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June 29,2011

MEMORANDUM

TO: Council Members

FROM: Terry Morlan

SUBJECT: Presentation on Puget Sound Energy Integrated Resource Plan

Phillip Popoff, Manager of Integrated Resource Planning at Puget Sound Energy (PSE), will discuss PSE's IRP planning and results. This presentation is in keeping with informing the Council of utility planning and how it relates to the Council's power plan and other work.

Phillip will discuss their IRP context, their major findings and conclusions, and how it relates to the Council plan and activities.

A PowerPoint presentation is attached.

Attachment

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2011 IRP Overview



July 12, 2011

Phillip Popoff

Manager, Integrated Resource Planning



Presentation Road Map

IRP Overview and Context

Insights from PSE's 2011 IRP

Resource Needs and "The Plan"

Comparisons with Council's 6th Plan

Relationships with Council Staff/Processes





Integrated Resource Planning

WAC 480-100-238 Integrated resource planning.



- (1) Purpose. Each electric utility... has the responsibility to meet its system demand with a **least cost mix of energy supply resources and conservation.**
- (2) (a) “Integrated resource plan” or “plan” means a plan... that will meet current and future needs at the **lowest reasonable cost...**
- (2)(b) “Lowest reasonable cost” means the **lowest cost mix...** of commercially available resources. At a minimum, this analysis must consider resource cost, market volatility risks...public policies regarding resource preference adopted by WA state or the federal government and the cost risks associated with environmental effects including emissions of carbon dioxide.

Plans Versus Planning





Key Take-Aways: Planning

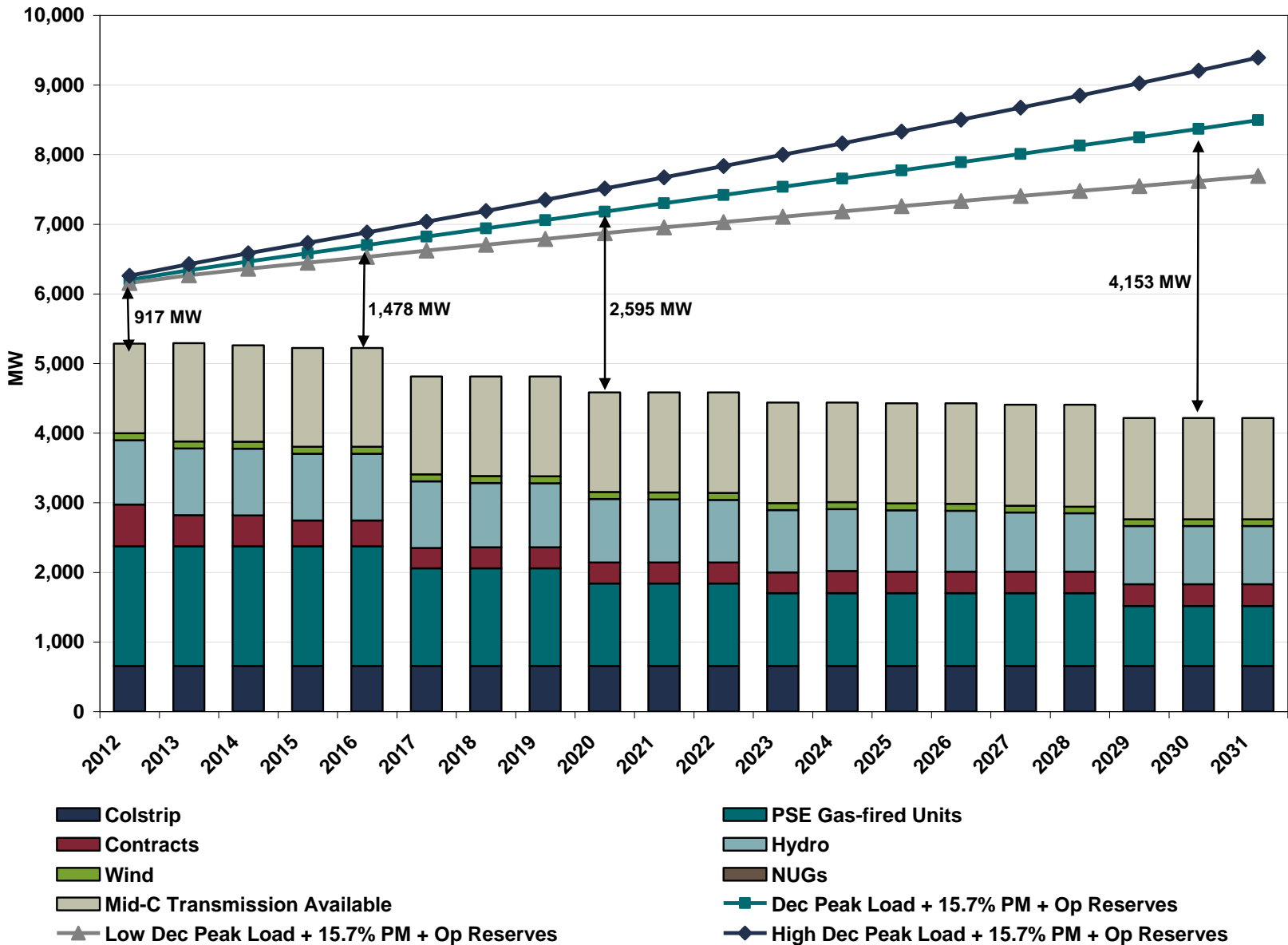
- Resource Alternatives Limited
- Demand-Side Resources Important
- Regional Surplus
 - Not so good for stimulating new base-load generation...
 - Good for customers of Washington's biggest electric utility!
- Cost Effectiveness of Renewables Challenged
 - ...but expect to stay under I-937 cost cap
- Significant Cost Uncertainty



