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Integrated Resource Plan 2009

Sixth Stakeholder Presentation & Discussion

Part 2

July 31, 2009

PGE
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Today's Topics

- EE Update
- CO2 Update
- Portfolio Analysis
- ➢ Scoring Grid Results
- Boardman Portfolio Analysis
- Proposed Action Plan
- Gas Transportation & Storage
- Remaining Schedule

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Portfolio Scoring Grid

Why Use a Scoring Grid?

- Integrates Cost and Risk results
- Provides insights into how each cost and risk factor impacts individual portfolio performance
- Provides ordinal ranking of portfolios
  - Performance across portfolios is clear and easy to interpret

- Transparency
  - Relative importance given to each cost and risk factor is clear
  - Responsive to feedback from 2007 IRP
  - Stakeholders requested more clarity regarding use of analytical and qualitative results in ranking and selecting portfolios
- Does not replace professional judgment
  - Scoring grid is a useful tool for delineating how the utility applies cost and risk results / metrics in evaluating portfolio performance and determining a preferred resource action plan
  - Use of a scoring grid informs decision making, but does not replace experience and business judgment

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Portfolio Scoring Grid

Scoring Grid Approach

- Each Cost and Risk factor assigned a weighting
- Cost and Risk factor weightings:
  - 50% to expected cost
  - 20% to scenario risk metrics (deterministic)
  - 10% to stochastic risk metrics
  - 15% to reliability performance as measured by EUE
  - 5% for portfolio diversity as measured by HHI
- Risk and Cost results for each portfolio calculated & tabulated
- Normalized grid scores are then calculated for each portfolio and corresponding risk metric
  - Scores are normalized by assigning a score of 100 to the best scoring portfolio and 0 to the worst scoring portfolio in each category
  - All other portfolios are then calibrated proportionately
- A composite score is calculated for each portfolio
  - Calculated as the weighted average of the scores from all categories
- Portfolios are ranked according to composite score

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Portfolio Scoring Grid

Cost & Risk Results Tabulated

	1. Portfolio Evaluation Scoring: Raw Performance Metrics	Screening		Deterministic					Stochastic		Reliability & Diversity	
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
	Scoring Consideration	Within Efficient Zone?	Meets Operating Reserve Req?	Cost: Expected Cost Reference Case	Prob. of Poor Perf.	Prob. of Good Perf.	Risk Durability: Good minus Bad	Risk Magnitude: Avg. Worst 4 vs. Reference Case	Risk: TailVar less Mean	Risk: Year-to-Year Variation	Reliability: Avg. EUE 2012-2020 & 2025	Diversity: Technology & Fuel: H-H Index
	Units	Y or N	Y or N	$ NPV Billion	%	%	%	$ NPV Billion	$ NPV Billion	$ nominal Million	Mwa	Points
1	Market	Y	N	$ 26,661	5%	90%	86%	$ 9,422	$ 6,870	$ 36,438	10.8	1774
2	Natural Gas	Y	Y	$ 28,621	10%	5%	-5%	$ 6,617	$ 6,851	$ 26,092	4.0	2077
3	Wind	Y	Y	$ 29,579	57%	5%	-52%	$ 5,178	$ 4,718	$ 15,163	6.0	1777
4	Diversified Green	Y	Y	$ 29,146	0%	14%	14%	$ 5,310	$ 4,927	$ 15,719	5.7	1646
5	Diversified Thermal with Wind	Y	Y	$ 28,671	0%	0%	0%	$ 6,263	$ 6,334	$ 23,079	5.4	1861
6	Bridge to IGCC in WY	N	Y	$ 32,640	100%	0%	-100%	$ 6,049	$ 5,076	$ 27,992	5.3	1876
7	Bridge to Nuclear	Y	Y	$ 29,492	33%	10%	-24%	$ 4,868	$ 5,032	$ 19,327	5.4	1638
8	Green w/ On-peak Energy Target	Y	Y	$ 29,084	0%	14%	14%	$ 5,236	$ 4,883	$ 14,561	5.1	1617
9	Diversified Thermal with Green	Y	Y	$ 28,301	5%	71%	67%	$ 6,429	$ 6,568	$ 25,684	4.2	1881
10	Boardman through 2014	Y	Y	$ 28,216	0%	76%	76%	$ 6,714	$ 7,769	$ 29,090	5.9	2170
11	Oregon CO2 Goal	N	Y	$ 30,978	81%	10%	-71%	$ 4,070	$ 4,841	$ 18,126	5.8	1626
12	Boardman through 2011	Y	Y	$ 28,396	10%	19%	10%	$ 6,652	$ 7,656	$ 28,352	5.5	2211
13	Diverse Green with wind in WY	N	Y	$ 31,010	90%	0%	-90%	$ 5,285	$ 4,856	$ 17,681	4.6	1645
14	Diversified Thermal w/ Green w/o Lease	Y	Y	$ 28,303	0%	71%	71%	$ 6,413	$ 6,756	$ 26,258	4.3	1926
15	Boardman through 2017	Y	Y	$ 28,429	10%	14%	5%	$ 6,664	$ 7,519	$ 27,634	4.4	2139

Performance Range for Scoring Normalization:

Best Performing Portfolio(s)			$ 26,661	100%	90%	86%	$ 4,070	$ 4,718	14,561	4.0	1,617
Best Basis			Min	Max	Max	Max	Min	Min	Min	Min	Min
Worst Performing Portfolio(s)			$ 32,640	0%	0%	-100%	$ 9,422	$ 7,769	36,438	10.8	2,211
Spread Best to Worst			$ 5,978	100%	90%	186%	$ 5,352	$ 3,050	21,877	6.7	594
% Difference			22.4%				131.5%	64.7%	150.2%	168.0%	36.7%

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Portfolio Scoring Grid

Normalized Scores

	2. Portfolio Evaluation Scoring: Normalized Scores (0 to 100)	Screening		Deterministic			Stochastic		Reliability & Diversity	
		(a)	(b)	(c)	(f)	(g)	(h)	(i)	(j)	(k)
	Scoring Consideration	**Within Efficient Zone?**	**Meets Operating Reserve Req?**	**Cost: Expected Cost**	**Risk Durability: Good minus Bad**	**Risk Magnitude: Avg. Worst 4 vs. Reference Case**	**Risk: TailVar less Mean**	**Risk: Year-to-Year Variation**	**Reliability: Avg. EUE 2012-2020 & 2025**	**Diversity: Technology & Fuel: H-H Index**
1	Market	Y	**N**	100.0	100.0	0.0	29.4	0.0	0.0	73.4
2	Natural Gas	Y	Y	67.2	51.3	52.4	30.1	47.3	100.0	22.6
3	Wind	Y	Y	51.2	25.6	79.3	100.0	97.3	70.1	73.0
4	Diversified Green	Y	Y	58.4	61.5	76.8	93.1	94.7	75.1	95.0
5	Diversified Thermal with Wind	Y	Y	66.4	53.8	59.0	47.0	61.1	79.6	58.9
6	Bridge to IGCC in WY	**N**	Y	0.0	0.0	63.0	88.3	38.6	80.4	56.4
7	Bridge to Nuclear	Y	Y	52.6	41.0	85.1	89.7	78.2	79.4	96.5
8	Green w/ On-peak Energy Target	Y	Y	59.5	61.5	78.2	94.6	100.0	83.2	100.0
9	Diversified Thermal with Green	Y	Y	72.6	89.7	55.9	39.4	49.2	97.7	55.4
10	Boardman through 2014	Y	Y	74.0	94.9	50.6	0.0	33.6	72.2	6.9
11	Oregon CO2 Goal	**N**	Y	27.8	15.4	100.0	96.0	83.7	73.8	98.5
12	Boardman through 2011	Y	Y	71.0	59.0	51.8	3.7	37.0	78.5	0.0
13	Diverse Green with wind in WY	**N**	Y	27.3	5.1	77.3	95.5	85.7	90.6	95.2
14	Diversified Thermal w/ Green w/o Lease	Y	Y	72.5	92.3	56.2	33.2	46.5	95.0	48.0
15	Boardman through 2017	Y	Y	70.4	56.4	51.5	8.2	40.2	94.6	12.0

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Portfolio Scoring Grid

Weighted Scores & Ranked Results

	3. Portfolio Evaluation Scoring: Total Weighted Scores	Screening		Deterministic			Stochastic		Reliability & Diversity				
		(a)	(b)	(c)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)
	Scoring Consideration	**Within Efficient Zone?**	**Meets Operating Reserve Req?**	**Cost: Expected Cost**	**Risk Durability: Good minus Bad**	**Risk Magnitude: Avg. Worst 4 vs. Reference Case**	**Risk: TailVar less Mean**	**Risk: Year-to-Year Variation**	**Reliability: Avg. EUE 2012-2020 & 2025**	**Diversity: Technology & Fuel: H-H Index**	**Weigted Combined Score (0 to 100)**	**Performance vs. Best (%)**	**Ordinal Ranking**
	Weight			**50%**	**10%**	**10%**	**5%**	**5%**	**15%**	**5%**			
1	Market	Y	N	50.0	10.0	0.0	1.5	0.0	0.0	3.7	65.1	90%	5
2	Natural Gas	Y	Y	33.6	5.1	5.2	1.5	2.4	15.0	1.1	64.0	88%	9
3	Wind	Y	Y	25.6	2.6	7.9	5.0	4.9	10.5	3.6	60.1	83%	12
4	Diversified Green	Y	Y	29.2	6.2	7.7	4.7	4.7	11.3	4.8	68.5	94%	4
5	Diversified Thermal with Wind	Y	Y	33.2	5.4	5.9	2.4	3.1	11.9	2.9	64.8	89%	6
6	Bridge to IGCC in WY	N	Y	0.0	0.0	6.3	4.4	1.9	12.1	2.8	27.5	38%	15
7	Bridge to Nuclear	Y	Y	26.3	4.1	8.5	4.5	3.9	11.9	4.8	64.1	88%	8
8	Green w/ On-peak Energy Target	Y	Y	29.7	6.2	7.8	4.7	5.0	12.5	5.0	70.9	98%	3
9	Diversified Thermal with Green	Y	Y	36.3	9.0	5.6	2.0	2.5	14.7	2.8	72.7	100%	1
10	Boardman through 2014	Y	Y	37.0	9.5	5.1	0.0	1.7	10.8	0.3	64.4	89%	7
11	Oregon CO2 Goal	N	Y	13.9	1.5	10.0	4.8	4.2	11.1	4.9	50.4	69%	13
12	Boardman through 2011	Y	Y	35.5	5.9	5.2	0.2	1.8	11.8	0.0	60.4	83%	11
13	Diverse Green with wind in WY	N	Y	13.6	0.5	7.7	4.8	4.3	13.6	4.8	49.3	68%	14
14	Diversified Thermal w/ Green w/o Lease	Y	Y	36.3	9.2	5.6	1.7	2.3	14.3	2.4	71.8	99%	2
15	Boardman through 2017	Y	Y	35.2	5.6	5.2	0.4	2.0	14.2	0.6	63.2	87%	10

