PACIFIC POWER
A DIVISION OF PACIFICORP

825 NE Multnomah, Suite 2000
Portland, Oregon 97232

December 14, 2020

VIA ELECTRONIC FILING

Public Utility Commission of Oregon
201 High Street SE, Suite 100
Salem, OR 97301-3398

Attn: Filing Center

RE: UM 2059—Preliminary Price Curve Sensitivities

PacifiCorp, d/b/a Pacific Power (PacifiCorp) submits an update to the summary of its preliminary price curve sensitivities initially submitted on December 11, 2020, in response to Staff's proposed indicative analysis that was filed in the above referenced docket on December 8, 2020. This updated summary includes present-value revenue requirement results for the three portfolios reflecting a unique set of bid selections analyzed in the Planning and Risk model.

Please direct informal inquiries regarding this filing to Cathie Allen, Regulatory Affairs Manager, at (503) 813-5934.

Sincerely,

Michael G. Wilding
Director Net Power Costs and Regulatory Policy

PacifiCorp 2020 All-Source Request for Proposals

Preliminary Price Curve Sensitivities
OPUC Public Meeting
December 17, 2020





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Introduction

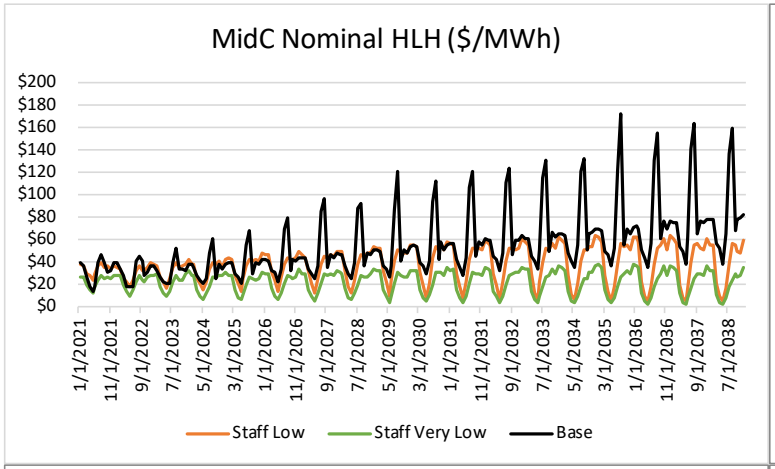
- PacifiCorp created two sensitivity studies using assumptions proposed by Staff and the IE—a "low" and a "very low" sensitivity case (summarized in more detail herein)
- Assumptions for these sensitivities were applied to the System Optimizer (SO) model to evaluate how 2020AS RFP bid selections *might* be affected
- At this phase of the 2020AS RFP, interconnection costs are not considered for any bid—these costs will be considered in the final shortlist analysis and could materially impact how sensitivity case assumptions influence bid selections and system costs when ultimately applied during the final shortlist phase of the 2020AS RFP
- For this "test run" of the sensitivities, three portfolios, reflecting a unique set of bid selections (without consideration of transmission upgrade costs), were analyzed in the Planning and Risk model (PaR)—these studies have completed, and present-value revenue requirement (PVRR) results are summarized herein
  - Each of the three portfolios—those resulting from application of base, low, and very low assumptions—were analyzed using assumptions from three cases to generate nine different PaR studies (3 portfolios x 3 sets of assumptions = nine cases)
  - PacifiCorp also summarized market purchase/sales data from these studies