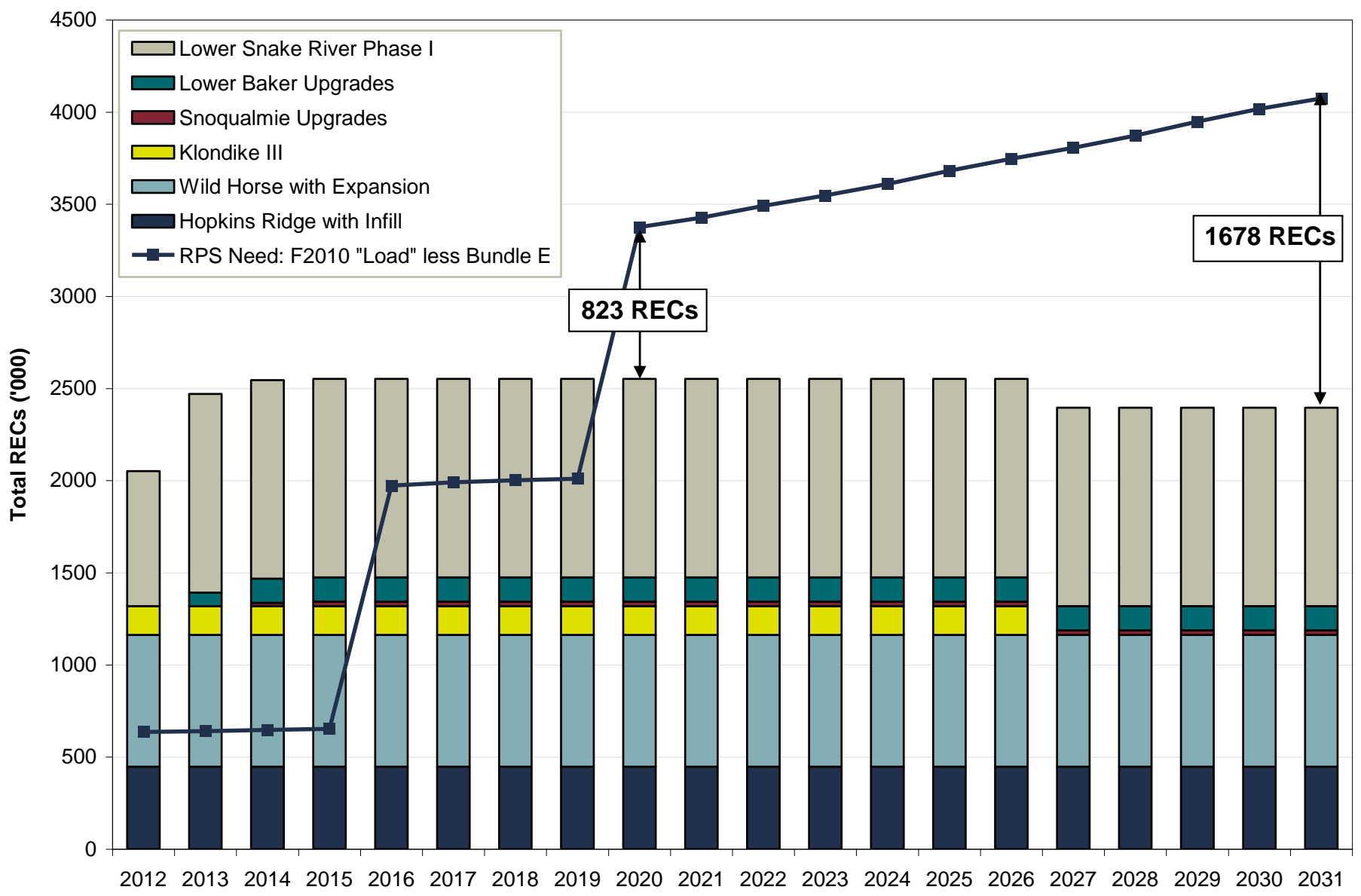


- Continue Aggressive Demand-Side Resources
- Peakers + Transmission for Capacity
- Market for Energy
- Additional Wind (after LSR) by 2020 for I-937

Peak-Hour Capacity Resource Needs



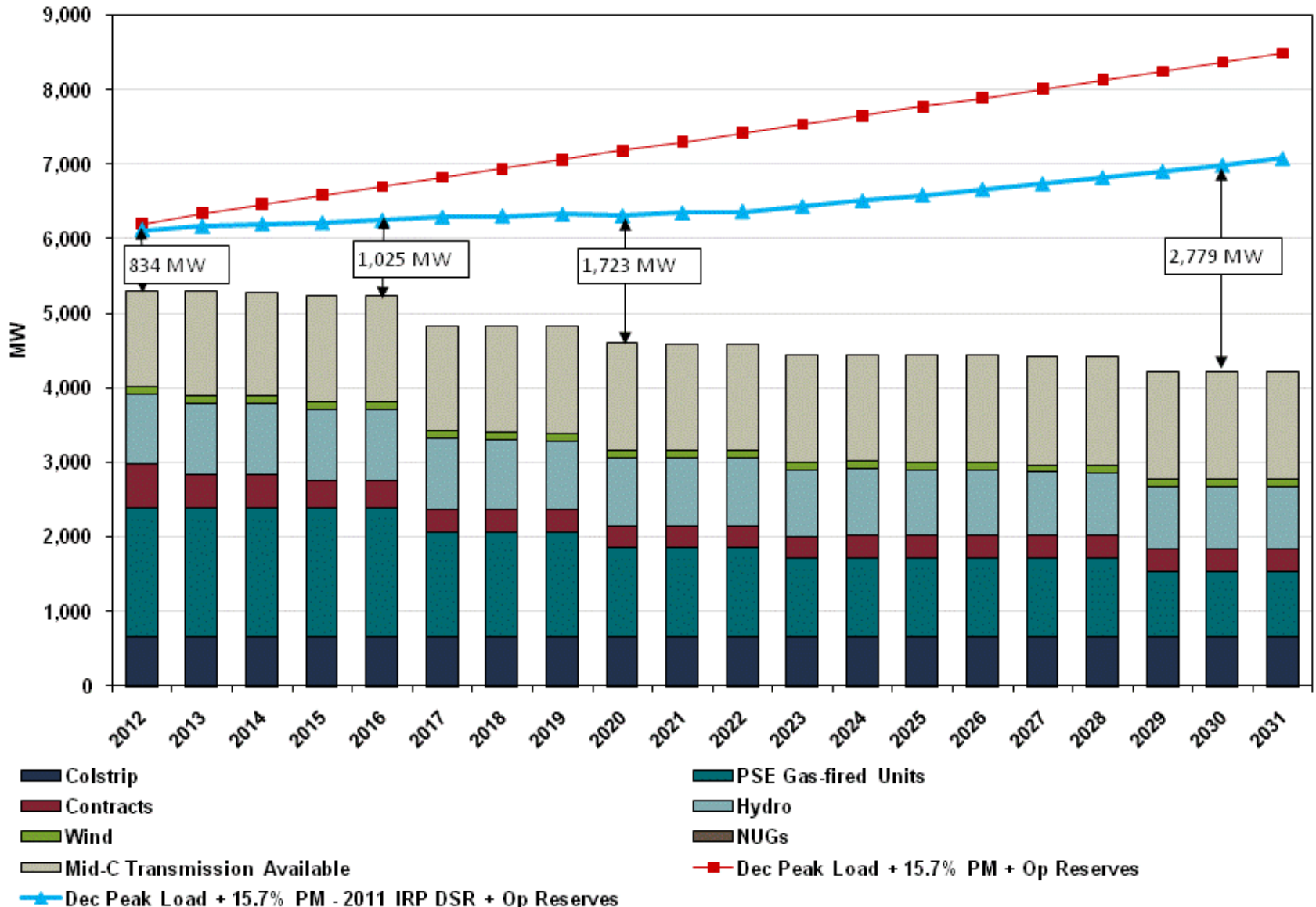
“Qualifying” Renewable Energy Need After DSR



