

Resource Planning Update

June 14, 2016

Board Committee Meeting Presentation



Strategic Directives

- SD-9 Resource Planning:
 - The Board of Directors recognizes that the District will have to adapt to the rapidly changing electric utility business environment. The OPPD resource planning process will provide the resources and analytical capability to adequately assess OPPD's Integrated Resource Portfolio to ensure reliable, competitive, cost-effective and environmentally sensitive service for our customer owners.
- SD-2 Competitive Rates:
 - The Board of Directors shall establish a rate target of 20% below the West North Central Regional average published rates on a system average basis.

Strategic Trends

- Increased Regulations
- Renewable Energy Investments
- Grid Modernization
- Distributed Generation
- Technology
- Customer Owner Expectations
- Increased Cyber Security
- Employee Benefits



- Sub 1% or Negative Growth
- Low Market Prices (gas and wind)
- Increased Energy Efficiencies
- Economic Pressures
- Continued Load Reduction

Study Framework Questions

- **What is OPPD's optimal rebalanced portfolio considering many market, regulatory, and technological futures?**
- **What current assets remain part of any optimal future OPPD portfolio?**
- **What is the cost of keeping the current assets in OPPD's future portfolio?**
- **What is the cost or benefit of delaying potential asset retirements?**

Technologies Considered by Optimization

- **Gas Turbines** (GE7FA, GE LMS100)
- **Combined Cycles** (2x1 GE7FA, 2x1 Advanced)
- **Cogen Combined Cycles** (Siemens 2000E, 5000FEE)
- **NG Reciprocating Engines** (Wartsila 1, 6, and 12 Unit 18V50SG)
- **New Solar**
- **New Wind**
- **Long Duration Batteries** (Zinc and Lithium Based)
- **Energy Efficiency Programs** (RIM Score over 1.0 by AEG study)
- **Capacity and Energy Contracts** (Thermal, Wind, and Solar)
- **Extended Power Uprate (EPU)**

Excluded by Preliminary Analysis: Pulverized Coal, IGCC, Nuclear

Scenarios Investigated

Scenario	No CPP	CPP	Purpose
<p>Baseline FCS is not retired and NO4 and NO5 converted to natural gas in 2023. (FCS uprate is model option)</p>	X	X	<p>Answers: What is the cost of business as usual?</p>
<p>Rebalanced All capacity and energy options are considered. Keep existing contracts (PPAs, WAPA, NC2). Must meet renewable target of 30-50%. A wide range of resource alternatives are considered including FCS uprate.</p>	X	X	<p>Answers: What is OPPD's optimum portfolio?</p>

Optimized Portfolio Capacity Options

Key Findings

- FCS drops out of every case when given an option
- Additions are economically driven not compliance driven
- EPU is not economic – other carbon free options are more economic
- OPPD is in a good economic position to comply with the current CPP regulation with or without FCS
- Constrained energy sales moderate market variability
- Stochastics confirm lower cost and risk associated with the rebalanced portfolio