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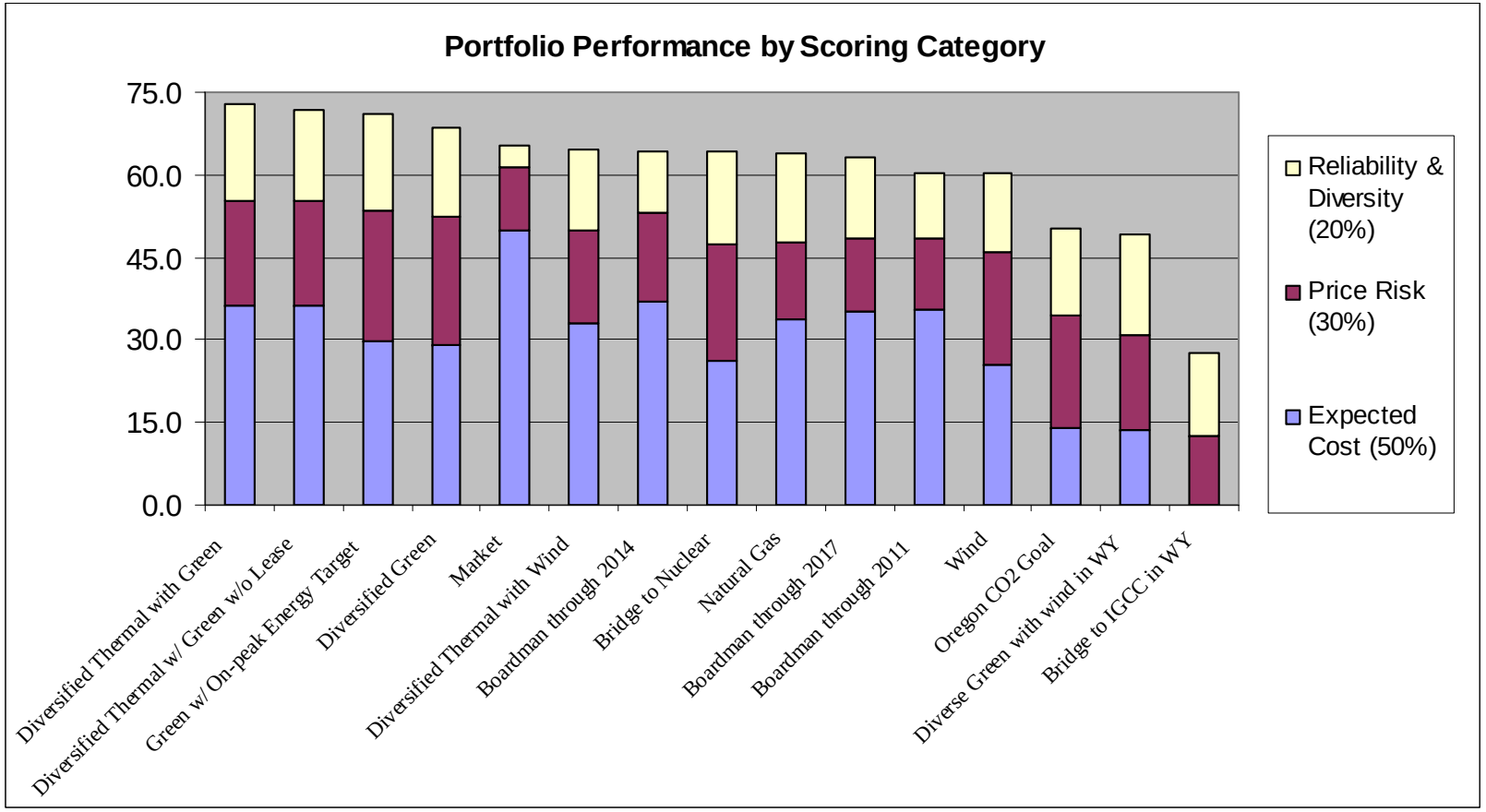
Portfolio Scoring Grid

Weighted Scores & Ranked Results



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Portfolio Scoring Grid

Insights & Conclusions - General

- The best performing portfolios are generally diverse, and include a mixture of new renewables and gas
  - Diversifying within renewables resource class is also beneficial
- Top performing portfolios exhibit relatively little cost, overall risk and scoring differences
  - Significant differences in cost and risk are observed when comparing the best performing portfolios to the worst performing
- "Diversified Thermal with Green" and "Green with On-Peak Energy" are top performing portfolios
  - These two portfolios are ranked 1 & 3. (The 2nd ranked portfolio contains only one variation from the top portfolio.)
  - The primary tradeoff between these two portfolios is lower expected cost vs. lower risk exposure
- We recommend "Diversified Thermal with Green" as our preferred portfolio
  - Diversified Thermal with Green offers lower implementation risk

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Boardman
EQC Regional Haze / BART Rule

Required Controls

- On June 19th the Environmental Quality Commission approved rules adopting Oregon's Regional Haze Plan that includes pollution control equipment installation for the Boardman coal-fired power plant.

- The control plan requires the following:
  - Phase 1 controls (BART)
    - New low NO_X burners and modified overfire air ports (July 2011)
    - Semi-dry SO_2 scrubbers (July 2014)
  - Phase 2 controls (Reasonable Progress)
    - Selective Catalytic Reduction (July 2017)

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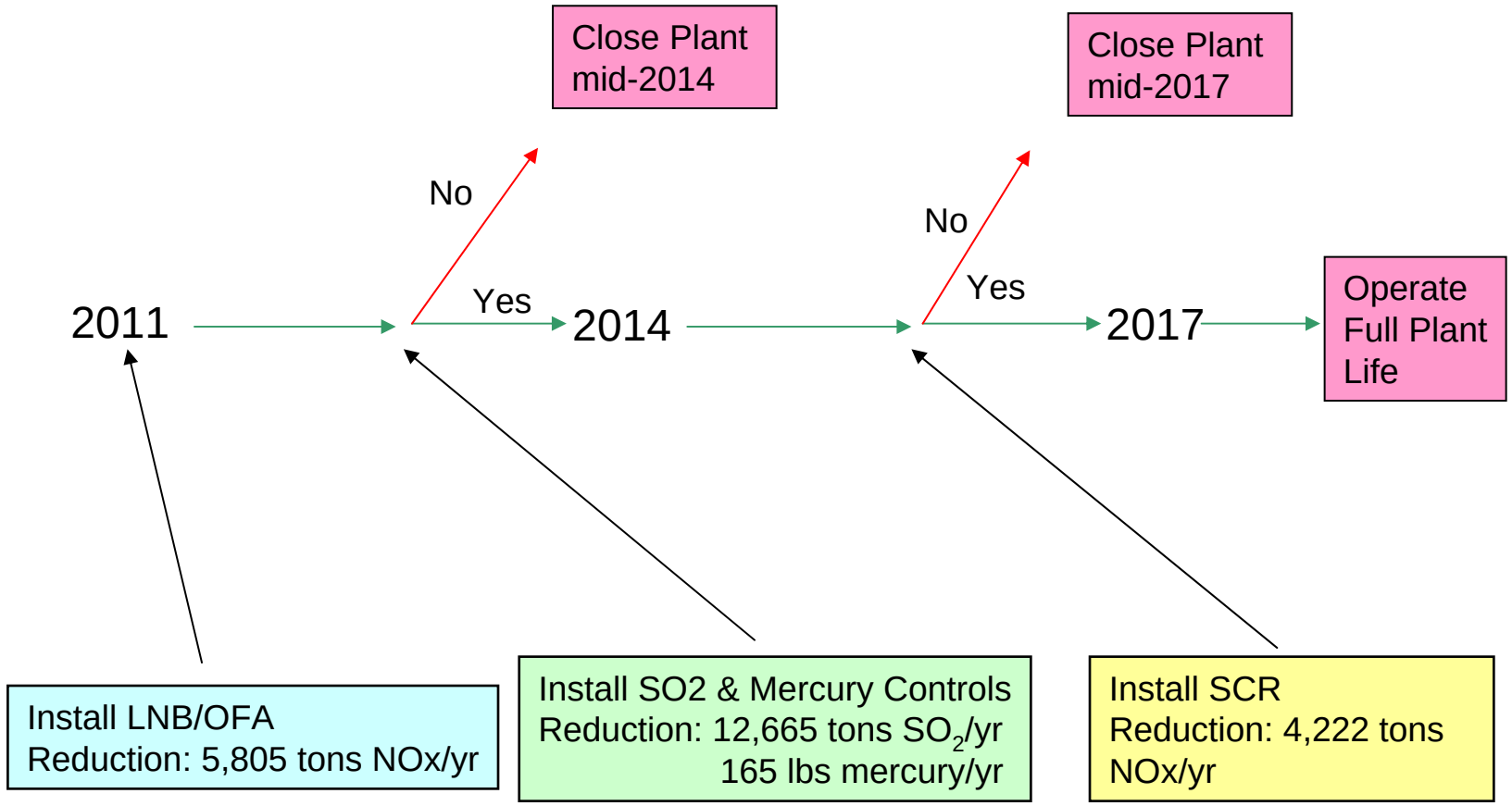
BART and Reasonable Progress Timeline (Commitments must be made up front)