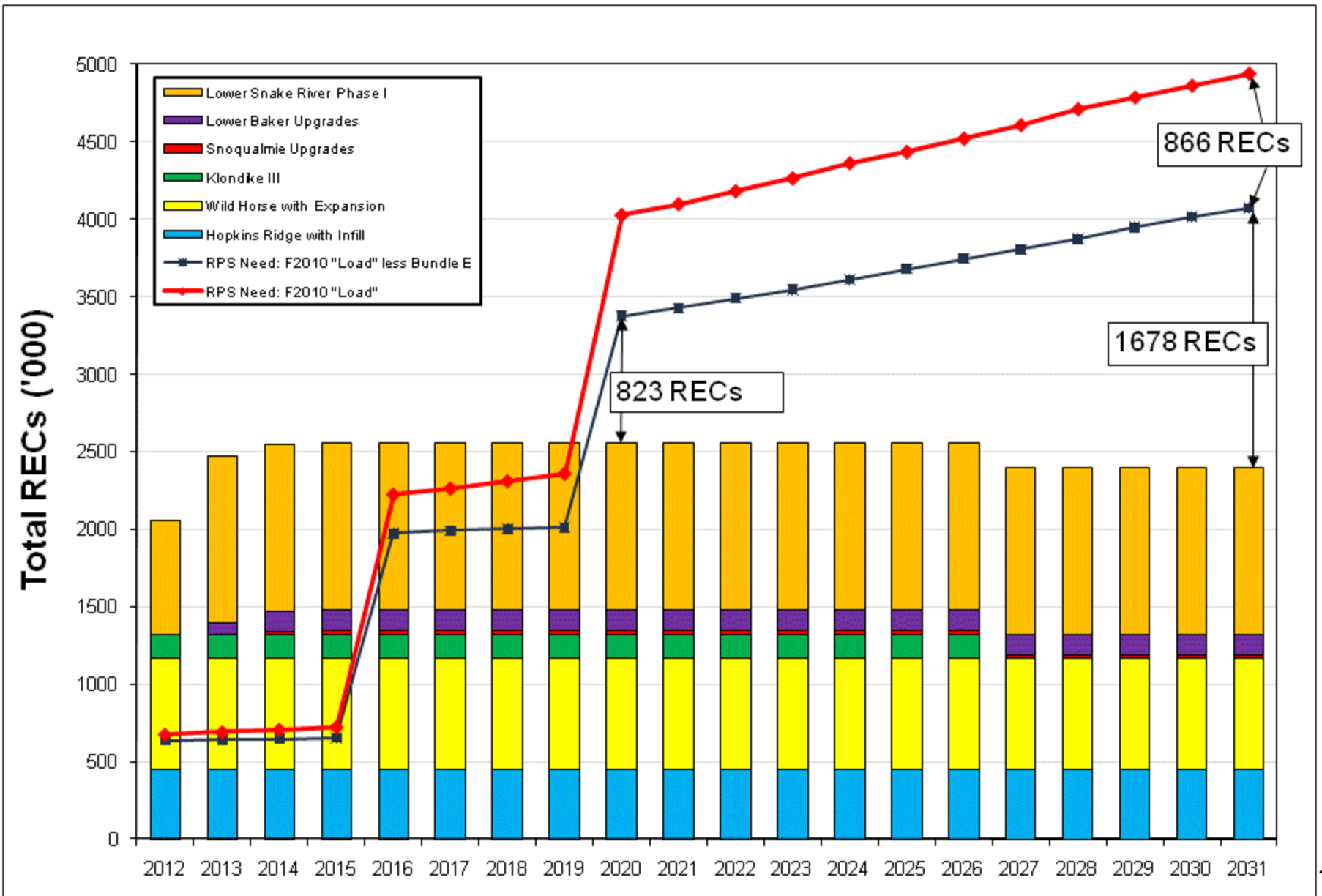
Incremental Additions in MW

	2016	2020	2025	2031
Demand-side Resources	423	815	1106	1319
Wind	0	300	300	400
Biomass	0	25	25	50
Transmission + Market	0	500	500	500
Peakers	1065	1278	1704	2443

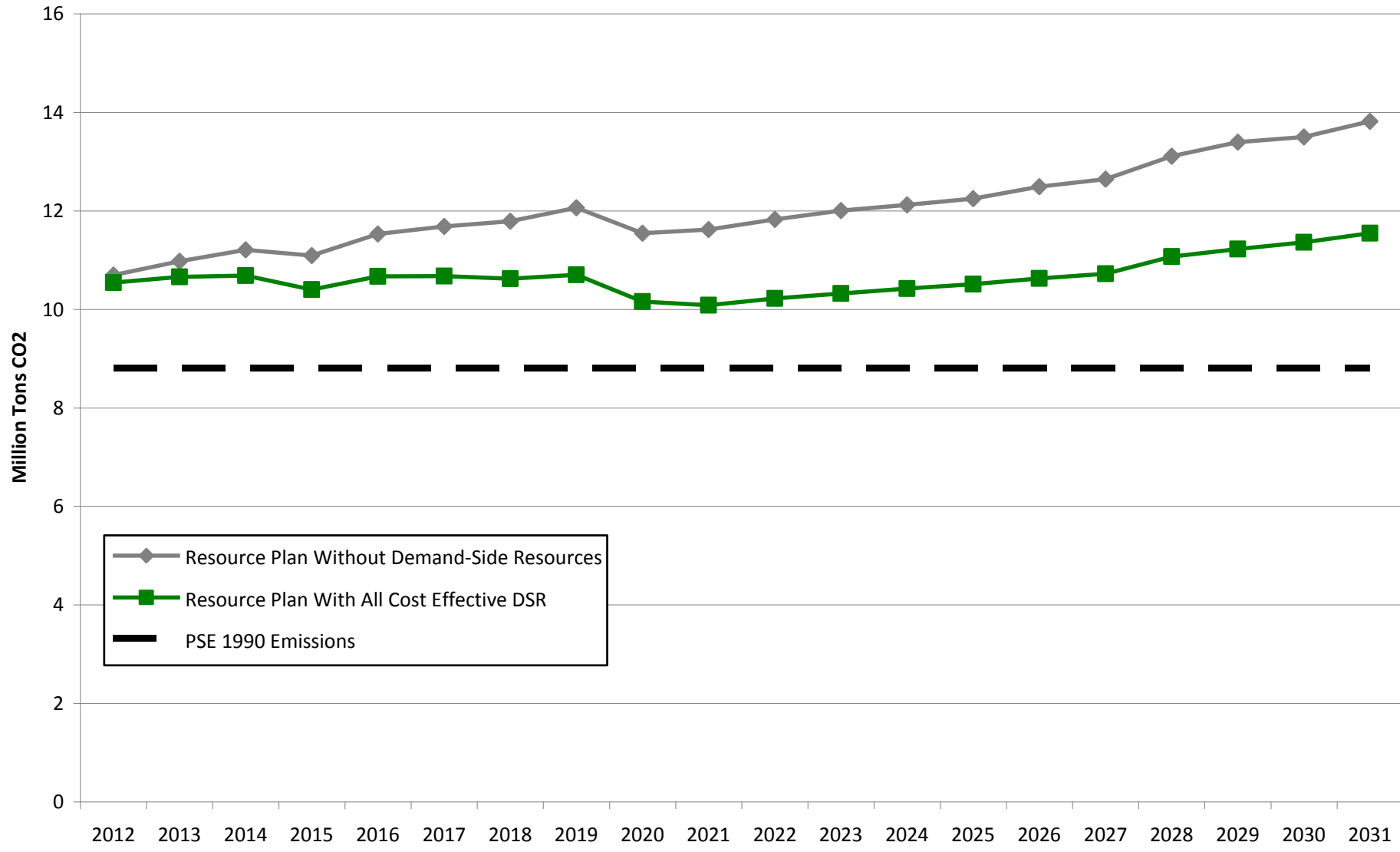
Impact of DSR on Capacity Need



Impact of DSR on Renewables



Projected CO2 Emissions and Emission Savings from Cost Effective Demand-Side Resources