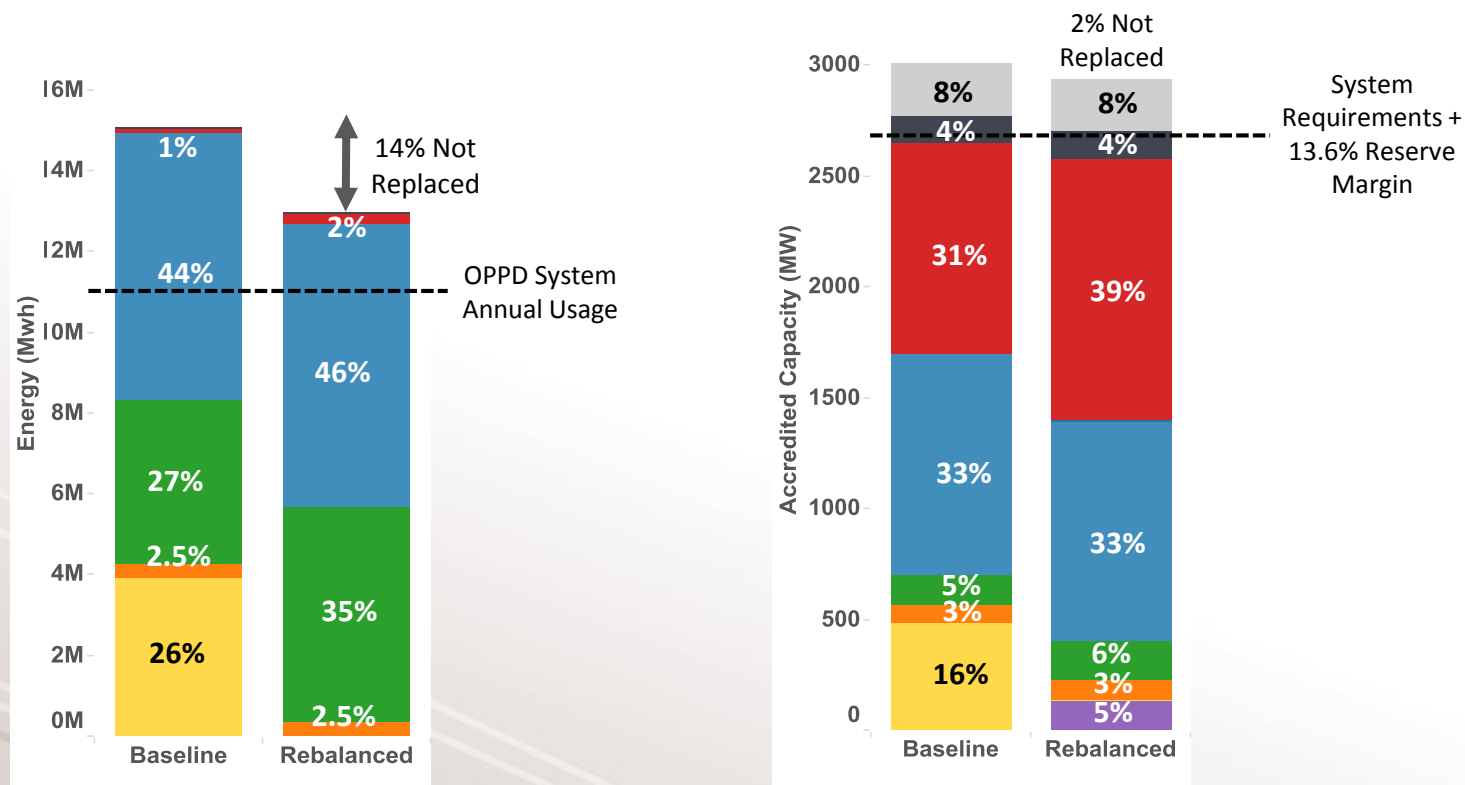
Energy versus Capacity

- Electricity term definitions:
 - Capacity – the amount of electricity that a power plant is capable of producing
 - Energy – the amount of electricity used by customer owners at any moment in time
 - System Requirements – the highest amount of energy expected to be consumed by our customer owners at any one moment in time during a given year plus the SPP mandated reserve margin

Baseline vs. Rebalanced 2025

Baseline: Some New Wind, North Omaha 4&5 Gas Conversion

Rebalanced: FCS Retirement 2016, New Wind, New Peaking



Energy**

Capacity



*Total generation includes system requirements and off-system sales, North Omaha 4 and 5 retired from coal in 2024.

**Energy percentages are relative to the baseline portfolio generation

Gas generation has a low fixed cost which makes it very economical to retain for 1%-2% usage during peak loads






Capacity Contract Plans

- Short Term Capacity Replacement
 - Utilize North Omaha 1-3 on natural gas during summer peak load periods
 - *Purchase available low cost capacity from other SPP participants
 - 90% of contracted capacity from a natural gas unit
 - 10% of contracted capacity from a coal facility
- Long Term Capacity Replacement
 - To be determined by formalized IRP

*Capacity contract only valid after Board approval and SPP grants firm transmission rights.

