



# **PacifiCorp AS2020 RFP – Special Public Meeting**

Oregon Public Utilities  
Commission

August 5, 2021

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# Introduction and Background

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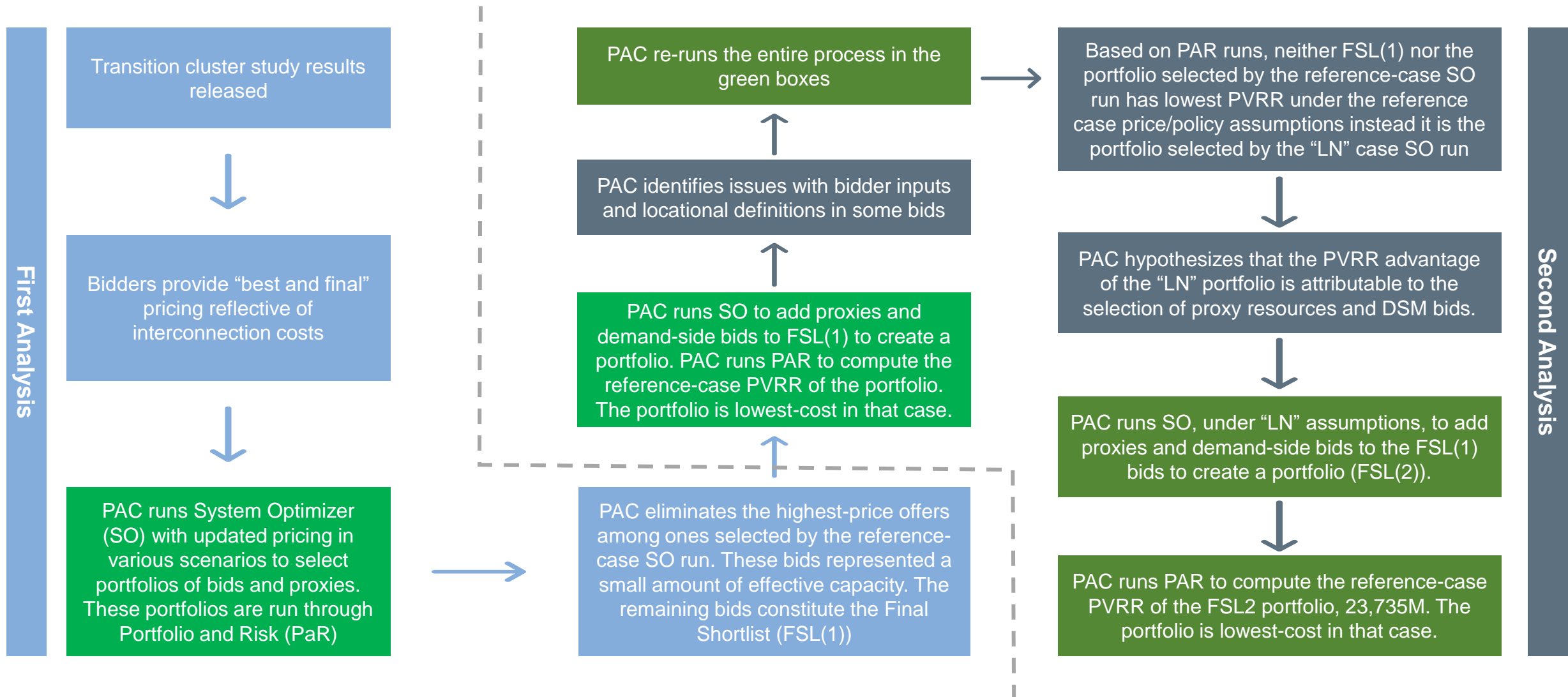
- PA Consulting (PA) was engaged by PacifiCorp (PAC) in April 2020 to provide Independent Evaluator services related to PacifiCorp's 2020 All-Source Request for Proposals (2020AS RFP)
- As the IE for PAC's procurement, PA focused on:
  - The design and content of the 2020AS RFP
  - Independent analysis and scoring of bids received leading up to the determination of the Initial Shortlist (ISL) and other bids which were evaluated in PAC's Transition Interconnection Cluster Study (the Cluster Study)
  - Review of the Cluster Study's results and their impact on the ISL and other bids
  - Review of PAC's revised opinions and on the eligibility of specific ISL bids for the Final Short List (FSL)
  - Review of revised bid pricing based on the Cluster Study results
  - Monitoring PAC's communications with bidders deemed eligible and non-eligible for the FSL
  - Analysis of PAC's FSL selection and reasonableness of PAC's decisions to select or eliminate bids to the FSL.
- The most recent step of PA's IE work has been to review and analyze PAC's sensitivity modeling related to the FSL
  - PA analyzed the sensitivity results obtained by PAC, which were designed to evaluate the FSL for its exposure to various risks such as over reliance on market sales, high/low market prices, no vs. strict CO2 regulation, etc.
  - PA filed its Independent Evaluator's Sensitivity Analysis Report on Friday July 30, 2021