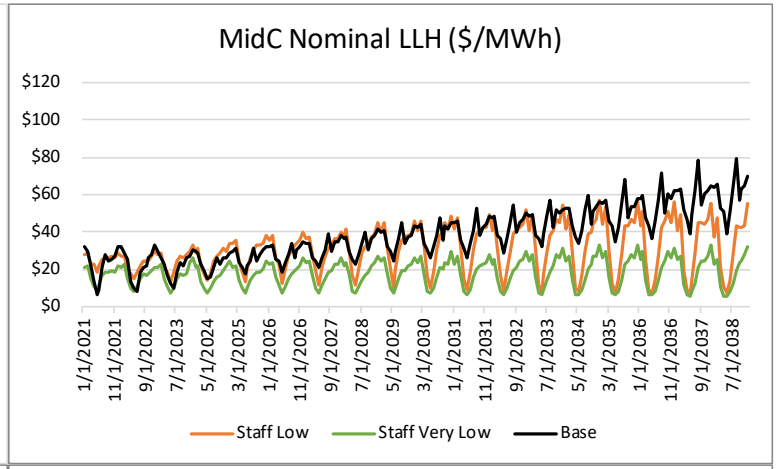
Sensitivity Definitions

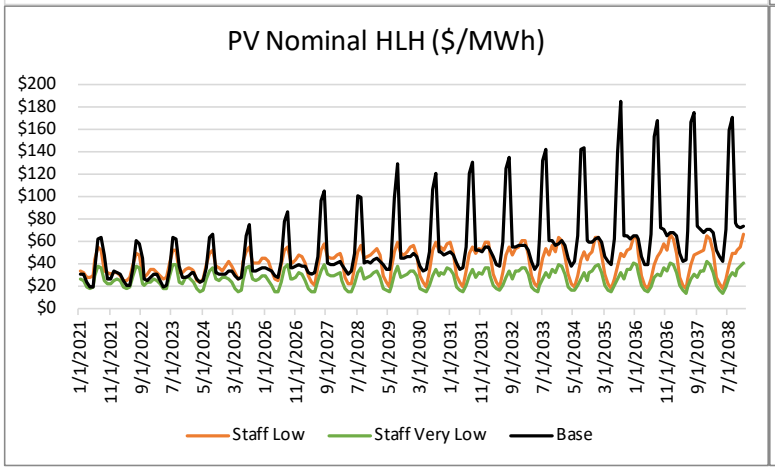
	Price Curve Assumptions (Aurora)		Price Curve and PacifiCorp System Assumptions (Aurora and SO/PaR)		PacifiCorp System Assumptions (SO/PaR)		
	WECC Renewable Buildout	WECC Load	Natural Gas Prices	CO_2 Prices	PacifiCorp Load	PacifiCorp Private Generation	Customer Preference Volume
Base	Base	Base	Base	Base	Base	Base	Base
Low	High	Base	Base	Base	Base	Base	Base
Very Low	High	Low	Low	None	Low	High	High

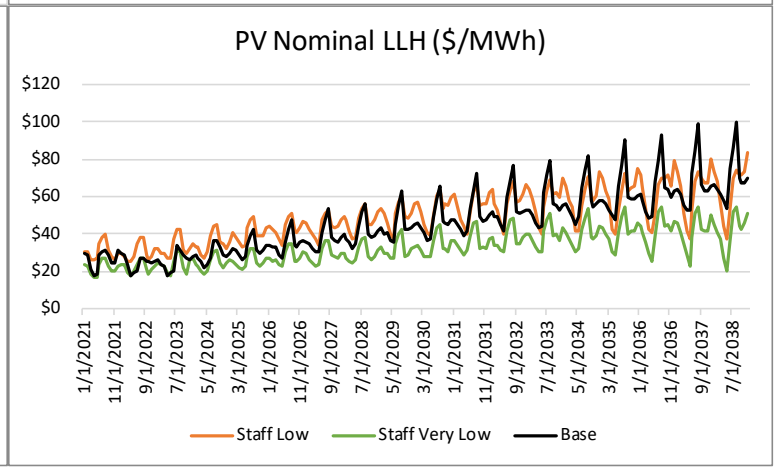
- A more detailed summary of specific assumptions proposed by Staff is provided in an appendix to this presentation
- PacifiCorp analyzed how bid selections are affected (excluding any potential transmission upgrade costs), when different assumptions are applied
- For each of the unique resource portfolios, PacifiCorp produced PVRR costs using PaR
- Information on market sales and purchases, based on PaR modeling outputs, are also summarized

Price Curve Results









- On a levelized basis, the low sensitivity is about 10 percent below the base with dampened summer-peak prices, and the very low case is 40+ percent below the base

Initial Shortlist Bid Selections (Low vs. Base)

		Base		Low		Change	
		Generator (MW)	Storage (MW)	Generator (MW)	Storage (MW)	Generator (MW)	Storage (MW)
SO Model Selection	Wind	2,479	0	2,376	0	(103)	0
	Solar	670	0	178	0	(492)	0
	Solar+BESS	1,512	612	1,733	643	221	32
	BESS	0	200	0	200	0	0
	Sub-Total	*4,660*	*812*	*4,286*	*843*	*(374)*	*32*
		Generator (MW)	Storage (MW)	Generator (MW)	Storage (MW)	Generator (MW)	Storage (MW)
ISL Additions	Solar+BESS	582	356	582	356	0	0
	Solar+BESS (w/Solar Alternative)	410	238	410	238	0	0
	Solar (w/Solar+BESS Alternative)	410	0	410	0	0	0
	Sub-Total	*992*	*356 - 594*	*992*	*356 - 594*	*0*	*0 - 0*
	Total	*5,652*	*1167 - 1050*	*5,279*	*1199 - 1081*	*(374)*	*32*