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Boardman Emission Controls – Update

Changes to Cost Estimate Since April Meeting

JULY 2009 REVISED ESTIMATES

in million$	LNB/OFA	Hg/ FGD	SCR	Total
Overnight Capex	$ 33	$ 298	$ 180	$ 510
AFDC	$ 4	$ 74	$ 42	$ 120
Cap Prop Tax	$ 0	$ 10	$ 6	$ 16
Total	$ 37	$ 381	$ 228	$ 646

APRIL 2009 PUBLIC MEETING

in million$	LNB/OFA	Hg/ FGD	SCR	Total
Overnight Capex	$ 36	$ 341	$ 210	$ 587
AFDC	$ 5	$ 84	$ 49	$ 138
Cap Prop Tax	$ 1	$ 11	$ 7	$ 18
Total	$ 41	$ 437	$ 266	$ 744

DIFFERENCE

in million$	LNB/OFA	Hg/ FGD	SCR	Total
Overnight Capex	$ (3)	$ (43)	$ (30)	$ (77)
AFDC	$ (1)	$ (10)	$ (7)	$ (18)
Cap Prop Tax	$ (1)	$ (1)	$ (1)	$ (2)
Total	$ (4)	$ (56)	$ (38)	$ (98)

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Boardman Emission Controls – Update

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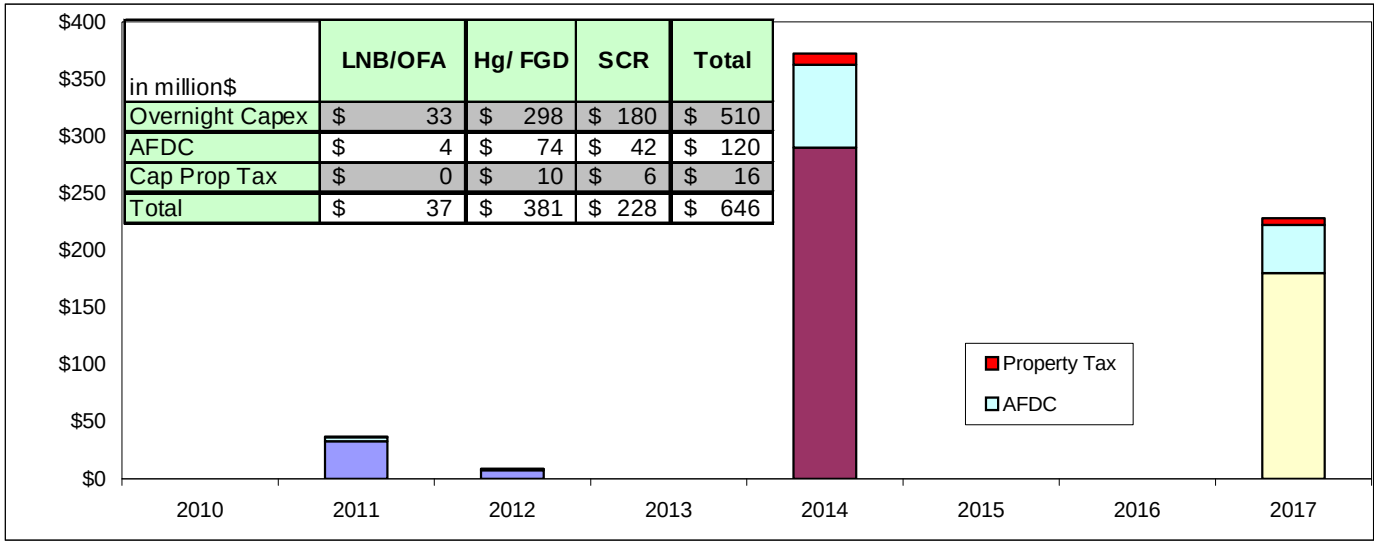

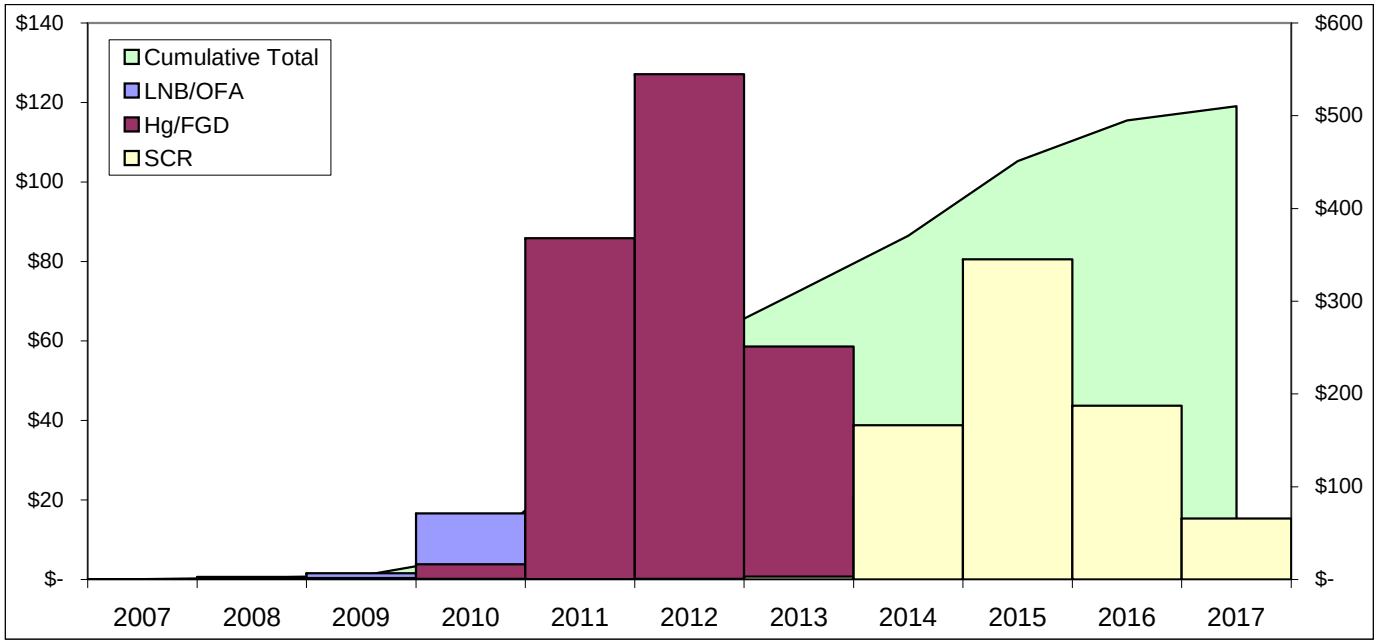

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Boardman Portfolio Analysis

Impact of Environmental Quality Commission (EQC) / BART Rule

- EQC did not approve PGE's "decision points" proposal
  - 2020 and 2029 Boardman alternatives are no longer available and have been removed from portfolio analysis

- Based on the EQC rule, we have added 2014 and 2017 early closure portfolios
  - 2014 portfolio includes expenditures for Low NOX Burners and Mercury Controls by 2012
    - Boardman operations cease Mid-2014
    - It assumes a baseload CCCT replacement resource by 2015
  - 2017 portfolio includes a Scrubber in 2014
    - Boardman operations cease Mid-2017
    - It assumes a baseload CCCT replacement resource in 2017

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Boardman Portfolio Analysis

Stand Alone vs. Portfolio Analysis

- Stand-alone
  - 24 dispatches per year (against monthly on- and off-peak market prices)
  - Boardman dispatches against avoided cost (based on fully-allocated cost of a new combined cycle CT)
  - Boardman is either fully on or full off (no ramp rates)
  - Value and Risk results consider only impacts to Boardman vs Alternative Generation (does not consider overall portfolio cost and risk performance)

- Portfolio Approach
  - Improved dispatch granularity – hourly dispatch thru 2040
  - Boardman dispatches against Aurora market prices
    - Aurora market prices determined based on WECC-wide resource dispatch
    - Market price is based on marginal costs (fuel and variable O&M)
  - Ramp rates are observed
  - End effects for both capital and replacement costs are explicitly included
  - Value is gauged in the context of risk impacts to the overall portfolio

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Boardman Portfolio Analysis

Stand Alone vs. Portfolio Analysis

- Summary of Differences
  - Portfolio analysis approach yields less economic value for Boardman and more economic value for a CT replacement (reference case assumptions)
  - Portfolio analysis provides a more comprehensive picture of risk
    - Portfolio analysis includes important measures such as stochastic and reliability risk
  - Portfolio analysis is both more granular and more complete