# The Sensitivity Analyses were Designed to Evaluate the Robustness of the FSL Against Multiple Risk Factors and Considerations

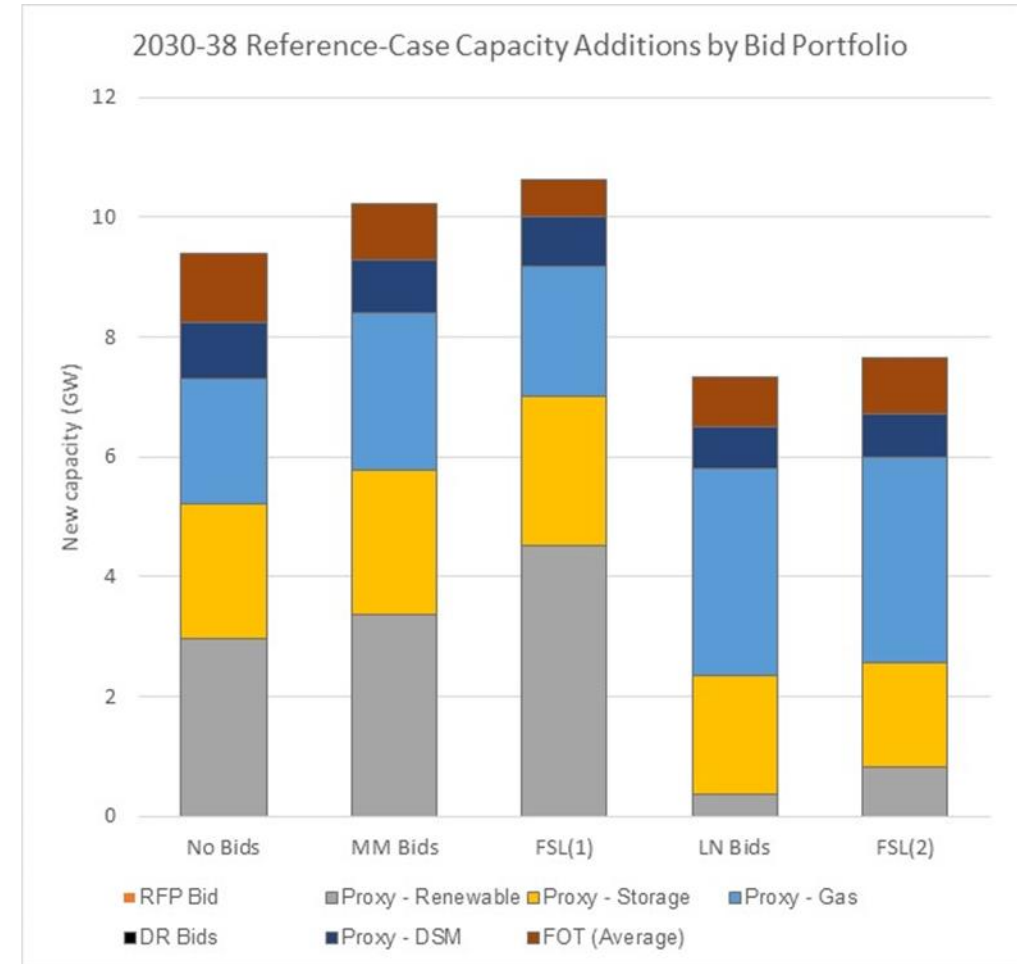
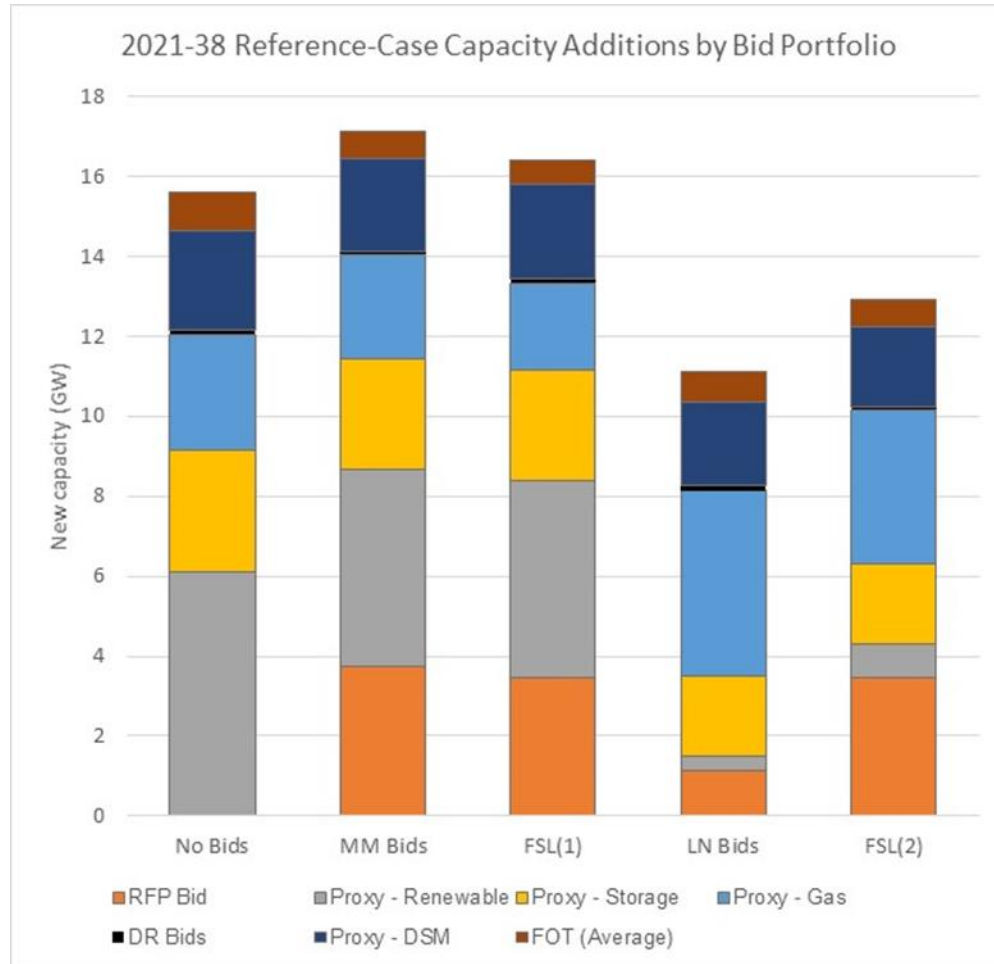
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<b>Purpose</b>	<ol style="list-style-type: none"><li>1. To better understand and anticipate the reaction of the selected project portfolio to various risks, and to form a judgement of its robustness</li><li>2. To determine how the selected project portfolio differs from a portfolio that might have been tailored to particular risks or a different view of the world</li><li>3. To adjust or replace the selected project portfolio to obtain a portfolio that may be somewhat more costly in the base but is much more resistant to poor performance in adverse cases</li></ol>		
<b>Risk factors</b>	<div>Market illiquidity</div>	<div>High/Low fossil price</div>	<div>High DER/ Renewable build</div>
	<div>Regulatory changes</div>	<div>High/Low power market price</div>	<div>High/no carbon price</div>
<b>Risk Considerations</b>	<ul style="list-style-type: none"><li>• Regional liquidity in a low-price environment absent an ISO</li><li>• Portfolio resource sizing across total and regional resources</li><li>• Risk variable relationships are accurately linked / correlated</li><li>• Defining / determining an appropriate and realistic downside case</li></ul>		

