Comments on
PGE 2009 Integrated Resource Plan

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Conclusions (1)

Spending $500 million on emissions controls at Boardman creates excessive uncertainty and risk for PGE ratepayers

- **Uncertainty as to the greenhouse gas emissions reductions that ultimately will be required as a result of federal, state or regional action and the timing and cost of compliance with likely future greenhouse gas regulations.**
- **Uncertainty about the impact of more stringent air emissions regulations and the cost of managing and storing coal combustion wastes.**
- **Uncertainty whether projected loads and energy sales will materialize.**
- **Uncertainty as to future coal prices and whether there will be supply disruptions that will affect plant performance and fuel prices.**
- **Uncertainty about the role that the Boardman plant will play as a baseload unit in the future.**

Conclusions (2)

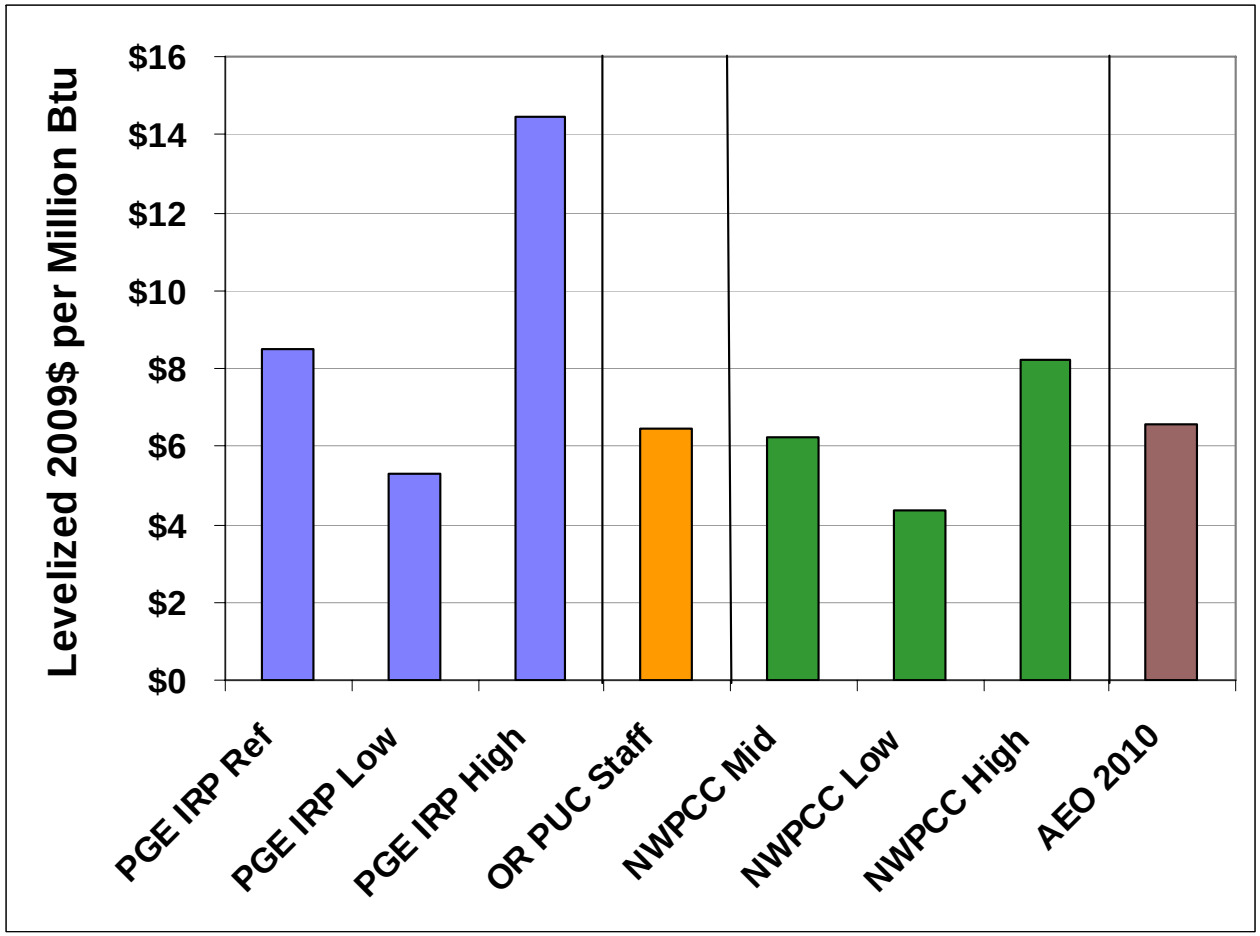
In light of these significant uncertainties, it would be better for the Company to adopt a resource plan that allows it to avoid large capital expenditures for the Boardman plant while offering the flexibility to modify course as circumstances change.

Our Recommendations:

1. The Commission should not approve PGE's requested expenditures for emissions controls for the Boardman coal plant.
2. The Commission should not approve PGE's recommended Action Plan which would allow the continued operation of the Boardman plant through the end of 2020.
3. The Commission should not approve PGE's alternate Action Plan that would allow PGE the option of continuing to operate the Boardman plant through 2040.

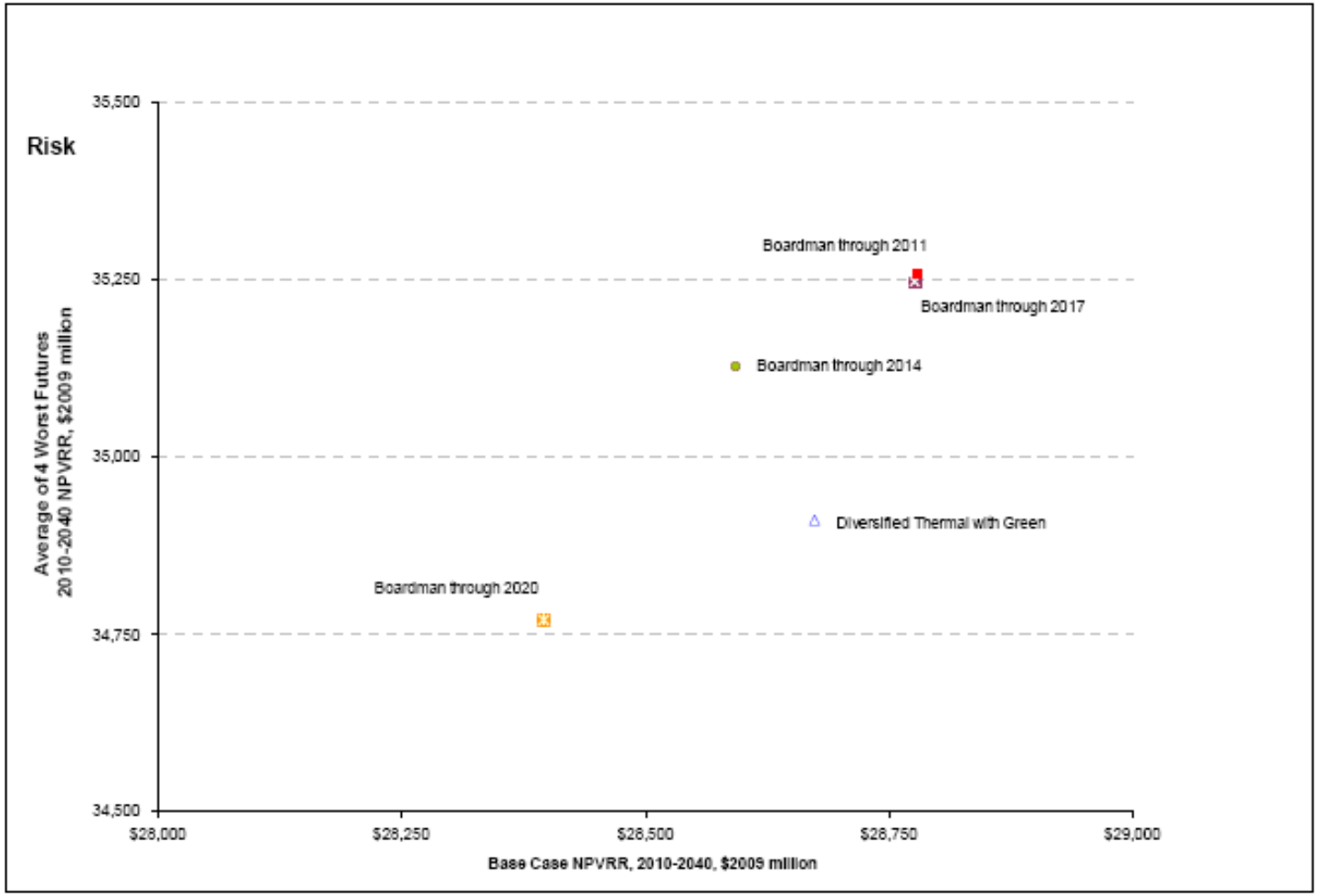
PGE IRP Gas Prices Unreasonably High

Figure 1: Natural Gas Prices Used in IRP Modeling Analyses vs. NWPCC, Oregon PUC Staff, AEO 2010 and NYMEX Futures (Levelized in 2009$)



Unreasonably High Gas Prices Distorted Reference Case and Risk Assessments (1)