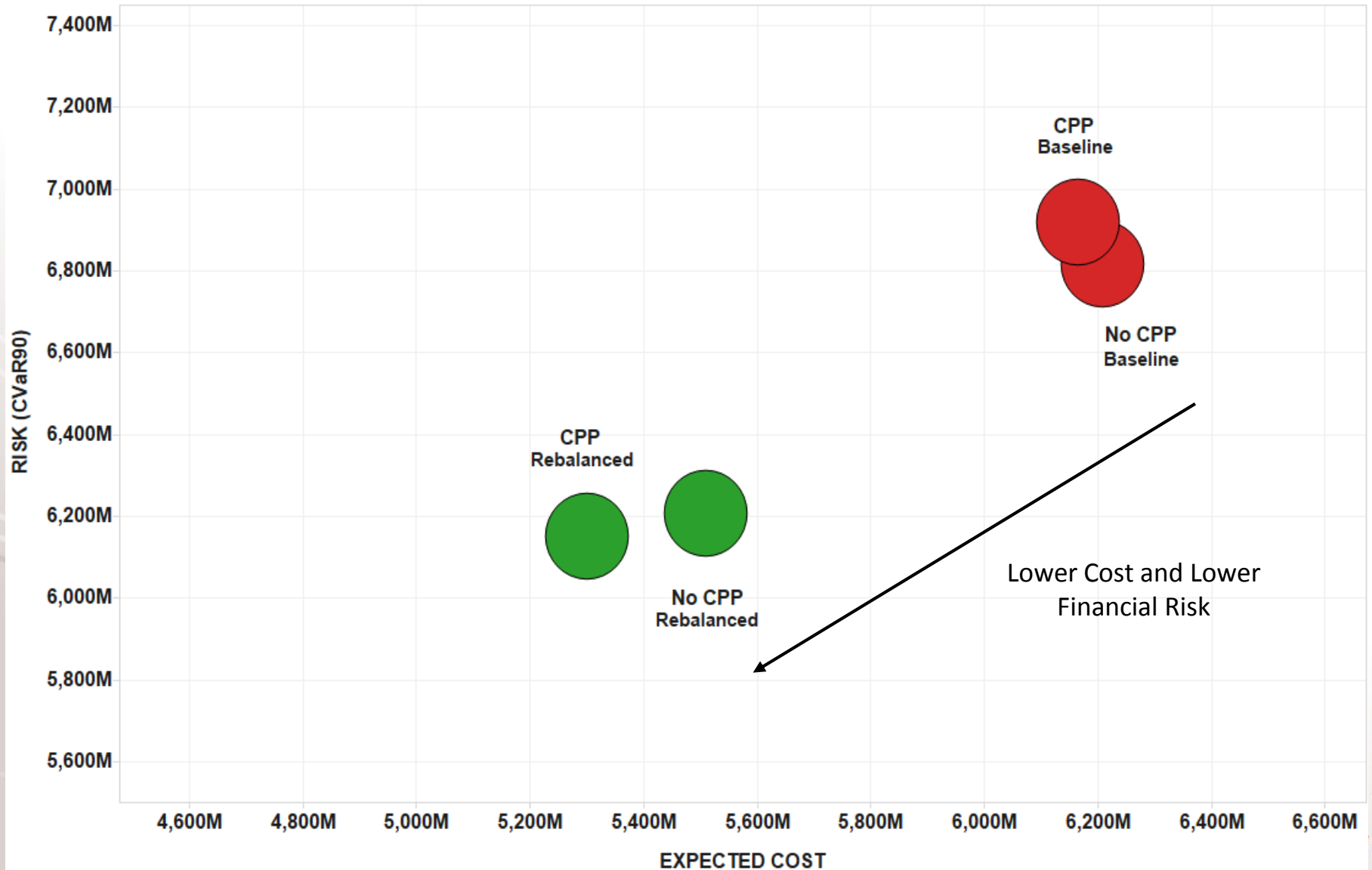
Portfolio System Cost, NPV Differential

Scenario	No CPP	CPP
Baseline	Reference	\$262M 
Rebalanced	\$994M 	\$735M 

NPV cost calculations from 2016-2035
based deterministic modeling results



Risk vs Cost Tradeoff



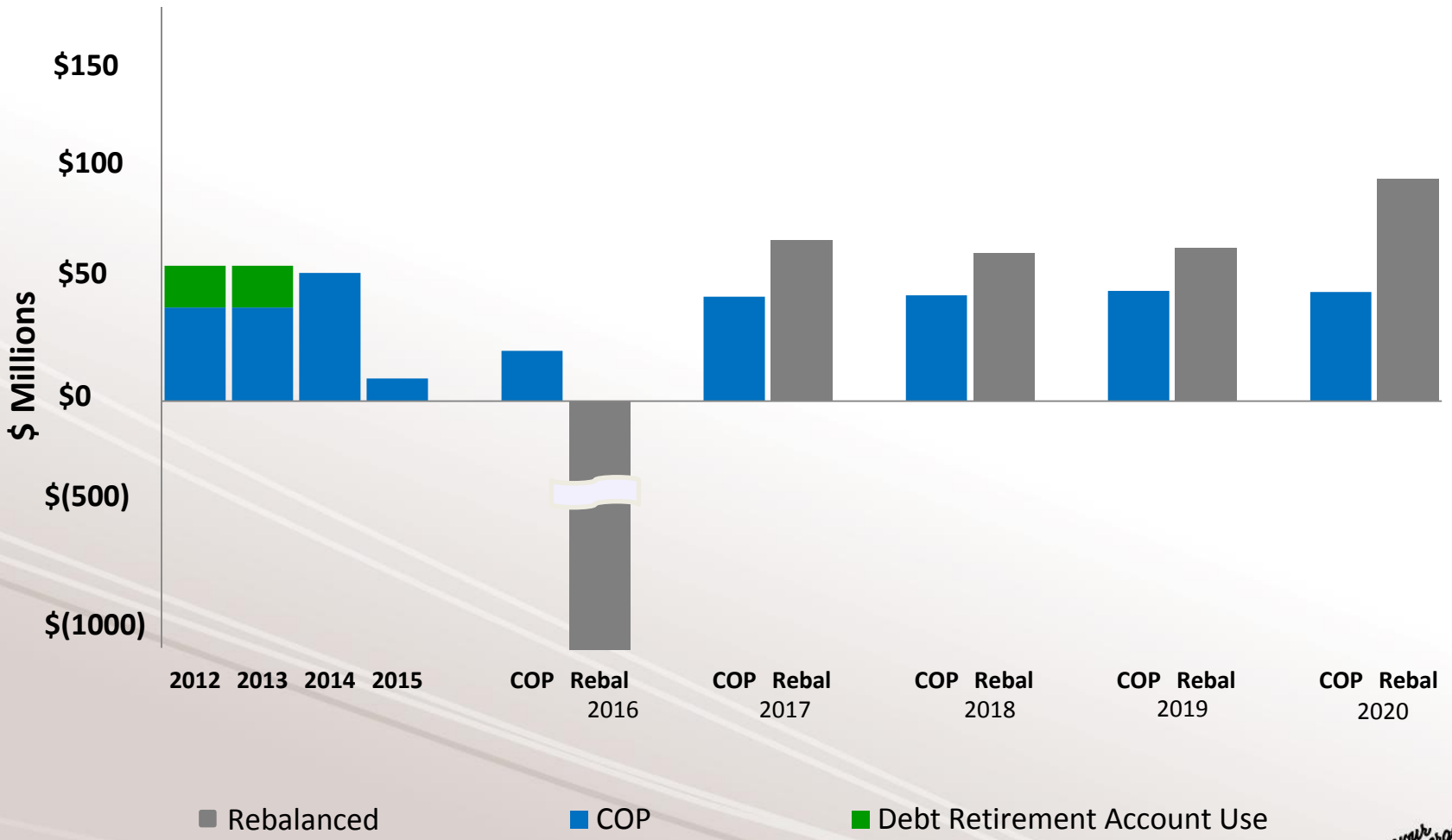
NPV of expected costs based on the average of the 200 scholastics modeling results

Financial Impacts

Financial Summary

- Discontinuing FCS operations results:
 - Improved competitive position
 - No projected general rate increases through forecast period
 - Fuel and Purchased Power Adjustment (FPPA) has been modeled
 - Results based on a reset of the energy rate within general rates in 2017
 - Large write off of FCS
 - Large net income loss in 2016
 - Increased debt ratio
 - Stable debt service coverage and liquidity position
 - Reduced financial risks