Scenarios: Complete Possible Futures

- Base Case
- Green World
- Low Growth
- High Growth



Sensitivities: What if/All Else Equal

- Base + CO₂ Costs
- No “Northwest Coal”
- Very High Gas Prices
- Very Low Gas Prices
- Electric Vehicles
- Financial Incentives for Renewables
- Accelerated Demand-Side Resources
- Drill Down on Peakers vs CCCT



Factors Affecting Resource Plans (Builds)

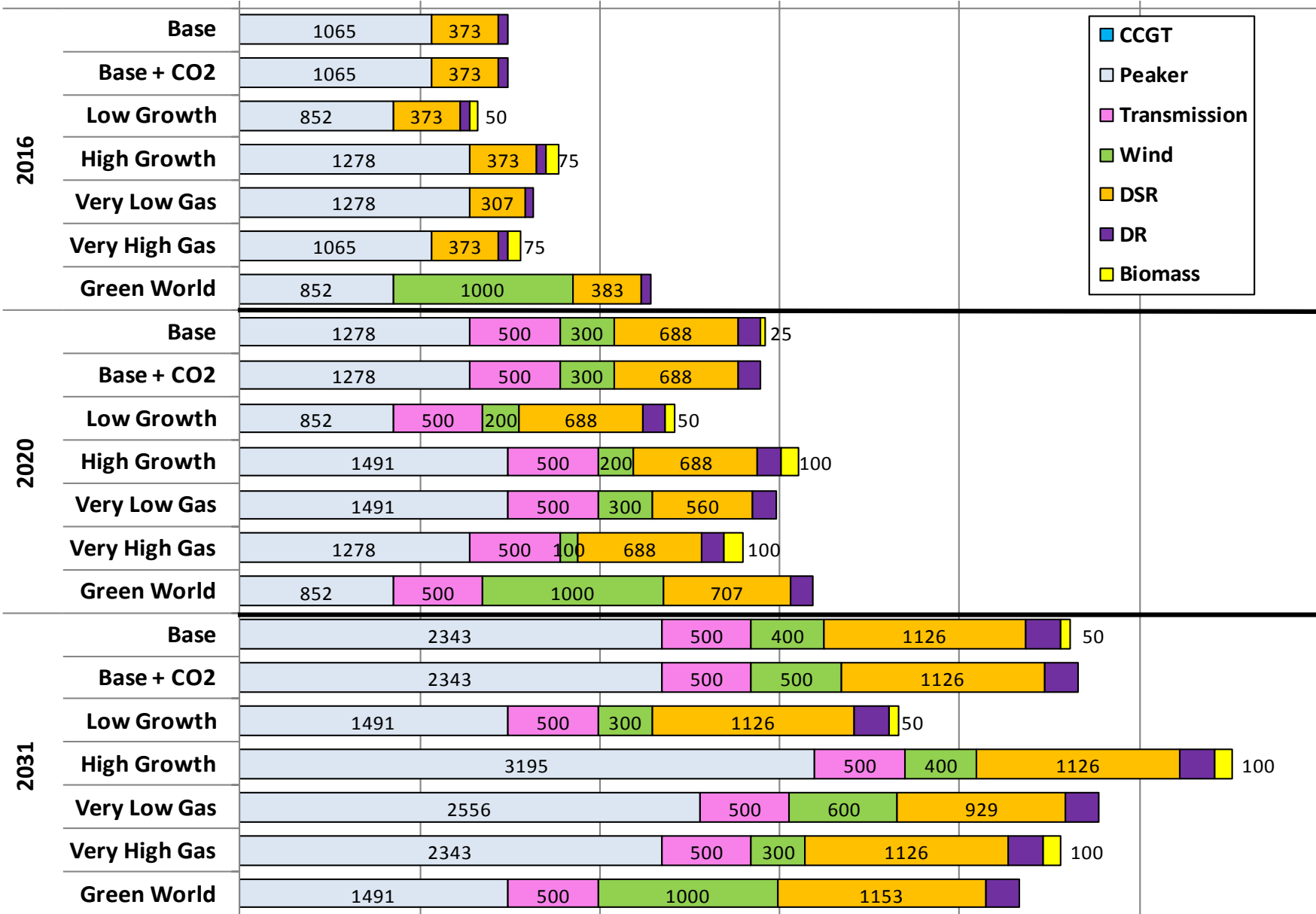
Factors Affecting Portfolio Costs

Note on Boundary of Assumptions/Frameworks

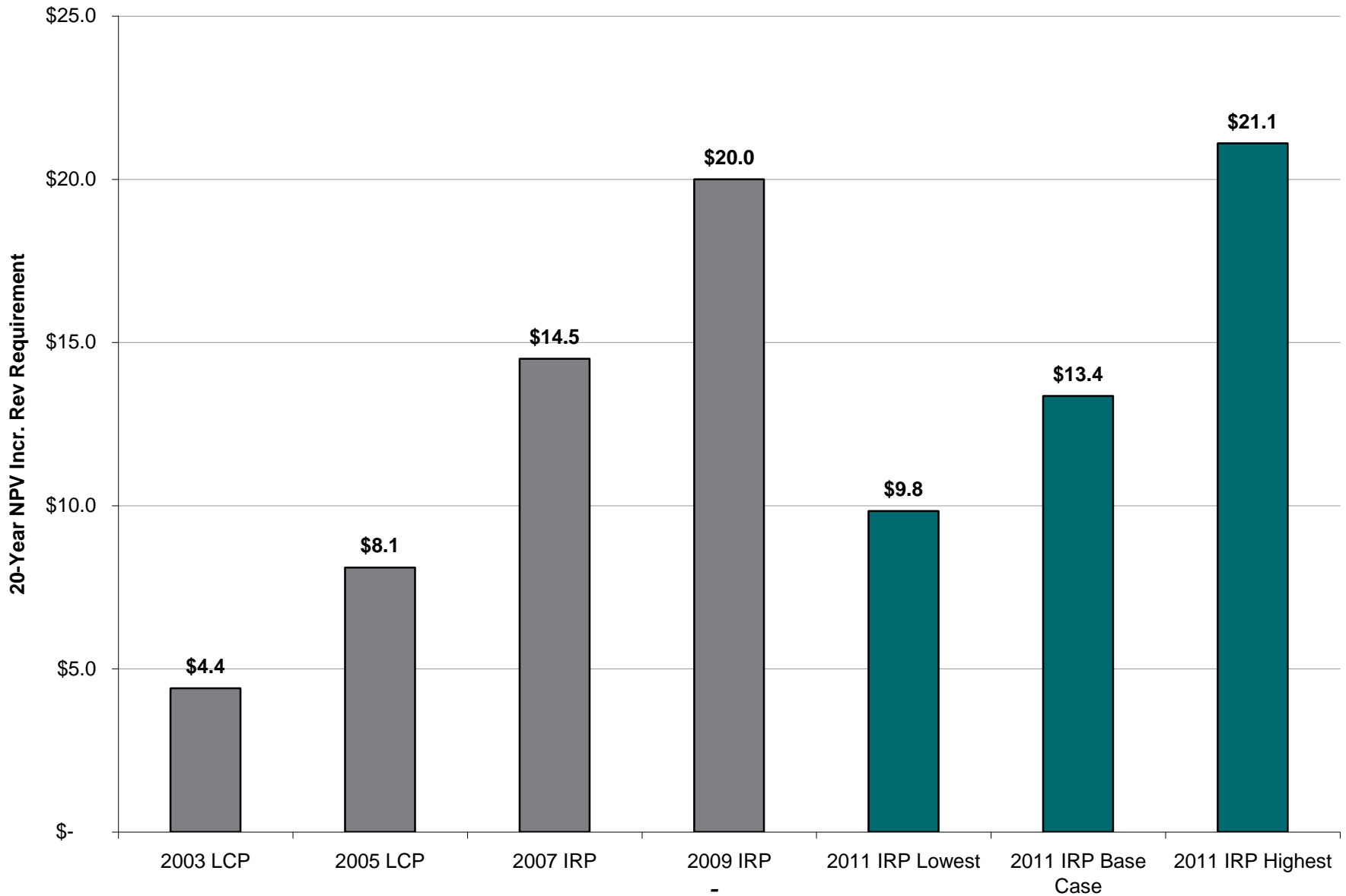


Nameplate (MW)

