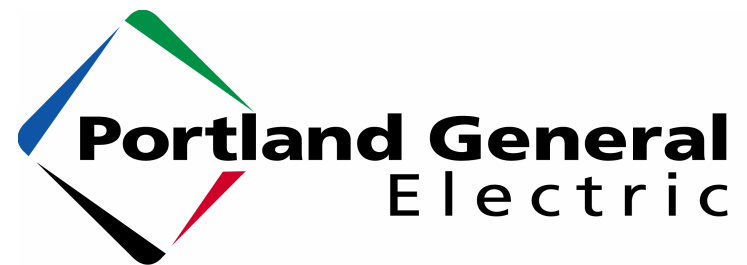


2009 Integrated Resource Plan



Boardman 2020 Alternative

March 15, 2010

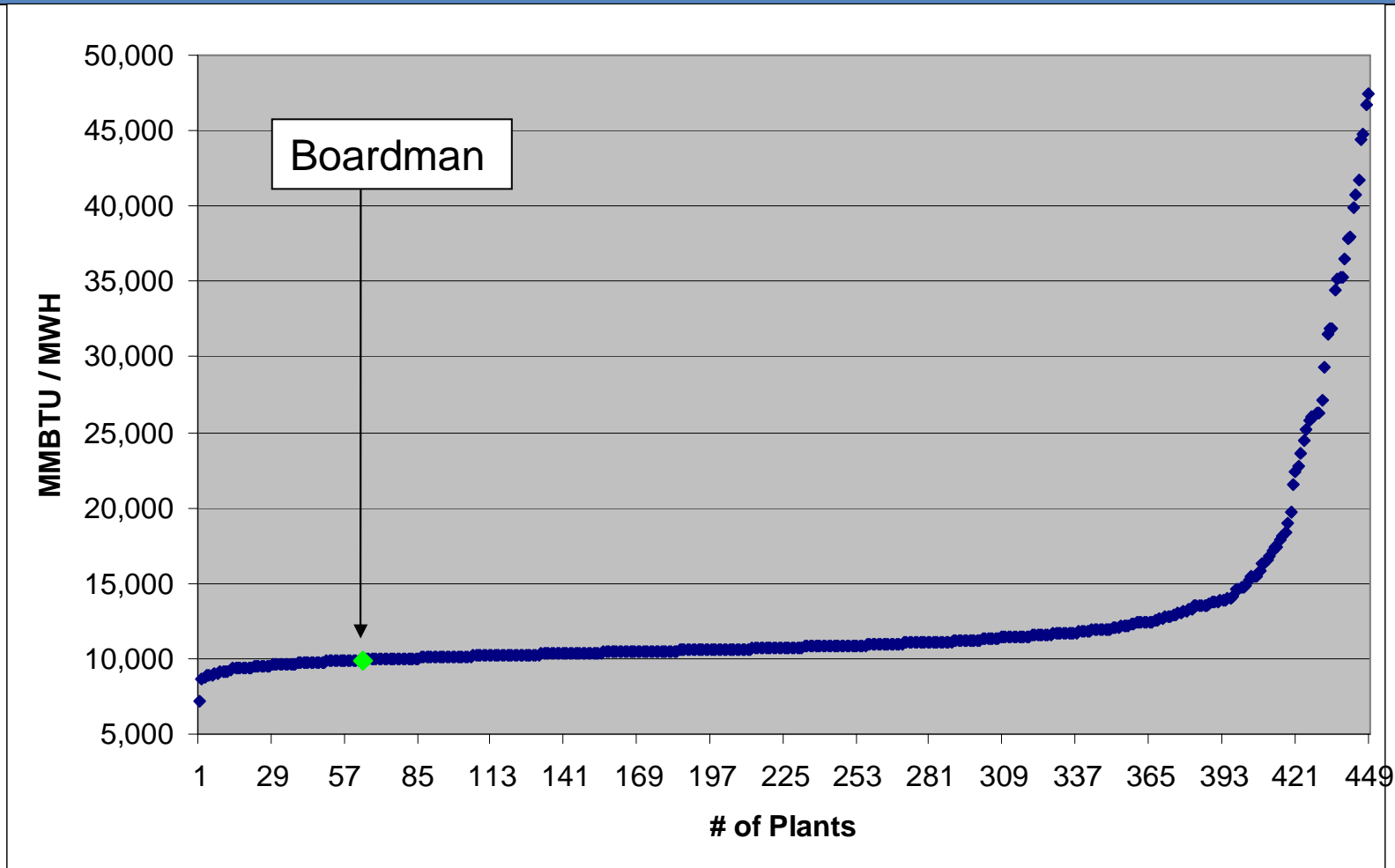


2020 Vision for Boardman

A 2020 plan for Boardman would be the most sustainable option for Oregon and our customers:

- The 2020 plan balances cost and risk, as well as impacts to the environment, Boardman community and employees.
- Saves customers about \$200 million (\$2009) NPVRR through 2040.
- Saves customers over \$600 million over the next 11 years as compared to 2014 closure.
- Meets or exceeds environmental goals.
- Gives PGE a reasonable timeframe to build or buy cost-effective and reliable replacement resources.
- Allows time for workers at the plant to transition to other jobs.
- Sets an important national precedent by eliminating the use of coal at a relatively young baseload plant 20 years ahead of schedule.

US Coal Fleet Heat Rate*

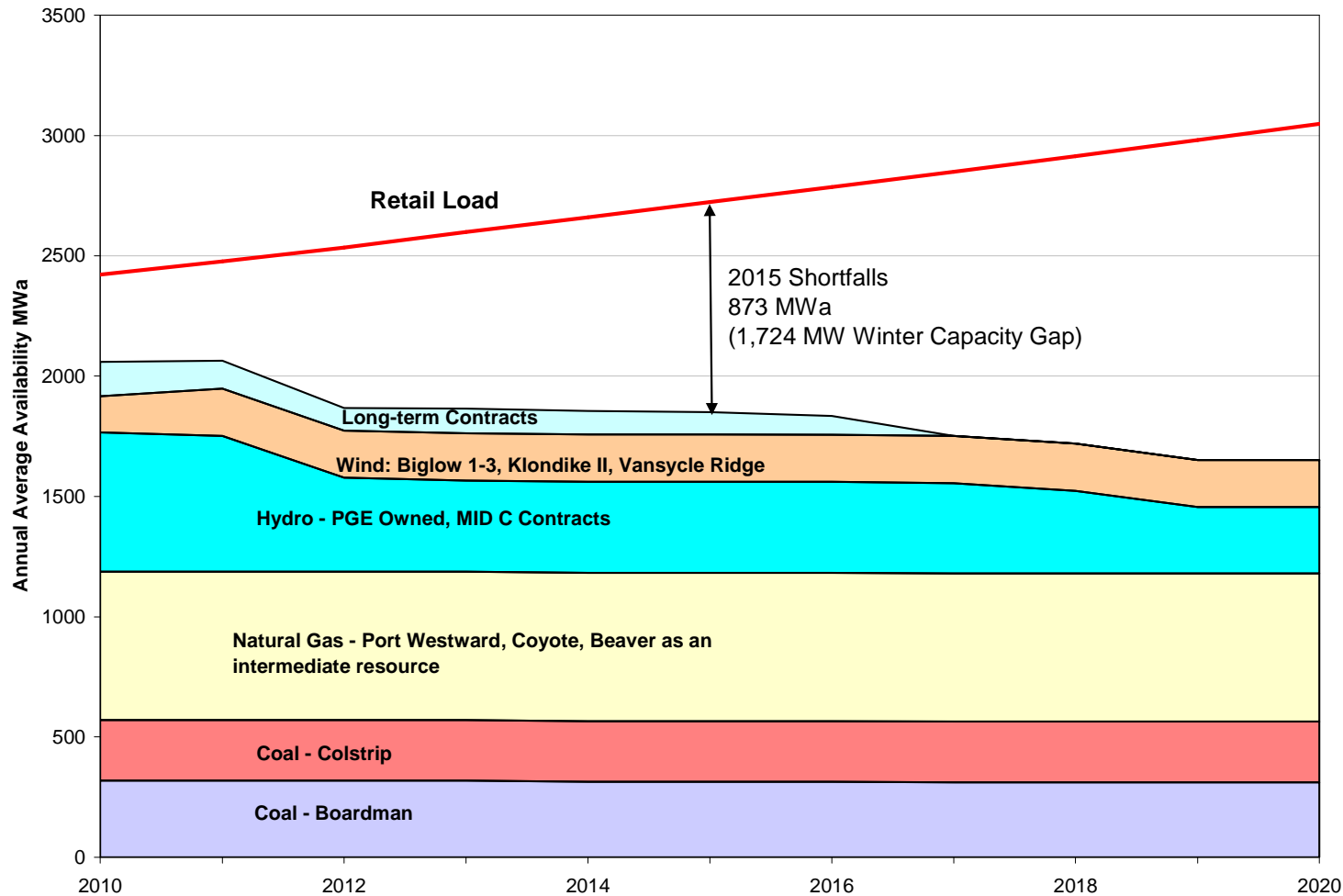


Source: 2000-2007 Average, SNL Financial Database

*Chart shows overall efficiency at 499 of the 533 U.S. coal plant sites where heat rate data is available. Some plant sites operate multiple coal-generating units. There are 1,325 coal-fired units operating in the U.S.; Boardman operates a single unit.

PGE Resource Needs – Energy

Load-Resource Balance 2010-2020



Existing resource need reflects load growth, expiring long term contracts, and RES requirements.

Closing Boardman in 2014 causes large resource deficit to get even bigger

Under 2014 closure scenario, resource deficit equals roughly 45% of total PGE customer demand

Retail load = Net System load – 5-yr opt out (about 30 MWa)



Proposed Action Plan

Key Proposed Resource Actions:

- Acquire 122 MWa of Renewable Energy Standard (RES) compliant renewables
 - Meets 2015 Oregon RES compliance
 - Found reasonable by OPUC in 2007 IRP
- 214 MWa of EE by 2015
- 300-500 MW High Efficiency Combined Cycle Gas Plant
- Up to 200 MW of flexible gas capacity resources
- Natural Gas Fueling
 - Acquire pipeline and storage capacity to meet future gas fueling requirements
- Cascade Crossing
 - 500 kV double-circuit transmission facility from Boardman area to southern end of PGE's system
- Other Actions: Contract renewals, DSG expansion, DR acquisitions
- Pursue Boardman 2020 operating plan
 - Install Emission Control Upgrades to meet requirements of proposed RH BART II filing
 - Include 2040 contingent plan if 2020 plan not achievable

Challenges

A workable alternative operating plan for Boardman must address:

- Regional Haze rules / BART requirements
- Potential National Emission Standards for Hazardous Air Pollutants (NESHAP) Maximum Achievable Control Technology (MACT) requirements
- Pending Sierra Club litigation
- IRP requirements
 - Cost and risk to customers

This will require a DEQ rule change, EPA approval of the state implementation plan for Regional Haze, OPUC acknowledgement, resolution of the pending litigation, and a strategy to address potential federal laws governing NESHAPs.

DEQ / EPA - Regional Haze Program

Federal Program

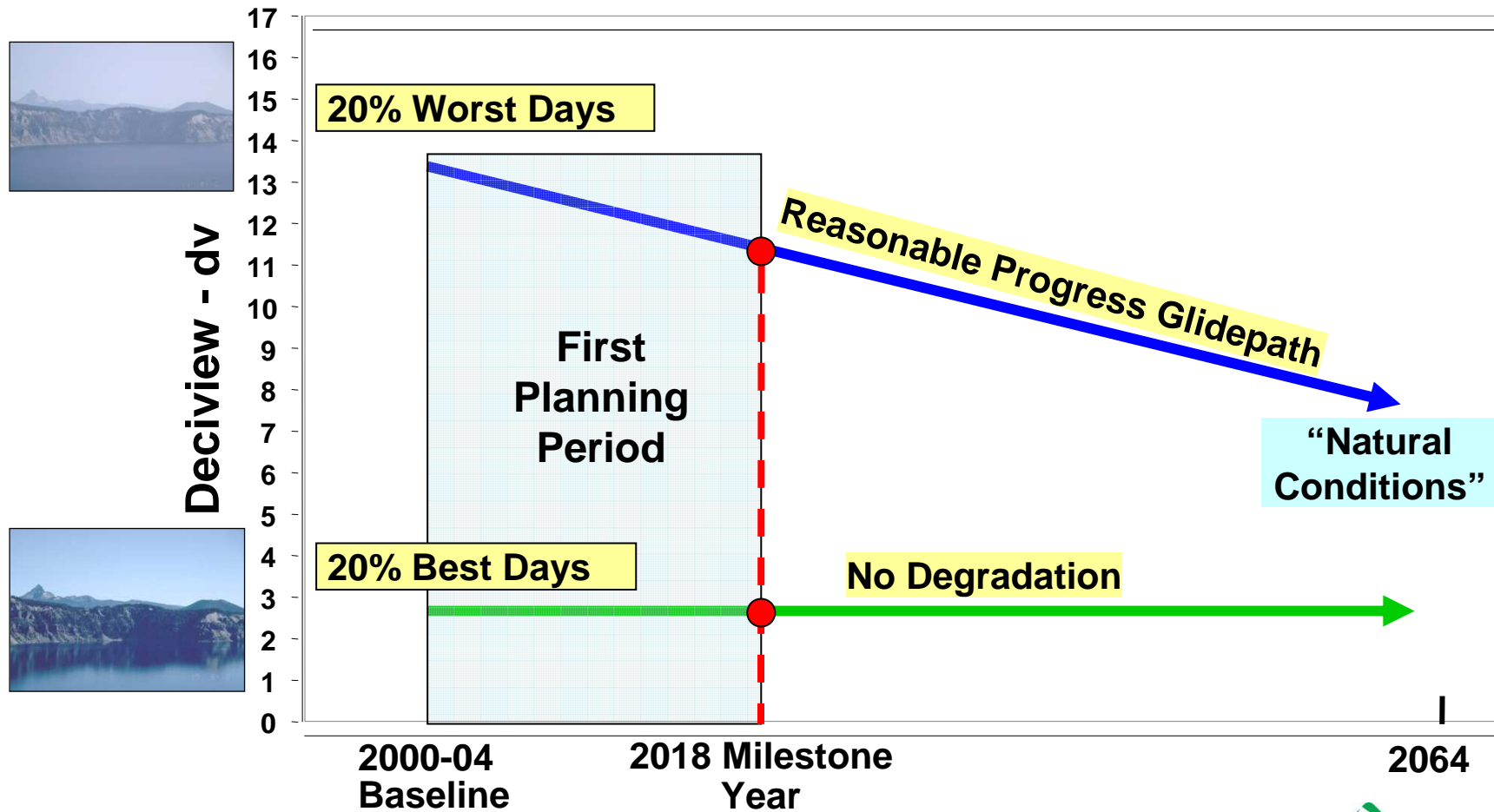
- Regional Haze Rule adopted July 1999
- Objective: Return visibility to natural background level by 2064
- States must submit and periodically update implementation plans

Oregon's Regional Haze Plan

- Identifies pollutants and sources causing haze
- Describes current visibility conditions for national parks/wilderness.
- Contains 10-year projection of visibility (first planning period) and compares to 2018 Milestone
- Explains how Oregon is showing “Reasonable Progress” in improving haze
- Contains a Long-Term Strategy
- Describes DEQ BART Review & DEQ proposal for PGE Boardman