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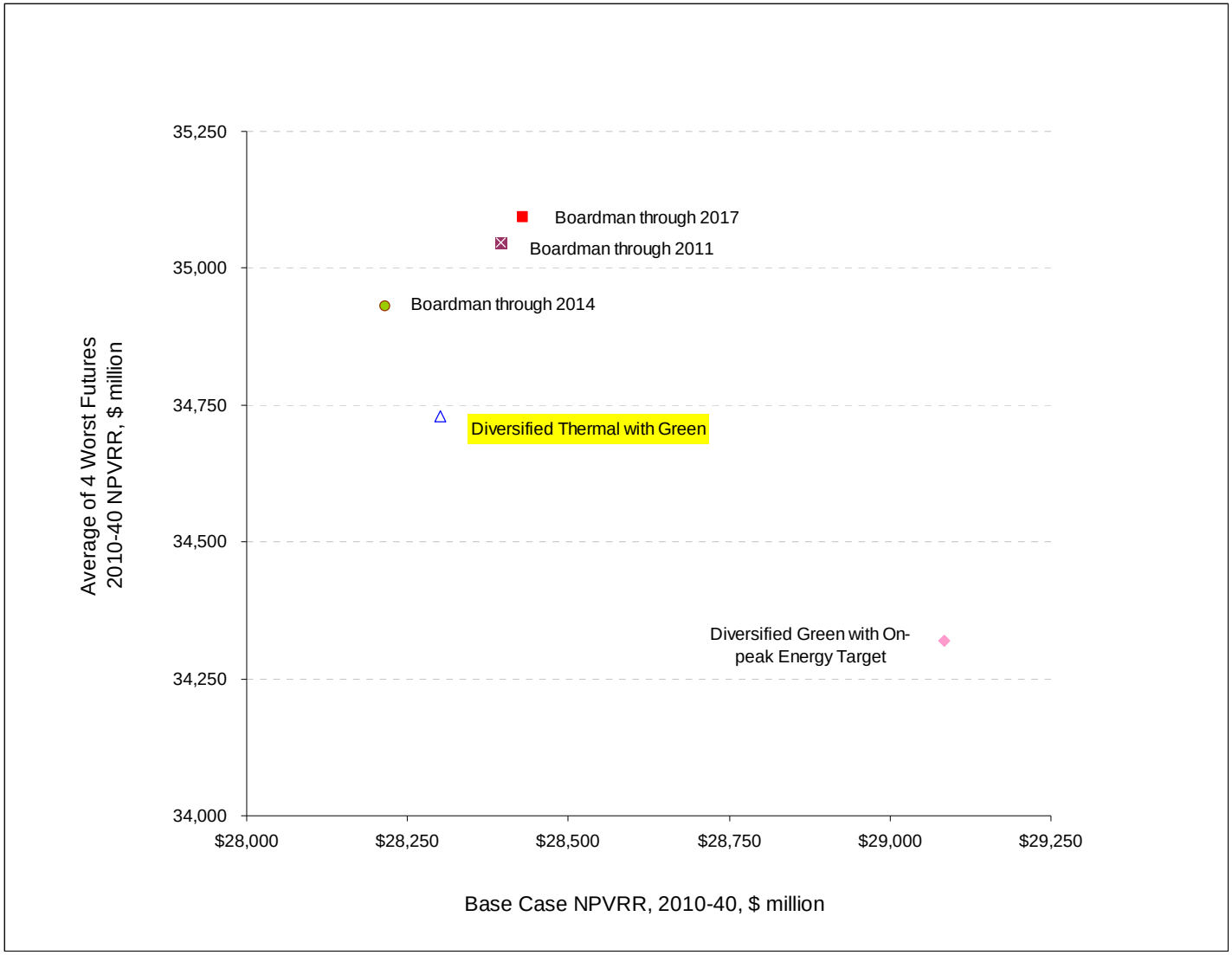
Boardman Portfolio Analysis – Results (2009$)



- Horizontal axis is net present value of revenue requirements of reference case for each portfolio.
- Vertical axis is average net present value of revenue requirements of 4 worst performances across futures for each portfolio.

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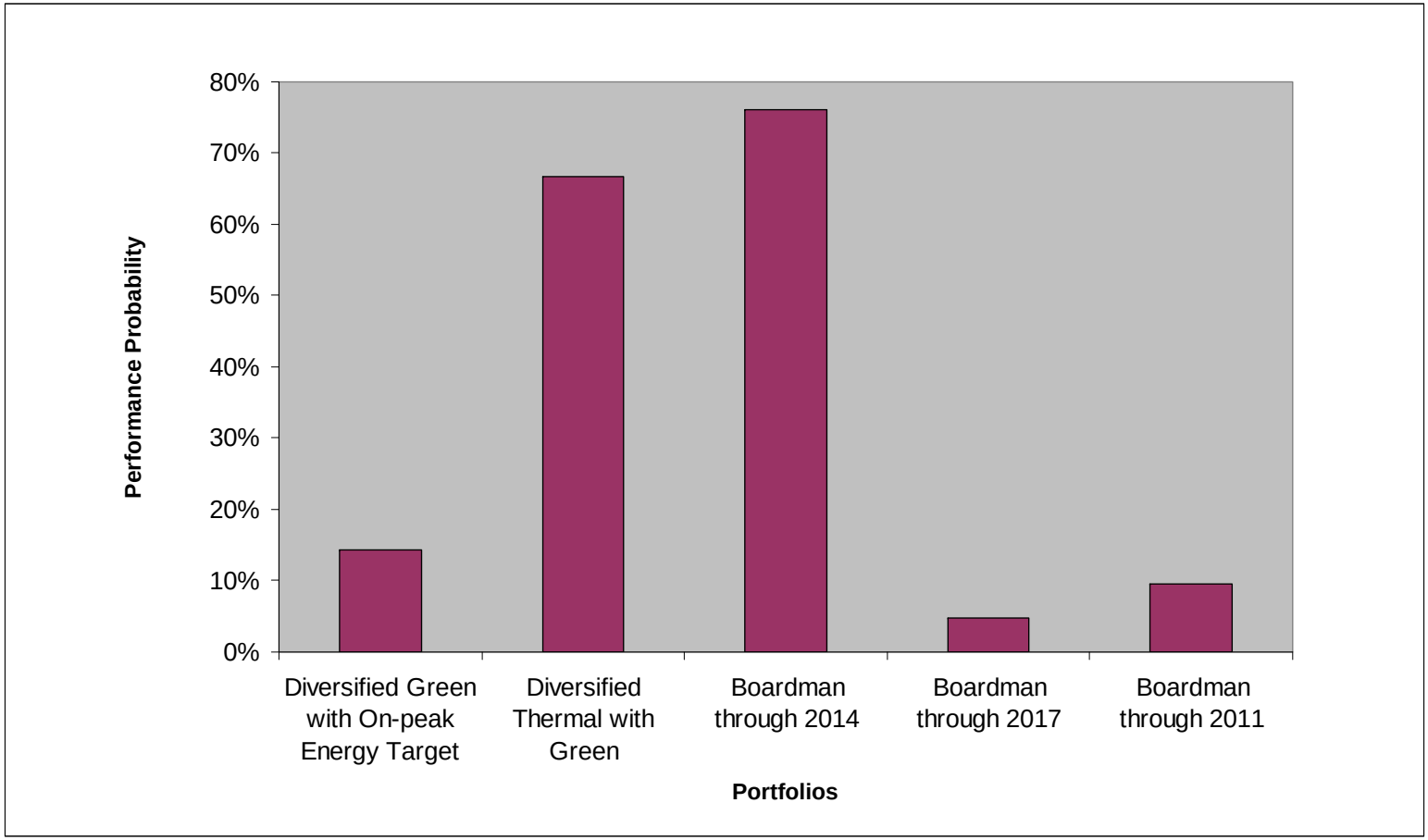
Boardman Portfolio Analysis
Combined Performance of Good vs. Bad Outcomes



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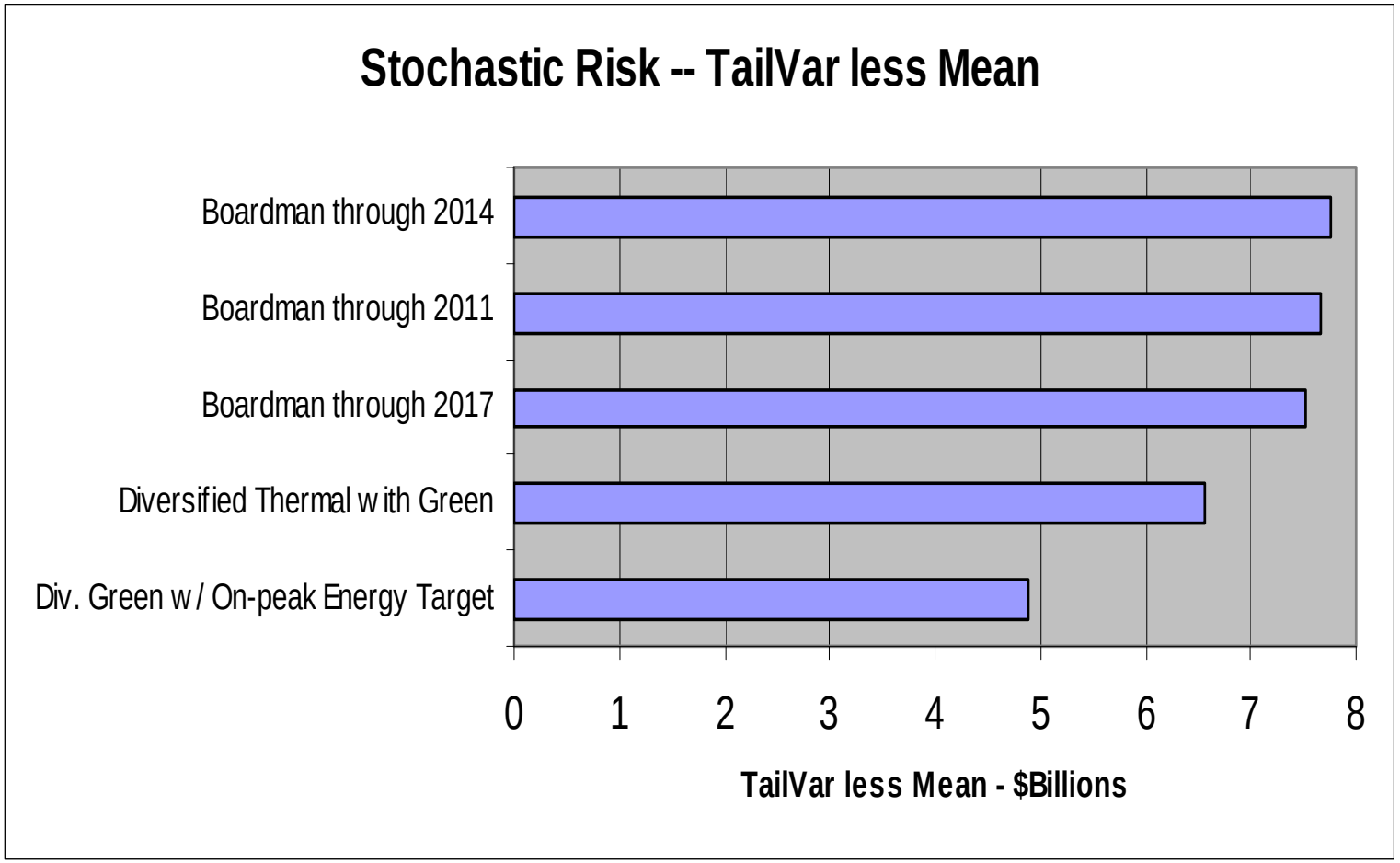
Boardman Portfolio Analysis
Cost Volatility Results