Figure 12A-1: Efficient Frontier for Boardman Portfolios

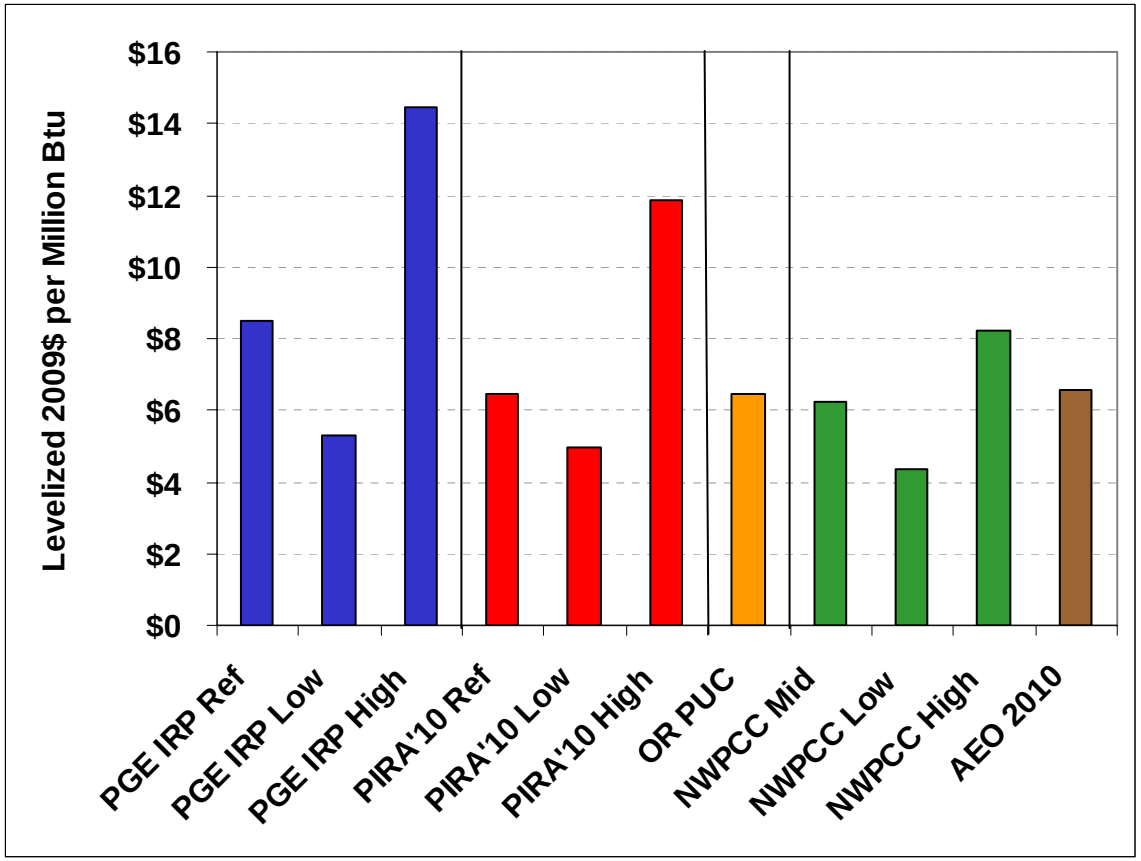


Unreasonably High Gas Prices Distorted Reference Case and Risk Assessments (2)

- **Four worst performing futures for Boardman through 2014 portfolio (in 2009$ Millions)**
  - **Low Coal – High Gas - $65 CO_2 per ton - $39,942**
  - **High Gas - $36,175**
  - **CO_2 $65 per ton - $32,596**
  - **High PGE Load Growth - $31,792**

New Projected Gas Prices are Significantly Lower

Figure 4: 2010 PIRA Natural Gas Price Forecasts vs. The Gas Prices Used in IRP Modeling Analyses and the NWPCC, Oregon PUC Staff, AEO 2010 and NYMEX Futures Prices (Levelized in 2009$)



PGE Assumption of Replacement Capacity

- **PGE arbitrarily assumed that Boardman would be replaced by gas-fired CC.**
- **PGE did not evaluate whether CC was the lowest cost, lowest risk option as replacement.**
- **PGE did not consider mid- or long-term PPA as part of a portfolio of alternatives to continued operation of Boardman.**
- **Assumption that PGE added a new CC in 2015 biased the analysis in favor of portfolios with longer Boardman operation due to heavily front-loaded rate impact of new plant investment.**

Excess Gas-Fired Capacity in NW

Table 1: Pacific Northwest Combined Cycle Capacity Factors in 2007 and 2008.[14]

Name	Technology	Primary Fuel	Installed Capacity (MW)	Initial Service Year	State	2007 Capacity Factor	2008 Capacity Factor
Beaver 1 - 7	CC	NG	586.2	1974	OR	7.10%	2.83%
Big Hanaford CC1A-1E	CC	NG	322.0	2002	WA	12.55%	11.07%
Chehalis Generating Facility	CC	NG	593.3	2003	WA	36.32%	40.96%
Coyote Springs 1	CCCG	NG	266.4	1995	OR	61.64%	64.61%
Coyote Springs 2	CC	NG	287.0	2003	OR	64.53%	67.47%
Encogen 1-4	CCCG	NG	176.4	1993	WA	11.73%	6.32%
Frederickson Power 1	CC	NG	318.3	2002	WA	32.27%	39.27%
Goldendale CC 1A & 1B	CC	NG	280.3	2004	WA	28.29%	55.04%
Grays Harbor Energy Facility (Satsop)	CC	NG	650.0	2008	WA	0.00%	14.37%
Hermiston Generating Project CC2A & 2B	CCCG	NG	234.5	1996	OR	55.47%	59.19%
Hermiston Power Project	CCCG	NG	689.4	2002	OR	50.97%	61.60%
Klamath Cogeneration Project	CCCG	NG	501.5	2001	OR	55.41%	69.10%
Lancaster (Rathdrum Generating Station)	CC	NG	270.0	2001	ID	53.93%	57.90%
March Point 1 - 4	CCCG	NG	167.0	1991	WA	69.32%	69.91%
Mint Farm	CC	NG	319.0	2008	WA	0.00%	25.71%
Port Westward CC1A & 1B	CC	NG	399.0	2007	OR	49.27%	81.08%
River Road Generating Plant	CC	NG	248.0	1997	WA	70.04%	74.40%
Sumas Cogeneration Station	CCCG	NG	125.5	1993	WA	20.64%	19.67%
Tenaska Washington Partners Cogeneratio	CCCG	NG	253.4	1994	WA	32.52%	27.53%

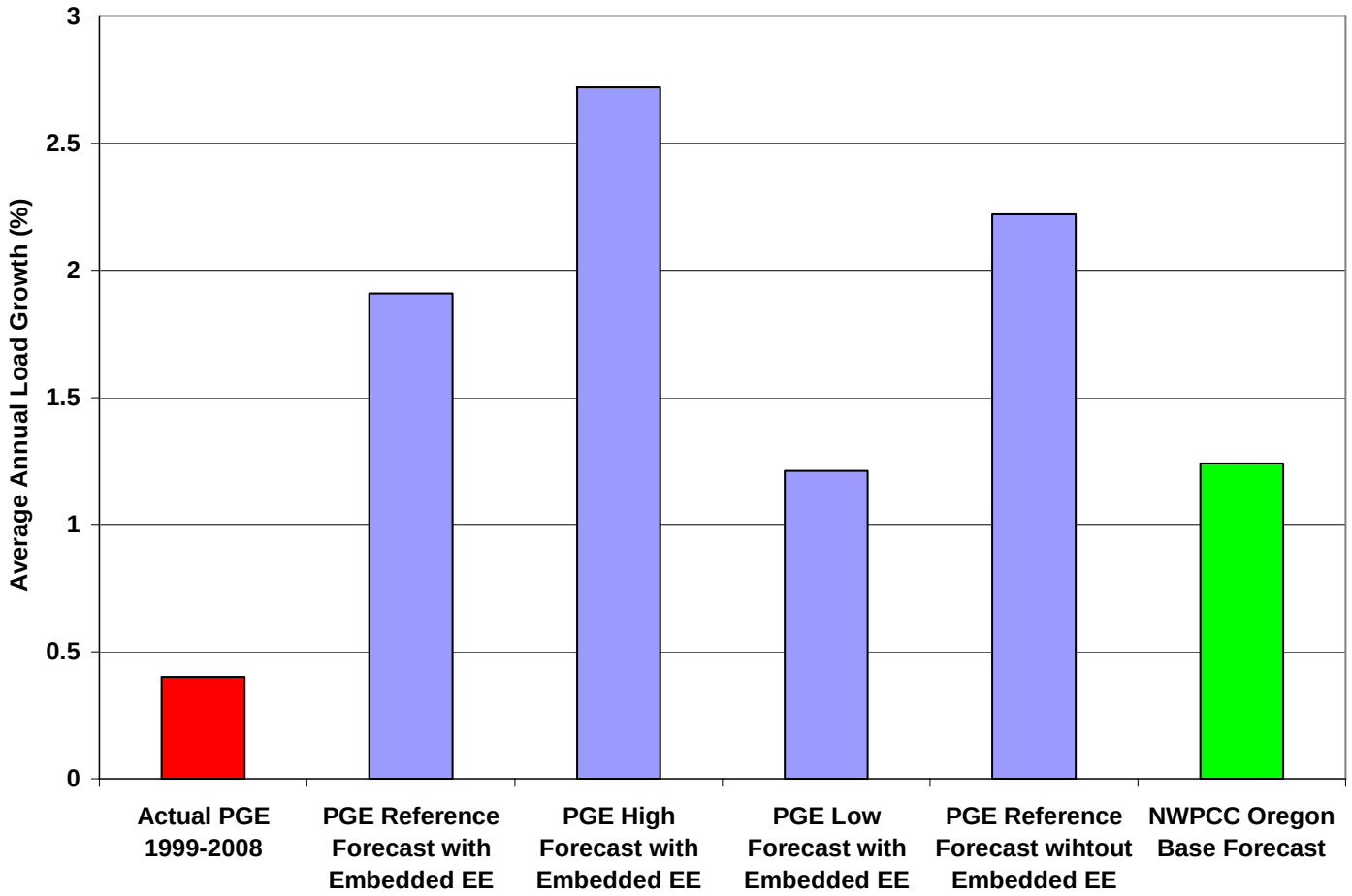
Historic PGE Energy Sales and Peak Loads