Objective of Regional Haze Plan

Class I Area



BART BASICS

- BART is “Best Available Retrofit Technology”
- BART applies to:
 - Major sources > 250 tons per year of any haze pollutant
 - Construction commenced 1962-1977
 - 26 source categories, including Electric Generating Units & industrial boilers, kraft pulp mills, and refineries
- BART is determined on case-by-case basis

5 Regulated Haze Emissions

- **Ammonium Sulfate:** SO_2 + ammonia, from combustion of fuels containing sulfur
- **Ammonium Nitrate:** NO_x + ammonia, from high temperature combustion processes
- **Organic and Elemental Carbon:** mostly combustion due to fire (wildfire + forest, agricultural, other controlled burning, and woodstoves)
- **Fine Soil:** dust from dirt roads, farmland, bare ground, dust storms
- **Coarse Mass:** larger dust particles
 - **Particulate Matter (PM):** Includes these fine and coarse particles in the air. PM_{10} and $\text{PM}_{2.5}$ are particles measured at less than 10 microns and less than 2.5 microns

Boardman BART / RP Required Controls

- **June 19, 2009 EQC adopted Boardman Regional Haze Rule requirements**

- **Best Available Retrofit Technology (BART) Requirement:**
 - NO_x (Low NO_x Burner & Over Fire Air)
 - 0.23 lb/mmBtu by 2011
 - SNCR contingency by 2014
 - SO₂ (Semi-Dry Scrubber)
 - 0.12 lb/mmBtu by 2014
 - PM (Bag House)
 - 0.012 lb/mmBtu by 2014

- **Reasonable Progress (RP) Requirement:**
 - NO_x 0.07 lb/mmBtu by July 1, 2017 (Installation of SCR)

Proposed Revision to BART – “BART II”

- **Submittal of a new BART application considering all possible alternatives including an early shut down (2020 option) with the following controls:**
 - NO_x: 0.23 lb/mmBtu by 2011
 - Combustion controls (Low NO_x Burner, Over Fire Air)
 - SNCR contingency by 2014
 - SO₂
 - Investigating alternatives
 - PM
 - No change from current emissions

- **Proposed BART Revision Schedule**
 - Submit Application – April 2010
 - DEQ Evaluation of Application – June 2010
 - Start public comment period – July 2010 through August 2010
 - EQC adoption of rule - December 2010

Comparison of existing vs. proposed BART rule

			Current Rule			Proposed Revision		
Controls	Constituent	Current Emissions ¹	Emissions*	Cost**	Schedule	Emissions*	Cost**	Schedule
Low-NOx Burner/ OFA	NOx	0.45	0.23	\$32.8 Million	Jul-11	0.23	\$32.8 Million	Jul-11
Scrubber/Bag House	SO2	0.61	0.12	\$289 Million	Jul-14	Coal Operations Shut Down in 2020		
	PM	0.04	0.012		Jul-14			
SCR	NOx		0.07	\$180 Million	Jul-17			
Mercury Rule	Hg		90%	\$7.7 Million	Jul-12		90%	\$7.7 Million
Aggregate Emissions (tons)			237,149***			232,453***		
Total costs				\$510 Million			\$40.4 Million	

* Lbs / mmBtu

** Costs are Nominal \$ - Does not include AFDC and Property Taxes

***Aggregate for NOx, SO2, PM

¹ Based on 2007 actual emissions

- Order equipment for Scrubber in Q1 2011
- Order sorbent injection equipment for Mercury controls Q2 2010
- Order Low-NOx Burner/OFA equipment Q1 2010

National Emissions Standards

- Recent D.C. Circuit court case established that EPA is required by the Clean Air Act to promulgate National Emission Standards for Hazardous Air Pollutants (NESHAPs) for Electrical Generating Units (EGUs). Rulemaking timeline is set in the consent decree that becomes effective soon.
- Standards may require **Maximum Achievable Control Technology (MACT)** on plants such as Boardman to control hazardous air pollutants, such as Hydrochloric Acid (HCL).
- Standards could require MACT controls to address hazardous air pollutants from Boardman prior to 2020. **MACT controls could be similar to those required by the current regional haze (BART) rule.**
- Current schedules proposed by EPA suggest NESHAPs for electrical generation units will be established with a **possible compliance date of approximately January 1, 2015.**
- PGE is examining solutions to the issues caused by the NESHAP standards, including legislative and regulatory resolutions.

MACT Timeline – Published Consent Decree

- January 2010: Information Collection Requests (ICRs) - §114 letters sent to utilities
- Through Sept. 2010: Fuel and Stack sampling data collected/submitted to EPA on a phased schedule
- Early / mid-Dec. 2010: Rule package to OMB (90 day review period)
- March 16, 2011: Notice of Proposed Rulemaking
- Nov. 16, 2011: Final Rule Signed by Administrator
- Jan. 1, 2012 (est.): Federal Register Publication of Final Rule (begins clock on 3 yr. compliance deadline) (assumes a 45 day period between signature of the rule documents and publication in the Federal Register)
- Jan. 1, 2015: Compliance Deadline – Extension Possible

MACT - Regulatory & Legislative Approach

- **Regulatory Approach**

- Examining DEQ and EPA roles in NESHAPs determination and compliance requirements
- Advocacy in NESHAPs Rulemaking Process re: Plants with Early Closure

- **Legislative Approach**

- Bingaman Energy Bill
- Climate Bill
- Multi-pollutant Bill

Sierra Club Lawsuit

- Plaintiffs are Sierra Club, Northwest Environmental Defense Center, Friends of the Columbia Gorge, Columbia Riverkeeper, and Hells Canyon Preservation Council
- Complaint alleged violations of federal Clean Air Act (CAA), Oregon's State Implementation Plan (SIP) at Boardman, the Plant's CAA Title V permit and other environmental regulations
- Complaint seeks penalties and injunctive relief including permanently enjoining PGE from operating Boardman except in accord with CAA, SIP and Plant's Title V Permit.
- Joint Proposed Case Management Plan, suggests liability trial completion by June, 2011. Remedy determination, if necessary, would follow in a separate proceeding.
- A remedy could require the Oregon DEQ to determine Best Available Control Technology ("BACT") in addition to penalties. BACT controls could include scrubbers and SCR.
- Normal time frame for installation of scrubbers and SCR, as BACT controls for Boardman would typically require approximately 36-40 months.
- If such BACT controls are required, PGE would install controls and continue to operate the plant through 2040.

IRP 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.



Modeling Updates

Deterministic Update:

- Added 2020 portfolio
 - Includes bridge PPA from 2017 to 2020

Stochastic Updates:

- Changed inputs for natural gas prices from real \$ to nominal \$
 - Results in higher TailVar and year-to-year variation for portfolios
 - Relatively little impact on TailVar less mean
- Modeled Klondike 2, Vansycle, and RES wind stochastically
 - Higher TailVar for wind, added equally to all portfolios

Modeling Updates

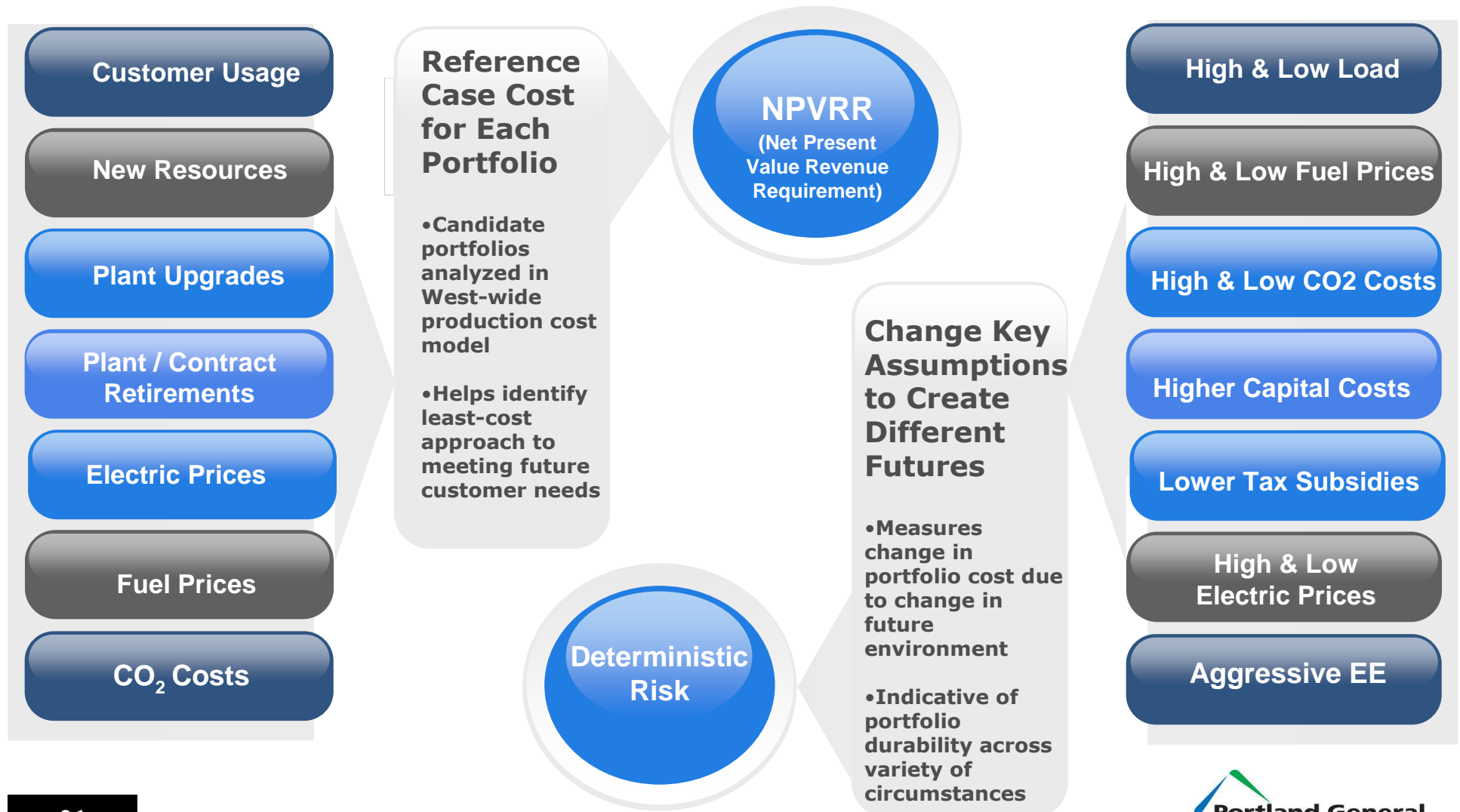
Loss of Load Probability (LOLP) / Expected Unserved Energy (EUE) Updates:

- Set thermal plant scheduled maintenance to zero
 - Assumes replacement supply procured well in advance for maintenance outages
- Constrained wind output for highest load hours to equal IRP capacity value of 5%
 - Applied to “super-peak” hours for all days in Dec-Jan (winter) and Jul-Aug (summer)
- Modeled Klondike 2, Vansycle, and RES wind stochastically
 - Impact is uniform in raising all LOLP statistics for all portfolios
- Added forced outage rate to PPAs equal to CCCT
 - PPAs sometimes linked to specific resource (tolling arrangement, unit contingent)
 - “Firm” PPAs only economically firm

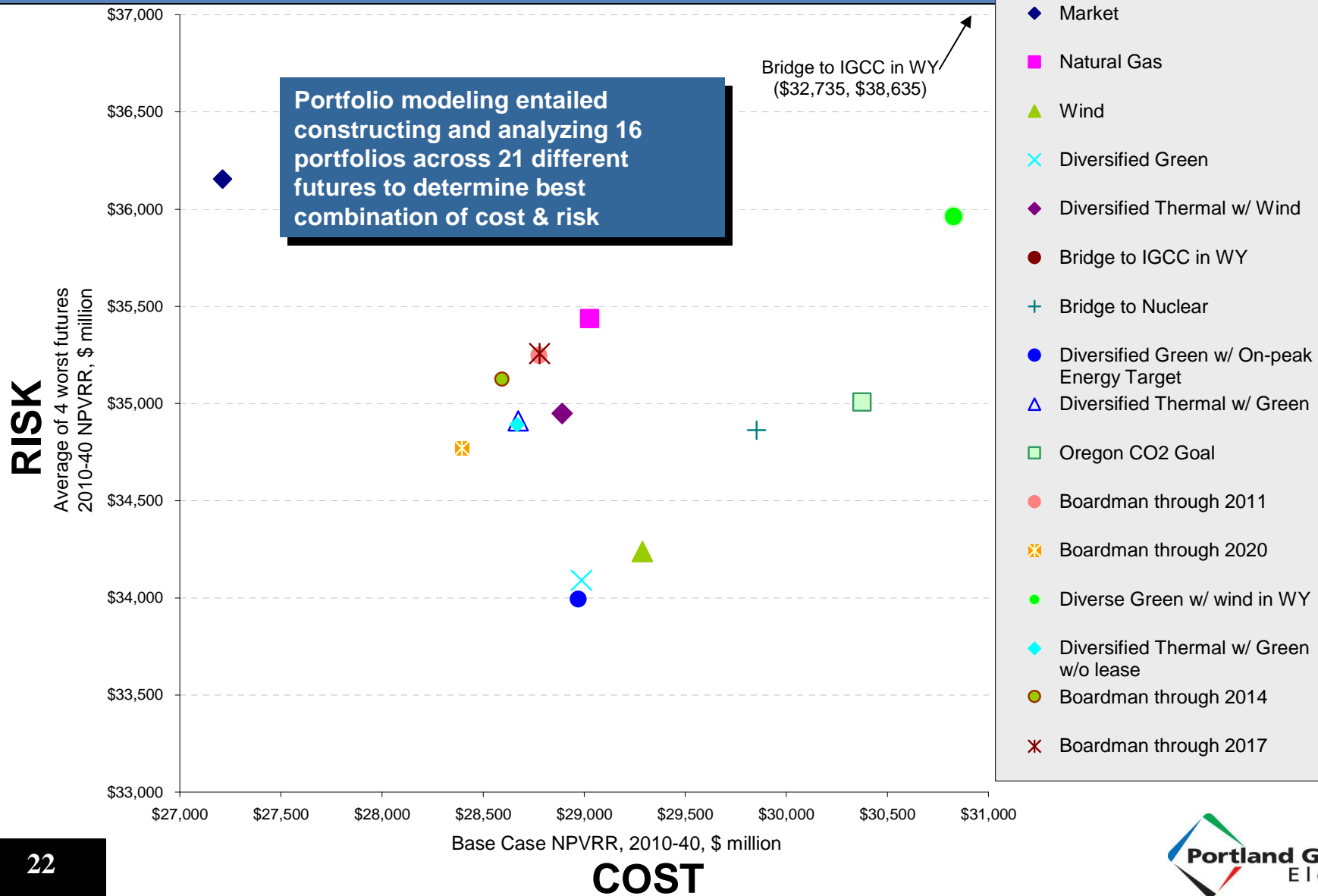
Other Updates:

- Herfindahl-Hirschman Index (HHI) time horizon changed from 2020 to 2021
- Added RES wind to HHI calculations