# PAC's FSL selection and sensitivity modeling process



# Capacity additions in candidate portfolio differ particularly in 2<sup>nd</sup> half of model horizon



# Scenario and Sensitivity Parameters are Designed to Test the Impact of Specific Assumption Changes on the Value and Reliability of Selected Resources

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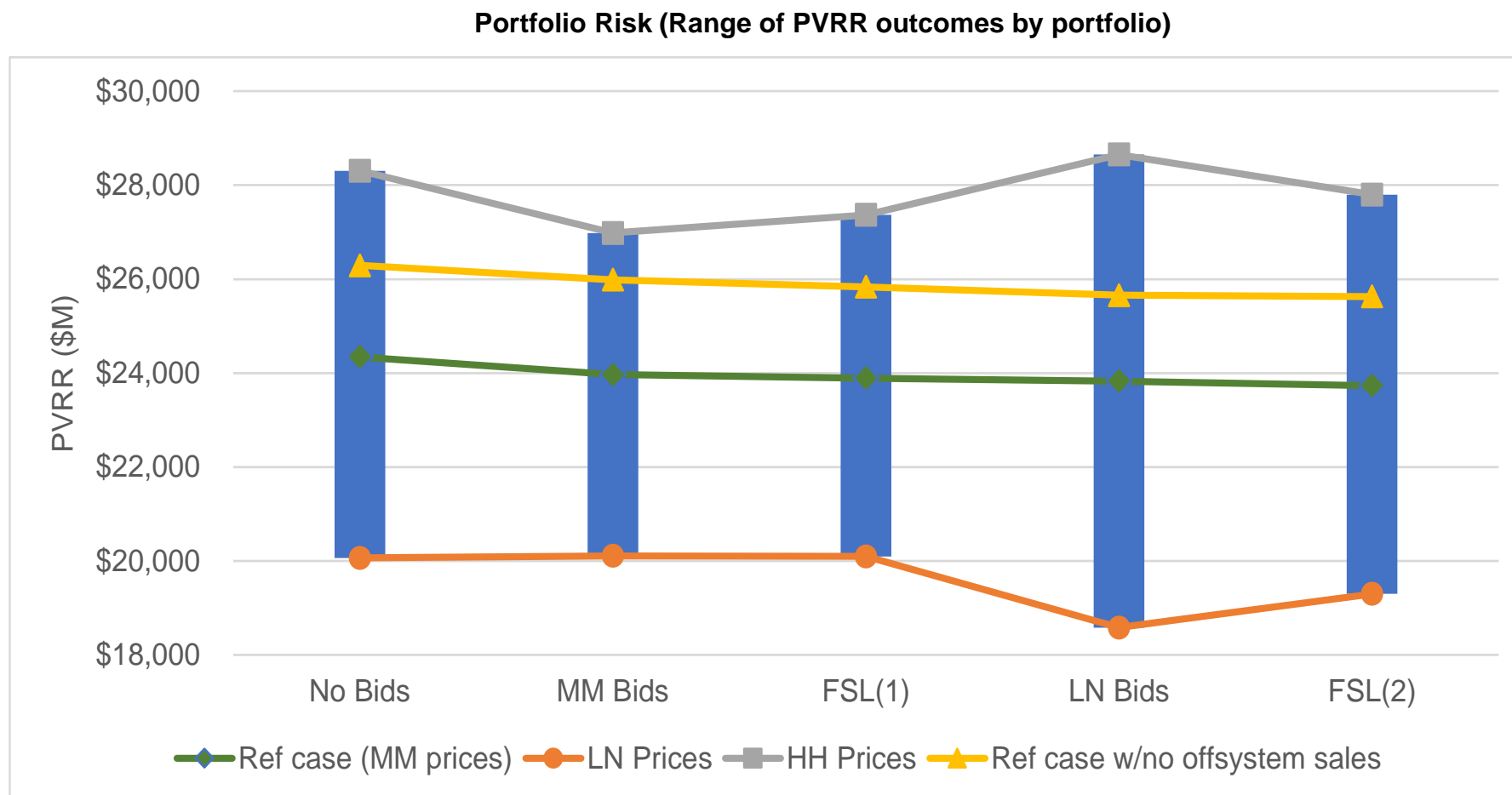
- Modeling sensitivity cases is intended to stress test the FSL against a range of possible futures to confirm that the selected portfolio (specifically, FSL(2)) is not exceptionally bad in some case
- It is most useful to test the impact of specific assumption changes through pairwise comparisons
  - These comparisons indicate the way a portfolio responds to individual assumption changes
  - Comparison across a wide variety of resource portfolios under a range of unknown but possible futures provides insight into the full range of risk
- It is sometimes helpful to view the full array of sensitivities to gain a “birds-eye view” of the performance of various portfolios across a range of possible futures; however, this can provide misleading insights
  - The full array of sensitivities should not be confused with the total distribution of possible futures; it is both a more limited set of possibilities, and generally overemphasizes extreme and serially overcorrelated cases
  - Looking at the full array of sensitivities at once implies a sense of equal probability for each of those possible futures

# Scenario Definitions

Price and Policy Scenarios		Bid Selection Scenarios	Bid Removal Scenarios
MM	Reference Case: medium gas prices, medium carbon prices	RFP	No market sales, remove Glen Canyon Solar
LN	Low gas prices, no carbon prices (No ESG)	RFP Final Short List	No market sales, remove Hamaker Solar + Storage
HH	High gas prices, high carbon prices	Proxy Resources Only	No market sales, remove Rock Creek 1 Wind
SL	Low market prices (due to oversupply, includes carbon pricing)	---	No market sales, remove Rock Creek 2 Wind
SNS	No market sales, medium (reference) market price	---	---
SNST	No market sales, medium (reference) price, and PTC/ITC extension	---	---

Note: The three Scenario columns are independent of each other, and should not be read as horizontal combinations