Table 2: PGE Historical Sales and Peak Loads from 1999 through 2008

Portland General Electric Company
TEN-YEAR SUMMARY
SELECTED STATISTICS

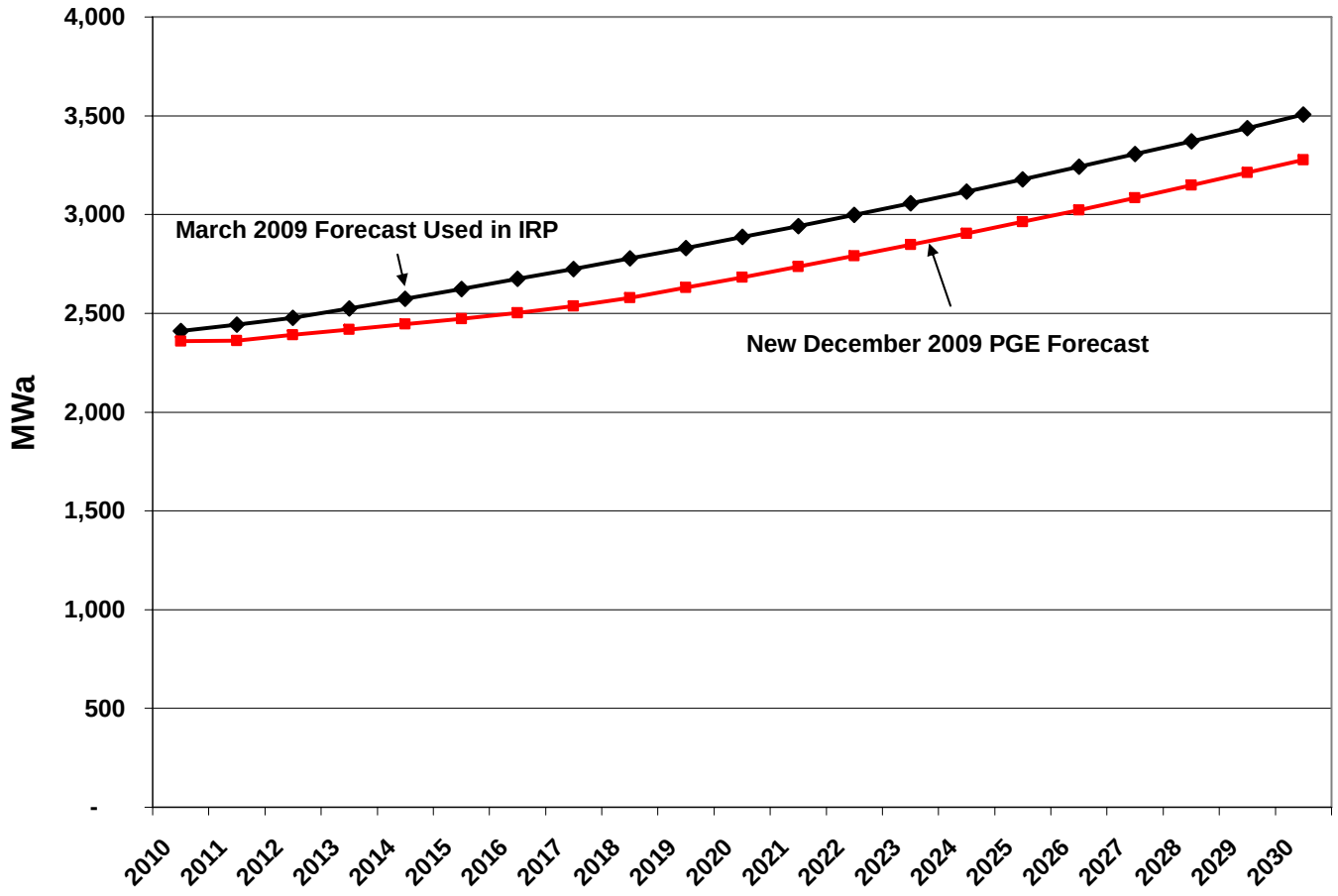
	Oregon Total[A]						Residential Averages in Oregon			
	Revenue From Retail Energy Customers	Energy Sold to Retail Customers (MWh)[B]	Delivery to ESS Customers (MWh)[B]	Average[D] Number of Customers	Revenue Per kWh (Cents)		Number of Customers	Revenue Per kWh (Cents)	Per Customer Revenue	Per Customer kWh
1999	$973,326,617	19,258,992	NA	714,130	5.05		627,396	5.90	$697	11,802
2000	$1,038,204,378	19,872,544	NA	728,039	5.22		637,331	6.02	$702	11,883
2001	$1,096,155,658	19,040,188	NA	733,068	5.76		643,596	6.59	$725	11,001
2002	$1,384,322,786	18,771,884	0	741,949	7.37		649,674	8.05	$874	10,864
2003	$1,283,136,445	18,425,854	0	750,498	6.96		658,232	7.82	$844	10,785
2004	$1,262,880,182 [C]	17,764,138	775,878	762,336	7.11	[E]	668,830	8.05	$875	10,870
2005	$1,264,877,648 [C]	17,540,047	1,213,906	775,533	7.21	[E]	680,093	8.10	$872	10,768
2006	$1,361,008,240 [C]	18,432,527	996,574	788,831	7.38	[E]	691,931	8.29	$907	10,944
2007	$1,439,248,223 [C]	17,461,742	2,164,687	800,587	8.24	[E]	701,952	9.31	$1,020	10,953
2008	$1,483,317,814	17,575,806	2,417,316	811,315	8.44		710,991	9.62	$1,066	11,080

PGE Load Forecasts Not Consistent with NWPCC



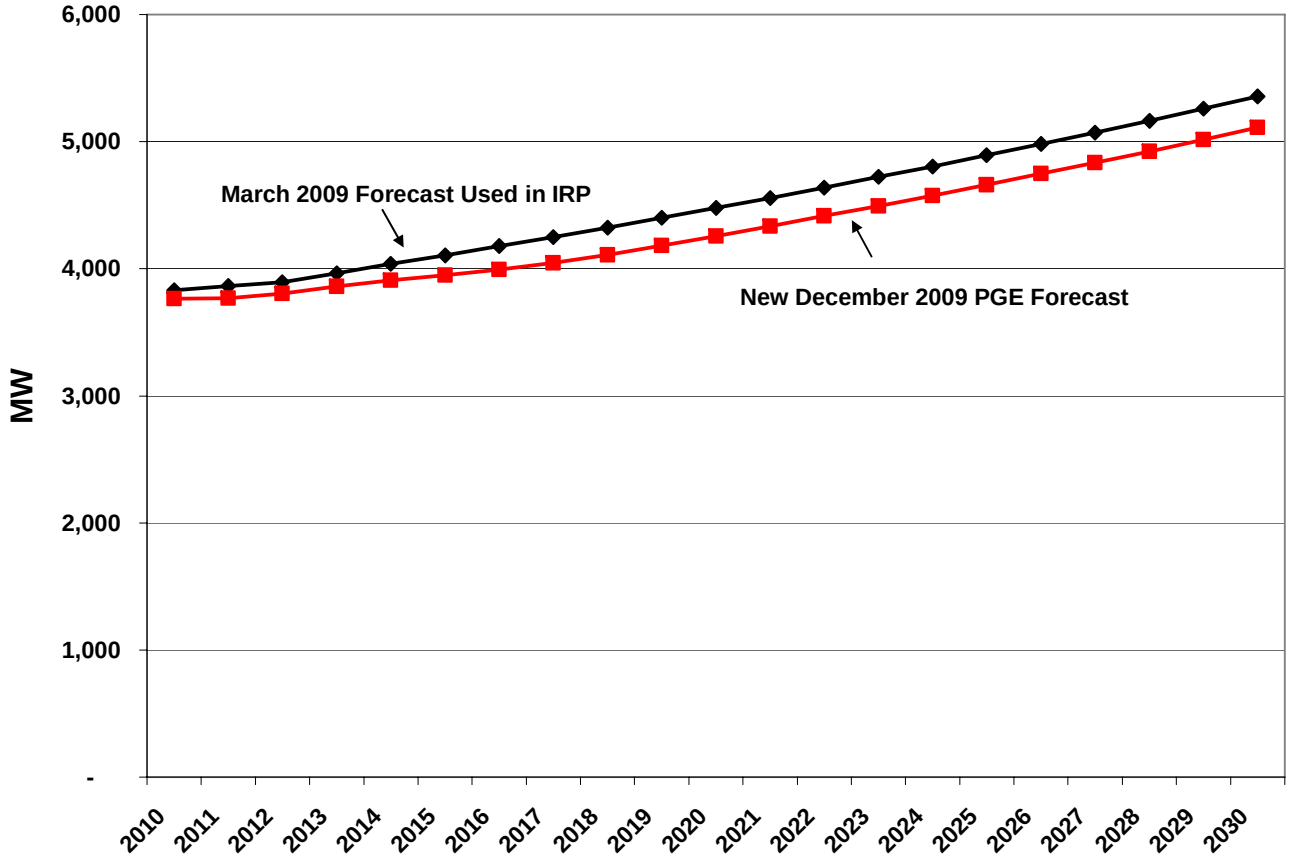
New PGE Energy Forecasts are Lower than IRP Forecasts

Figure 7.a: PGE March 2009 Energy Forecast Used in IRP vs. Company's December 2009 Forecast



