MTM \$MM	Approx. Treasury Yield Curve	Discount MTM \$MM
250	1	30%	\$3.50	\$ 14.2	2.30%	\$ 14.0
60%	2	20%	\$4.00	9.5	2.80%	9.08
7200	3	20%	\$4.00	9.5	3.00%	8.79
150	4	20%	\$4.00	9.5	3.40%	8.42
25,920	5	20%	\$4.00	9.5	3.80%	8.00
20	6	20%	\$4.00	9.5	4.00%	7.63
\$5.00	7	20%	\$4.00	9.5	4.20%	7.24
	8	20%	\$4.00	9.5	4.35%	6.87
	9	20%	\$4.00	9.5	4.50%	6.51
	10	20%	\$4.00	9.5	4.60%	6.17
\$ 129.5	11	20%	\$4.00	9.5	4.65%	5.87
\$ 106.0	12	20%	\$4.00	9.5	4.70%	5.58
	13	20%	\$4.00	9.5	4.75%	5.30
	14	20%	\$4.00	9.5	4.80%	5.02
	15	20%	\$4.00	9.5	4.85%	4.76
	16	20%	\$4.00	9.5	4.90%	4.51
	17	20%	\$4.00	9.5	4.95%	4.26
	18	20%	\$4.00	9.5	5.00%	4.03
	19	20%	\$4.00	9.5	5.00%	3.84
	20	20%	\$4.00	9.5	5.00%	3.65
						\$ 129.5
2005 GRC						
Year-end Estimate \$ MM						
Debt	\$2,440	55.0%		\$2,440		
Equity	\$1,997	45.0%		\$2,103	1.3%	incremental equity ratio
	\$4,437	100.0%		\$4,543		100.0%
			Imputed Equity Offset 2005	106		

Gas Hedge – 10,000 mmbtu / day \$22 million Credit Requirement

Assumptions:

- S&P liquidity stress test of 30% price change in first year and 20% thereafter.
- Hedges are comprised of an equal mix of 10, 7, 5, and 3-year fixed price deals.
- 10,000 mmbtu/day and a \$5 nominal fixed price.
- Discounted at Libor/Treasury rates for terms of 1 to 10-years.



First year Credit	
10yr	\$ 32.4M
7yr	\$ 24.7M
5yr	\$ 18.9M
3yr	\$ 12.5M
Average	\$ 22.1M

Q&A