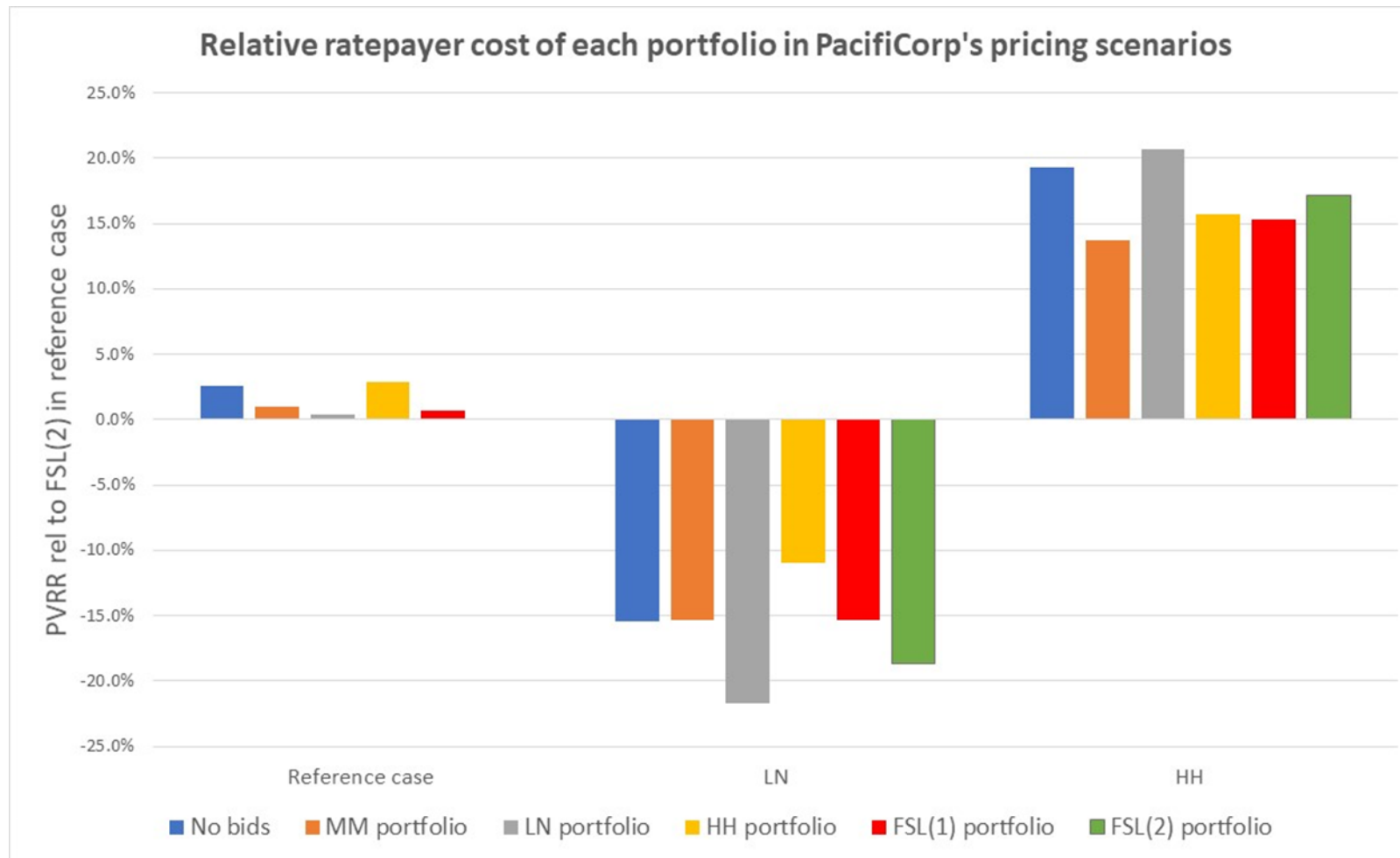
# Procuring the FSL Resources – and Developing the Energy Gateway South – Reduces the Expected PVRR as well as Risk



- The LN portfolio – which doesn't select EGS – has the greatest rate risk
- Selecting bids from the RFP reduces rate risk, especially in a high-price scenario
- The initial FSL(1) has a slightly smaller risk range than FSL(2) due to a different selection of proxy resources, which represents future decision-making



## With These Sensitivity Assumptions, it is Riskier to Select to Select a Portfolio Based on Low Prices than One Based on High Prices



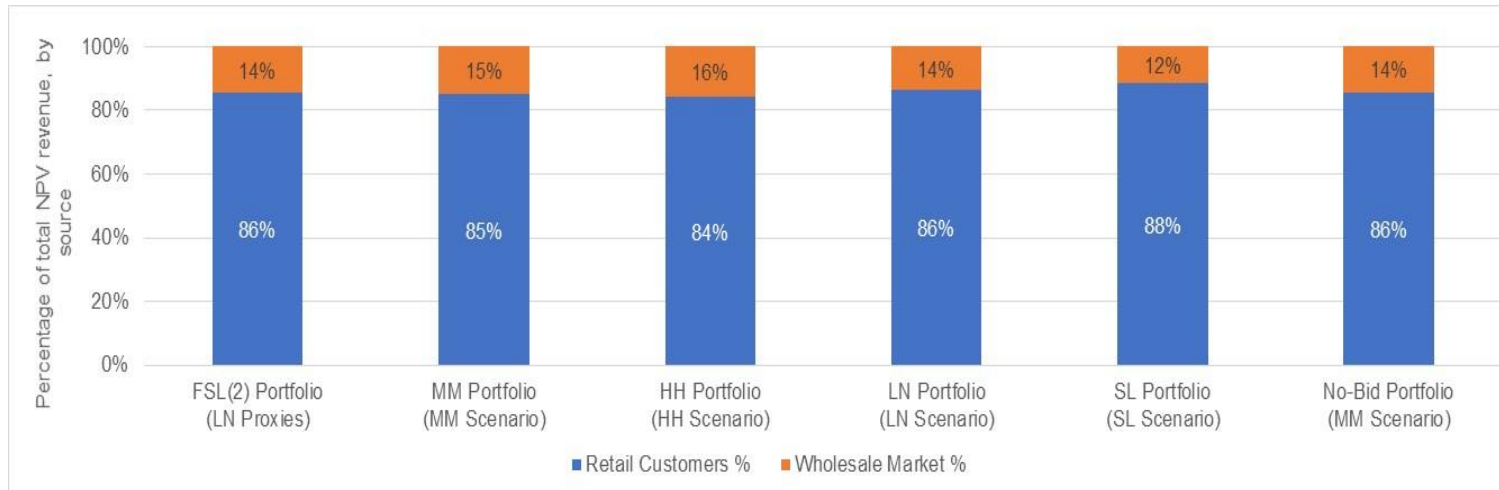
# Assessing the Risk of Off-System Sales