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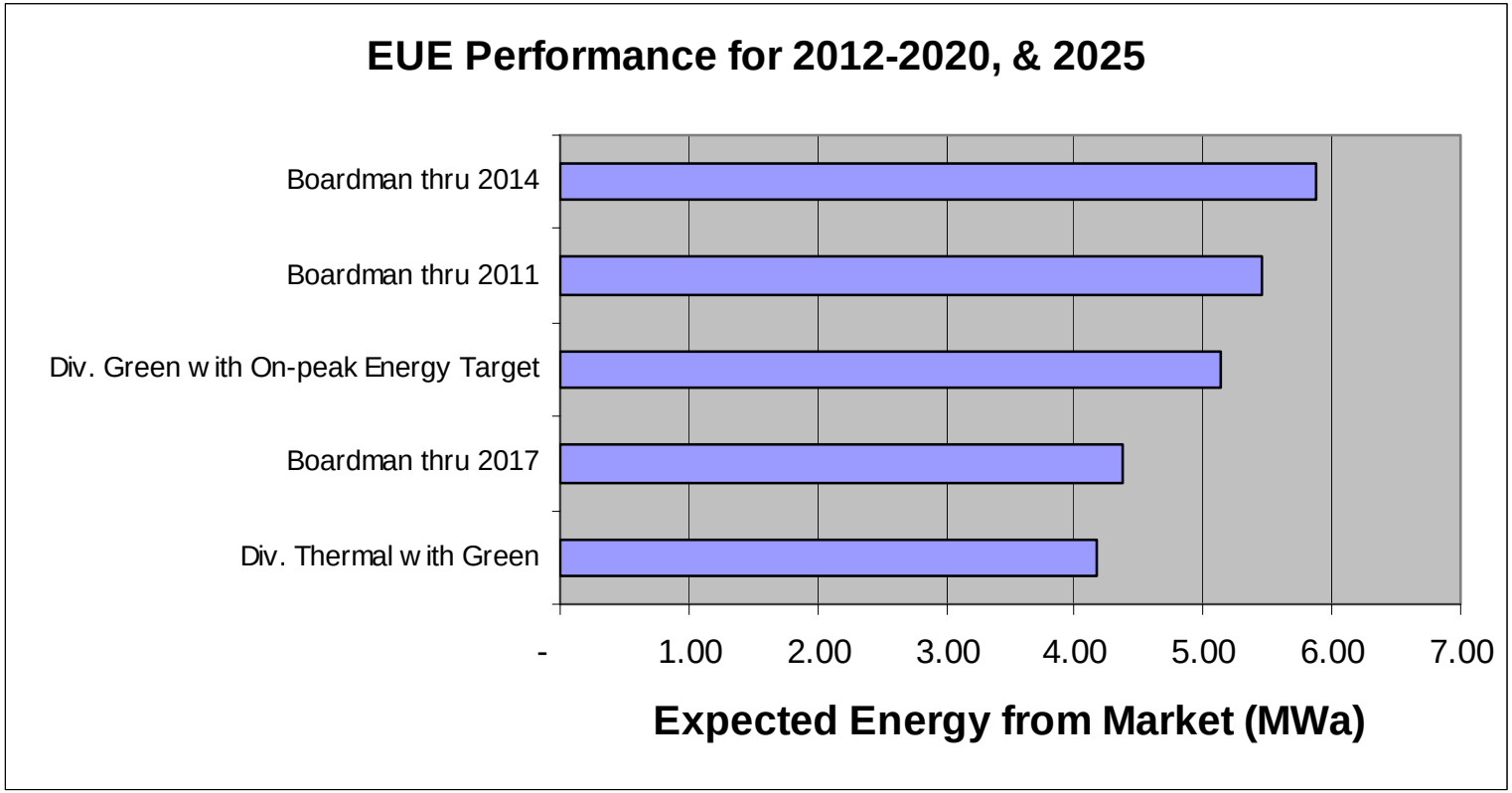
Boardman Portfolio Analysis
Reliability Results

Expected Unserved Energy (EUE)



- Portfolios with larger shaft risk do not perform as well as those with smaller or multiple shafts

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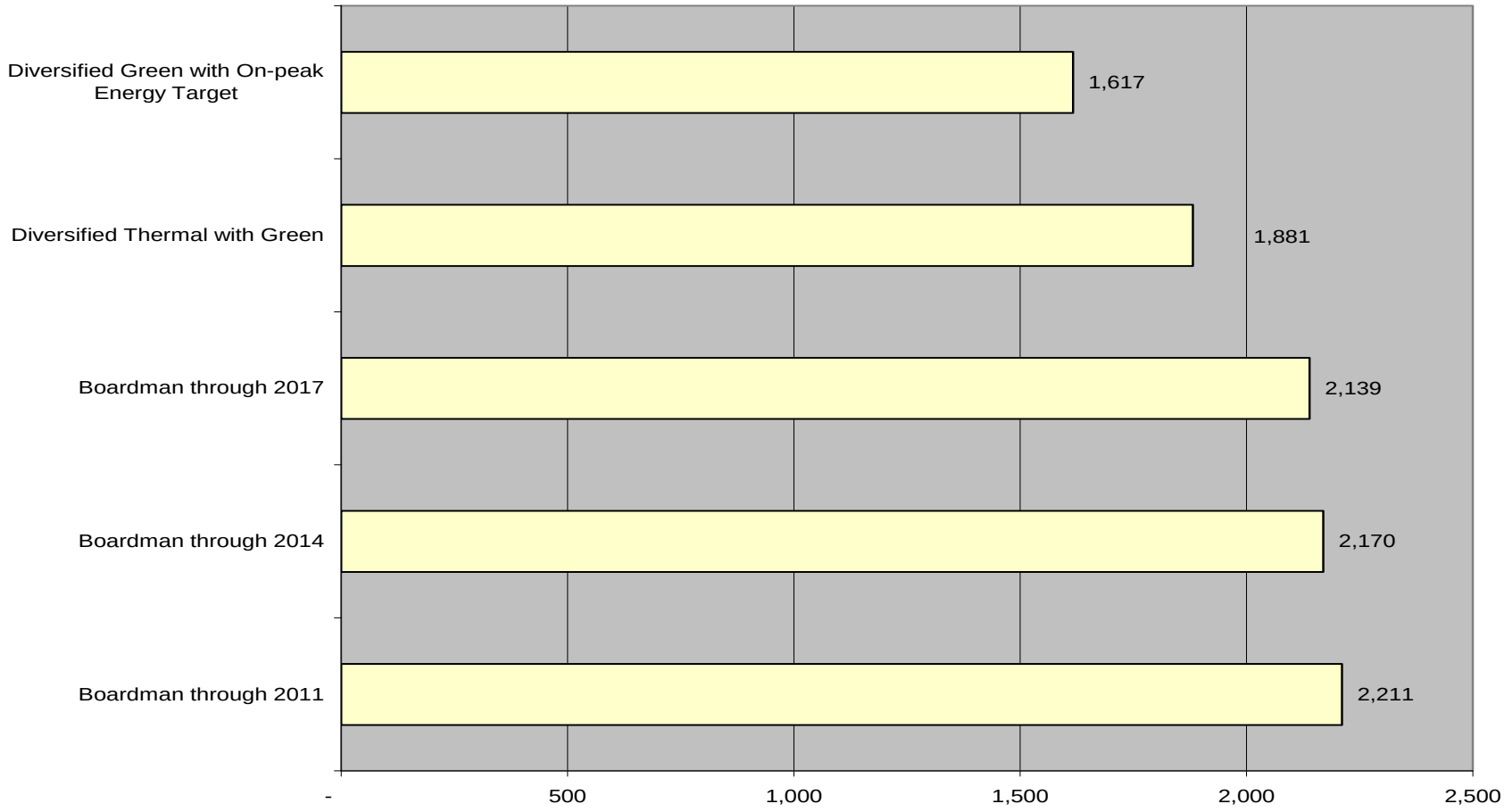
Boardman Portfolio Analysis
HHI Results – Composite Results