Cost & Deterministic Risk Metrics

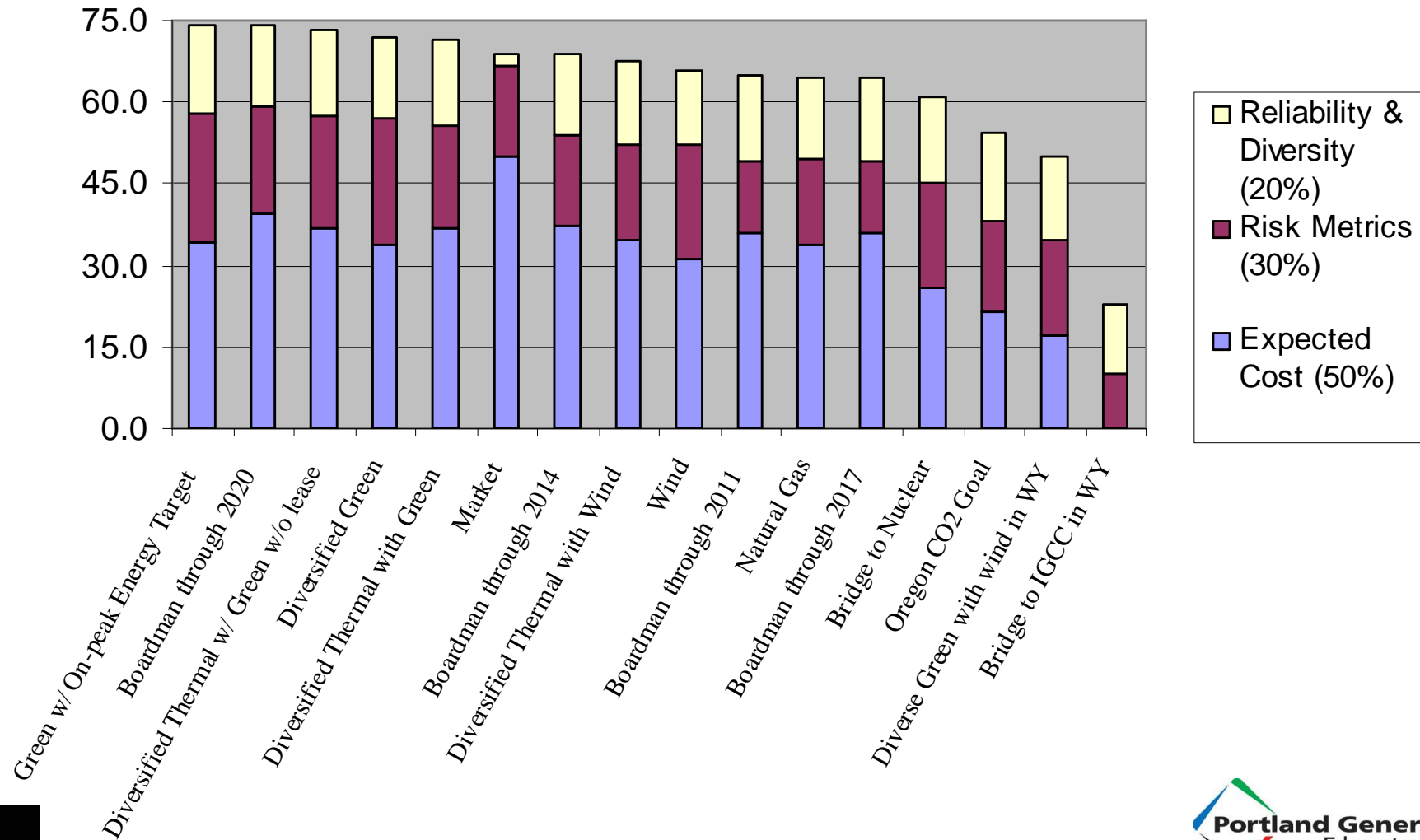


Scenario Analysis: Portfolio Cost vs. Risk



Portfolio Scoring Grid

Weighted Scores & Ranked Results



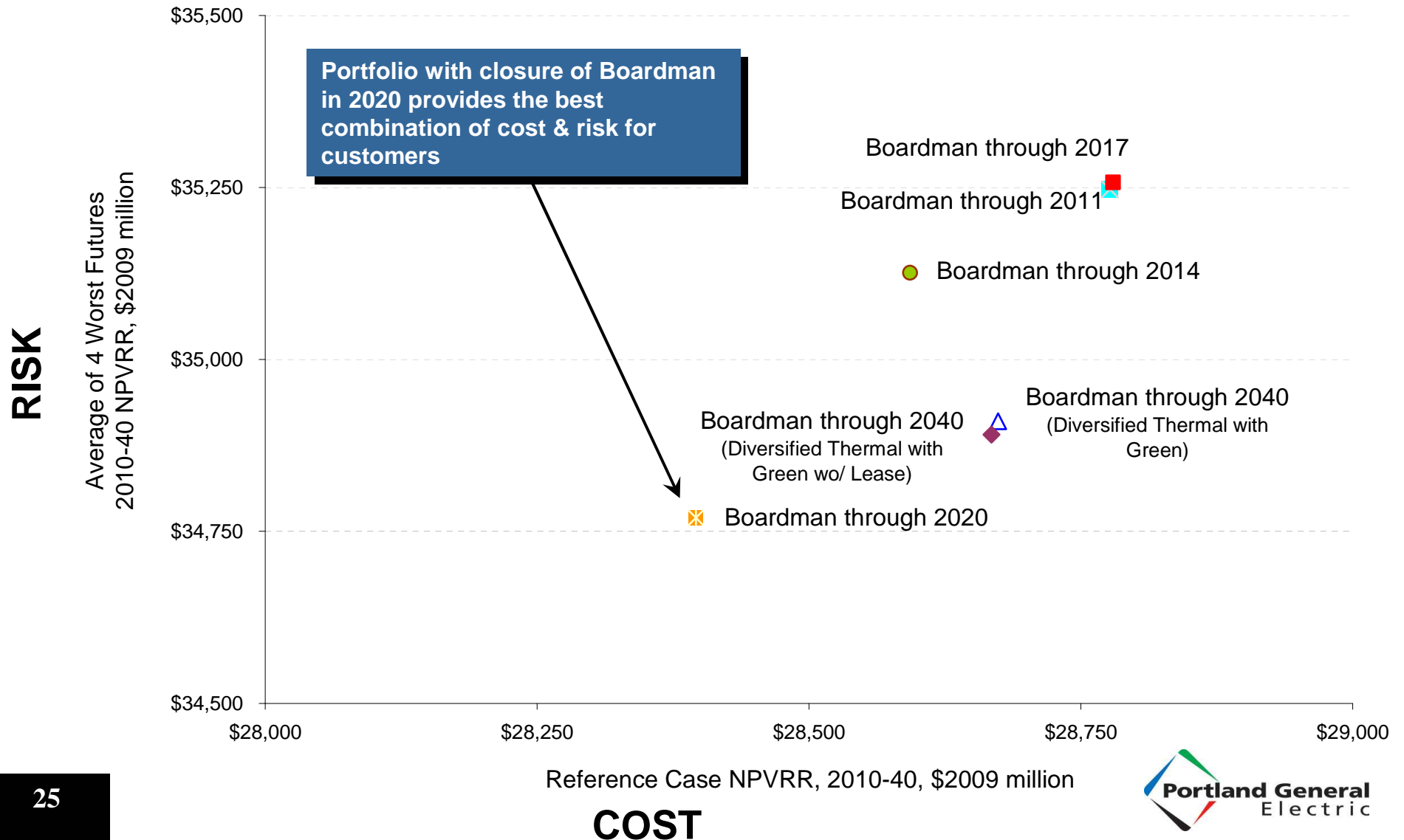
Portfolio Scoring Grid

Weighted Scores & Ranked Results

3. Portfolio Evaluation Scoring:		Screening		Deterministic			Stochastic			Reliability & Diversity			(l)	(m)	(n)	
Total Weighted Scores		(a)	(b)	(c)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(l)	(m)	(n)
Scoring Consideration	Within Efficient Frontier Zone?	Meets Operating Reserve Req?	Cost: Expected Cost	Risk Durability: Good minus Bad	Risk Magnitude: Avg. Worst 4 vs. Reference Case	Risk Magnitude: Avg. Worst 4 vs. Reference Case	Risk: TailVar	Risk: TailVar less Mean	Risk: Year to-Year Variation	Reliability: Avg. EUE 2012-2020 & 2025	Diversity: Technology HHI	Diversity: Fuel HHI	Weighted Combined Score (0 to 100)	Performance vs. Best (%)	Ordinal Ranking	
Weight			50%	10%	5%	5%	3.3%	3.3%	3.3%	15%	2.5%	2.5%				
1	Market	Y	N	50.0	10.0	2.7	0.0	2.5	1.0	0.6	0.0	2.2	0.0	69.0	93%	6
2	Natural Gas	Y	Y	33.6	5.1	3.4	2.9	1.3	1.2	2.0	13.2	0.5	1.0	64.3	87%	11
3	Wind	Y	Y	31.2	5.9	4.7	4.6	2.8	3.0	0.0	12.0	0.0	1.3	65.6	88%	9
4	Diversified Green	Y	Y	33.9	6.2	4.9	4.5	3.1	2.9	1.4	12.2	1.1	1.8	71.9	97%	4
5	Diversified Thermal with Wind	Y	Y	34.8	5.1	4.0	3.3	1.8	1.6	1.7	12.9	1.1	1.2	67.5	91%	8
6	Bridge to IGCC in WY	N	Y	0.0	0.0	0.0	3.5	1.1	3.1	2.5	10.1	1.7	0.5	22.7	31%	16
7	Bridge to Nuclear	N	Y	26.1	1.0	4.1	4.6	3.1	3.2	3.1	11.8	2.5	1.7	61.1	82%	13
8	Green w/ On-peak Energy Target	Y	Y	34.1	6.4	5.0	4.5	3.3	3.0	1.6	13.1	1.1	2.1	74.3	100%	1
9	Diversified Thermal with Green	Y	Y	36.8	6.4	4.0	3.1	1.8	1.4	2.0	13.1	1.4	1.2	71.4	96%	5
10	Boardman through 2014	Y	Y	37.5	8.7	3.8	2.8	0.0	0.0	1.3	14.0	0.1	0.7	68.9	93%	7
11	Oregon CO2 Goal	N	Y	21.4	1.8	3.9	5.0	1.8	2.9	1.2	12.9	1.0	2.5	54.4	73%	14
12	Boardman through 2011	Y	Y	35.8	5.4	3.6	2.9	0.0	0.1	1.3	15.0	0.1	0.4	64.7	87%	10
13	Boardman through 2020	Y	Y	39.3	9.7	4.2	3.0	1.0	0.7	1.4	13.4	0.1	1.2	74.1	100%	2
14	Diverse Green with wind in WY	N	Y	17.3	0.8	2.9	4.4	2.5	3.3	3.3	12.5	1.3	1.8	50.0	67%	15
15	Diversified Thermal w/ Green w/o lease	Y	Y	36.8	8.7	4.0	3.2	1.5	1.2	1.9	13.6	1.2	1.2	73.3	99%	3
16	Boardman through 2017	Y	Y	35.8	4.9	3.6	2.9	0.2	0.3	1.4	14.0	0.1	1.0	64.3	87%	12

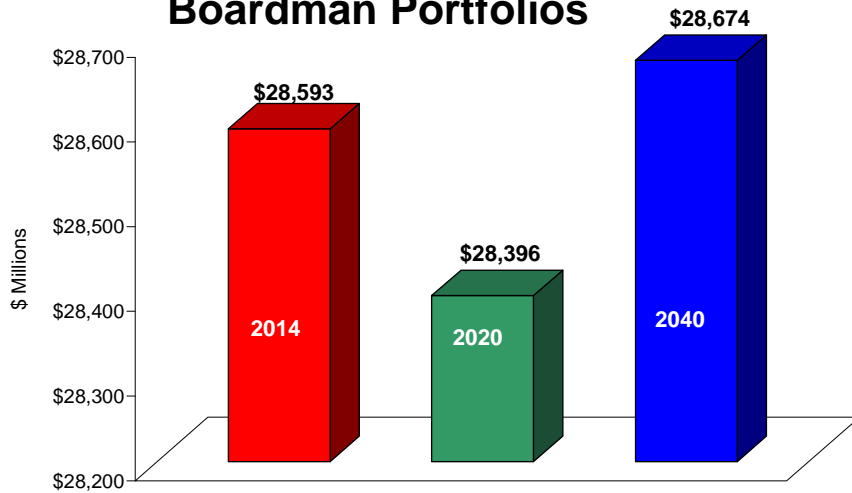
Scenario Analysis: Boardman Highlight

Horizontal axis shows expected cost; vertical axis shows risk of higher cost than expected.



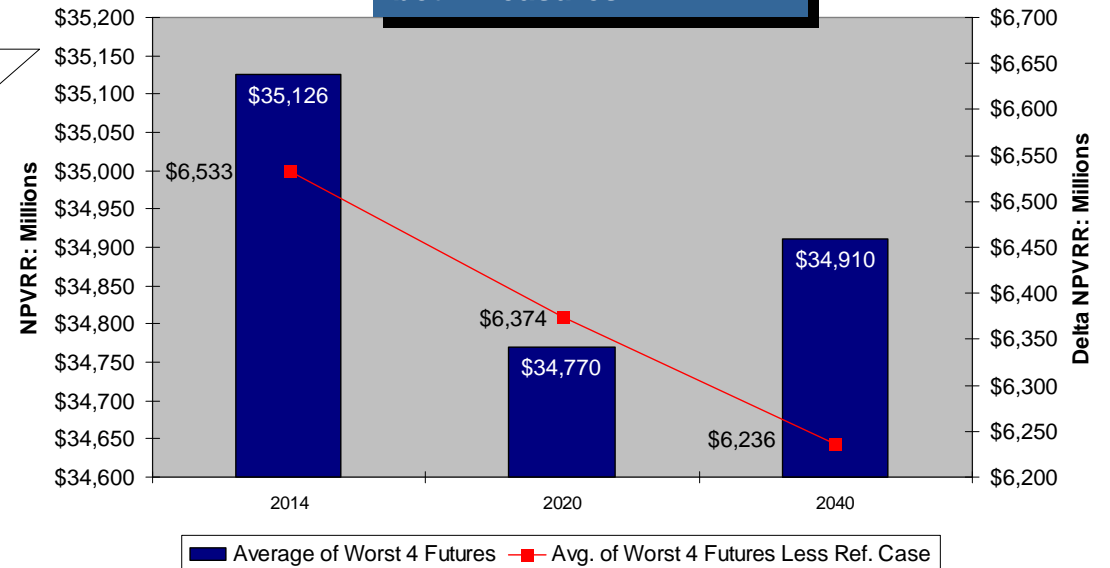
NPVRR (2009\$) – Reference Case Cost & Deterministic Risk

Boardman Portfolios



Boardman 2020 portfolio provides lower cost for customers by \$197 MM NPV as compared to 2014 Boardman option

Both 2020 and 2040 closure cases perform well under deterministic risk measures. 2014 case is riskier according to both measures.