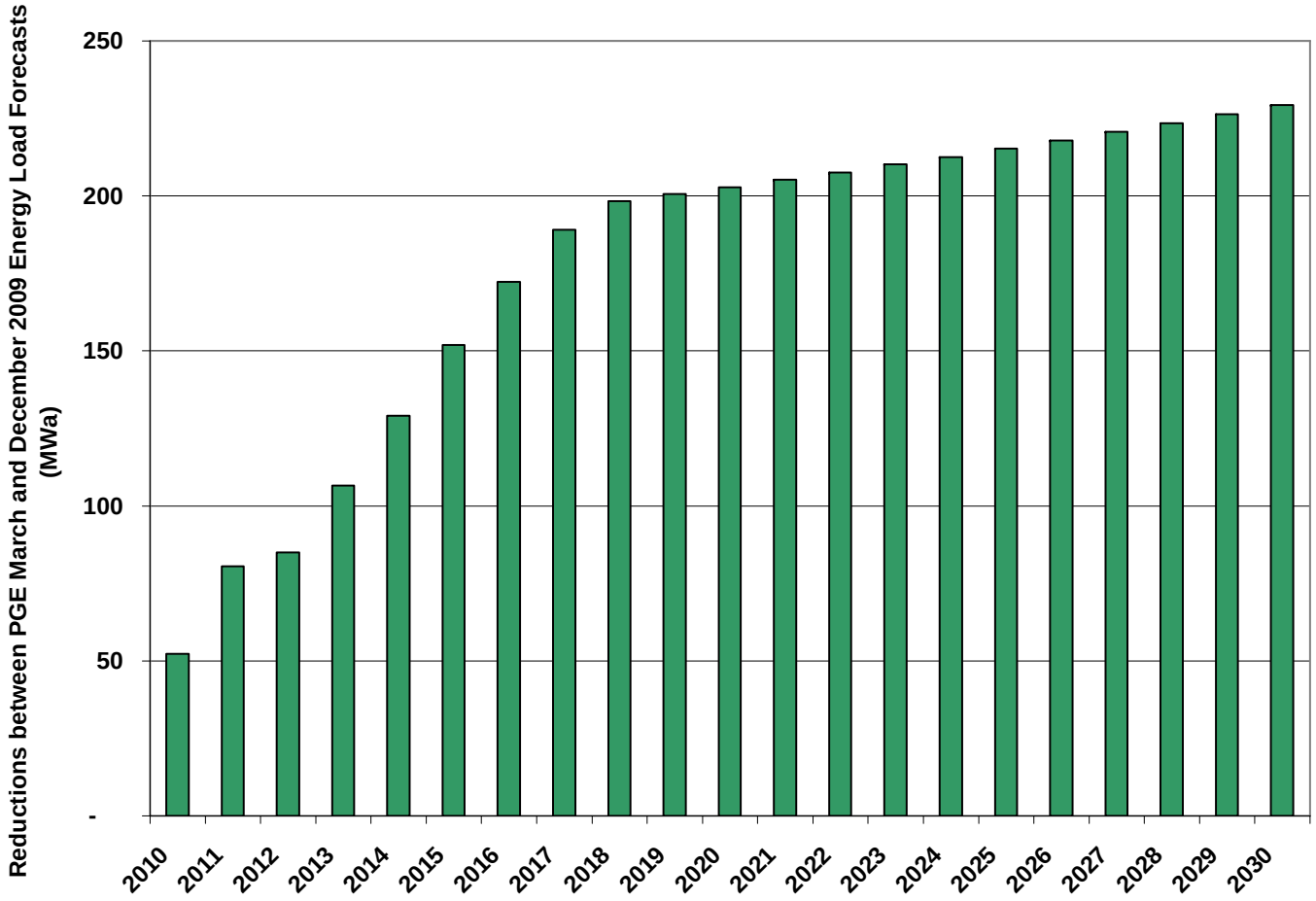
New PGE Peak Forecasts are Lower than IRP Forecasts

Figure 7.b.: PGE March 2009 Peak Load Forecast Used in IRP vs. Company's December 2009 Forecast



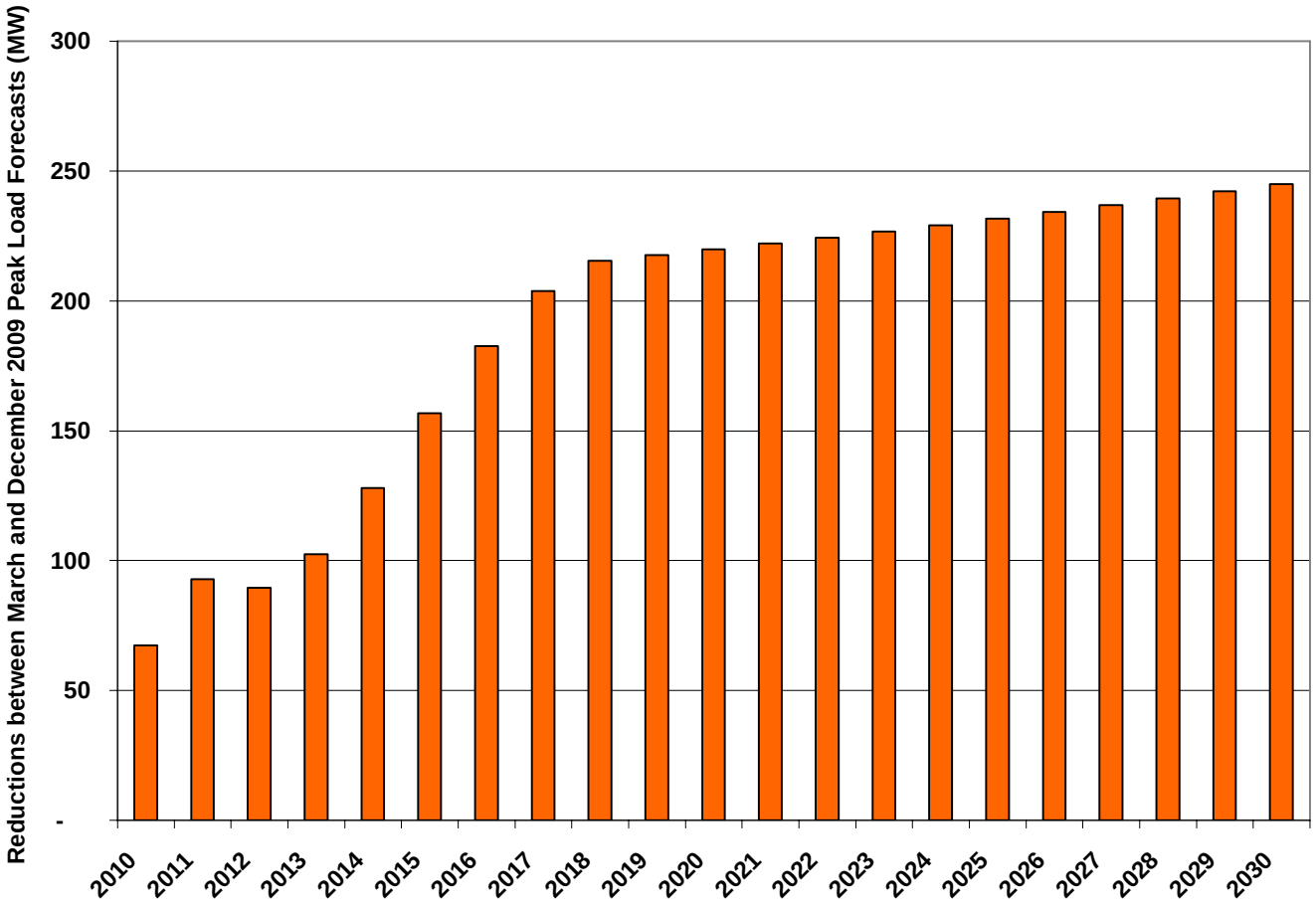
Reductions in Recent PGE Energy Load Forecasts

Figure 8.a.: Annual Reductions in PGE Energy Load Forecasts between March 2009 Forecast Used in IRP and December 2009 Forecast