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Boardman Portfolio Analysis

Scoring Grid

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Green w/ On-peak Energy Target	Y	Y	59.5	61.5	78.2	94.6	100.0	83.2	100.0
Diversified Thermal with Green	Y	Y	72.6	89.7	55.9	39.4	49.2	97.7	55.4
Boardman through 2014	Y	Y	74.0	94.9	50.6	0.0	33.6	72.2	6.9
Boardman through 2011	Y	Y	71.0	59.0	51.8	3.7	37.0	78.5	0.0
Boardman through 2017	Y	Y	70.4	56.4	51.5	8.2	40.2	94.6	12.0

3. Portfolio Evaluation Scoring: Total Weighted Scores	Screening		Deterministic			Stochastic		Reliability & Diversity				
	(a)	(b)	(c)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)
Scoring Consideration	**Within Efficient Zone?**	**Meets Operating Reserve Req?**	**Cost: Expected Cost**	**Risk Durability: Good minus Bad**	**Risk Magnitude: Avg. Worst 4 vs. Reference Case**	**Risk: TailVar less Mean**	**Risk: Year-to-Year Variation**	**Reliability: Avg. EUE 2012-2020 & 2025**	**Diversity: Technology & Fuel: H-H Index**	**Weigted Combined Score (0 to 100)**	**Performance vs. Best (%)**	**Ordinal Ranking**
Weight			**50%**	**10%**	**10%**	**5%**	**5%**	**15%**	**5%**			
Green w/ On-peak Energy Target	Y	Y	29.7	6.2	7.8	4.7	5.0	12.5	5.0	70.9	98%	3
Diversified Thermal with Green	Y	Y	36.3	9.0	5.6	2.0	2.5	14.7	2.8	72.7	100%	1
Boardman through 2014	Y	Y	37.0	9.5	5.1	0.0	1.7	10.8	0.3	64.4	89%	7
Boardman through 2011	Y	Y	35.5	5.9	5.2	0.2	1.8	11.8	0.0	60.4	83%	11
Boardman through 2017	Y	Y	35.2	5.6	5.2	0.4	2.0	14.2	0.6	63.2	87%	10

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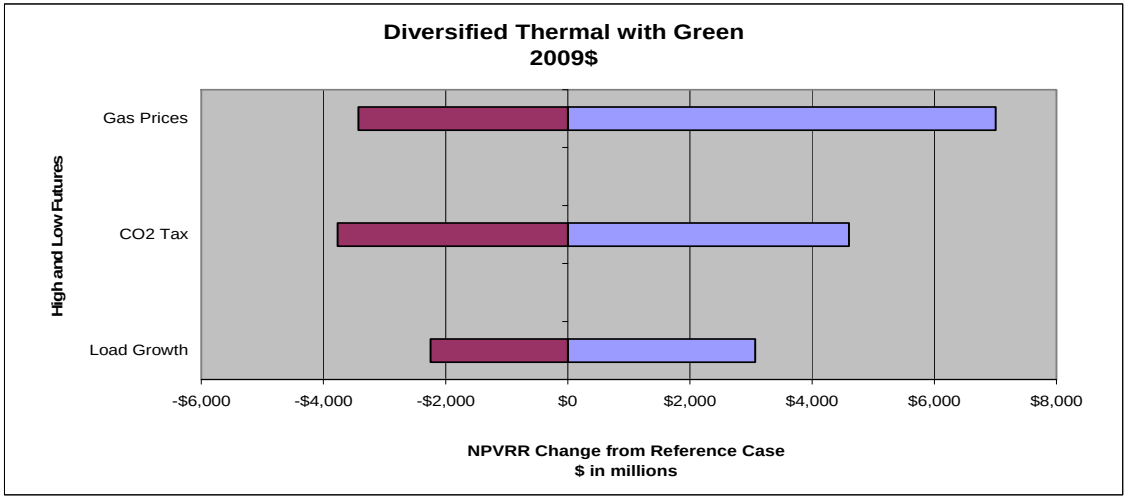
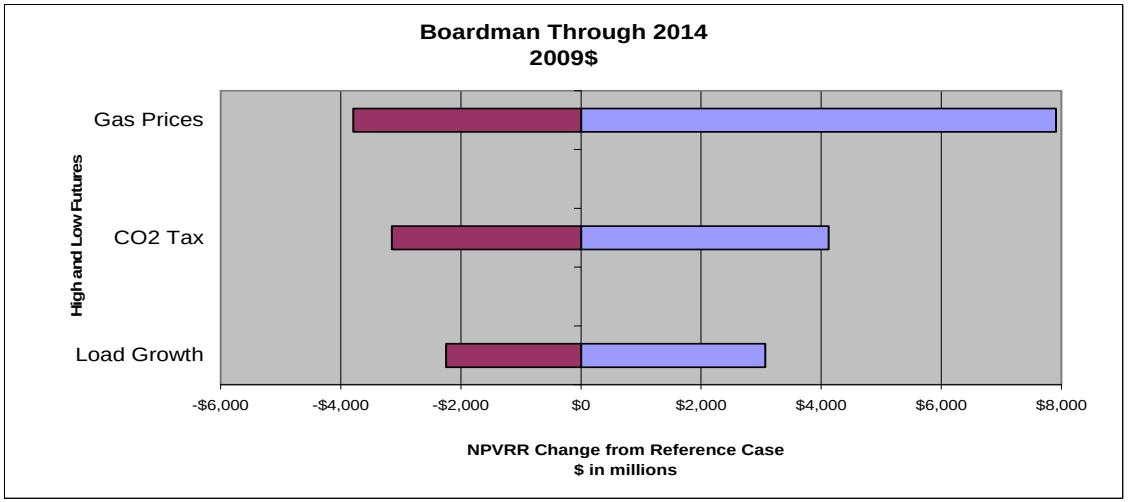
Boardman Portfolio Analysis

Primary Drivers of Uncertainty





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Boardman Portfolio Analysis

Primary Drivers of Uncertainty

- Consistent with stand-alone analysis scenario results, the two primary drivers to Boardman value are:
  - First, natural gas prices, and
  - Second, the cost of CO2 compliance.

- For natural gas heavy portfolios risk is asymmetric
  - Greater exposure to bad outcomes than good outcomes

- A $1 per MMBtu increase in gas prices through 2040 adds about $7 per MWh to the dispatch cost of a CCCT (at a 7,000 Heat Rate)
  - The higher gas price improves the relative value of Boardman by $176 million NPV (about $15 million per year)

- A $1 per ton change in CO2 cost through 2040 changes the value of Boardman by $12 million NPV

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Boardman Portfolio Analysis

Insights & Conclusions

- Portfolio modeling provides a more comprehensive look at Boardman value & risk

- Expected cost differences across portfolios are generally not as significant (as a % portfolio NPV) as differences observed for risk categories

  – As an example, the cost difference from the lowest cost portfolio to the highest cost portfolio is 22% while the differences in risk between best and worst performing portfolios range between approximately 65% - 150%

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Boardman Portfolio Analysis

Insights & Conclusions

- Portfolio modeling reveals only modest cost differences (as a % of total portfolio NPV) between the best performing portfolios that include Boardman through 2040 and those that close Boardman early.
  - The expected cost of the top-performing portfolios that include Boardman through 2040 are only modestly higher than the cost of the 2014 Boardman closure portfolio, but lower in cost than the portfolios that close Boardman in 2011 and 2017
  - Cost delta between the best performing portfolio (Diversified Thermal with Green) that includes Boardman through 2040 vs the 2014 Boardman closure case is less than 0.3%

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Boardman Portfolio Analysis

Insights & Conclusions (cont.)

- With respect to Risk (Scenario, Stochastic and Reliability), most portfolios that include Boardman through 2040 outperform the early Boardman closure portfolios

- When considering both expected cost and risk, investing in RH BART emissions controls and continuing Boardman operations through 2040 outperforms early closure cases

- Based on portfolio analysis results, PGE recommends proceeding with emission control upgrades and retaining Boardman in our resource portfolio

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Today's Topics

- EE Update
- CO2 Update
- Portfolio Analysis
- Scoring Grid Results
- Boardman Portfolio Analysis
- ➢ Proposed Action Plan
- Gas Transportation & Storage
- Remaining Schedule

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Action Plan Objective

The primary goal of the IRP is to identify a resource action plan, that when considered with our existing portfolio, provides the best combination of expected cost and associated risks and uncertainties for the utility and its customers.

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Proposed Action Plan

- PGE's Preferred Portfolio – "Diversified Thermal with Green"
  - Preferred portfolio invests in new emissions control upgrades for existing Boardman plant, and emphasizes incremental EE, Renewables and High-efficiency Natural Gas for new resource additions

- Action Plan is based on Preferred Portfolio
  - Preferred portfolio includes major resource additions through 2020
  - Preferred portfolio includes RPS compliance and EE through 2029

- Action Plan includes only proposed resource additions from preferred portfolio that are targeted to be online by 2015
  - Action Plan includes resources and actions that would be taken or committed to by 2014 (within 2 – 4 years from expected Action Plan acknowledgement)

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Proposed Action Plan

Key Proposed Resource Actions:

- 122 MWa renewables
  - Meets 2015 Oregon RPS compliance
  - Found reasonable by OPUC in 2007 IRP
- 215 MWa of EE
- 450 MW High Efficiency Combined Cycle Gas Plant
- Up to 200 MW of flexible gas capacity resources
- Boardman Emission Control Upgrades to meet RH BART requirements
- Natural Gas Fueling
  - Acquire pipeline and storage capacity to meet future gas fueling requirements
- Other Actions: contract renewals, Boardman lease, DSG expansion, DR acquisitions

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Action Plan – Energy

Energy MWa @ Normal Hydro	Action Plan 2015*	2020
PGE system load at normal weather	2,624	2,886
Remove assumed 5-yr. opt-out load	(28)	(28)
Existing PGE & contract resources	(1,850)	(1,652)
Remove post 2008 cumulative embedded EE	128	187
PGE Resource Target	**873**	**1,393**
Resource Actions		
Thermal Resource Actions:		
Combined Cycle Combustion Turbine (2015)	406	406
Combined Heat & Power (2015, 2017, 2019)	2	5
Boardman Lease Contract (2014)	72	72
Renewable & EE Resource Actions:		
ETO Energy Savings Target (2009-2020)	214	322
Existing Contracts Renewals	66	66
2015 RPS Compliance**	122	122
Biomass (2017, 2019)	-	50
Geothermal (2019)	-	50
Solar PV (2019)	-	4
RPS Compliance (2016-2020)	-	168
To Hedge Load Variability:		
Short- and Mid-term Market Purchases	100	100
(Surplus) / deficit met by market	(108)	28
Total Resource Actions	**873**	**1,393**
*Actions will be taken, or committed to by end of year 2014 for resources online by 2015		
**2015 RPS Compliance is for the 122 MWa necessary for physical compliance in 2015.		