NPVRR = Net present value of revenue requirement
 *2040 is Diversified Thermal with Green Portfolio



Summary of Cost & Deterministic Risk NPVRR \$2009 in Millions

Cost & Risk: Deterministic NPVRR \$2009 in Millions

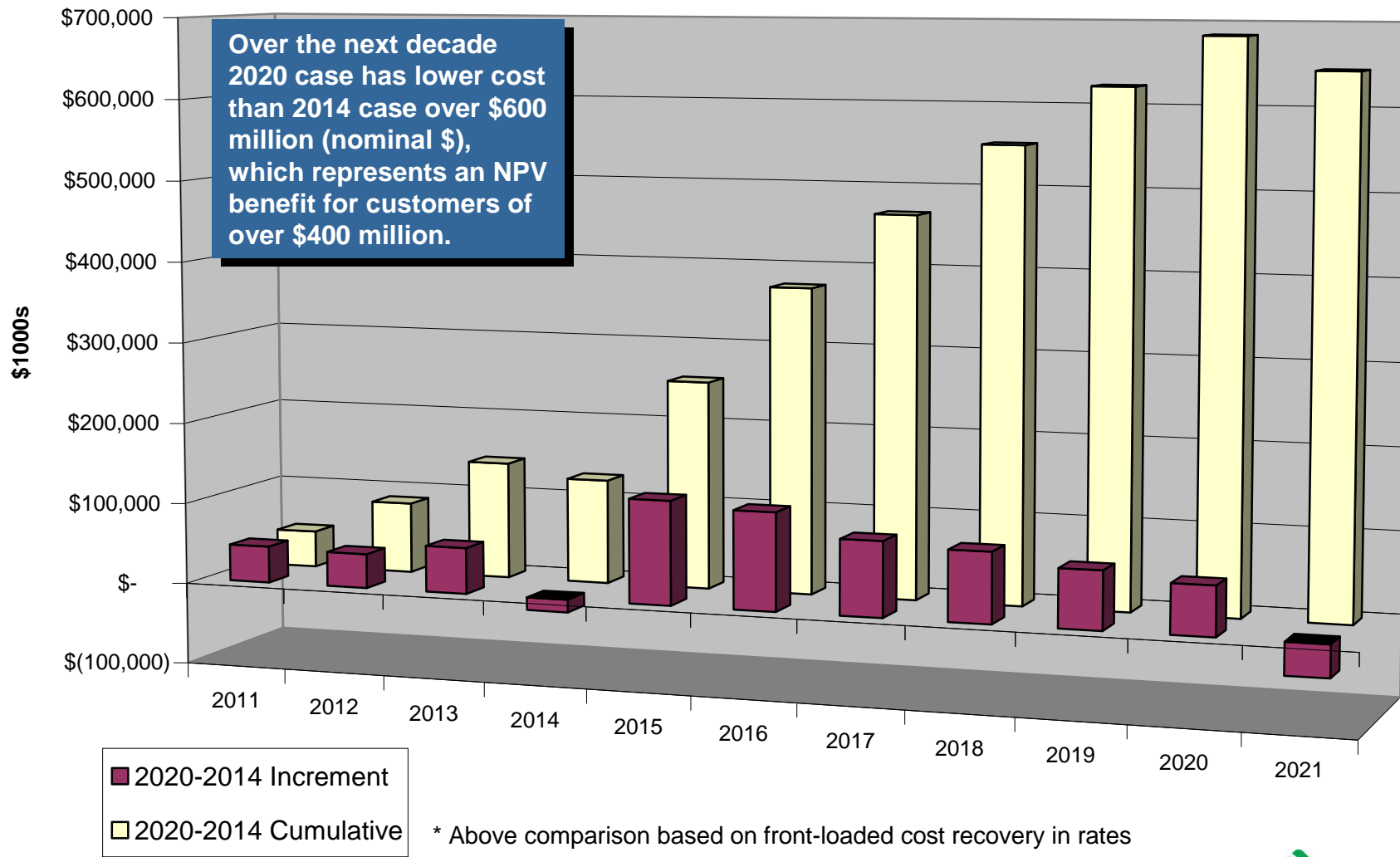
Future	Boardman through 2014	Boardman through 2020	Boardman through 2040*
Reference Case	\$28,593	\$28,396	\$28,674
Rank	2	1	3
Delta from 2040	(\$81)	(\$278)	
Delta from 2014		(\$197)	\$81
Average of Worst 4 Futures	\$35,126	\$34,770	\$34,910
Rank	3	1	2
Delta from 2040	\$216	(\$140)	
Delta from 2014		(\$356)	(\$216)
Average of Worst 4 Futures - Reference Case	\$6,533	\$6,374	\$6,236
Rank	3	2	1
Delta from 2040	\$297	\$138	
Delta from 2014		(\$159)	(\$297)

* Diversified Thermal with Green Portfolio

NOTE: Positive number indicates higher cost

Cost Impacts to 2021

Boardman 2014 vs. 2020 Closure



Summary Comparison: Boardman Cases 2014, 2020 and 2040

Summary	2014 vs. 2020*	2014 vs. 2040*	2040 vs. 2020*
Cost & Risk Metrics (\$2009 millions)			
NPVRR - Reference Case Costs	\$197	(\$81)	\$278
Deterministic Risk - Avg. of Worst 4 Futures	\$356	\$216	\$140
Deterministic Risk - Avg. of Worst 4 Futures Less Reference Case	\$159	\$297	(\$138)
Revenue Requirements 2011 - 2021 (millions)			
Nominal Change	\$645	\$324	\$321
NPV Change (\$2009)	\$421	\$233	\$187
Rate Impacts 2011 - 2021**			
First Year Impacts	2.6%	3.3%	-0.6%
Average Rate Impacts	3.2%	1.6%	1.5%

* Delta of first comparison year less second comparison year

** Based on current revenue requirement with 1.9% load growth.

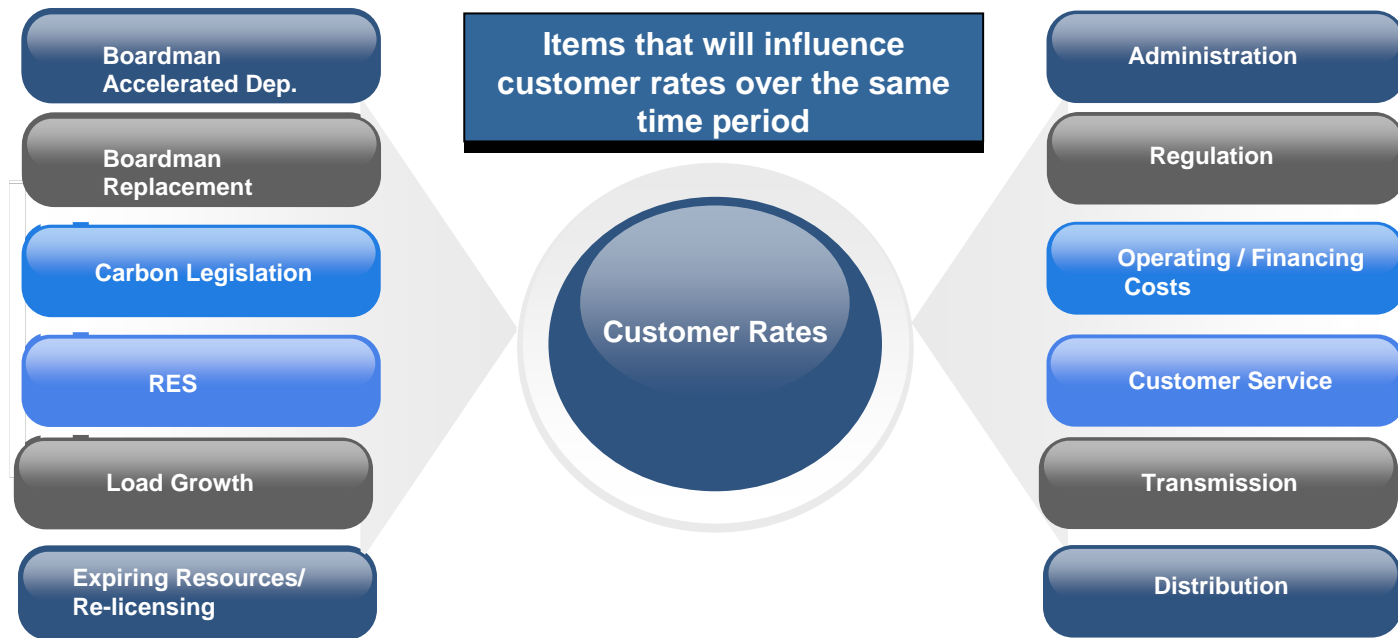
NOTES:

Positive number indicates higher cost
Numbers based on PGE share of the plant

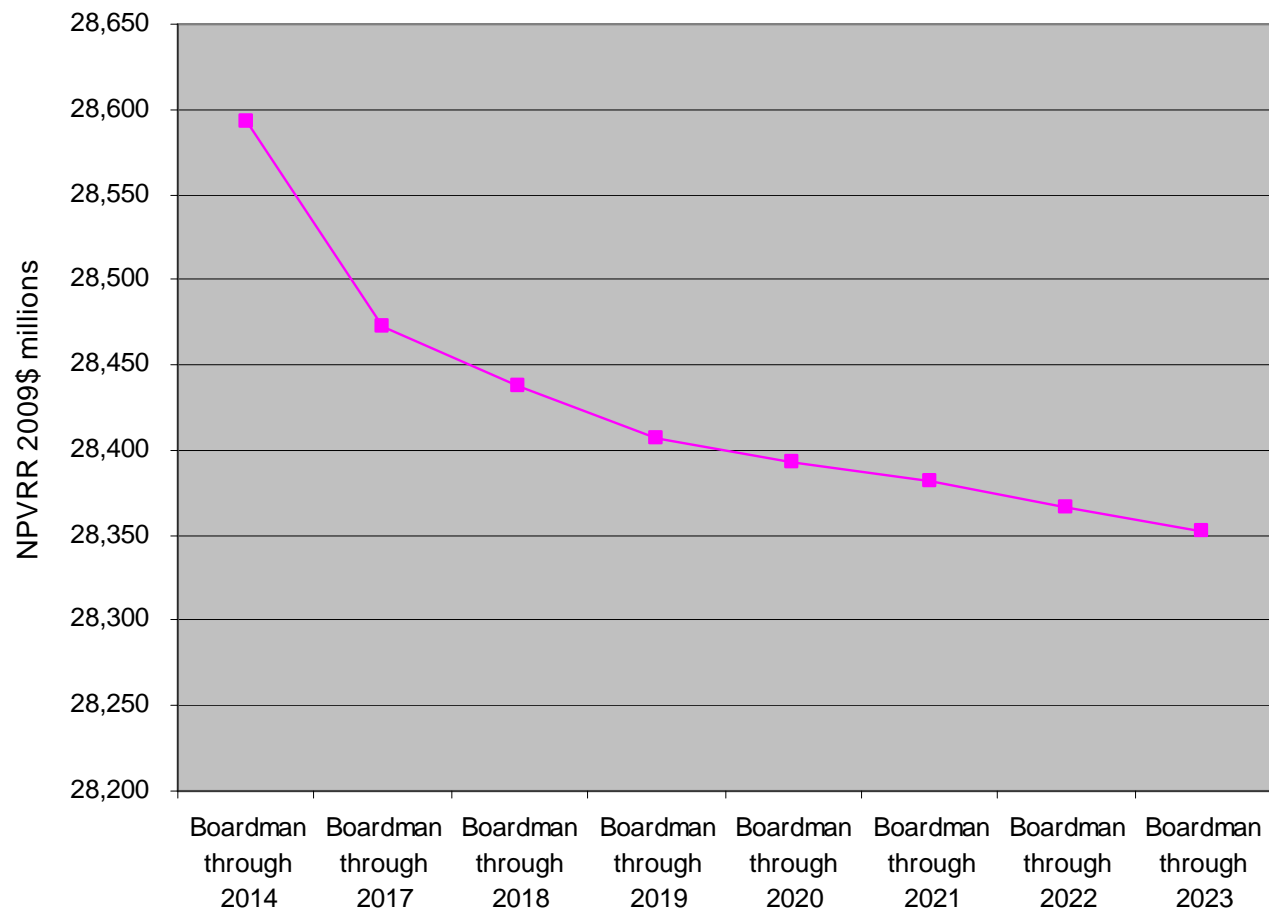


Rate Impacts

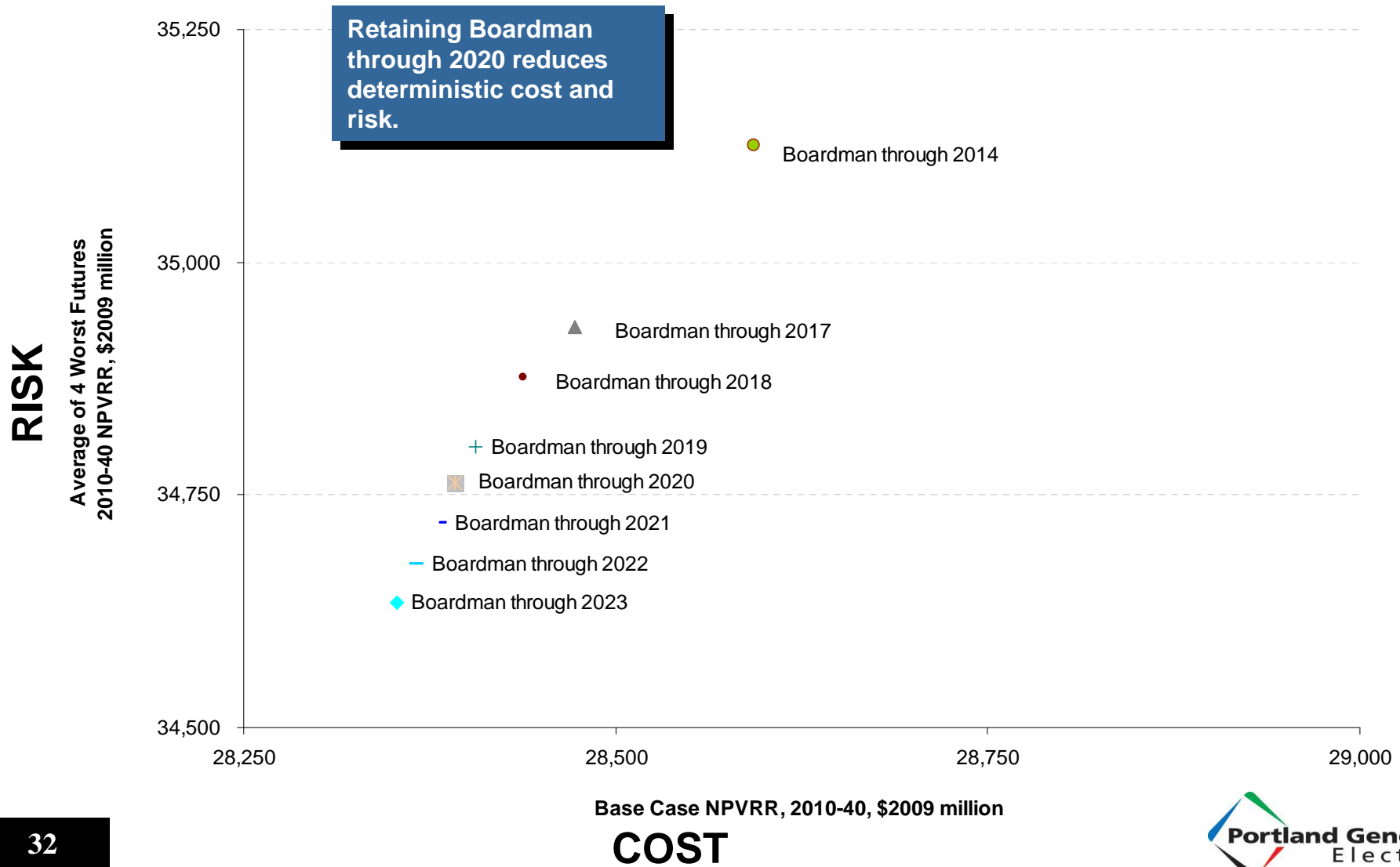
Boardman Closure Rate Impacts 2011 – 2021		
	2014 vs. 2020	2014 vs. 2040
First Year Impacts	2.6%	3.3%
Average Rate Impacts	3.2%	1.6%