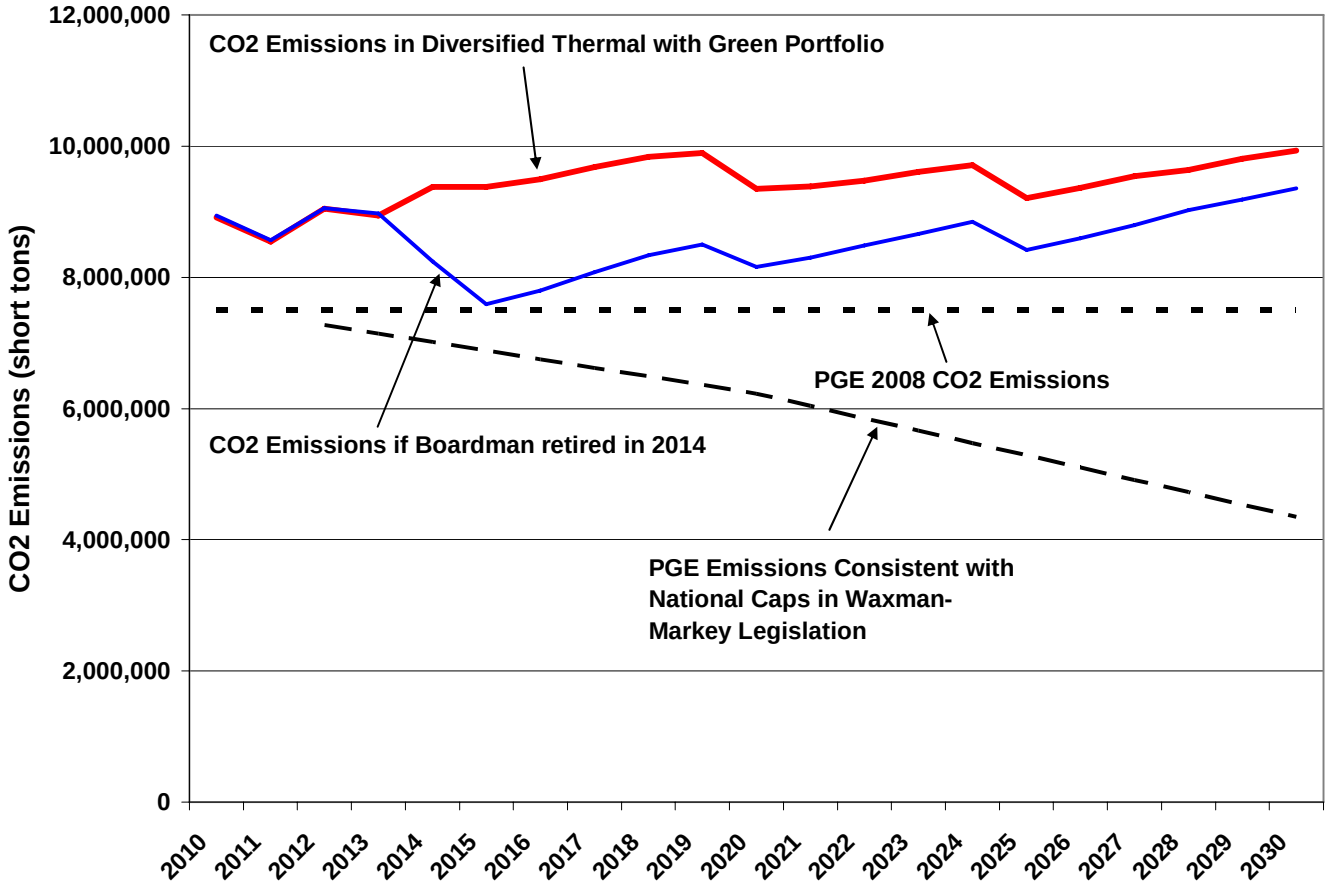
Reductions in Recent PGE Peak Load Forecasts

Figure 8.b.: Annual Reductions in PGE Peak Load Forecasts between March 2009 Forecast Used in IRP and December 2009 Forecast



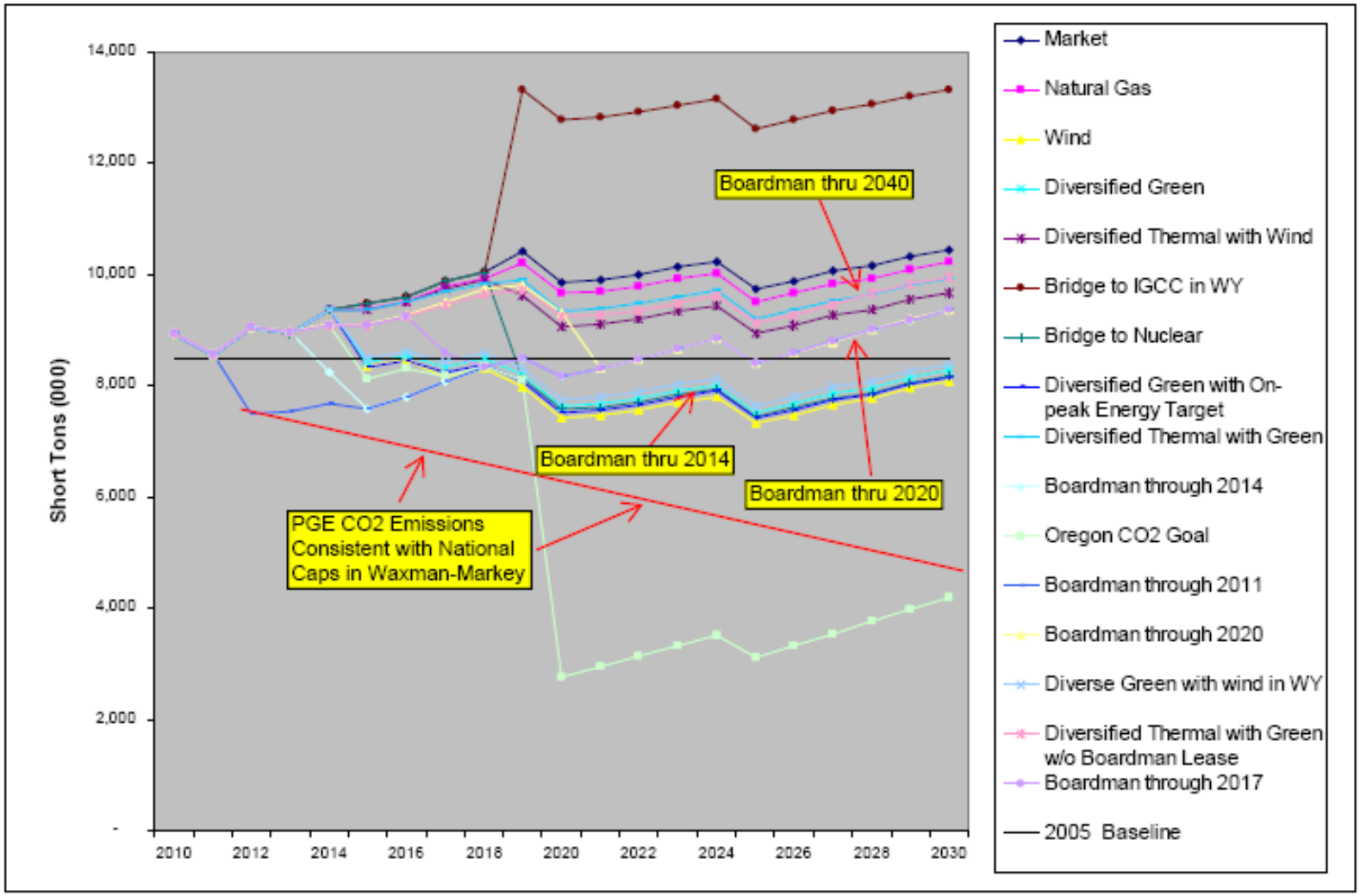
PGE Projected Annual CO_2 Emissions (1)

Figure 9: Annual PGE CO_2 Emissions in Diversified Thermal with Green and Boardman through 2014 Portfolios with Reference Case CO_2 Prices



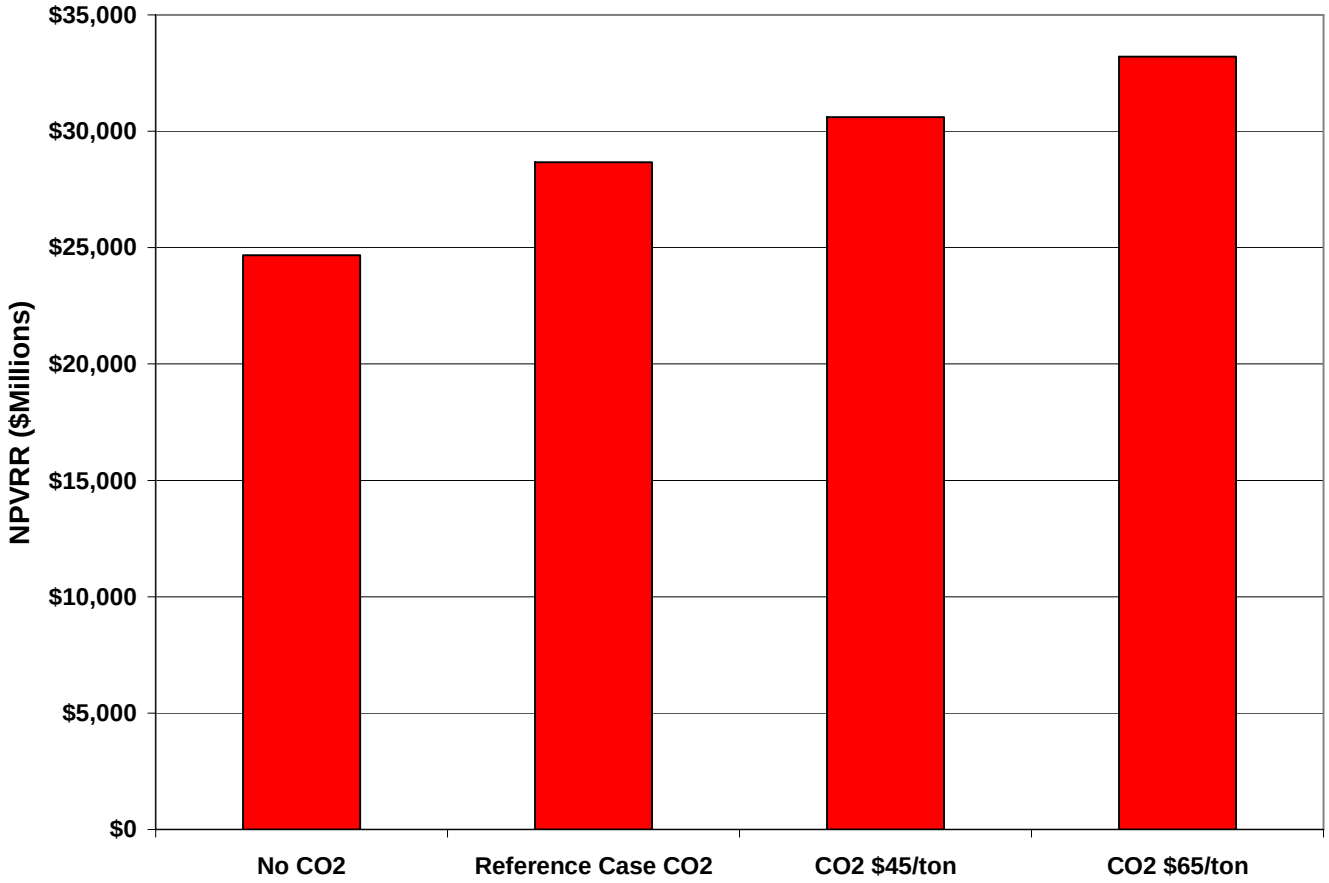
PGE Projected Annual CO_2 Emissions (2)