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Action Plan – January Capacity

January Capacity MW @ Normal Hydro	Action Plan 2015*	2020
PGE system peak at normal weather	4,107	4,478
Operating Reserves (approximately 6% of generation)	205	204
Contingency Reserves (6% of Load)	245	267
Remove assumed 5-yr opt outs (w/contingency reserves)	(31)	(31)
Existing PGE & contract resources	(2,989)	(2,563)
Remove post 2008 cumulative embedded EE	188	275
PGE Resource Target	**1,724**	**2,630**
Resource Actions		
Thermal Resource Actions:		
Combined Cycle Combustion Turbine (2015)	441	441
Combined Heat & Power (2015, 2017, 2019)	2	6
Boardman Lease Contract (2014)	86	86
Renewable Resource Actions:		
Existing Contracts Renewals	167	167
2015 RPS Compliance**	18	18
Biomass (2017, 2019)	-	58
Geothermal (2019)	-	58
Solar PV (2019)	-	1
RPS Compliance (2016-2020)	-	25
To Hedge Load Variability:		
Short- and Mid-term Market Purchases	100	100
Capacity only resources:		
Flexible Peaking Supply (2013)	200	560
Customer-Based Solutions (Capacity only):		
Dispatchable Standby Generation (2010-2013)	52	52
Demand Response (2010-2012 and 2017-2020)	60	95
Seasonally Targeted Resources:		
ETO Capacity Savings Target (2009-2020)	315	474
Bi-seasonal Capacity	123	450
Winter-only capacity	160	38
Total incremental resources	**1,724**	**2,630**

*Actions will be taken, or committed to by end of year 2014 for resources online by 2015

**2015 RPS Compliance includes assumed capacity from 122 MWa necessary for physical compliance in 2015. The capacity value is based on filling renewable need with wind resources.

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Action Plan – August Capacity

August Capacity MW @ Normal Hydro	Action Plan 2015*	2020
PGE system peak at normal weather	3,778	4,239
Operating Reserves (approximately 6% of generation)	205	204
Contingency Reserves (6% of Load)	225	252
Remove assumed 5-yr opt outs (w/contingency reserves)	(31)	(31)
Existing PGE & contract resources	(2,841)	(2,415)
Remove post 2008 cumulative embedded EE	126	184
PGE Resource Target	**1,460**	**2,434**
Resource Actions		
Thermal Resource Actions:		
Combined Cycle Combustion Turbine (2015)	441	441
Combined Heat & Power (2015, 2017, 2019)	2	6
Boardman Lease Contract (2014)	86	86
Renewable Resource Actions:		
Existing Contracts Renewals	167	167
2015 RPS Compliance**	18	18
Biomass (2017, 2019)	-	58
Geothermal (2019)	-	58
Solar PV (2019)	-	1
RPS Compliance (2016-2020)	-	25
To Hedge Load Variability:		
Short- and Mid-term Market Purchases	100	100
Capacity only resources:		
Flexible Peaking Supply (2013)	200	560
Customer-Based Solutions (Capacity only):		
Dispatchable Standby Generation (2010-2013)	52	52
Demand Response (2010-2012 and 2017-2020)	60	95
Seasonally Targeted Resources:		
ETO Capacity Savings Target (2009-2020)	210	316
Bi-seasonal Capacity	123	450
Winter-only capacity	-	-
Total incremental resources	**1,460**	**2,434**

*Actions will be taken, or committed to by end of year 2014 for resources online by 2015

**2015 RPS Compliance includes assumed capacity from 122 MWa necessary for physical compliance in 2015. The capacity value is based on filling renewable need with wind resources.

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Gas Transportation & Storage

Portfolio Gas Fueling Requirements

Natural Gas Requirements by Plant		Dth/day
Beaver Units 1-8		117,000
Transport Supporting Plant:		
Sumas to PDX	17,000	
Storage	70,000	
Total Transport Supporting Plant	87,000	
Net Transport Postion Surplus/(Deficit)		(30,000)
Port Westward		70,000
Transport Supporting Plant:		
Sumas to KB	30,000	
Rockies to KB	30,000	
Sumas to PDX	10,000	
Total Transport Supporting Plant	70,000	
Net Transport Postion Surplus/(Deficit)		-
Coyote Springs		41,000
Transport Supporting Plant:		
NIT to Coyote Lateral	41,000	
Total Transport Supporting Plant	41,000	
Net Transport Postion Surplus/(Deficit)		-

New Capacity Resource		40,000
Transport Supporting Plant:		
From Hub (either Sumas/Rockes/NIT) to Plant w/ Storage Support	40,000	
Total Transport Supporting Plant	40,000	
Net Transport Postion Surplus/(Deficit)		-

New Energy Resource		40,000
Transport Supporting Plant:		
From Hub (either Sumas/Rockes/NIT) to Plant w/ Storage Support	40,000	
Total Transport Supporting Plant	40,000	
Net Transport Postion Surplus/(Deficit)		-

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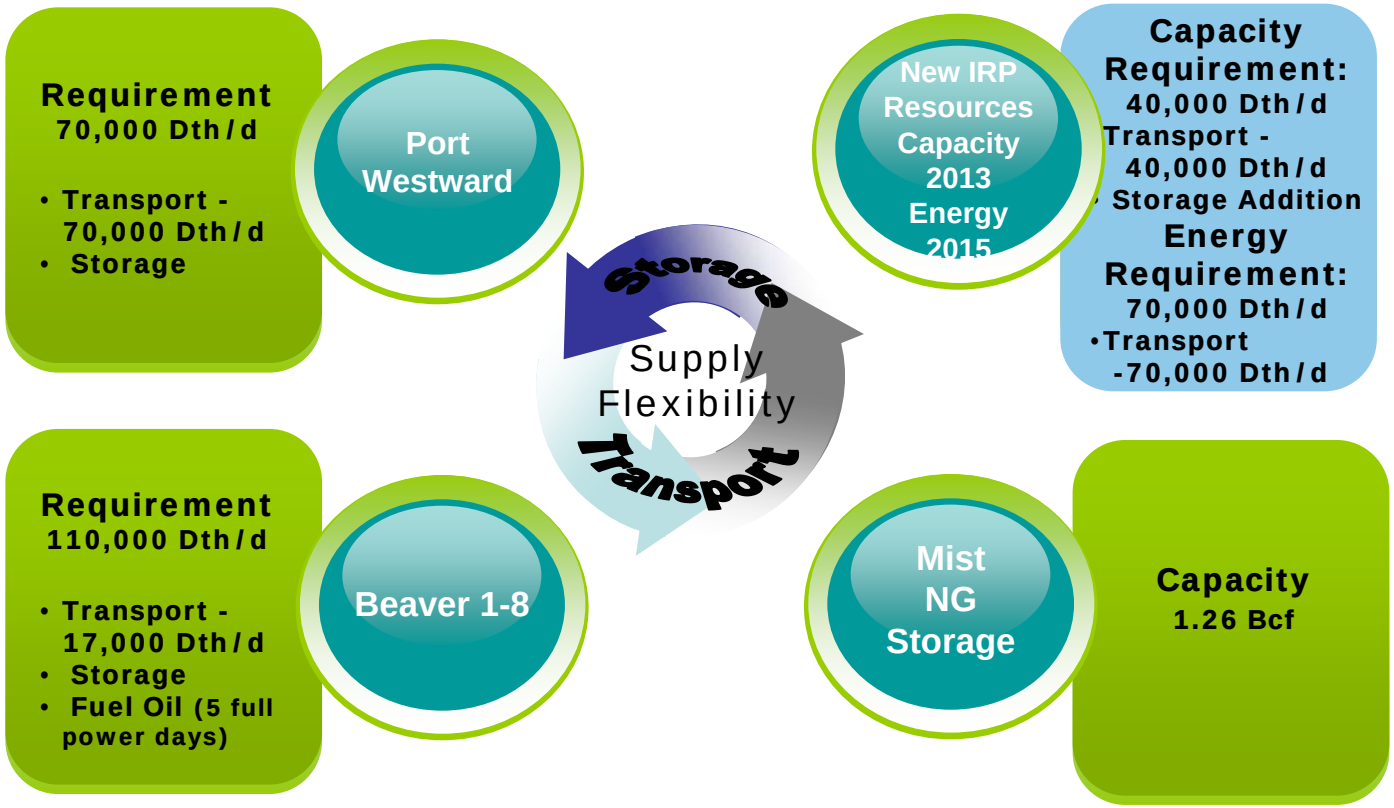
Gas Transportation & Storage

Supply – Gas Transport & Storage Strategy



NG transport combined with gas storage allows for optimizing fuel flexibility and lowering supply costs