Boardman Alternatives NPVRR of Reference Case

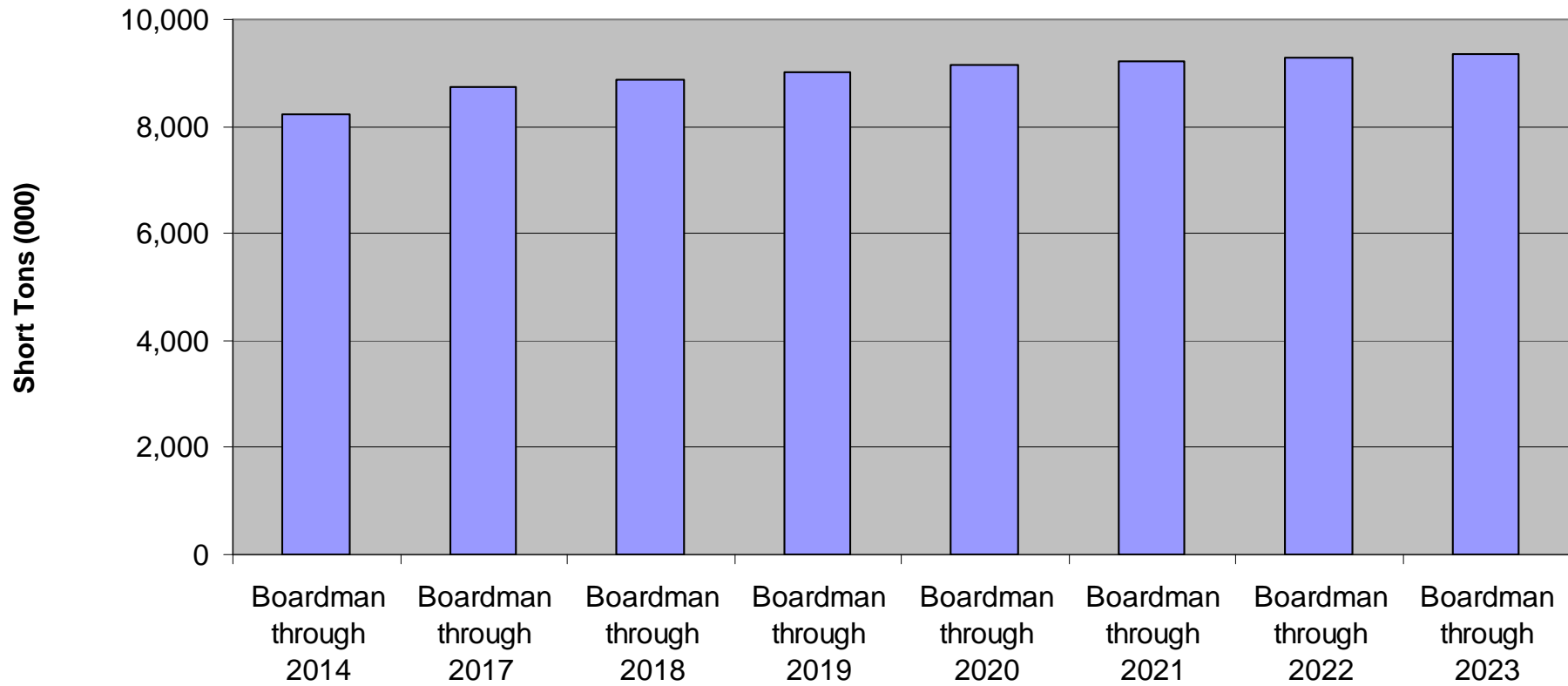


Boardman Alternatives Cost vs. Risk



Boardman Alternatives CO₂ Emissions

Average Emissions 2014-2023



Why Boardman 2020 Plan?

A 2020 plan for Boardman is the best option for PGE and our customers. The 2020 plan balances cost and risk, as well as impacts to the environment, community and employees.

As compared to 2014, the 2020 plan:

- Saves customers about \$200 million (\$2009) NPVRR through 2040.
- Reduces risk exposure by approximately \$350 million (\$2009) NPVRR through 2040.
- Gives PGE a reasonable timeframe to build or buy cost-effective, diverse and reliable replacement resources.
- Provides time for technology advancement for potential replacement resources.
- Allows Oregon to transition away from coal in an orderly and cost-effective manner.
- Minimizes social impacts to local community and plant employees.

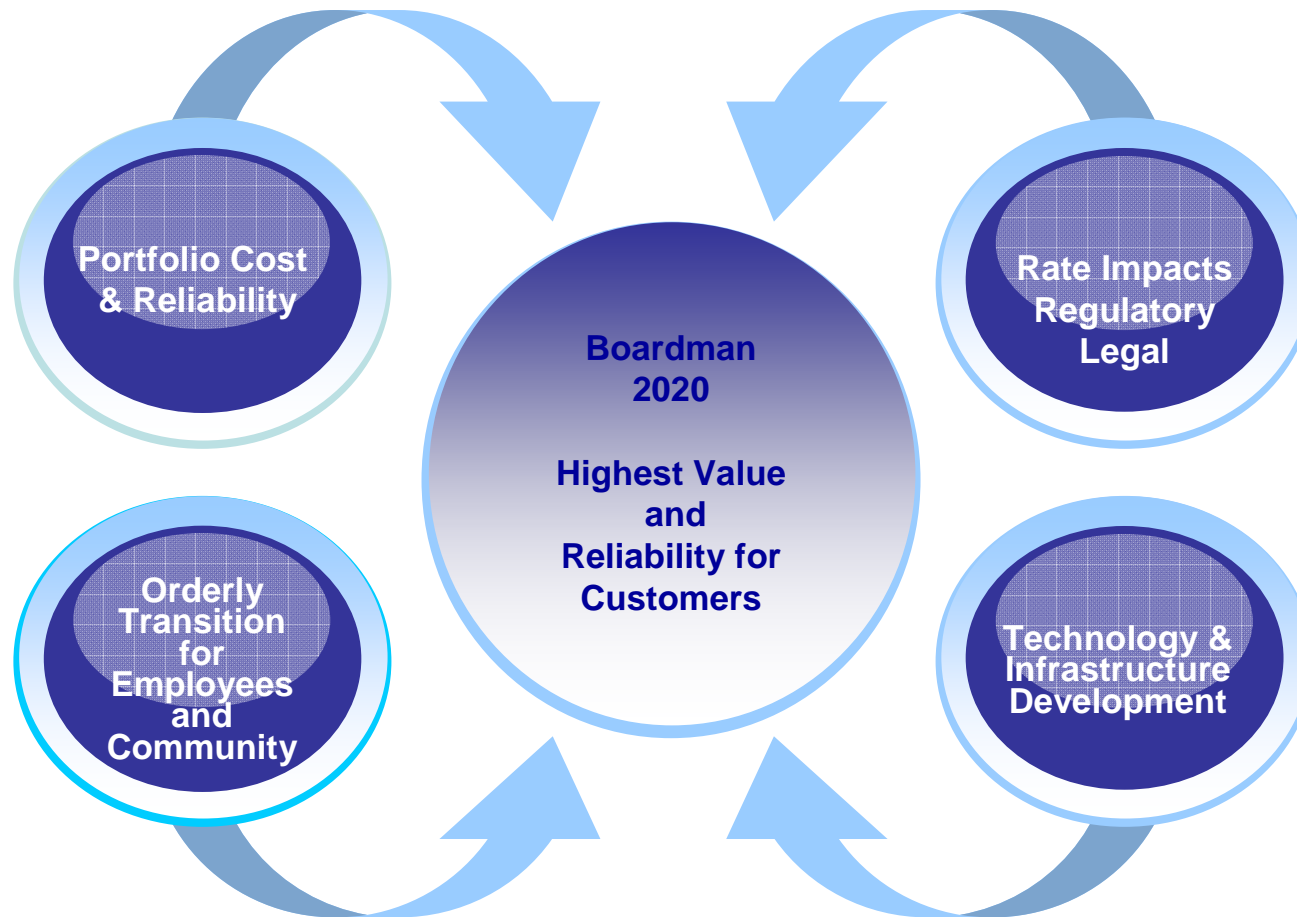
Why Boardman 2020 Plan?

Analysis shows the 2020 operating plan for Boardman takes advantage of the plant's economic benefits over the next decade while minimizing cost and risk uncertainty after 2020.

As compared to 2014, the 2020 plan:

- Reduces the amount of money that PGE must recover from its customers over the next decade by more than \$600 million (over \$400 million NPV in 2009 dollars).
- Results in lower rates for customers by an average of 3.2 percent over the next 11 years. Reduced rate impacts for 2020 plan are driven by:
 - ✓ Lower power costs 2014-2020.
 - ✓ Does not accelerate depreciation between 2011 and 2014.
 - ✓ Delays capital investment for a replacement resource.

Boardman Decision Factors



Next Steps

- Early April - Submit BART II to DEQ
- April 8 - File IRP Addendum
- April 26 - IRP Presentation at Commission Public Meeting
- May-July – IRP Review and Comment Period
- Late August - Commission Ruling on IRP

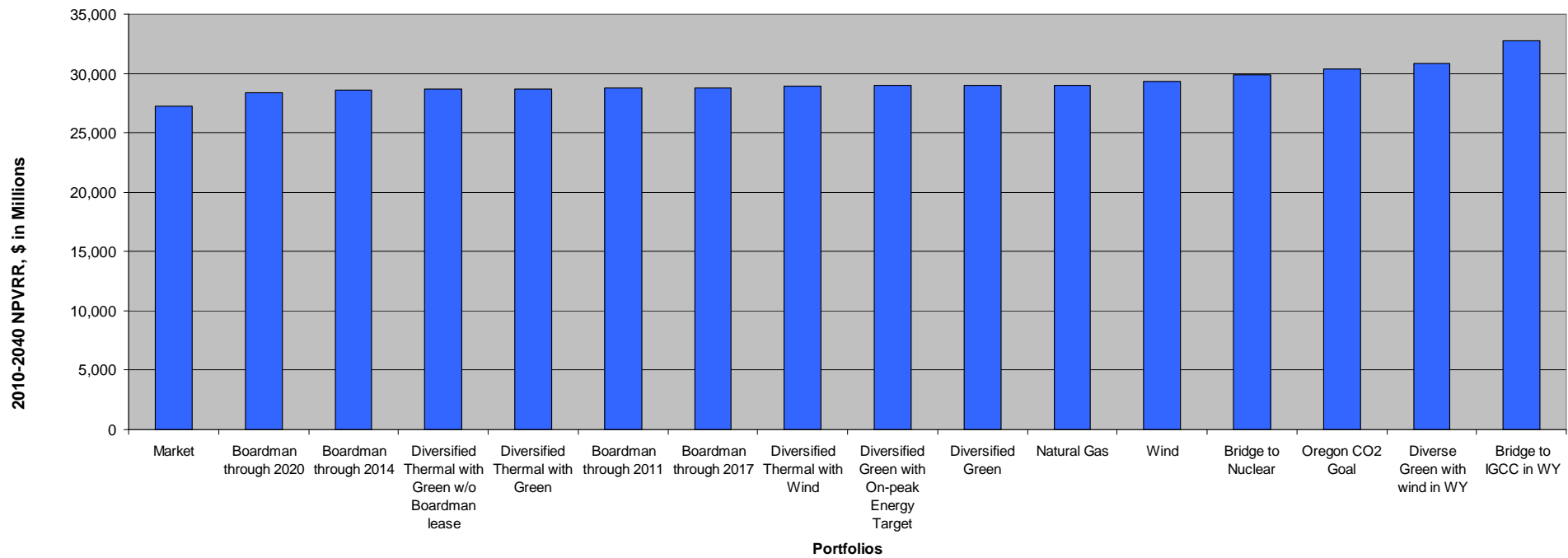
Appendix

IRP Analytical Results – Scoring Grid Backup

Portfolio Analysis

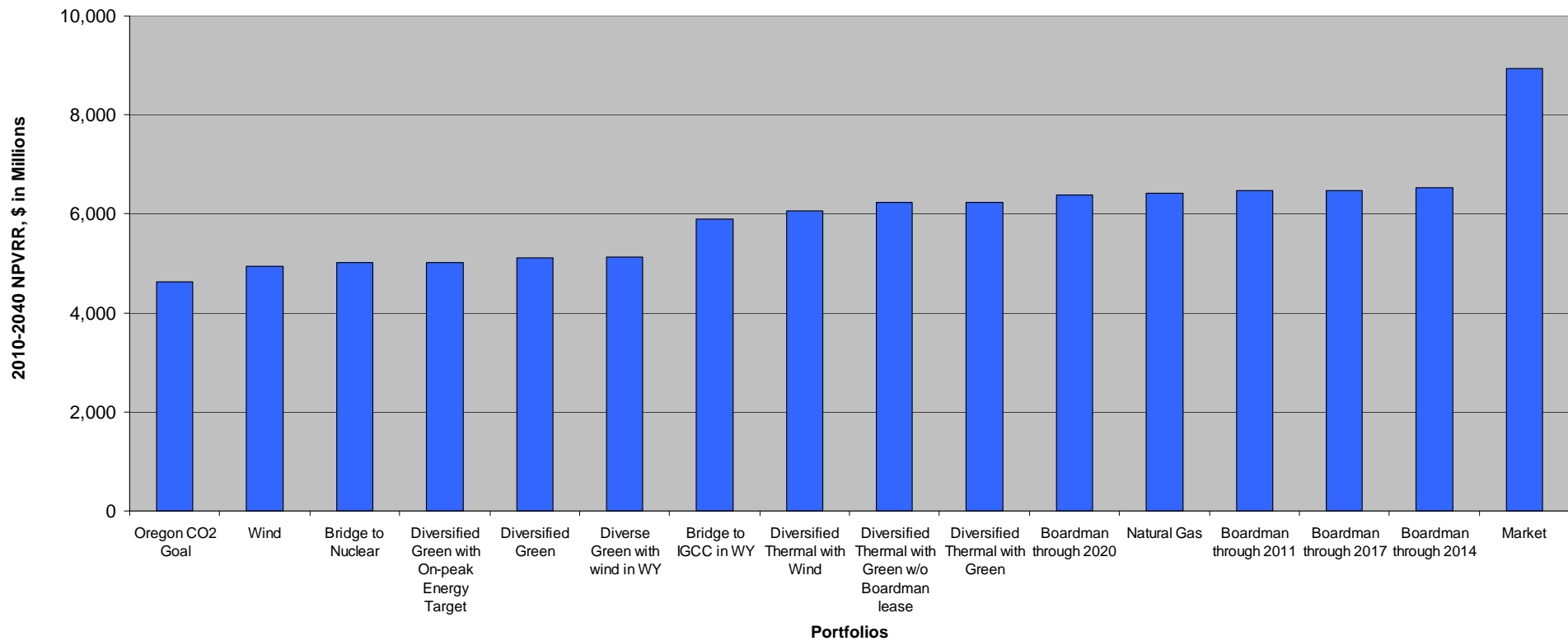
Reference Case

NPV of Revenue Requirements (2009\$)