Figure 11A-16: 2010-2030 Reference Case CO_2 Emissions in Short Tons by Portfolio



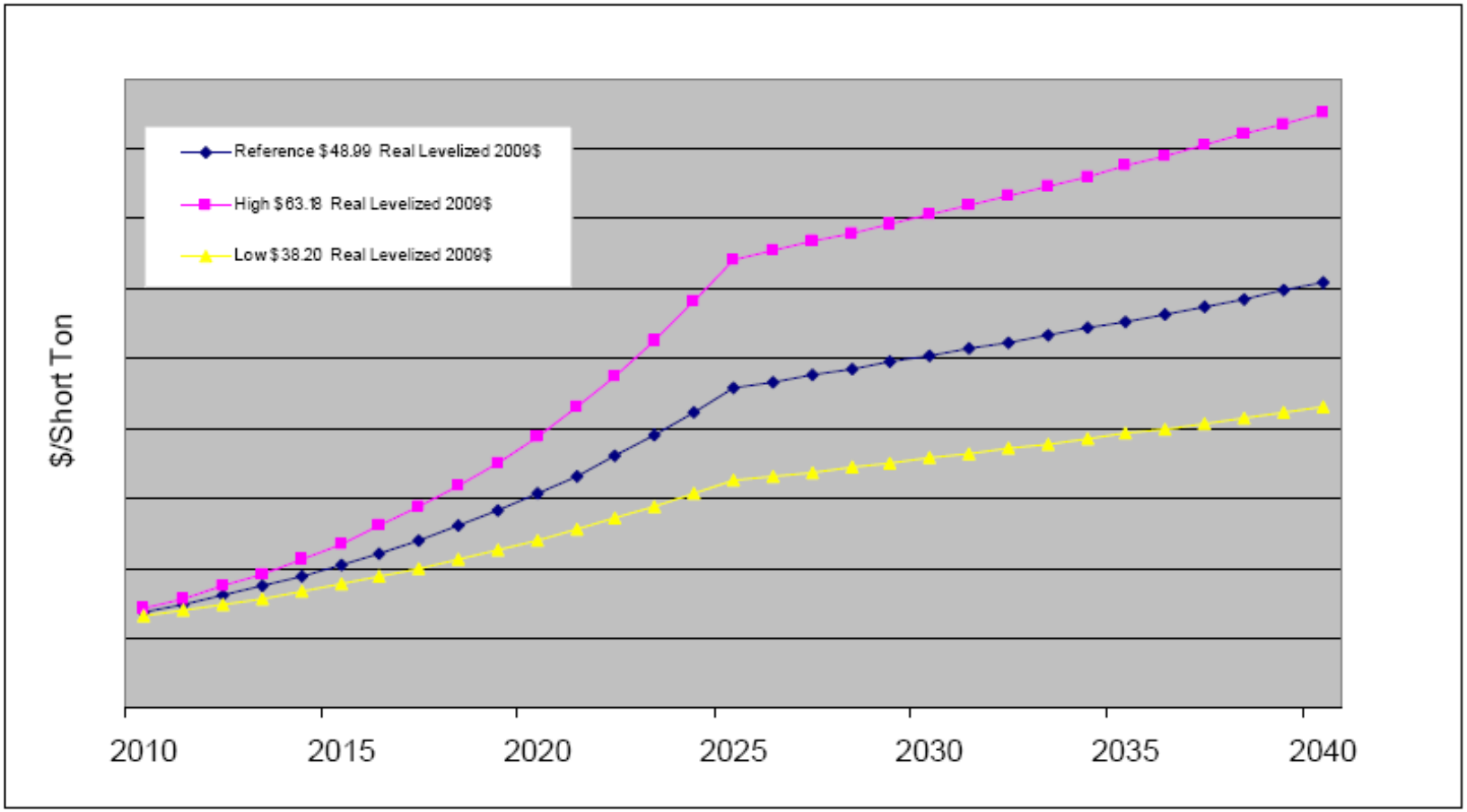
Ratepayer Risk Exposure to CO_2 Costs from Continued Operation of Boardman through 2040

Figure 11: NPVRR of Diversified Thermal with Green Portfolio in PGE CO_2 Price Scenarios



PGE Coal Price Forecasts – What Happened to the High Forecast?

Figure 5-2: PRB 8,400 Btu/lb. Low Sulfur Delivered Coal, Nominal $/ Short Ton



Electric System Reliability

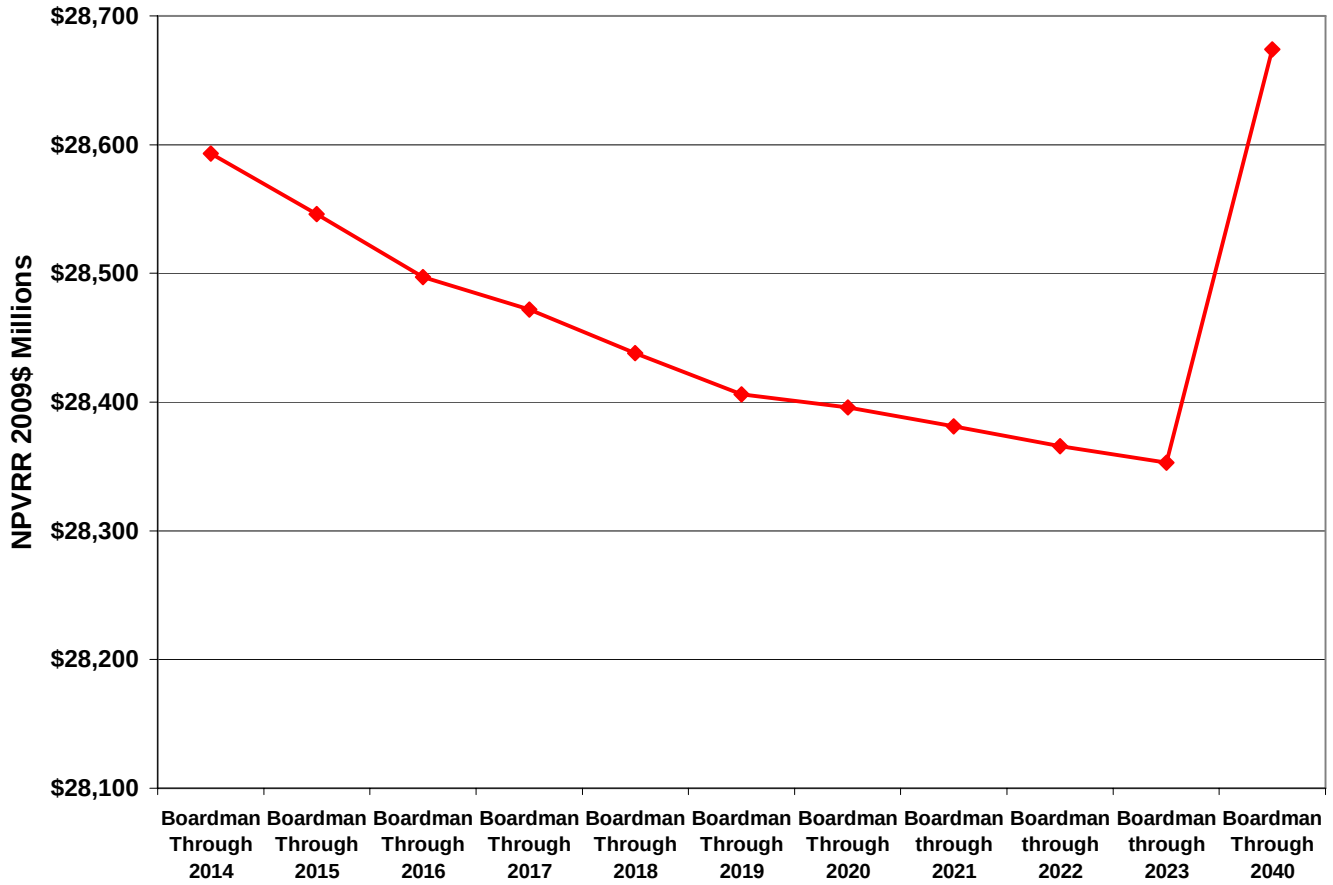
- **PGE has not shown that the retirement of the Boardman plant as early as 2014 would adversely affect the reliability of the electric grid in Oregon or its ability to provide reliable service to its customers.**
- **PGE limited its assessment of reliability to whether it would need to purchase power from the market and not to whether it would be unable to do so or would, in any way, be unable to provide power to its customers.**
- **PGE measures show relatively same "reliability" whether Boardman retired in 2014, 2020 or 2040.**

Fuel Diversity

- **Fuel diversity important consideration.**
- **PGE has not shown that the HHI differences presented in IRP are in any way meaningful.**
- **Each of the Boardman retirement portfolios has the high HHIs shown in IRP precisely because PGE failed to consider any alternative in place of Boardman other than adding a new combined cycle gas-fired unit. Could have had lower HHIs if more EE or renewable resources included.**
- **PGE methodology does not make sense – portfolios with lowest HHIs are those with investments in riskiest technologies or most dependent on the market.**