- Initial Shortlist (ISL) additions, which are not available for SO model selection in any case, are unchanged among cases
- Among SO model selections, generator capacity is reduced by 374 MW under the low sensitivity (reductions in solar and wind are partially offset by an increase in solar + BESS capacity)
- The Final Shortlist (FSL) analysis, when transmission upgrade costs will be considered, is expected to include fewer projects than on the ISL. When these costs are factored in, the same sensitivity (updated for then current assumptions), may not materially change bid selections relative to a base case

Initial Shortlist Bid Selections (Very Low vs. Base)

		Base		Very Low		Change	
		Generator (MW)	Storage (MW)	Generator (MW)	Storage (MW)	Generator (MW)	Storage (MW)
SO Model Selection	Wind	2,479	0	2,357	0	(122)	0
	Solar	670	0	0	0	(670)	0
	Solar+BESS	1,512	612	45	13	(1,467)	(599)
	BESS	0	200	0	0	0	(200)
	Sub-Total	*4,660*	*812*	*2,402*	*13*	*(2,258)*	*(799)*
		Generator (MW)	Storage (MW)	Generator (MW)	Storage (MW)	Generator (MW)	Storage (MW)
ISL Additions	Solar+BESS	582	356	582	356	0	0
	Solar+BESS (w/Solar Alternative)	410	238	410	238	0	0
	Solar (w/Solar+BESS Alternative)	410	0	410	0	0	0
	Sub-Total	*992*	*356 - 594*	*992*	*356 - 594*	*0*	*0 - 0*
	Total	*5,652*	*1167 - 1050*	*3,394*	*368 - 251*	*(2,258)*	*(799)*

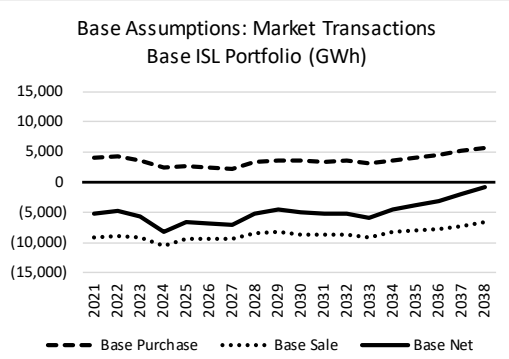
- Among SO model selections, generator capacity is reduced by 2,258 MW under the very low sensitivity (reductions in all technology types). With reduced loads, high private generation and high customer preference assumptions, PacifiCorp's need is reduced relative to the base case (peak is down 761 MW in 2024 and down 1,492 MW by 2038)
- In the FSL analysis, a similar outcome is likely. PacifiCorp views the "Very Low" sensitivity as a low-probability case that should not be used for decision-making purposes. This sensitivity is defined assuming sustained decades-long downside drivers for resource procurement and no measurable movement on GHG policies that might impute costs on electric-sector emissions, which expectedly reduces the need for resources throughout the planning horizon
- As applied in during this phase of the 2020AS RFP, nearly all solar and solar + BESS bids are eliminated

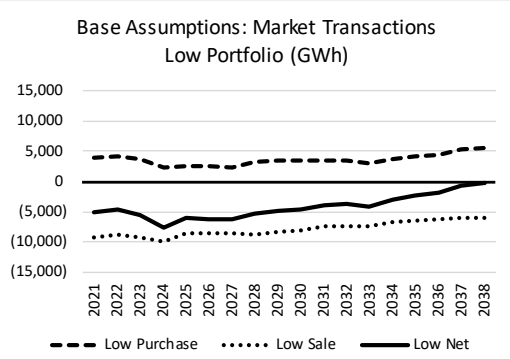
Initial Shortlist PVRR Summary

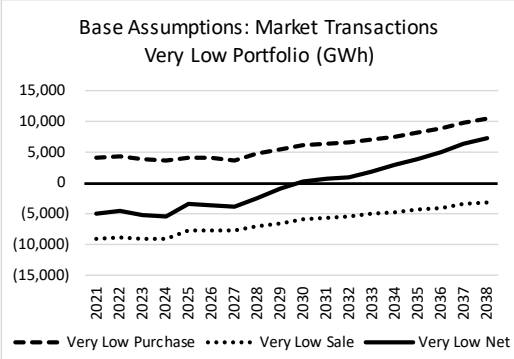
PaR Stochastic-Mean PVRR ($ million)	Base Assumptions Applied	Low Sensitivity Assumptions Applied	Very Low Sensitivity Assumptions Applied
Base ISL Portfolio	**$22,380**	$23,288	$19,249
Low Sensitivity Portfolio	$22,492	**$23,280**	$18,770
Very Low Sensitivity Portfolio	$22,882	$23,381	**$17,553**
(Benefit)/Cost of Base Relative to Low	($112)	$8	$479
(Benefit)/Cost of Base Relative to Very Low	($502)	($94)	$1,696