Portfolio Analysis

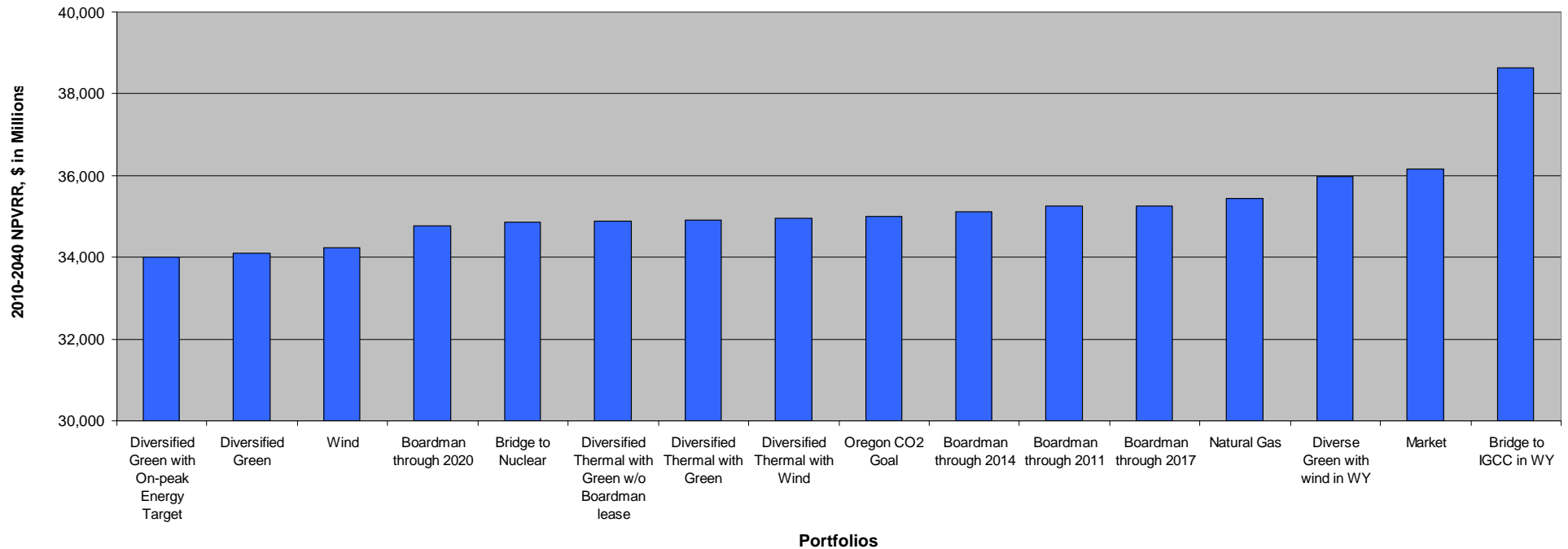
Worst 4 Futures Less Reference Case Net Present Value of Revenue Requirements (2009\$)



Portfolio Analysis

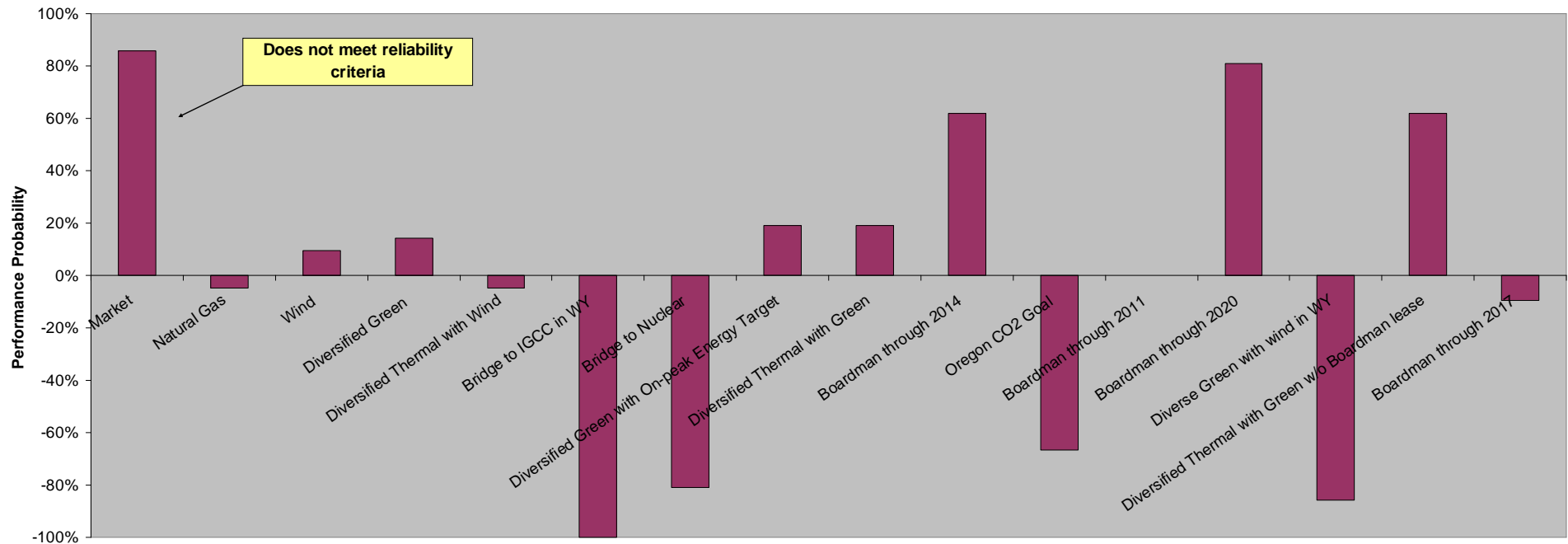
Worst 4 Futures

Net Present Value of Revenue Requirements (2009\$)



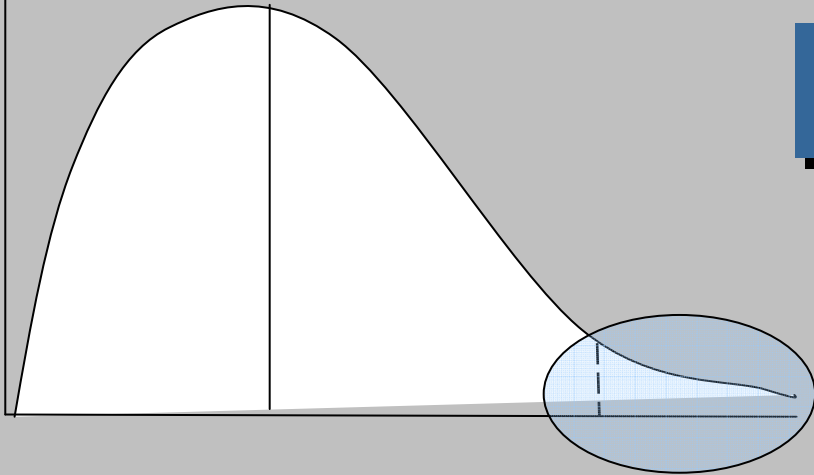
Portfolio Analysis

Combined Performance Frequency of Good vs. Bad Outcomes



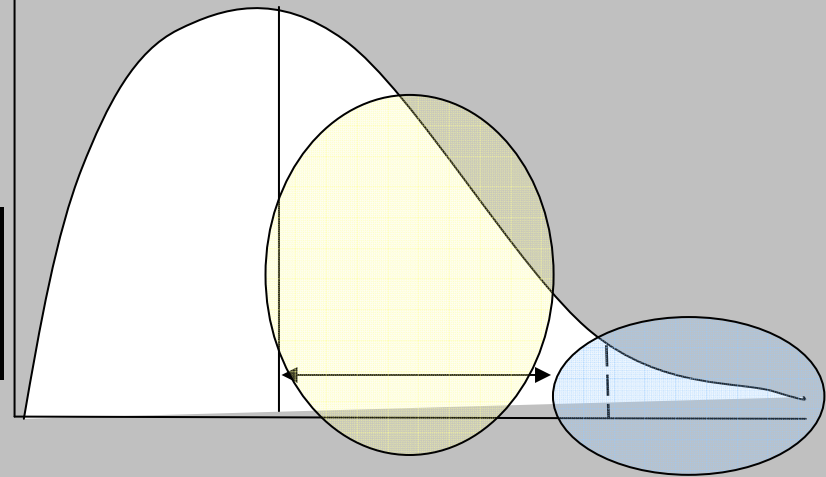
Risk Metrics - illustration

Average of 4 Worst Futures



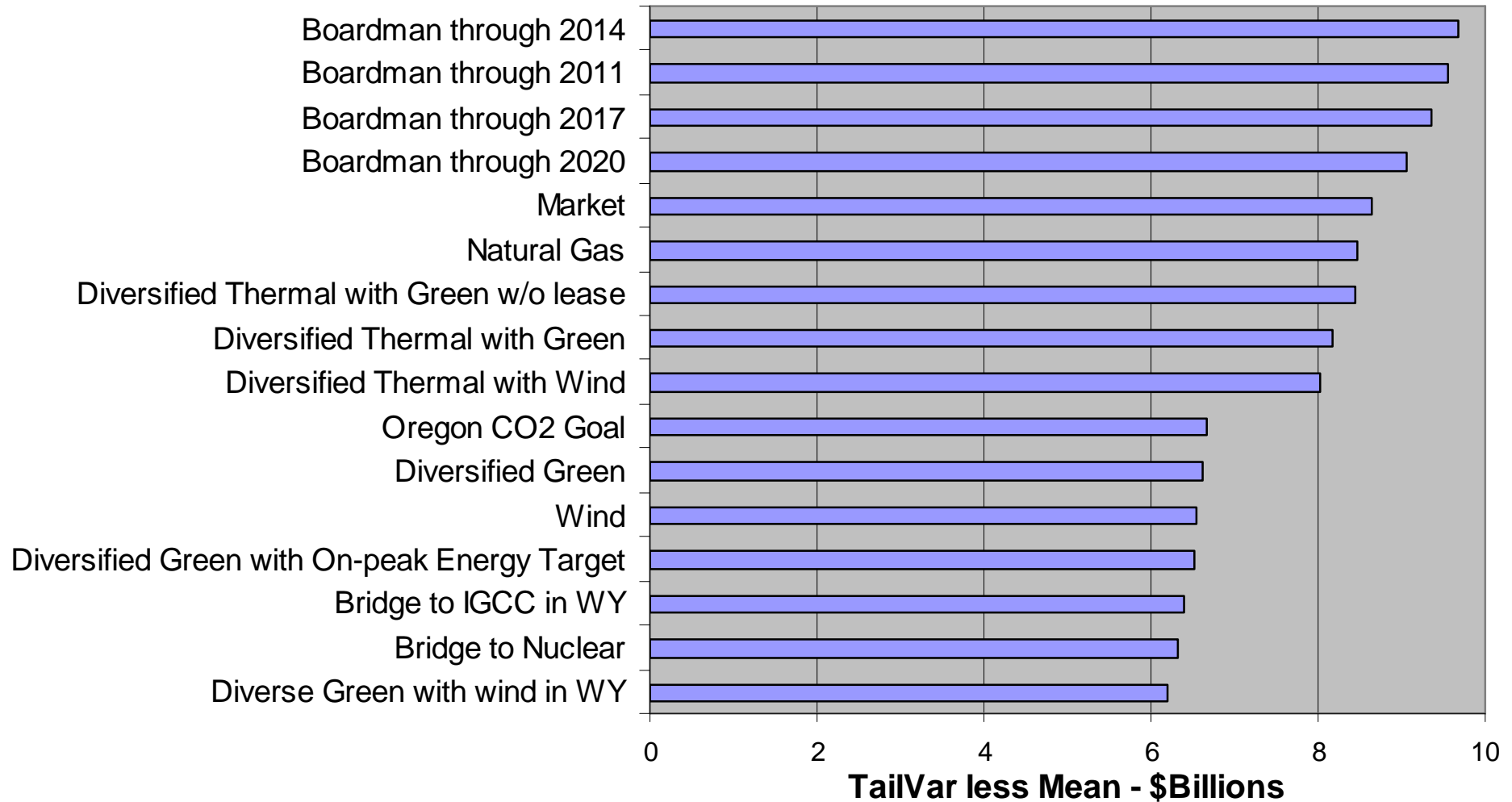
Shows magnitude of potential worst cost outcomes