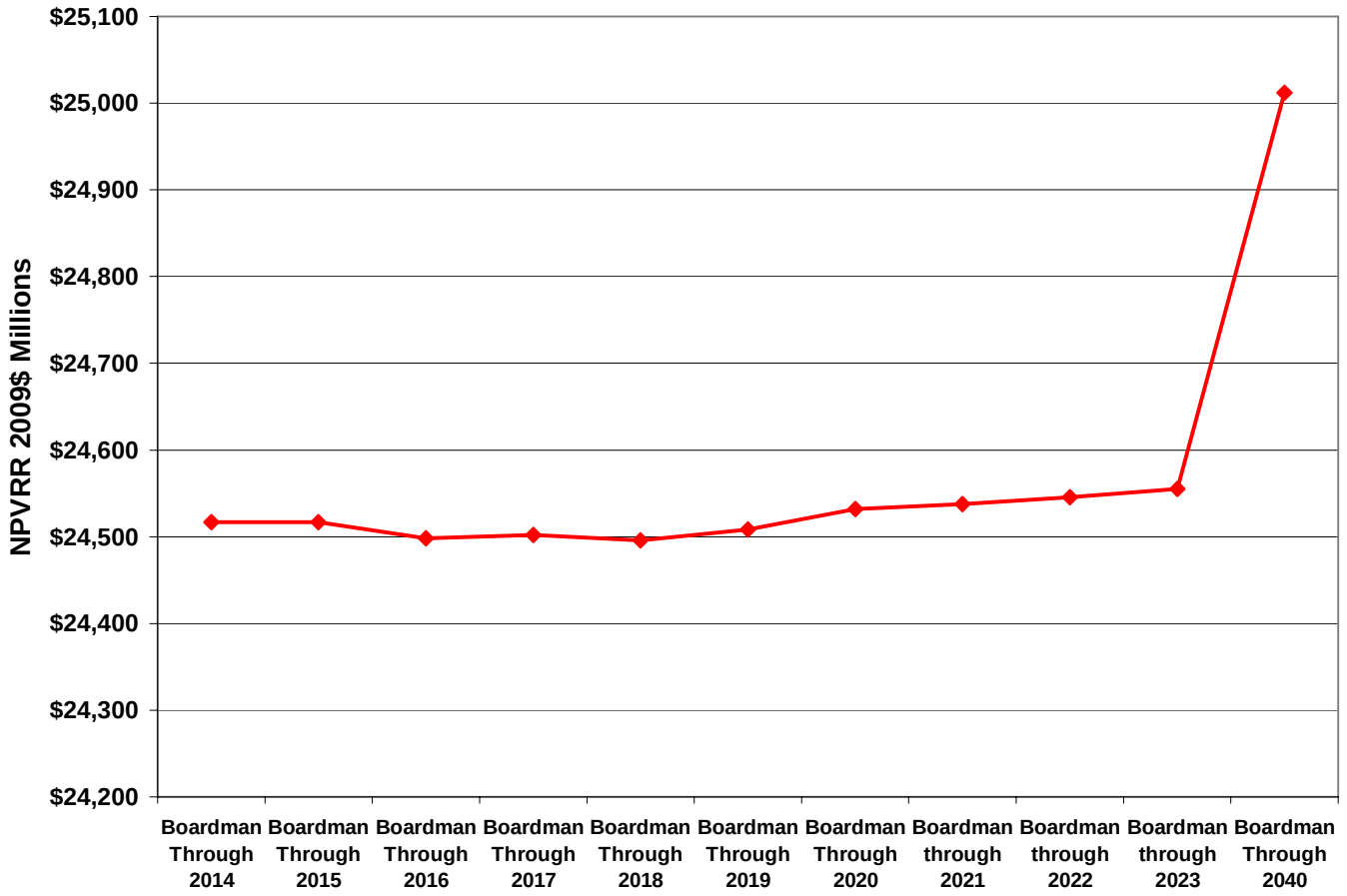
NPVRR Boardman Portfolios – Reference Case Gas Prices

Figure 12: NPVRR of Early Retirement and Boardman through 2040 Portfolios with PGE Reference Case Gas Prices



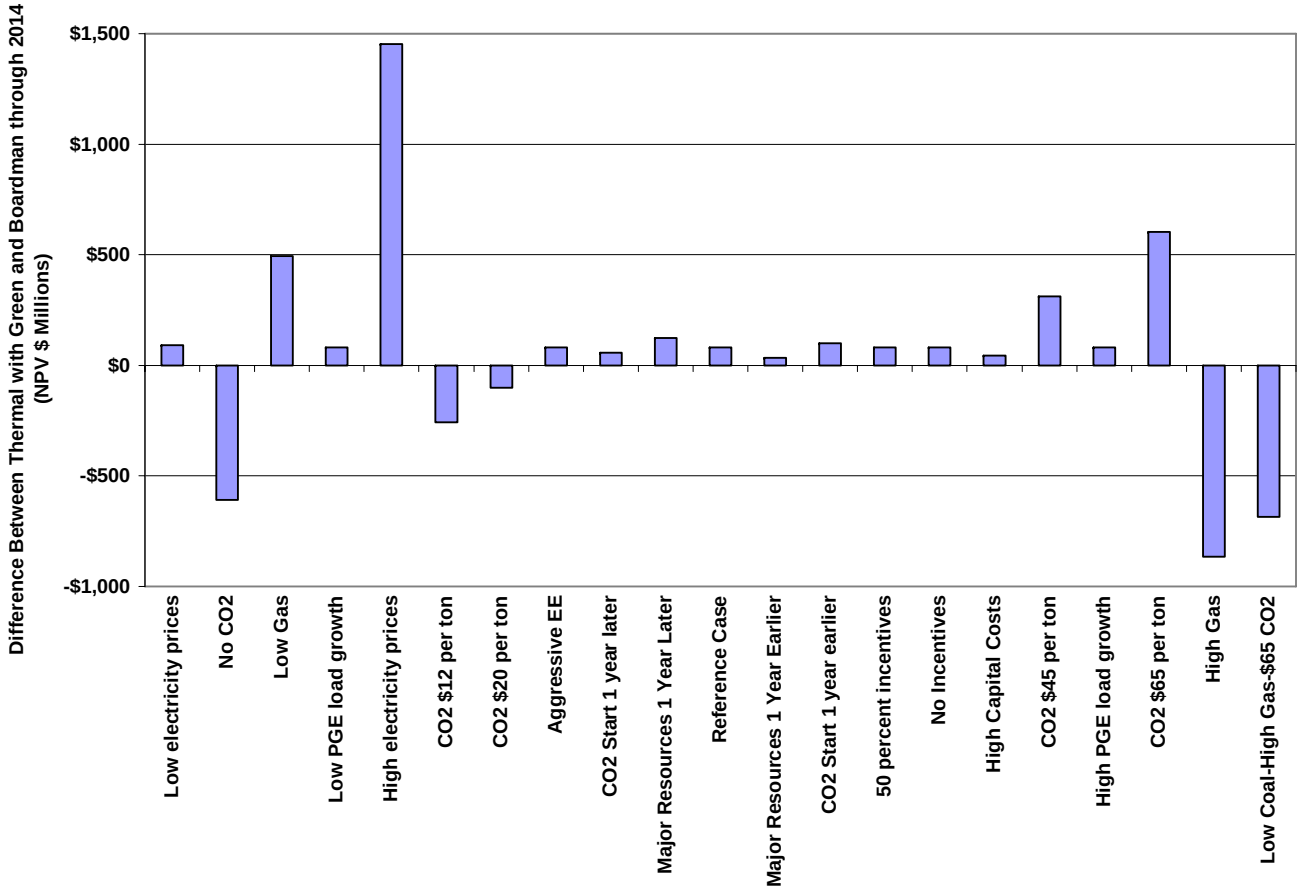
NPVRR Boardman Portfolios – PGE Low Gas Prices

Figure 13: NPVRR of Early Retirement and Boardman through 2040 Portfolios with PGE Low Case Gas Prices



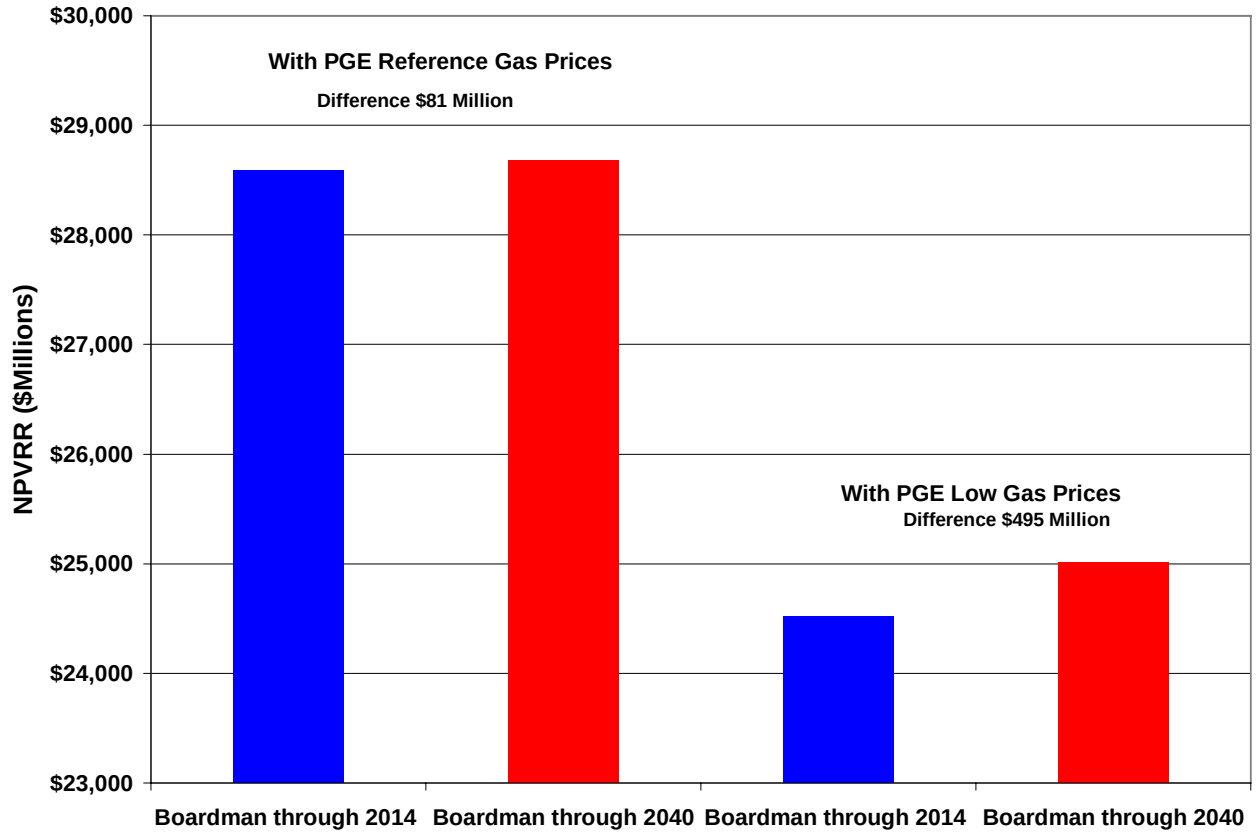
Boardman through 2014 Less Expensive than Boardman through 2040 in 16 Futures