The off-system sales impact analysis revealed that if PAC cannot make ANY off-system sales, PVRR with the selected FSL would increase by approximately \$1.9 billion, or ~8%

Impact on Revenue Requirement if PAC Cannot Make Off-System Sales

Figures in \$M	FSL / SNSLN bids	MM bids
<b>PVRR - Sales permitted</b>	\$23,735	\$23,968
<b>PVRR - No Sales permitted</b>	\$25,629*	\$25,985

Retail/Wholesale Breakdown of Total Revenue Expected for Each Scenario



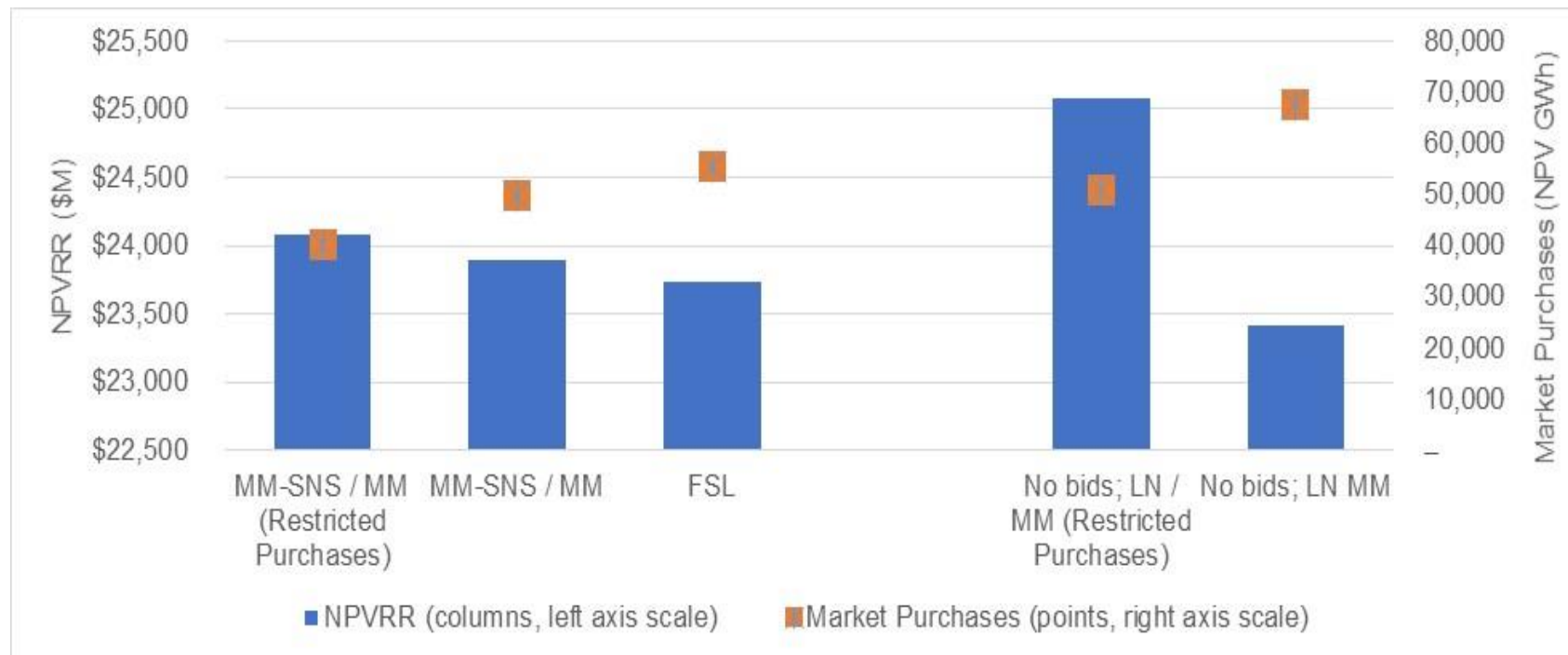
Across portfolios, the off-system sales revenue portion of the total revenues expected remains fairly constant, averaging approximately 14%

\* The PVRR is estimated based on comparison of other cases

# Assessing the Risk of Reliance on Off-System Purchases

In the FSL(2) analysis, PAC introduced a scenario evaluating limited market purchases and found that with restricted purchases, the expected PVRR increases. The selected FSL portfolio (more reliant on off-system purchases) was not evaluated in this scenario.