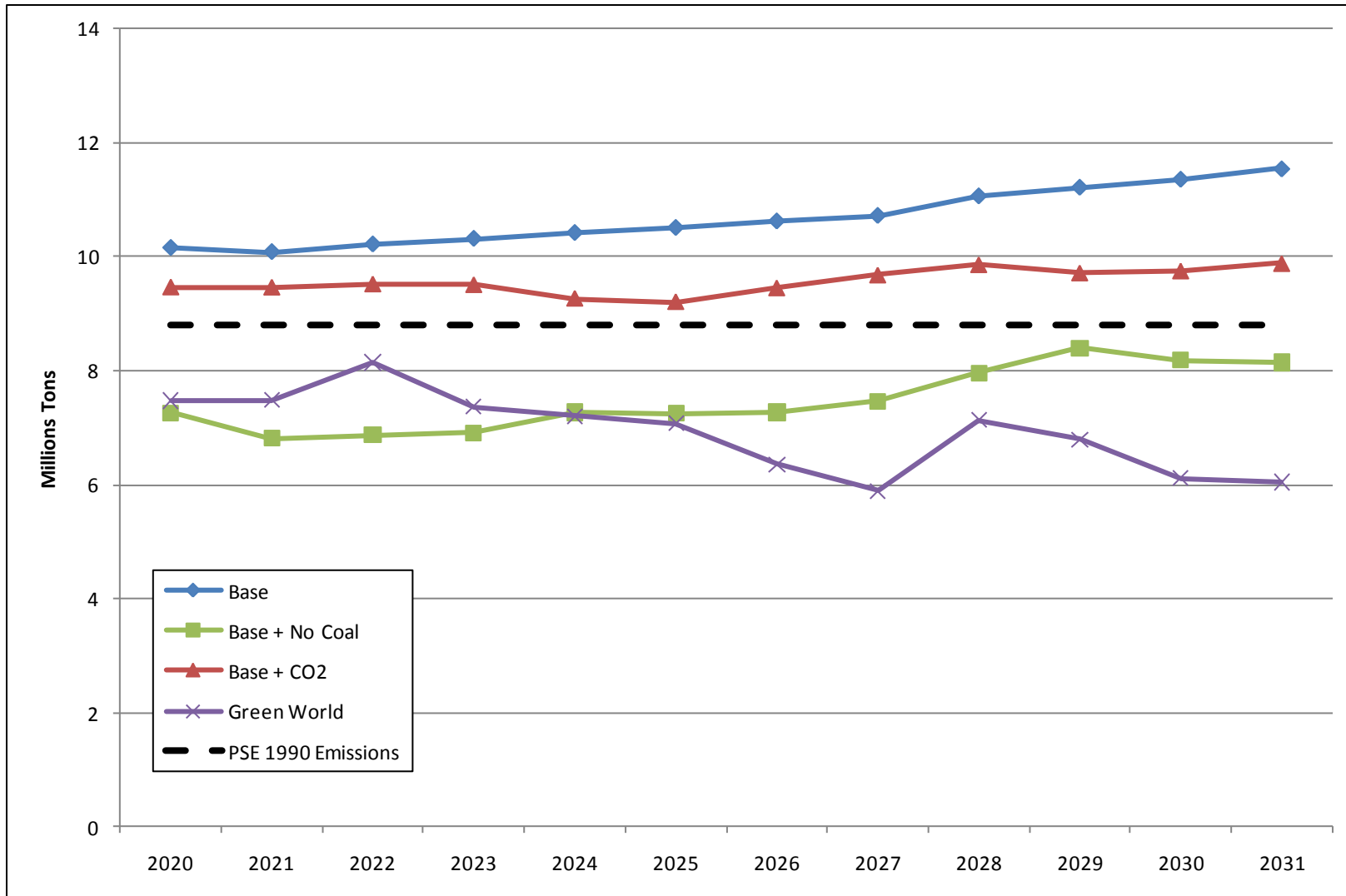
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Range of Incremental Cost