Figure 14: NPVRR Difference between PGE Diversified Thermal with Green and Boardman through 2014 Portfolios (2009$ Millions)



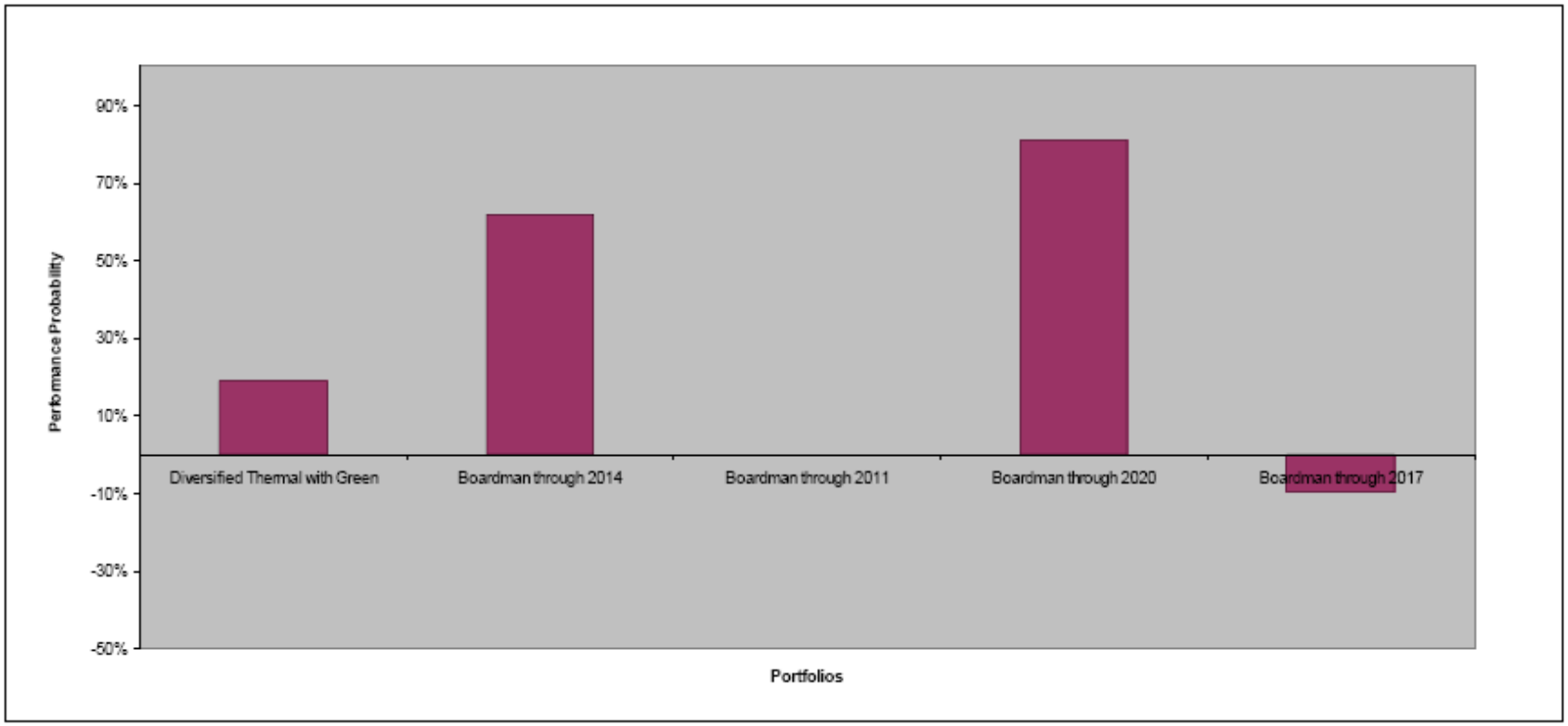
NPVRR Benefit of Boardman through 2014 with PGE Reference and Low Gas Prices

Figure 15: Net Present Value Revenue Requirement Benefit to Retiring Boardman in 2014 as Compared to Operating the Plant through 2040 with PGE Reference and Low Gas Prices



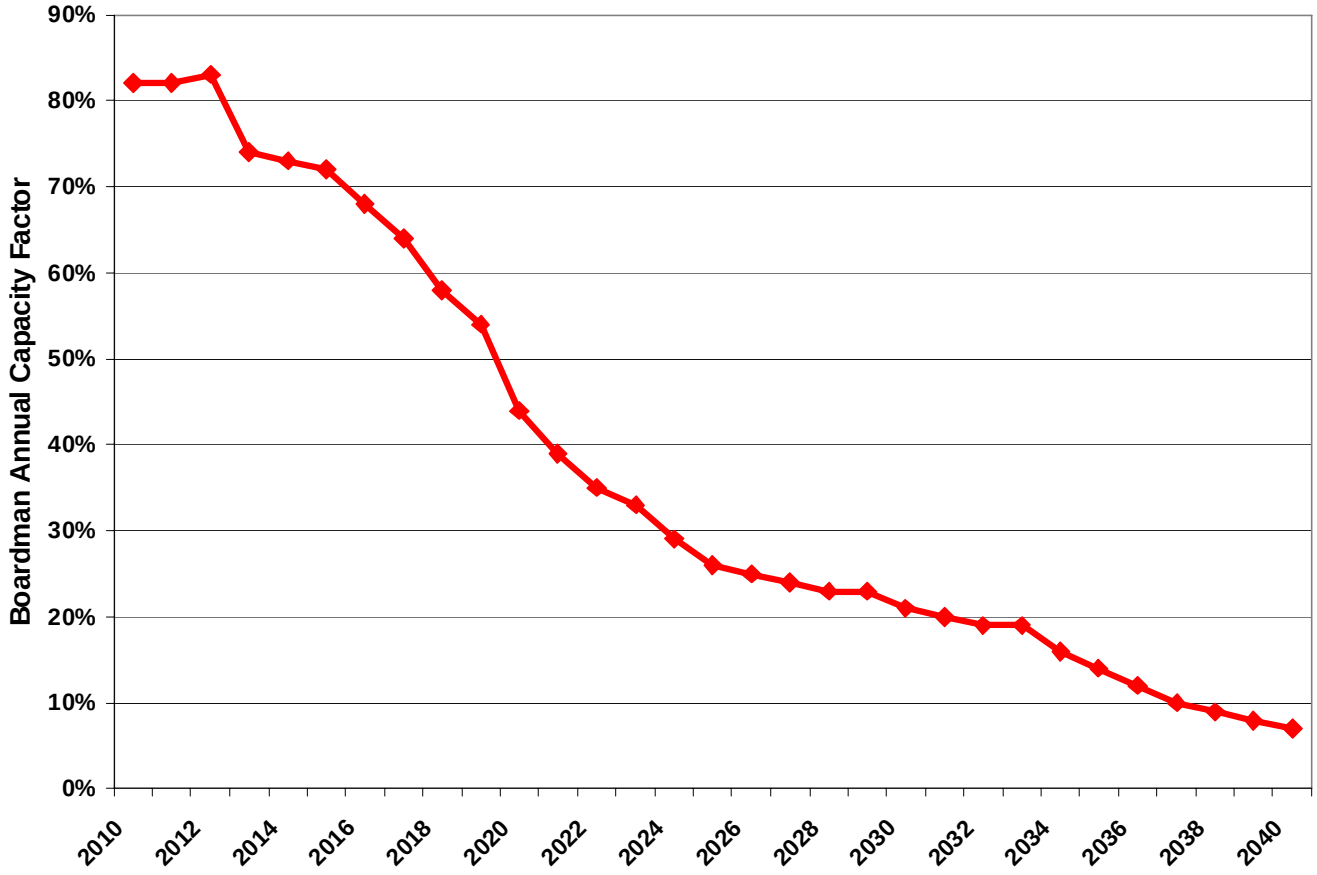
PGE Risk Assessment of Boardman Portfolios

Figure 12A-2: Combined Probability of Good and Bad Outcomes for Boardman Portfolios



By 2020 Boardman No Longer a Baseload Unit in PGE Reference Case Analysis

Figure 16: Boardman Capacity Factors 2010-2040 in Diversified Thermal with Green Portfolio



Boardman through 2014 vs. Boardman through 2020

Figure 17: NPVRR Differences between PGE Boardman through 2014 and Boardman through 2020 Portfolios (2009$ Millions)