Comparison of Value and Energy Purchases of Restricted Portfolios

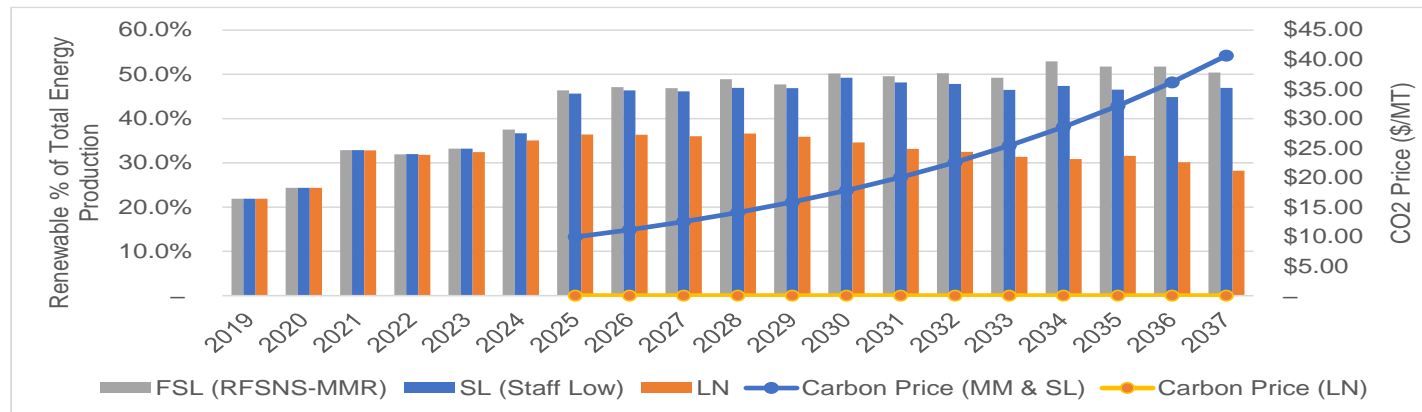


# Assessing the Impact of Carbon Regulations on Portfolio GHG Emissions

The portfolios are generally sensitive to some level of carbon regulation, represented in the modeling via a carbon price. The table below illustrates that the carbon intensity decreases noticeably when moving from a no-carbon-price scenario to a mid-range carbon price but decreases much less when moving from a mid-range price to a high price.

In the comparison figure below, the FSL and SL portfolios produce similar levels of renewable production, while the LN scenario contains much less renewable production due to the absence of carbon regulation in the LN scenario.

Comparison of Renewable Production and Carbon Price Outlooks

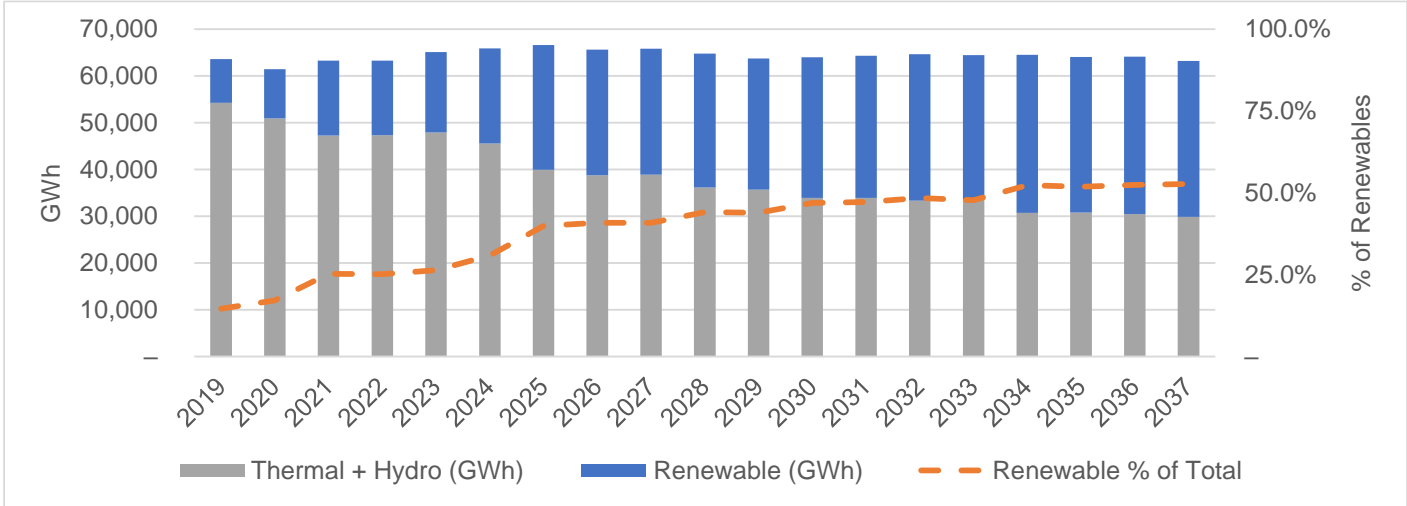


Carbon Intensity of the PacifiCorp System in 2025  
(tons/MWh)

Anticipated Carbon Price	Realized Carbon Price		
	None	Medium	High
None	0.52	0.54	0.51
Mid-range	0.45	0.46	0.44
High	0.43	0.45	0.42