Avg. of 4 Worst Futures Less Ref. Case

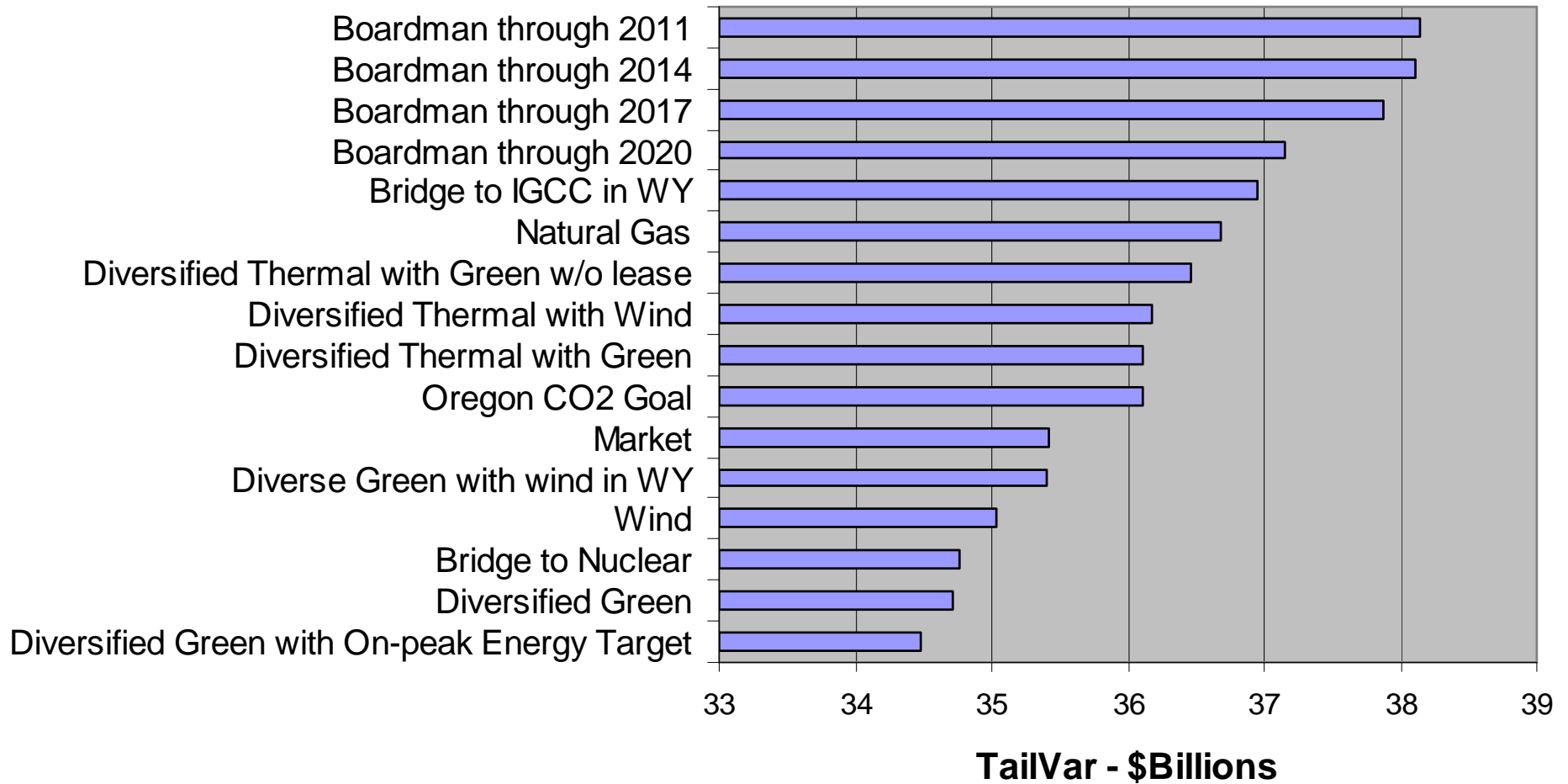


Shows difference between worst outcomes and expected cost

Stochastic Risk – TailVar 90 less the Mean

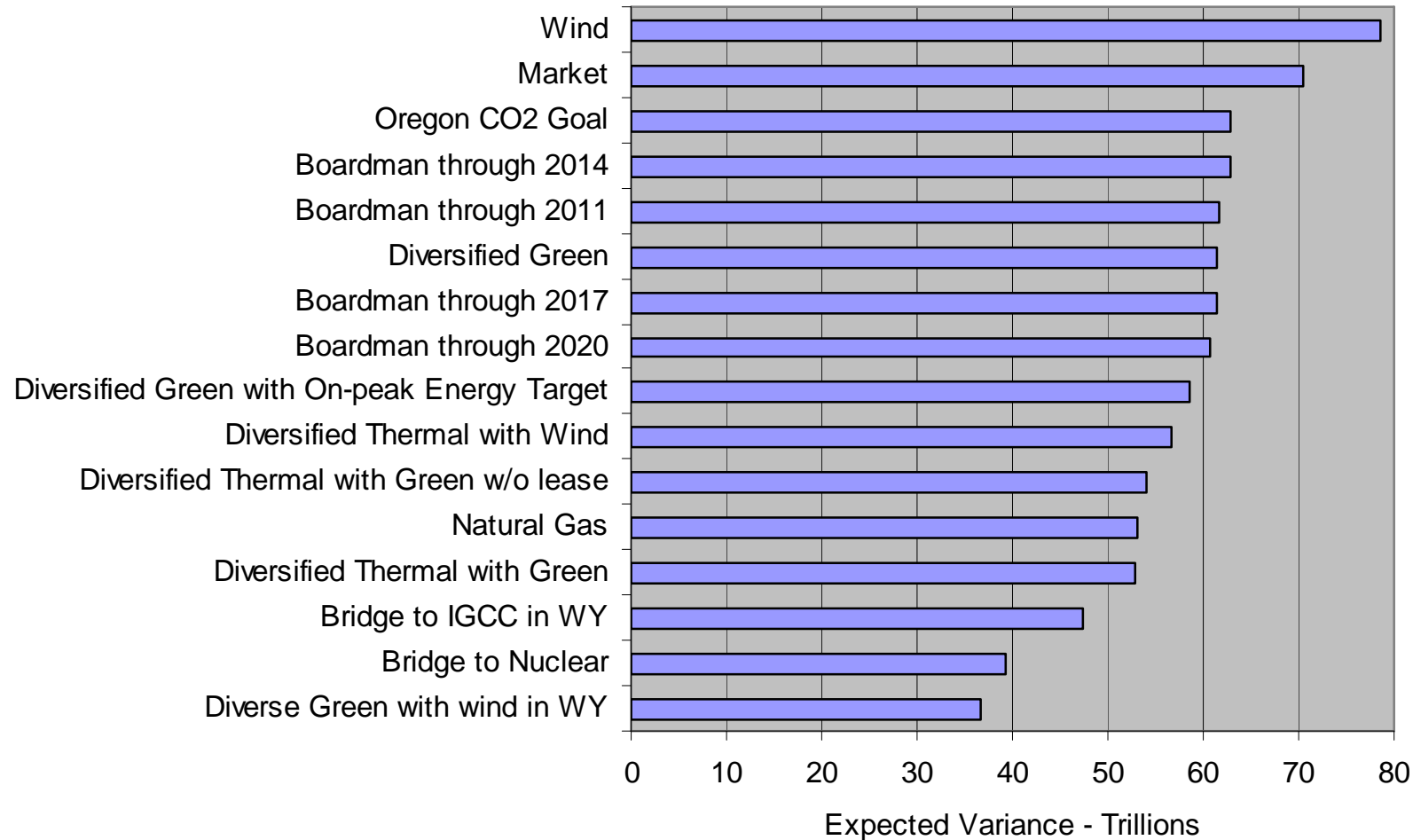


Stochastic Risk - TailVar

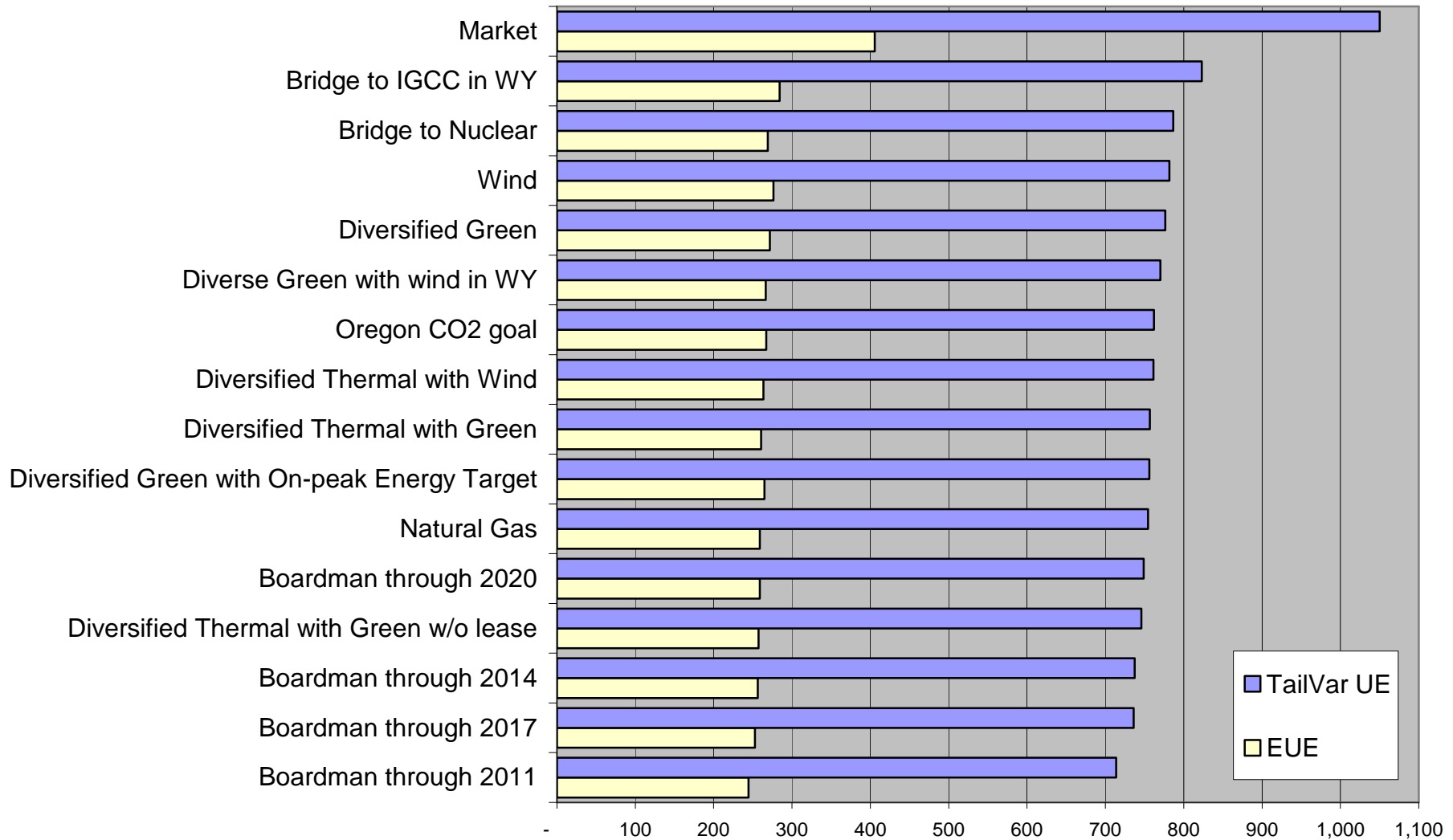


Stochastic Risk – Annual Cost Variance

Year-to-Year Portfolio Average Variance



Portfolio Reliability – Unserved Energy 2012-2020 & 2025



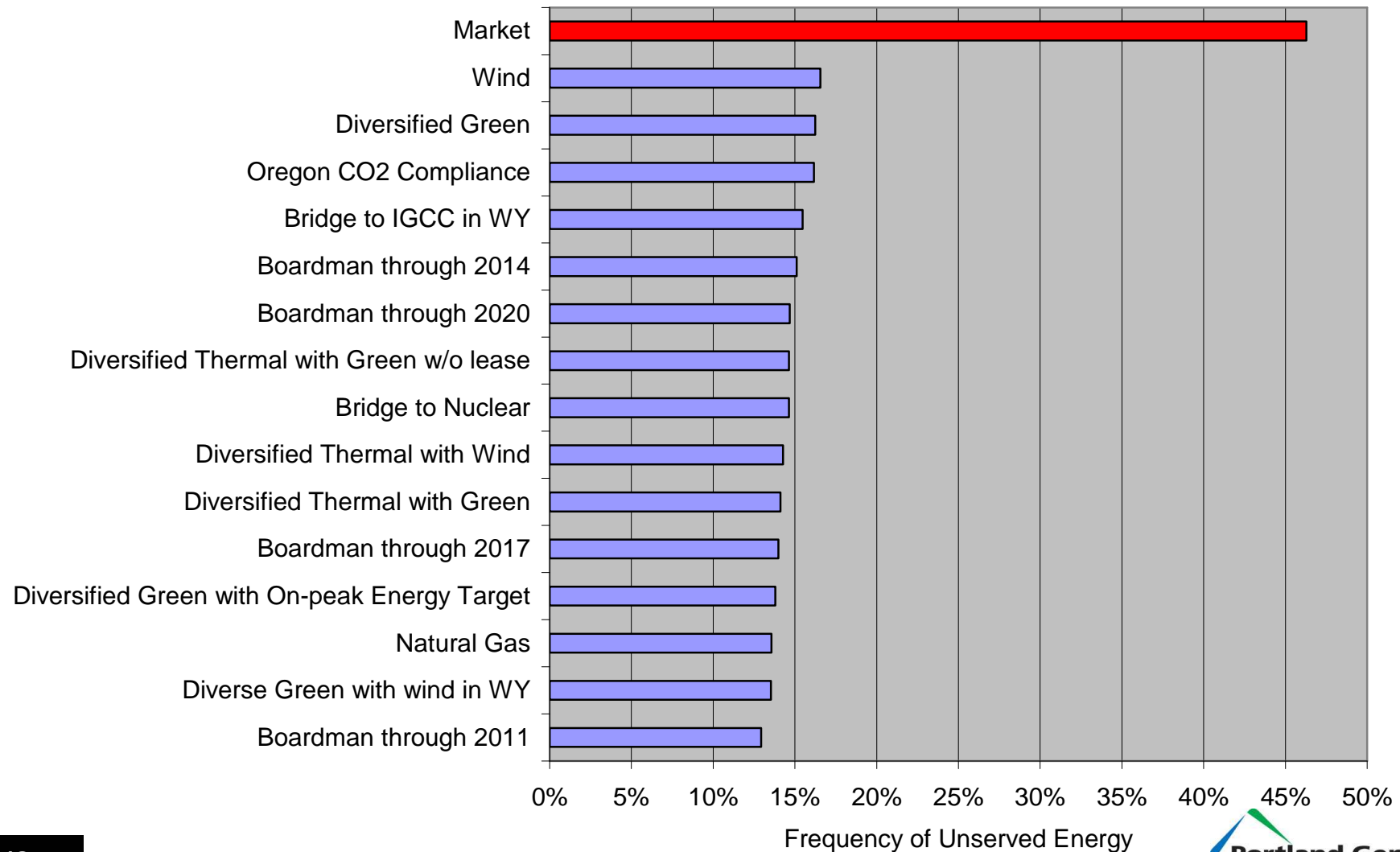
Does not include other contingencies, e.g. fuel supply, fuel transportation and electric transmission.

Energy Deficit (MWa)