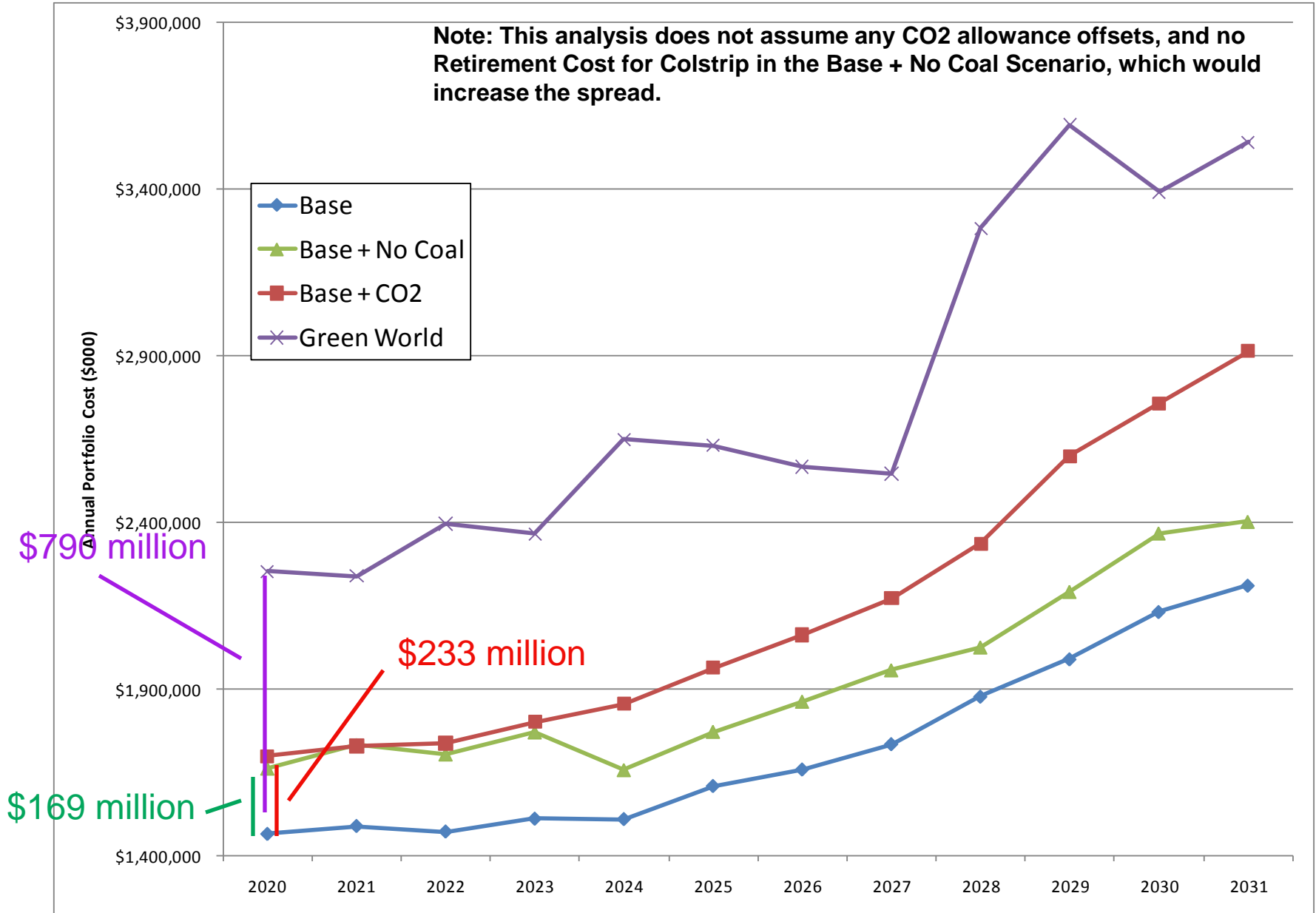


Comparison of Forecast CO₂ Emissions



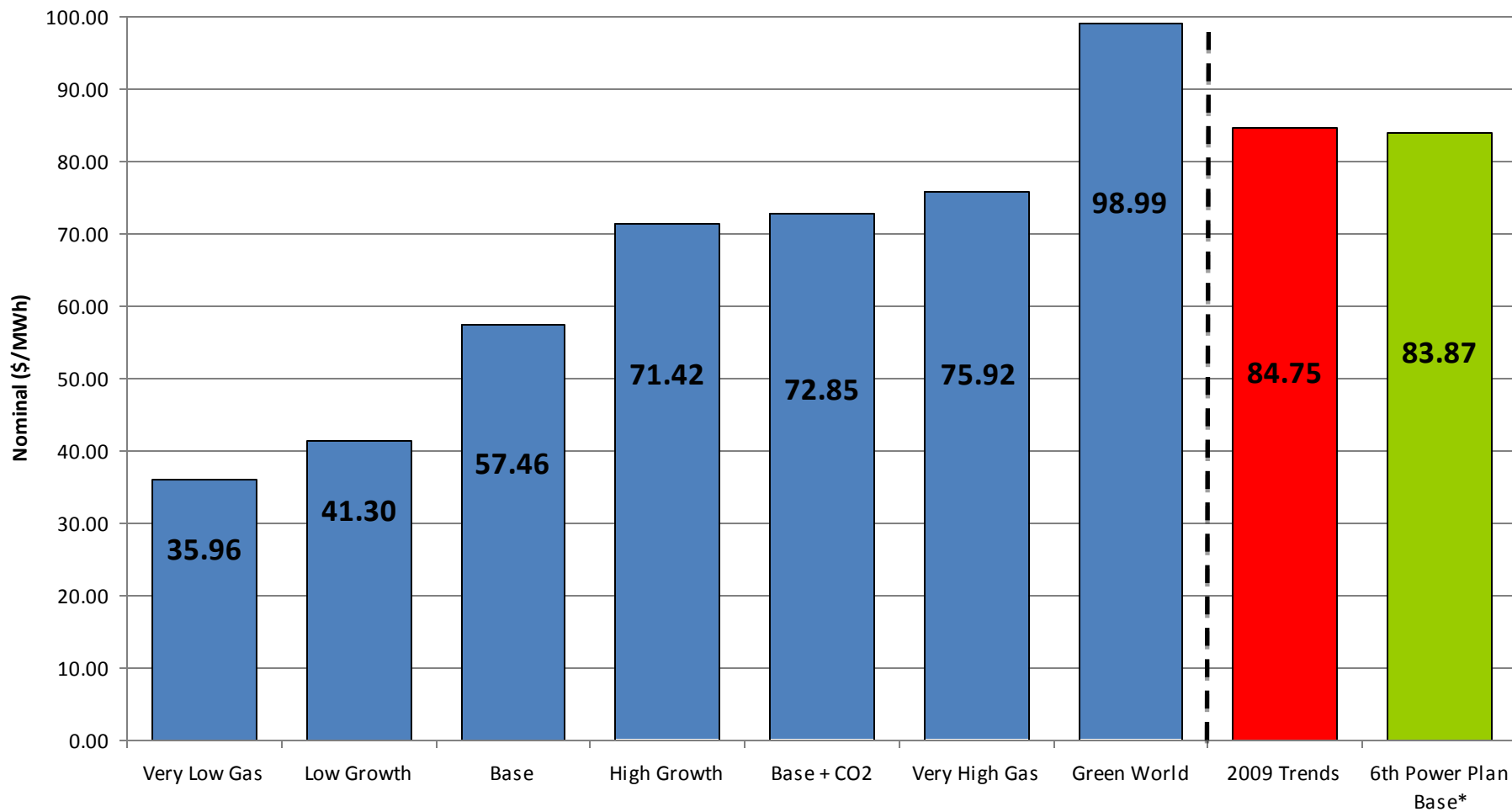
Est. Impact on Annual Revenue Requirement

Note: This analysis does not assume any CO2 allowance offsets, and no Retirement Cost for Colstrip in the Base + No Coal Scenario, which would increase the spread.