# FSL Impacts to PAC's System Capacity and Energy mix

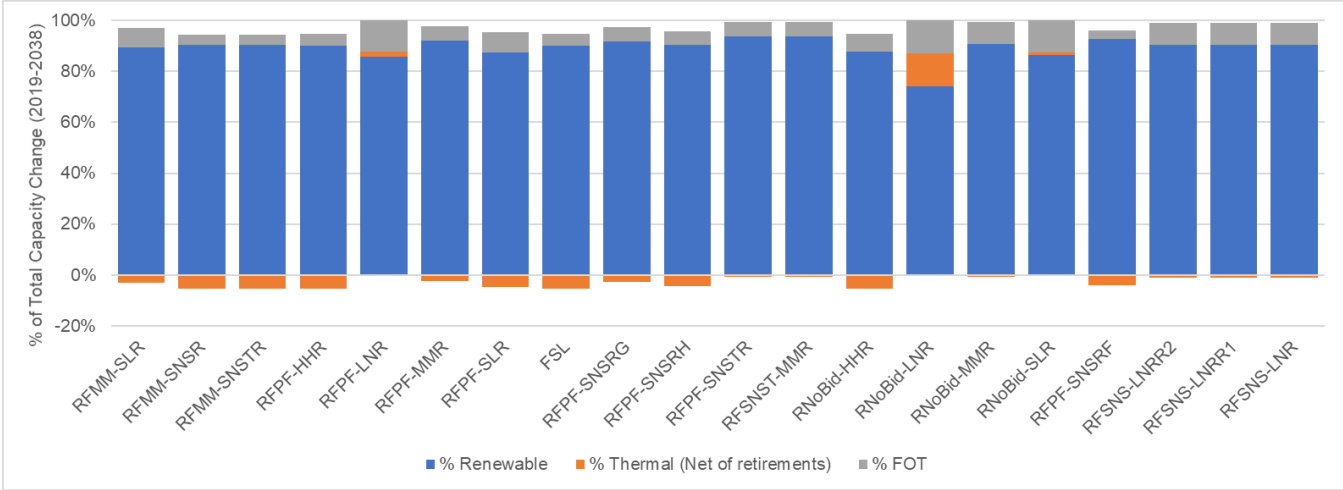
Forecast Energy Mix with the FSL Portfolio



With the FSL portfolio, the renewable share of PAC's production will increase rapidly through the 2020s

Across nearly all scenarios and portfolios, the net capacity change over twenty years is dominated by renewable additions and thermal retirements

Capacity Changes by Resource Type and Scenario (20 year total)



## Areas in Which the Sensitivity Analyses were Inconclusive

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- The PTC sensitivity analyses generally were inconclusive began PTC extension being bundled in with other assumption changes that may have had similar impact -- so it is difficult to isolate the impact of the PTC extension itself
- Similarly, the sensitivity analyses were not designed to explicitly evaluate reliability metrics other than the reserve margin constraints we believe to have been implemented in SO, so there is little insight into whether certain market conditions or regulatory actions impact reliability

# Recommendations

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- During this procurement, much attention was focused on the risk of being potentially unable to make sales into a thin or low-priced market. There is a similar risk associated with being unable to purchase needed power and capacity. PacifiCorp did identify this late in the process and developed sensitivities around the cost impact of purchase restrictions. It would be useful for the Commission to better understand the ability of PacifiCorp to purchase capacity products, as well as the ability of both capacity and spot energy products to address the reliability need represented by an open position
- Scenarios evaluating the impact of tax credit eligibility extension may have been as the extension was bundled with other changes that may have had similar impacts on the bid selection. For future procurements, it may be more informative to the Commission to develop an explicit tax credit eligibility extension scenario
- To identify the revised FSL, PacifiCorp effectively employed a two-stage portfolio optimization, selecting bids based on an MM scenario and then proxy resources based on a different scenario. This method could be used even more portfolio evaluation, as well as a PaR evaluation metric based on shorter-term (5- or 10-year) PVRR, as it helps identify the impact of proxy units – or future resource decisions – on the final selection
- The concept of risk sharing is primarily a rate-making issue rather than procurement design issue. Risks that a utility cannot control, and these may be addressed via hedge programs, whose quality (but not necessarily performance) can be examined. Other risks may be addressed by Performance Based Ratemaking (PBR). For example, the construction of EGS is a major investment for ratepayers so the completion and operational performance of Wyoming resources, or the result of contractual assurances, may be a target for PBR.



## About PA.

We believe in the power of ingenuity to build a positive human future in a technology-driven world.

As strategies, technologies and innovation collide, we create opportunity from complexity.

Our diverse teams of experts combine innovative thinking and breakthrough use of technologies to progress further, faster. Our clients adapt and transform, and together we achieve enduring results.

An innovation and transformation consultancy, we are over 3,200 specialists in consumer, defense and security, energy and utilities, financial services, government, health and life sciences, manufacturing, and transport. Our people are strategists, innovators, designers, consultants, digital experts, scientists, engineers and technologists. We operate globally from offices across the UK, US, Europe, and the Nordics.

**PA. Bringing Ingenuity to Life.**

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