Net Income*



*Includes \$1.02B write-off for FCS plant investment less depreciation



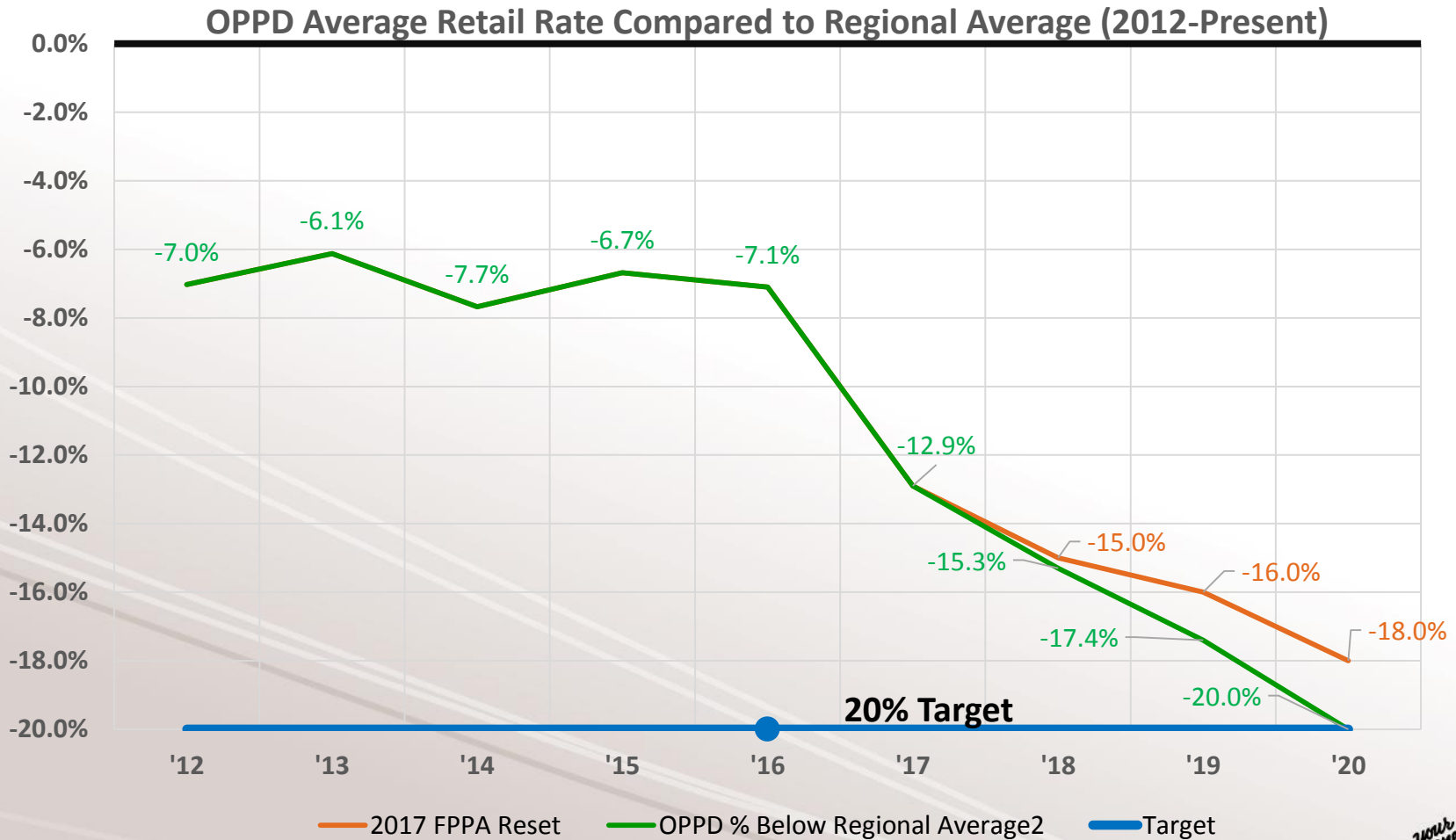
Accounting Impact

- Write-off following assets
 - FCS Plant assets in service
 - FCS Construction work in progress
 - Regulatory Assets (Deferred Decommissioning Expense, FCS Outage Costs, FCS Depreciation)
 - Stores (net of salvage)
 - Nuclear fuel (net of salvage)
- Revise depreciation estimate for North Omaha Station Unit 3
- Recognize decommissioning liability for NRC required obligation
 - Request Board Authorization for Regulatory Asset

Accounting Write-Off

Assets Written-Off (\$ in millions)	Estimate as of Year End 2015	Estimate as of June 2016	Difference
Net Electric Plant in Service	\$488	\$498	\$10
Construction Work in Progress	\$283	\$308	\$25
Nuclear Fuel	\$47	\$57	\$10
Stores Material	\$60	\$65	\$5
Regulatory Asset – Deferred Decommissioning Expense	\$3	\$6	\$3
Regulatory Asset – Outage Costs	\$21	\$10	\$(11)
Regulatory Asset – FCS Depreciation	<u>\$75</u>	<u>\$80</u>	<u>\$5</u>
Total	\$977	\$1,024	\$47

Rate Target – History*



Regional Average Source for 2010-2016 EIA, 2017-2020 IHS Global Insights



Decommissioning

Nuclear Decommissioning Overview

(source: Nuclear Regulatory Commission)

Definition: The process of safely closing a nuclear power plant to retire it from service after its useful life has ended. This process primarily involves:

- Decontaminating the facility to reduce residual radioactivity to a level that permits release of the property and termination of the operating license
- Releasing the property for unrestricted or (under certain conditions) restricted use
- Often includes dismantling the facility or dedicating it to other purposes
- Begins after the nuclear fuel is removed from the core
- Regulations and NRC oversight to protect workers and the public during the decommissioning process

Time: Decon or Safstor must be completed within 60 years of the plant ceasing operations.