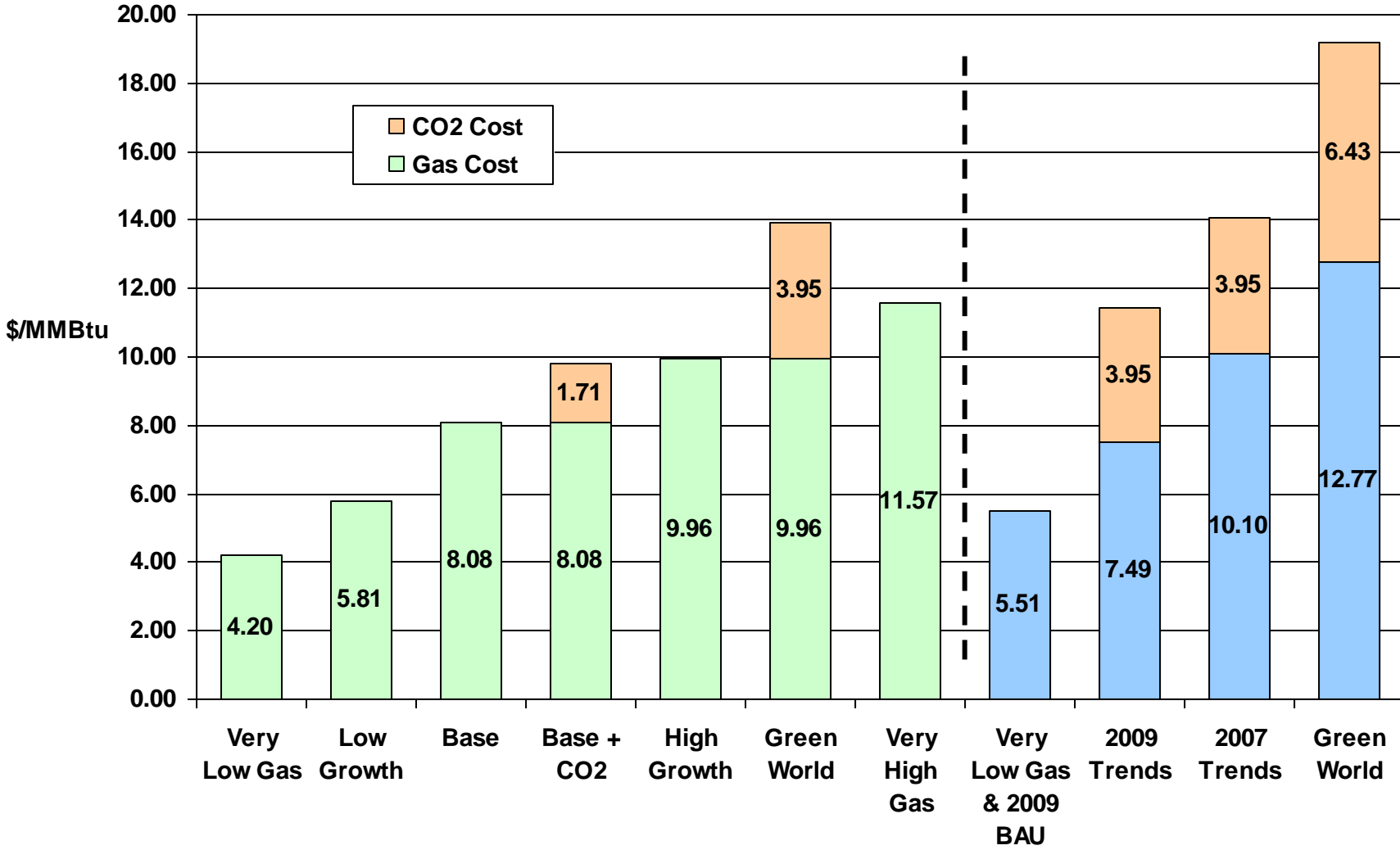


Mid-C Power Prices, 20-year levelized (2012-2031), Nominal \$/MWh

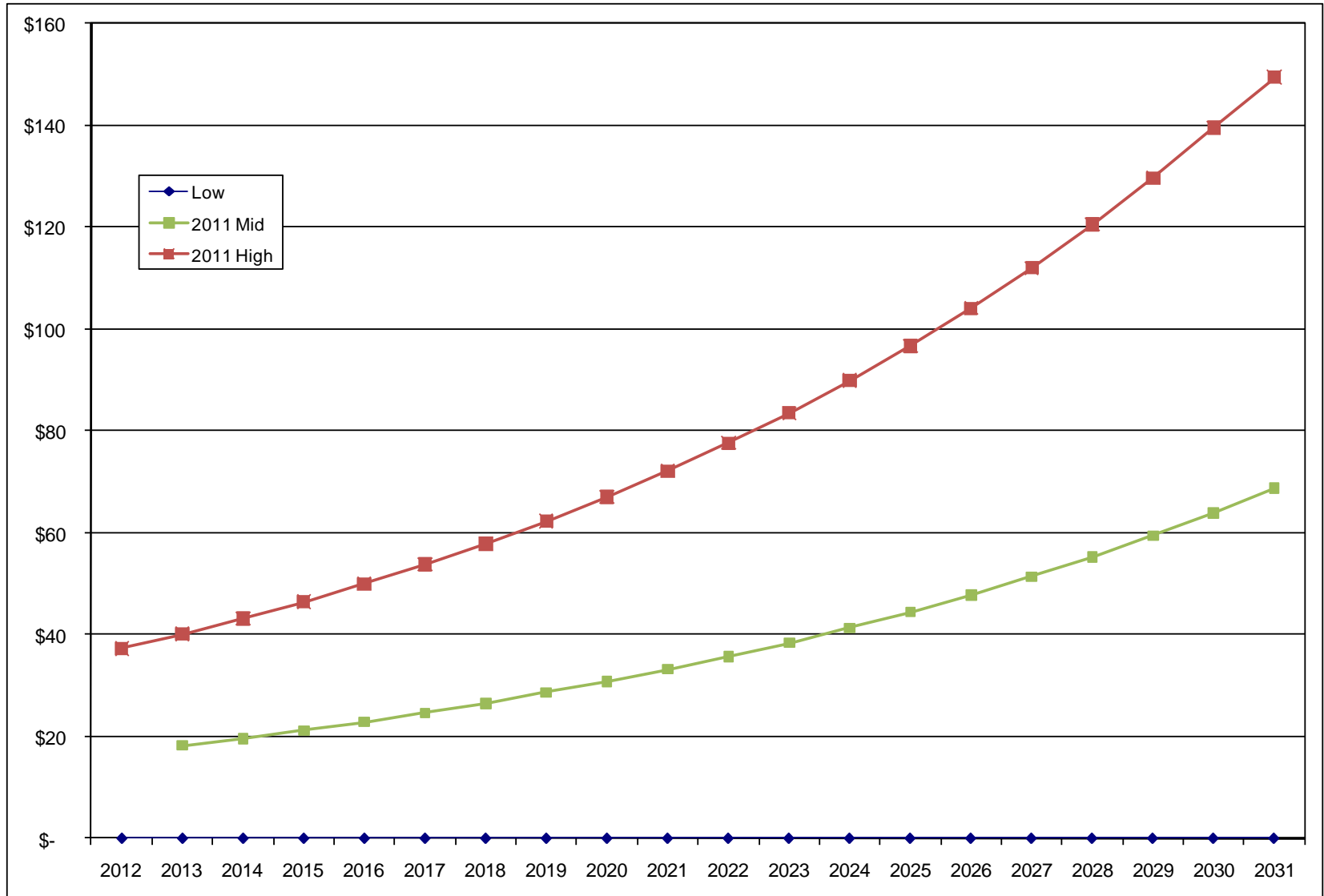


Levelized Gas Prices

(Sumas Hub, 20 year levelized - 2012-31, nominal \$)



CO₂ Price Assumptions





Check In

IRP Overview and Context

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How Does 2011 IRP Compare with 6th Plan

- Short Answer: 42
- Resource Plan in General
- Demand-Side Resources
 - Focus on Ramp Rates
 - Calculator: Though Not Relevant for Large IOU...