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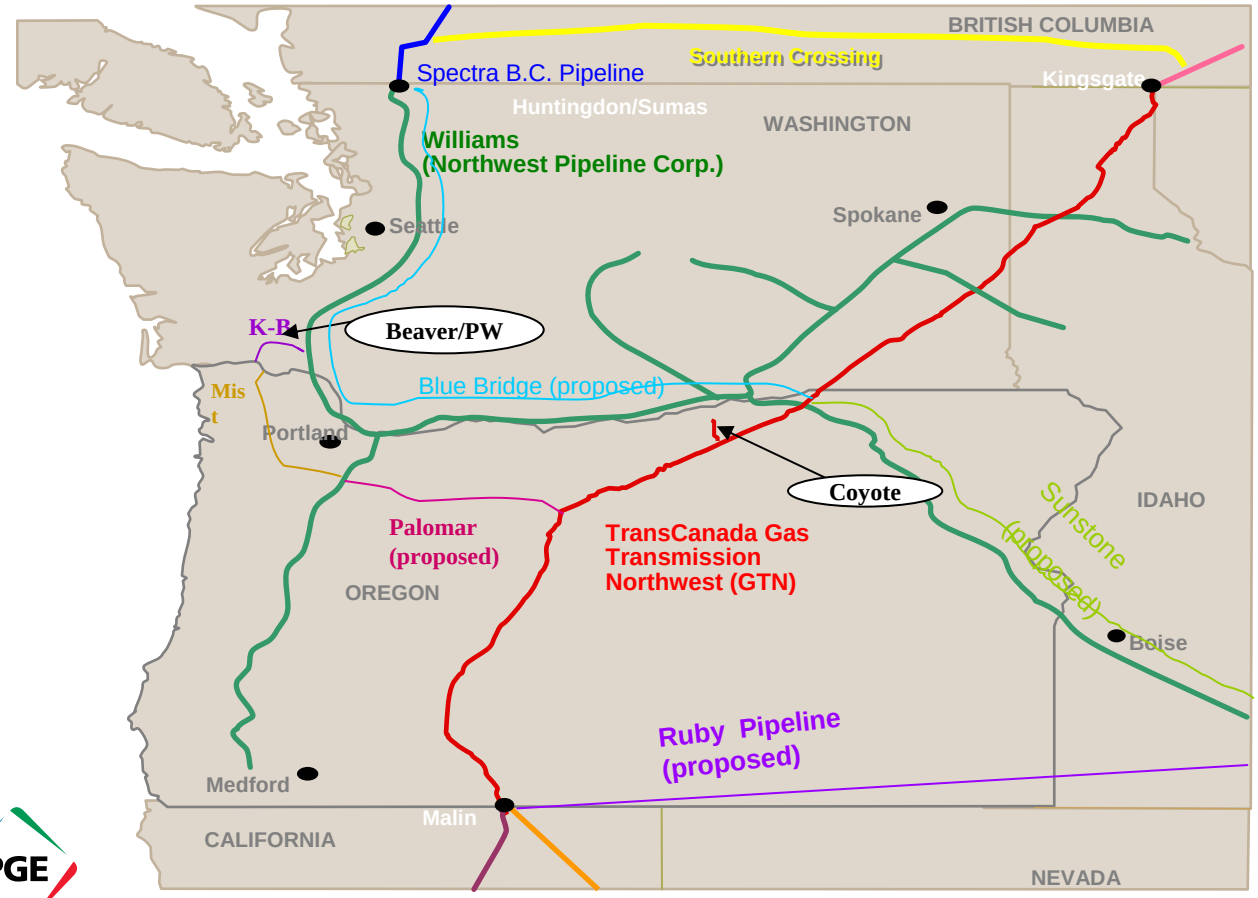
Gas Transportation & Storage

Future Supply Alternatives – Potential Expansion Projects



- Several competing projects are currently under development.
- Projects would allow additional gas supply from the Rockies to reach markets in the Pacific Northwest.
- Currently, there is not enough commitment from shippers to make any one expansion project viable.
- PGE is considering participation in one or more of the expansion projects to support IRP capacity and energy requirements.

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Gas Transportation & Storage

Strategy to Meet Future Gas Needs

- Given the changes in natural gas transportation and supply markets and the composition of PGE's generation portfolio, it is important that our natural gas portfolio be matched to meet growing requirements such as:
  - Intraday flexibility in gas scheduling to accommodate following of loads and intermittent generation
  - Supply diversity – to reduce concentration in any one particular supply basin. Currently, PGE relies on Canadian sources for 70% of its supply.
  - Term diversity – to reduce price volatility and supply reliability
  - Fueling requirements of new resource additions

- To ensure ability to fuel current and future resources, we will likely need to acquire additional rights as new transport and storage projects are being developed – timing may not always coincide with new generation.

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Gas Transportation & Storage

Fueling Strategy Short-to-Long Term

- Short-Term (year 1)
  - Hedge 100% of within year physical natural gas requirements
  - Ensure pipeline capacity is adequate to meet plant requirements
  - Utilize storage contract to provide operational flexibility
- Mid Term (years 2-5)
  - Hedge a portion of fueling requirements over 5-year period – combined power and gas
  - Purchase small portion of index priced gas over 2 years
  - Hedge financially to fix prices
  - Layered purchasing approach across 5 year term
- Long Term (> 5 years)
  - Acquire sufficient gas supplies to fuel PGE's growing power demand
    - Natural Gas Reserves (gas in ground)
    - Long-term physical supply contracts
  - Acquire pipeline capacity to accommodate growing gas portfolio
  - Contract for additional gas storage capacity to meet peaks and manage intermittent resources

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Action Plan Fulfillment

- PGE plans to issue one or more RFPs pursuant to acknowledgement of the proposed Action Plan

- PGE will include benchmark resources for energy and capacity
  - 300-to-500 MW CCCT base-load, high-efficiency natural gas resource located in Boardman area
  - Up to 200 MW of flexible, natural gas-fired capacity resources located near the Port Westward generating project site
  - A 330-to-385 MW wind farm located in one or more of Sherman, Jefferson or Umatilla counties

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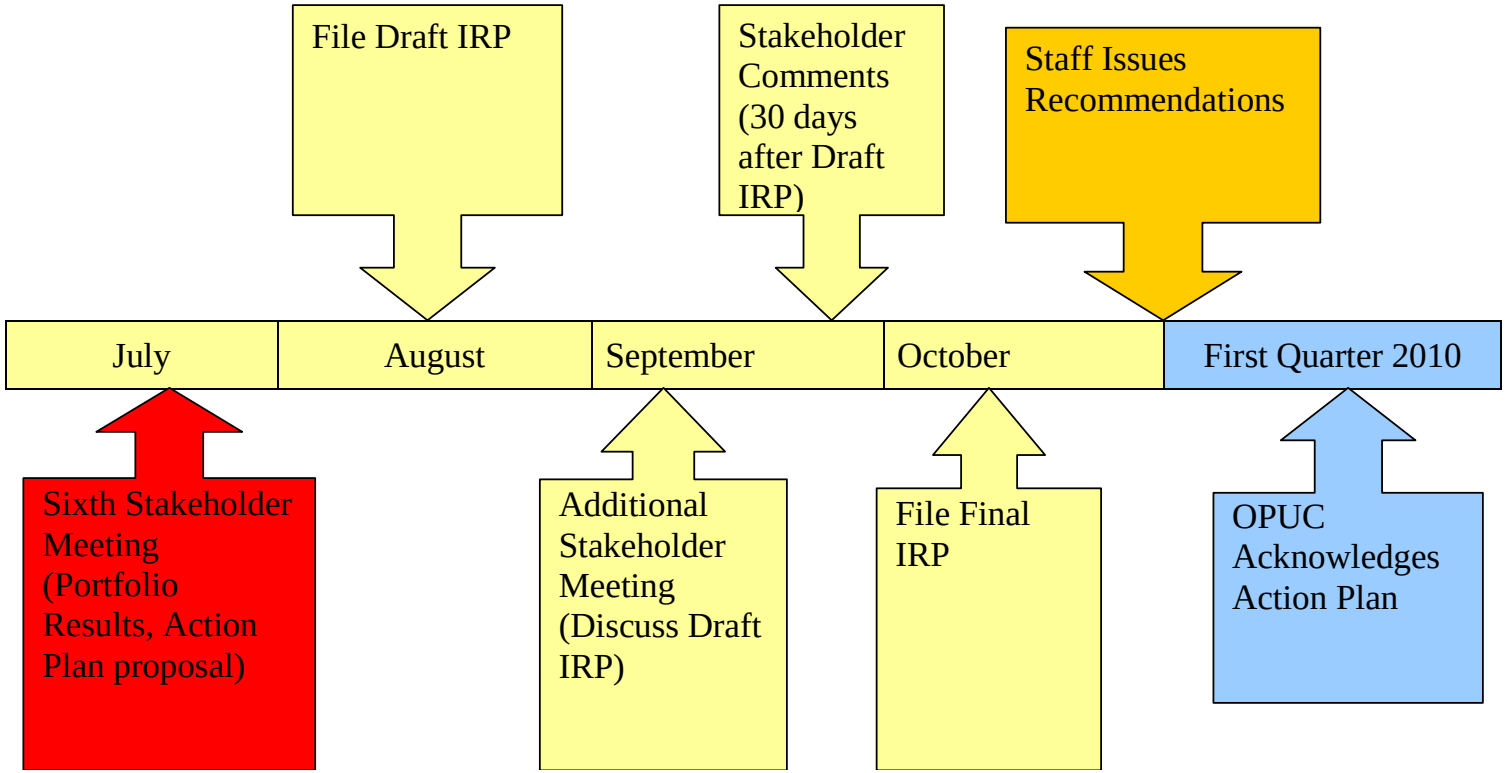
IRP Remaining Schedule

- File Draft IRP – August
- Conduct Additional Stakeholder Meeting after draft IRP filing
- Stakeholder comments – 30 days after Draft IRP filing
- Final IRP filed – 60 days after Draft IRP



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2009 PGE IRP

Please call if you have additional questions or feedback.

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Thank You!

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