Methodologies:

TYPE	DEFINITION	TIME
DECON	Soon after the nuclear facility closes, equipment, structures, and portions of the facility containing radioactive contaminants are removed or decontaminated to a level that permits release of the property and termination of the NRC license.	Approximately 10 years
SAFSTOR	Maintain and monitor facility in a condition that allows the radioactivity to decay; afterwards, the plant is dismantled and the property decontaminated	Completed within 60 years
ENTOMB	Radioactive contaminants are permanently encased on site in structurally sound material such as concrete. Facility is maintained and monitored until the radioactivity decays to a level permitting restricted release of the property.	(100-110 years)

Decommissioning Status:

U.S. Commercial Nuclear Power Reactors Undergoing Decommissioning and Permanently Shut Down - Formerly Licensed To Operate

(Source: Nuclear Regulatory Commission, Information Digest, 2015–2016, Appendix C, pp 22-24)

Total Reactors **29** **Decon*** **59%** **Safstor** **41%**

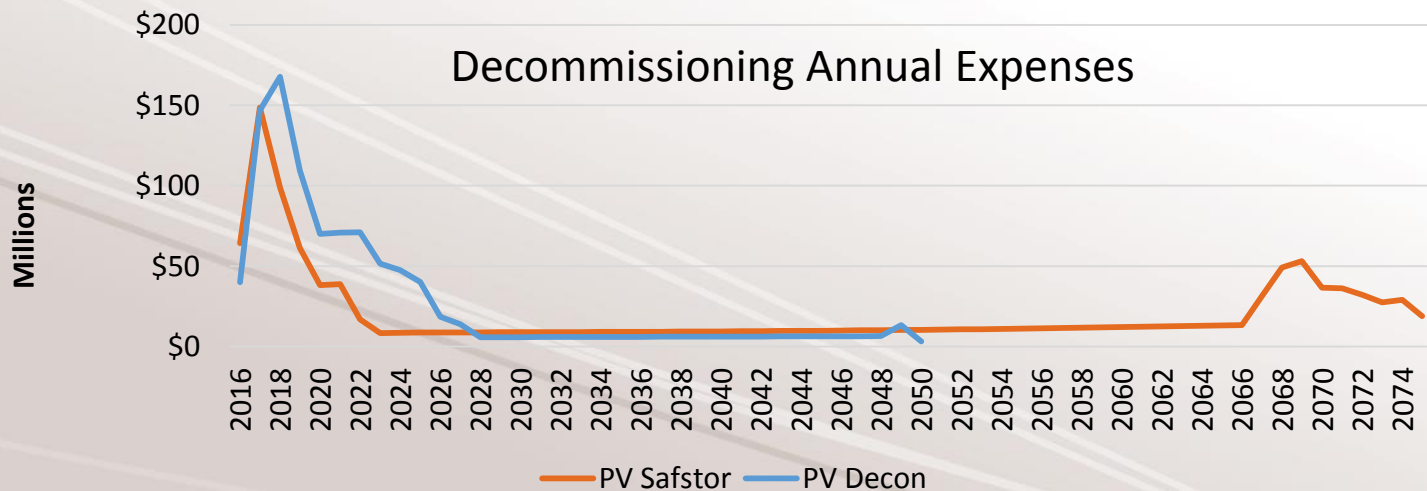
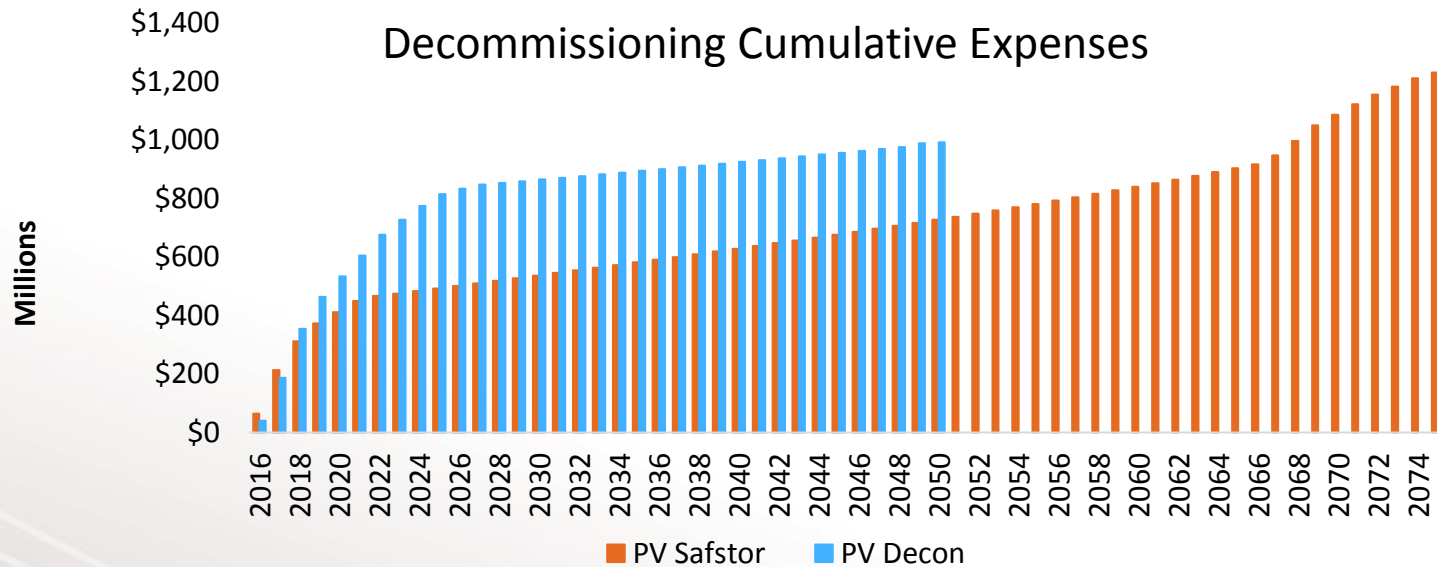
Reactor	Location	Capacity (MW)	Ceased Operations After 2000	Status
Crystal River 3	Crystal River, FL	860	2/20/2013	SAFSTOR
Kewaunee	Carlton, WI	556	5/7/2013	SAFSTOR
San Onofre 2 and 3	San Clemente, CA	1,127 each	6/12/2013	DECON
Vermont Yankee	Vernon, VT	605	12/29/2015	SAFSTOR