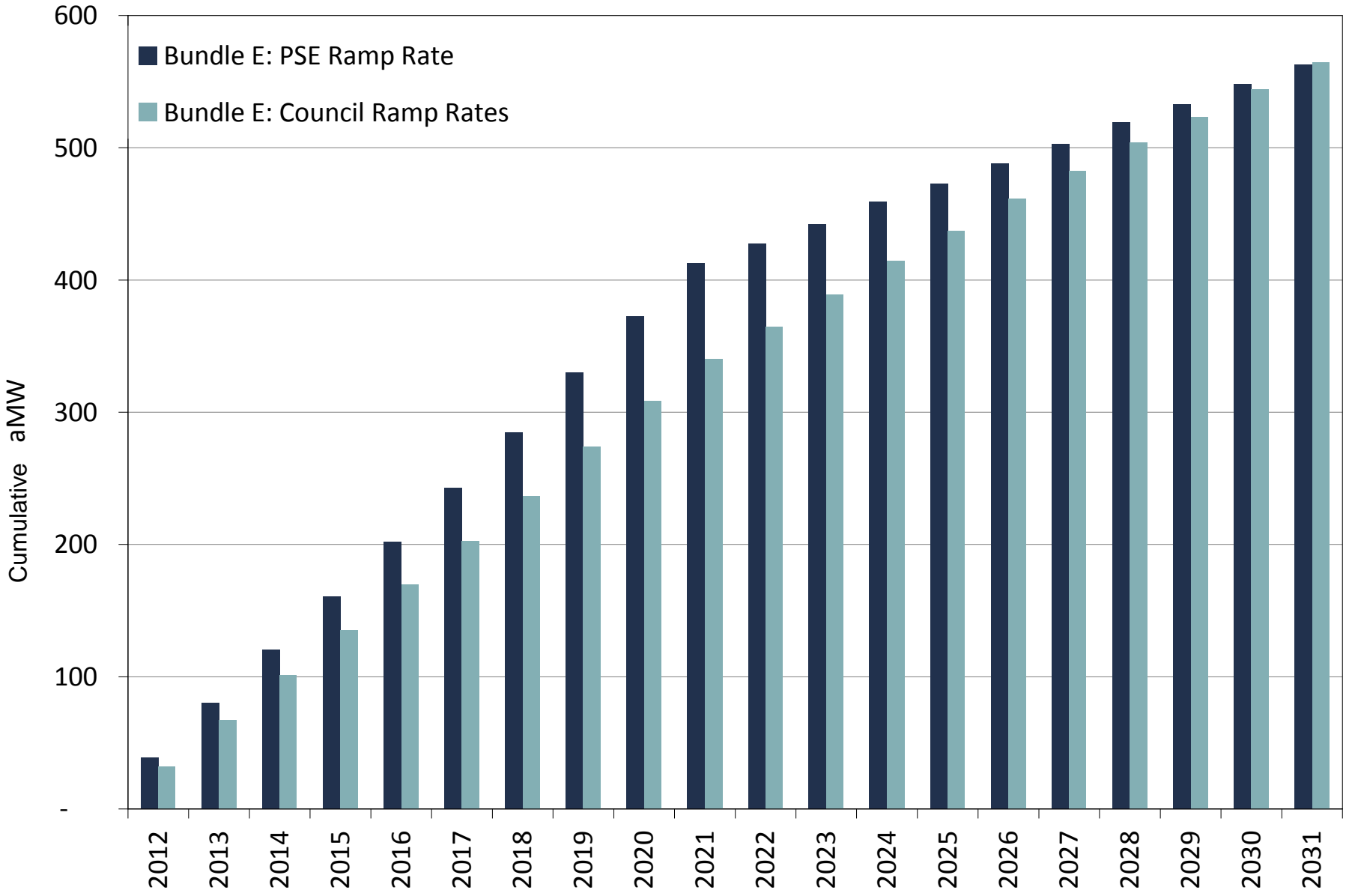




Resource Plans: High Level Consistent

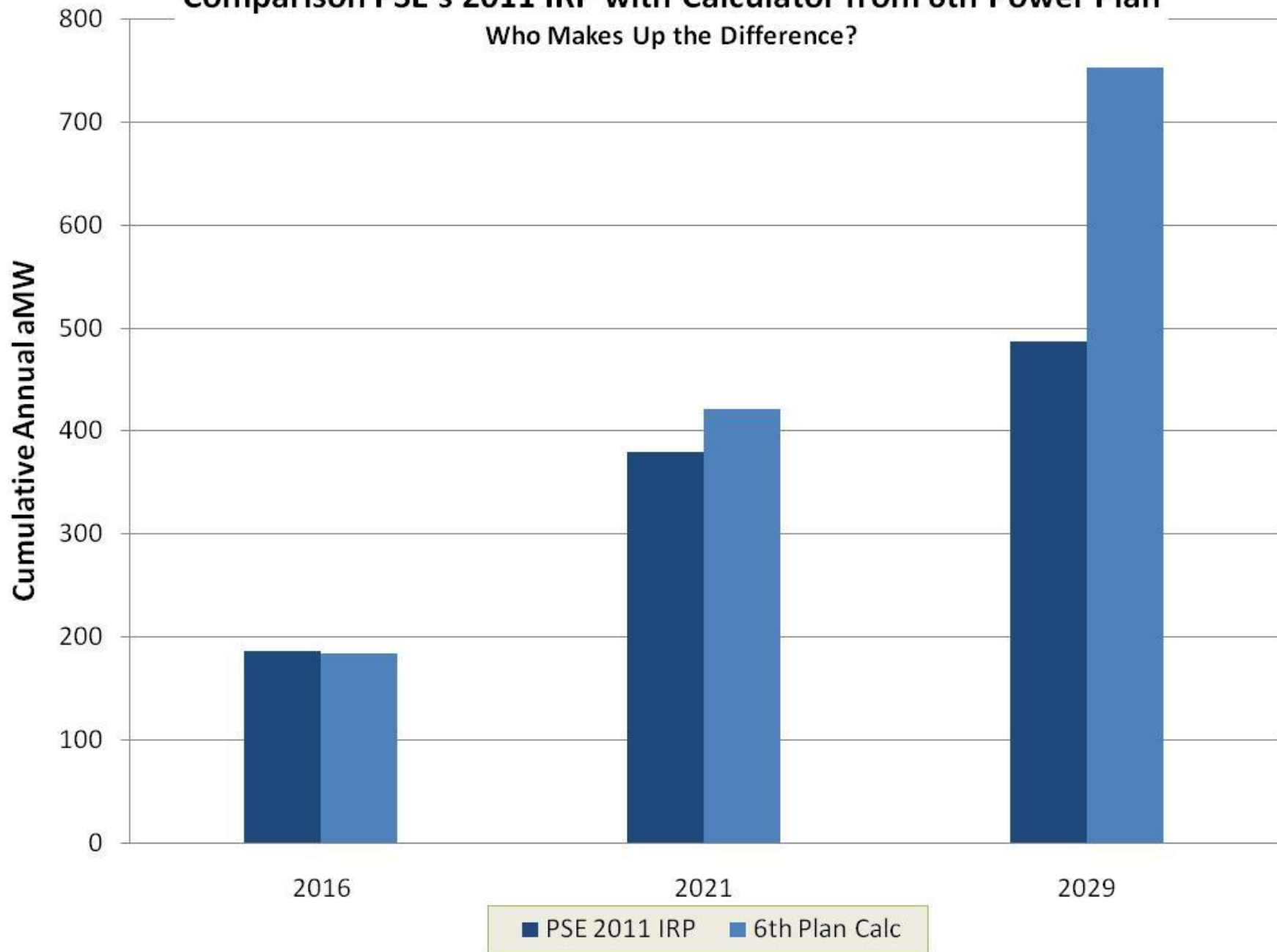
- Continue Aggressive Demand-Side Resources
- Transmission to Access Regional Surplus
- Peakers for Capacity Based on Transmission Constraints
- Additional Wind (after LSR) by 2020 for I-937

Faster Acquisition of DSR is Better



Comparison PSE's 2011 IRP with Calculator from 6th Power Plan

Who Makes Up the Difference?





Relationships and Processes



- Consultation
 - Thank you to Council Staff. I am most grateful for opportunities to have such qualified and personable folks with which we can (and do!) consult, brainstorm, and share results of analysis.
- Resource Adequacy Forum
- Regional Technical Forum
- Power Plan Development Advisory Groups
- Wind Integration Forum



Additional Questions/Discussion?



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