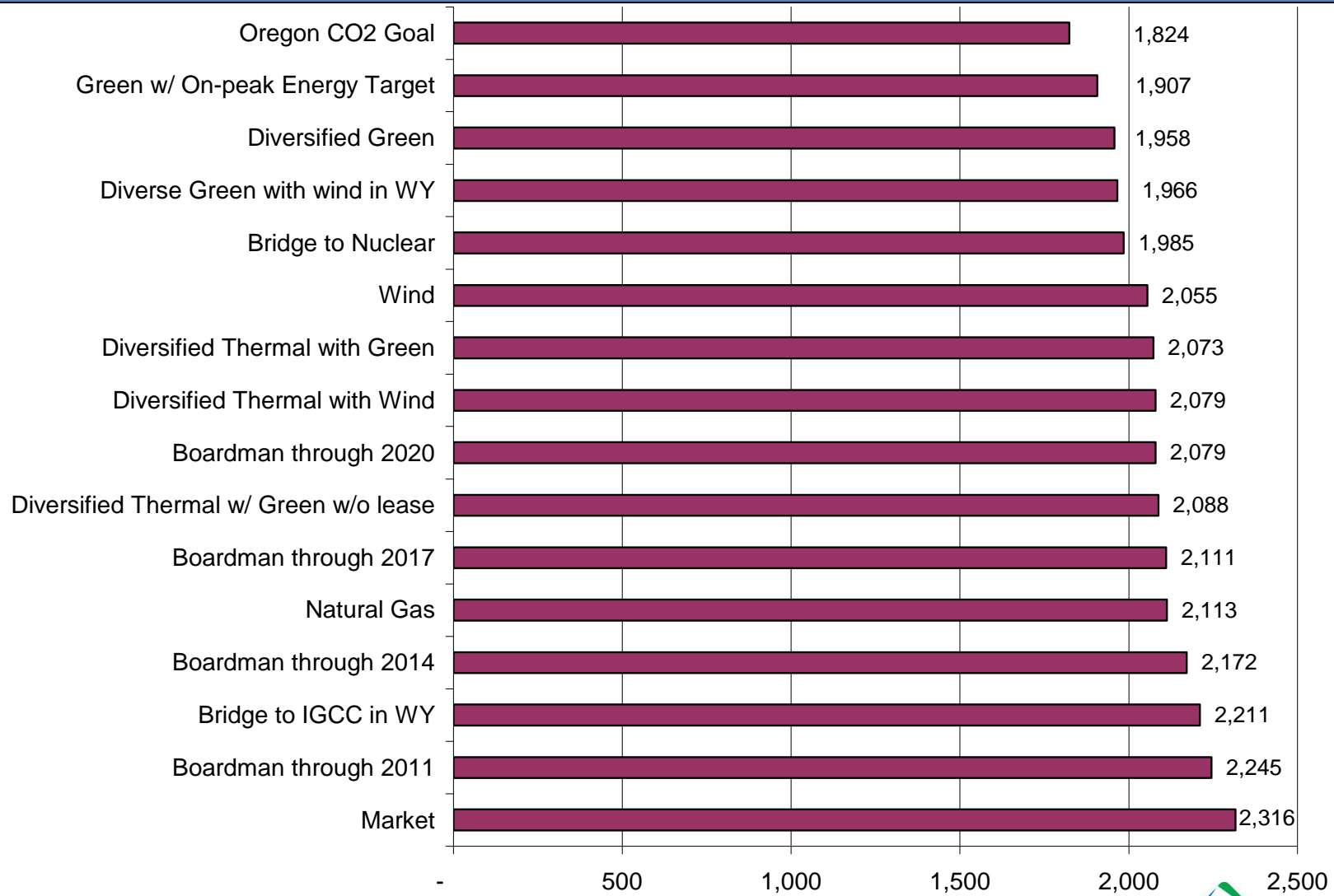


Portfolio Reliability - LOLP

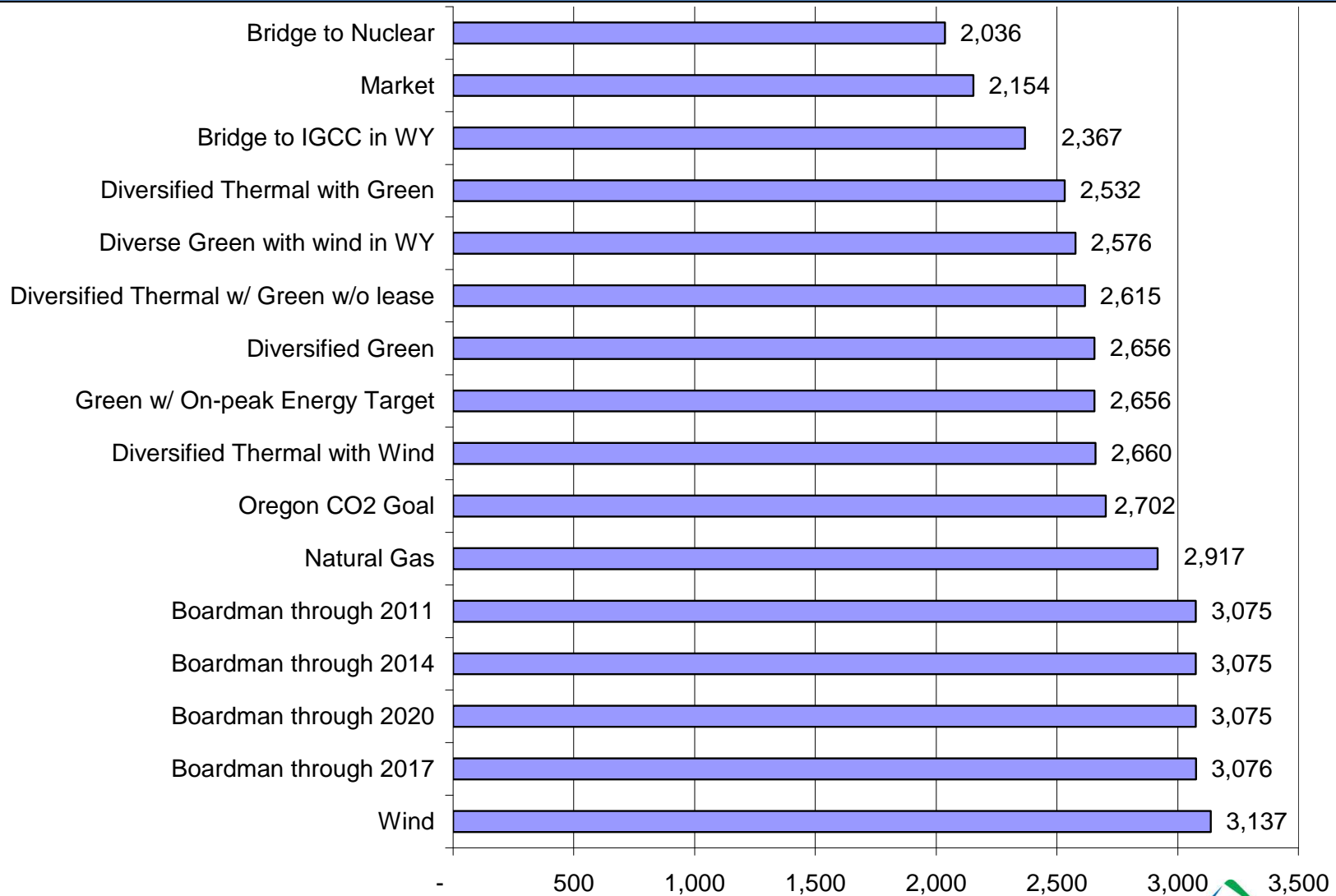
LOLP Performance for 2012-2020, & 2025



HHI - Fuel



HHI - Technology



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)	(l)	(m)	(n)
Scoring Consideration	Within Efficient Frontier 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	Risk Magnitude: Avg. Worst 4 vs. Reference Case	Risk: TailVar	Risk: TailVar less Mean	Risk: Year-to-Year Variation	Reliability: TailVar Unserved Energy 2012-2020 & 2025	Diversity: Technology HHI	Diversity: Fuel HHI
Units	Y or N	Y or N	\$ NPV	%	%	%	\$ NPV Million	\$ NPV Million	\$ NPV Million	\$ NPV Million	Trillion	MW _a	Points	Points
1 Market	Y	N	\$ 27,211	5%	90%	86%	\$ 36,155	\$ 8,943	\$ 35,414	\$ 8,631	70	1050	2154	2316
2 Natural Gas	Y	Y	\$ 29,027	10%	5%	-5%	\$ 35,436	\$ 6,410	\$ 36,675	\$ 8,458	53	755	2917	2113
3 Wind	Y	Y	\$ 29,288	5%	14%	10%	\$ 34,238	\$ 4,949	\$ 35,037	\$ 6,547	78	782	3137	2055
4 Diversified Green	Y	Y	\$ 28,987	0%	14%	14%	\$ 34,091	\$ 5,104	\$ 34,718	\$ 6,624	61	777	2656	1958
5 Diversified Thermal with Wind	Y	Y	\$ 28,891	5%	0%	-5%	\$ 34,949	\$ 6,057	\$ 36,175	\$ 8,025	57	761	2660	2079
6 Bridge to IGCC in WY	N	Y	\$ 32,735	100%	0%	-100%	\$ 38,635	\$ 5,900	\$ 36,950	\$ 6,397	47	823	2367	2211
7 Bridge to Nuclear	N	Y	\$ 29,853	81%	0%	-81%	\$ 34,863	\$ 5,010	\$ 34,768	\$ 6,311	39	787	2036	1985
8 Green w/ On-peak Energy Target	Y	Y	\$ 28,971	0%	19%	19%	\$ 33,993	\$ 5,023	\$ 34,481	\$ 6,517	58	756	2656	1907
9 Diversified Thermal with Green	Y	Y	\$ 28,674	5%	24%	19%	\$ 34,910	\$ 6,236	\$ 36,116	\$ 8,171	53	757	2532	2073
10 Boardman through 2014	Y	Y	\$ 28,593	5%	67%	62%	\$ 35,126	\$ 6,533	\$ 38,112	\$ 9,689	63	737	3075	2172
11 Oregon CO2 Goal	N	Y	\$ 30,375	81%	14%	-67%	\$ 35,007	\$ 4,632	\$ 36,112	\$ 6,665	63	762	2702	1824
12 Boardman through 2011	Y	Y	\$ 28,777	10%	10%	0%	\$ 35,247	\$ 6,470	\$ 38,142	\$ 9,551	62	714	3075	2245
13 Boardman through 2020	Y	Y	\$ 28,396	0%	81%	81%	\$ 34,770	\$ 6,374	\$ 36,999	\$ 8,987	61	749	3075	2079
14 Diverse Green with wind in WY	N	Y	\$ 30,828	86%	0%	-86%	\$ 35,962	\$ 5,134	\$ 35,399	\$ 6,191	37	770	2576	1966
15 Diversified Thermal w/ Green w/o lease	Y	Y	\$ 28,668	0%	62%	62%	\$ 34,891	\$ 6,223	\$ 36,461	\$ 8,432	54	746	2615	2088
16 Boardman through 2017	Y	Y	\$ 28,780	10%	0%	-10%	\$ 35,257	\$ 6,477	\$ 37,877	\$ 9,358	61	736	3076	2111

Performance Range for Scoring Normalization:

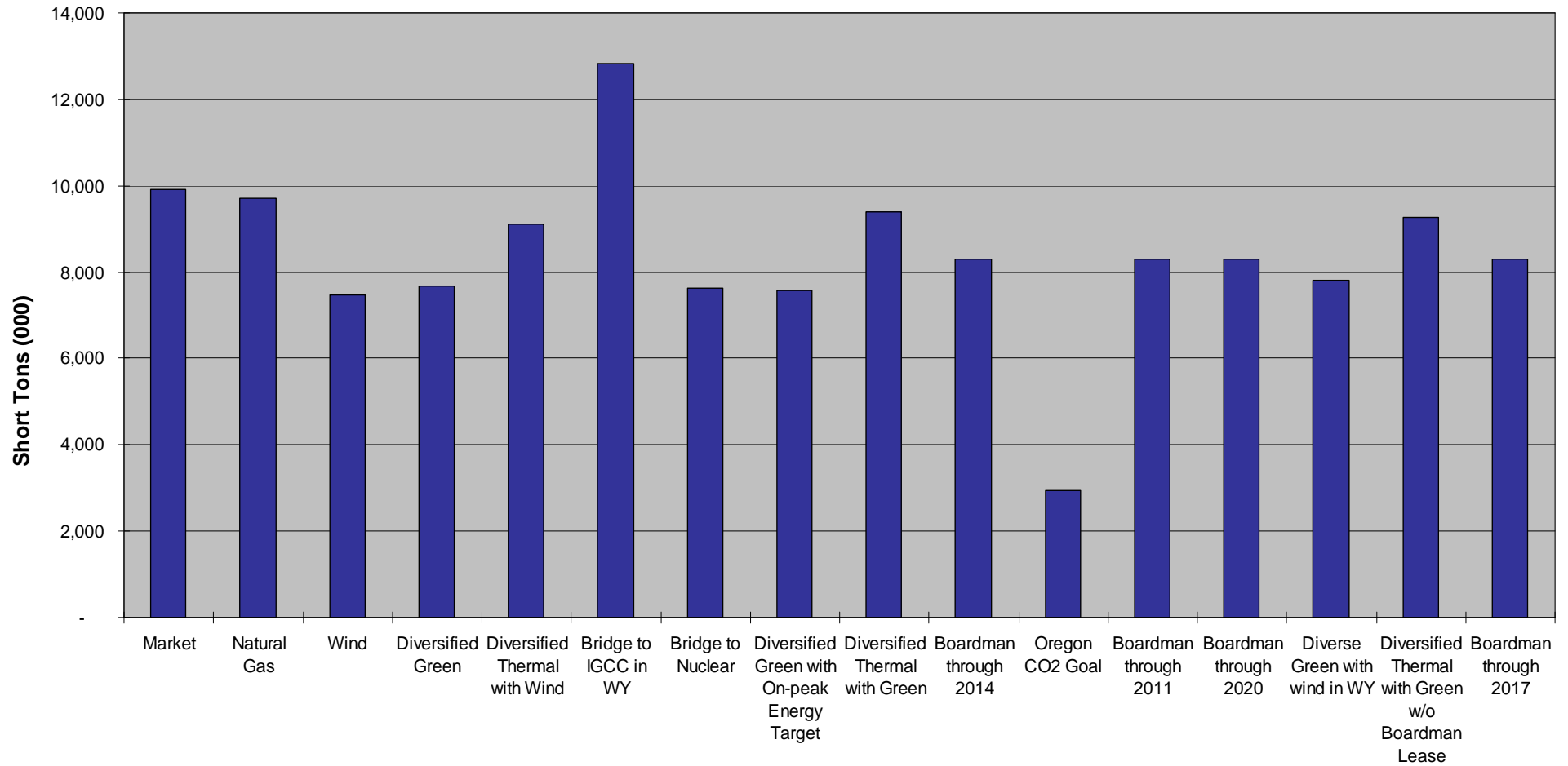
Best Performing Portfolio(s)			\$ 27,211	100%	90%	86%	\$ 33,993	\$ 4,632	\$ 34,481	\$ 6,191	37	713.9	2,036	1,824
Best Basis			Min	Max	Max	Max	Min	Min	Min	Min	Min	Min	Min	Min
Worst Performing Portfolio(s)			\$ 32,735	0%	0%	-100%	\$ 38,635	\$ 8,943	\$ 38,142	\$ 9,689	78	1,050.3	3,137	2,316
Spread Best to Worst			\$ 5,524	100%	90%	186%	\$ 4,641	\$ 4,311	\$ 3,661	\$ 3,498	42	336.4	1,101	492
% Difference			20.3%				13.7%	93.1%	10.6%	56.5%	113.9%	47.1%	54.1%	27.0%

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)	(l)	(m)	(n)
Scoring Consideration		Within Efficient Frontier Zone?	Meets Operating Reserve Req?	Cost: Expected Cost	Risk Durability: Good minus Bad	Risk Magnitude: Avg. Worst 4 vs. Reference Case	Risk Magnitude: Avg. Worst 4 vs. Reference Case	Risk: TailVar	Risk: TailVar less Mean	Risk: Year-to-Year Variation	Reliability: Avg. EUE 2012-2020 & 2025	Diversity: Technology HHI	Diversity: Fuel HHI
1	Market	Y	N	100.0	100.0	53.4	0.0	74.5	30.2	19.3	0.0	89.3	0.0
2	Natural Gas	Y	Y	67.1	51.3	68.9	58.8	40.1	35.2	60.8	87.9	20.0	41.3
3	Wind	Y	Y	62.4	59.0	94.7	92.6	84.8	89.8	0.0	79.9	0.0	53.1
4	Diversified Green	Y	Y	67.9	61.5	97.9	89.1	93.5	87.6	40.6	81.4	43.7	72.6
5	Diversified Thermal with Wind	Y	Y	69.6	51.3	79.4	66.9	53.7	47.6	52.3	85.9	43.3	48.2
6	Bridge to IGCC in WY	N	Y	0.0	0.0	0.0	70.6	32.6	94.1	74.7	67.5	69.9	21.3
7	Bridge to Nuclear	N	Y	52.2	10.3	81.3	91.2	92.2	96.6	93.5	78.3	100.0	67.2
8	Green w/ On-peak Energy Target	Y	Y	68.1	64.1	100.0	90.9	100.0	90.7	47.9	87.4	43.7	83.2
9	Diversified Thermal with Green	Y	Y	73.5	64.1	80.3	62.8	55.3	43.4	61.2	87.3	54.9	49.3
10	Boardman through 2014	Y	Y	75.0	87.2	75.6	55.9	0.8	0.0	37.6	93.0	5.6	29.3
11	Oregon CO2 Goal	N	Y	42.7	17.9	78.2	100.0	55.5	86.5	37.4	85.7	39.5	100.0
12	Boardman through 2011	Y	Y	71.7	53.8	73.0	57.4	0.0	4.0	40.0	100.0	5.6	14.3
13	Boardman through 2020	Y	Y	78.6	97.4	83.3	59.6	31.2	20.1	42.9	89.6	5.6	48.0
14	Diverse Green with wind in WY	N	Y	34.5	7.7	57.6	88.4	74.9	100.0	100.0	83.3	50.9	71.1
15	Diversified Thermal w/ Green w/o lease	Y	Y	73.6	87.2	80.7	63.1	45.9	35.9	58.3	90.5	47.4	46.3
16	Boardman through 2017	Y	Y	71.6	48.7	72.8	57.2	7.2	9.5	41.0	93.4	5.5	41.7

CO₂ Emissions – 2021 Annual Total



CO₂ Emissions – 2021 Intensity