*Number of reactors have completed Decon but many started in Safstor; appears to be driven by the funding situation

OPPD Decommissioning Funds

- Two FCS decommissioning funds
 - Minimum Required NRC Decommissioning Fund
 - Current Balance - \$285 M
 - Supplemental Decommissioning Fund
 - Current Balance - \$96 M
- Incremental funding as required is a blend of:
 - Operations and maintenance expense savings as a result of not operating the facility
 - Associated earnings on both funds mentioned above
 - Spent fuel management reimbursements from DOE

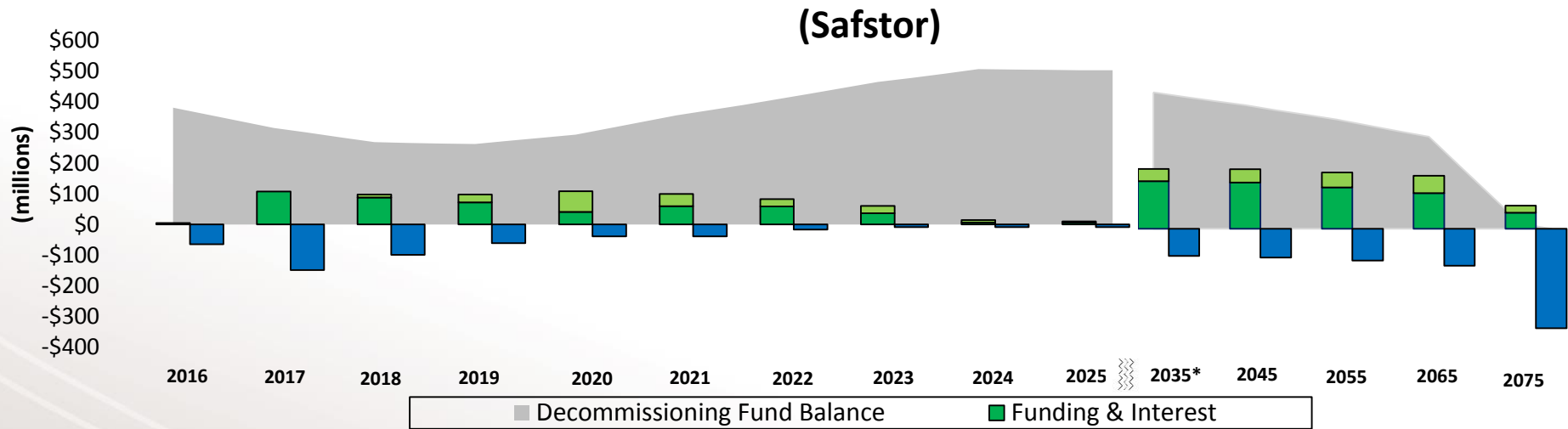
Decommissioning Expenses



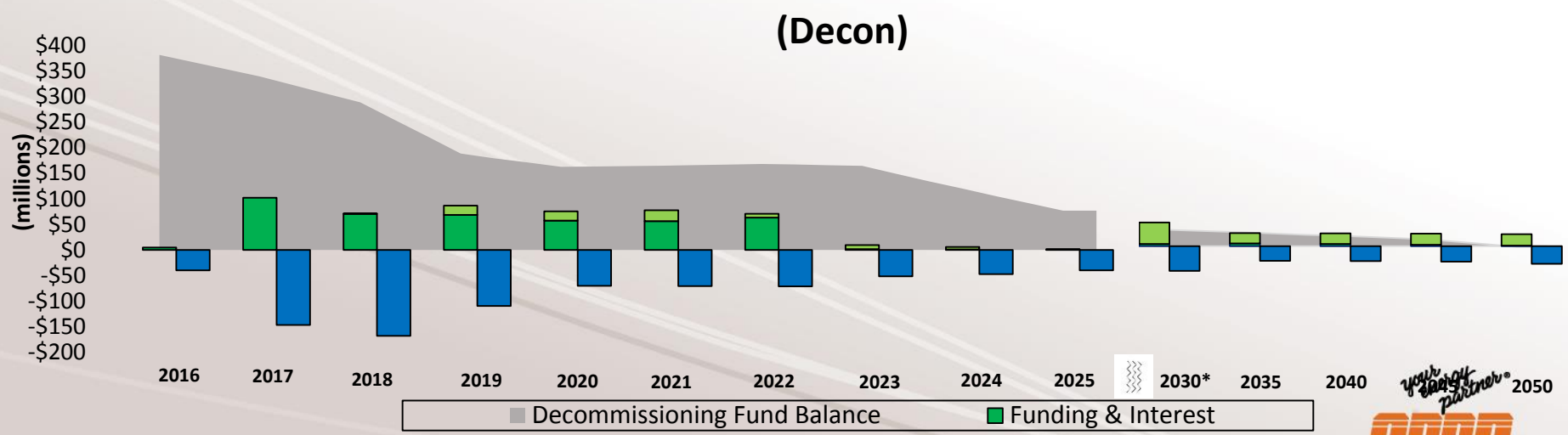
Safstor: Present value of \$1.2 billion (through 2075) Decon: Present value of \$1.0 billion (through 2050)



Decommissioning Funding (present value \$)



* Ten-year cumulative amounts for 2035 onward



* Five-year cumulative amounts for 2030 onward



Decommissioning Decision Criteria

- Financial Stewardship
 - Financial flexibility
 - Corporate health
 - Talent and project execution
- Safety and Regulatory
 - Nuclear and Radiological Safety
 - Environmental Safety
 - Industrial Safety
 - Regulatory Flexibility
- Customer Owner, Community and Company
 - Customer Owner and Stakeholder Perspective
 - Corporate Reputation and goodwill

Conclusion

While the two decommissioning methodologies are close from a decision criteria basis, *the flexibility allowed by selecting Safstor brings greater value to our customer owners*

Recommendations

- Cease operations at FCS by December 31, 2016
- Decommissioning methodology recommendation is to pursue Safstor
- No projected general rate increase through 2021 creating a path to being 20% below the regional average
- Approval of proposed accounting treatment
- Continued pursuit of Rebalanced Portfolio Options
 - Long Term Capacity Replacement
 - Utilize Integrated Resource Plan and Stakeholder process to finalize replacement options
 - Short Term Capacity Replacement
 - Utilize North Omaha 1-3 on natural gas during peak load periods
 - Purchase available low cost capacity from other SPP participants