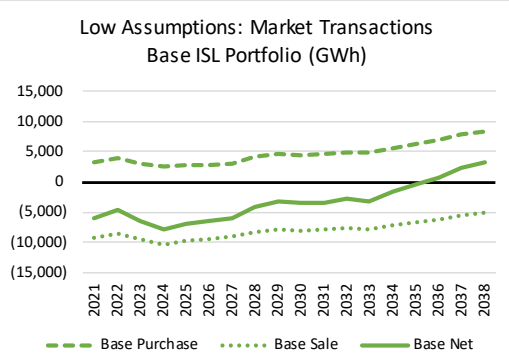
- The Base/Low/Very Low portfolios selected in SO were each run in PaR under all three conditions
- Each portfolio ranks highest in PaR when the same assumptions used in SO selection are applied, as shown in **bold and underline**.
- All portfolios have the highest system costs under Low assumptions, as lost revenue from market sales outweighs the benefit from reduced market purchase costs.
- All portfolios have the lowest system costs under Very Low assumptions. While lower electricity market price can have a mixed effect on total costs, lower gas prices, no CO_2 price, and lower PacifiCorp load all result in lower costs, though the size of the change depends on the portfolio.

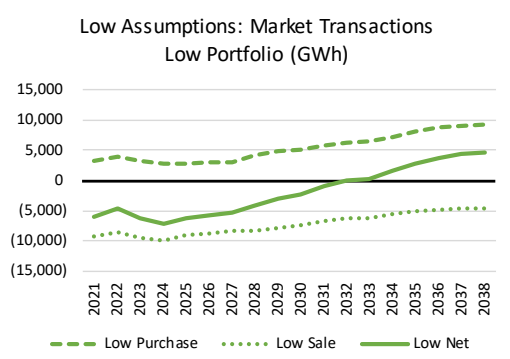
Market Purchase and Sales Data (Volume in GWh)

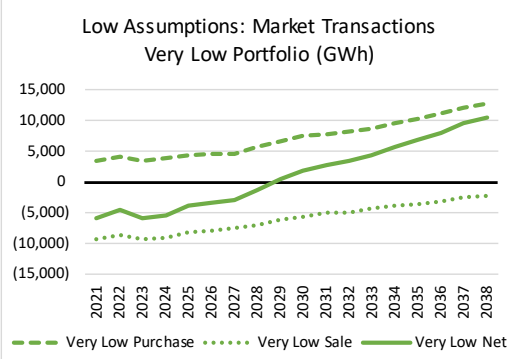


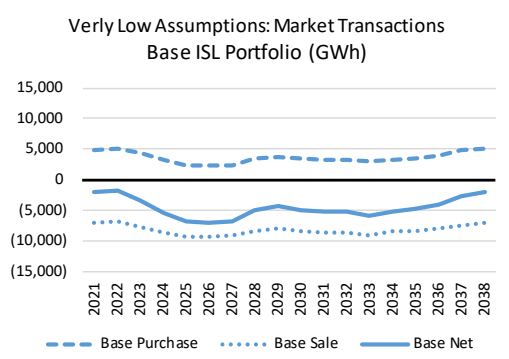


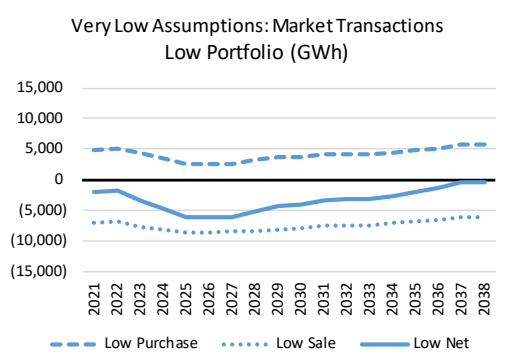


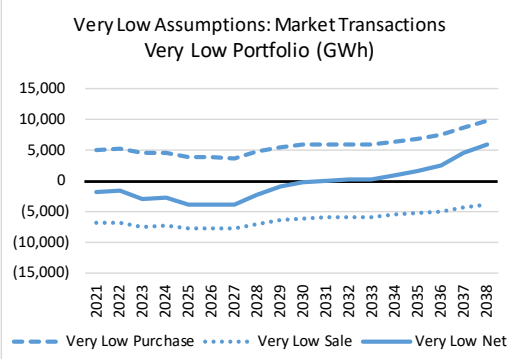




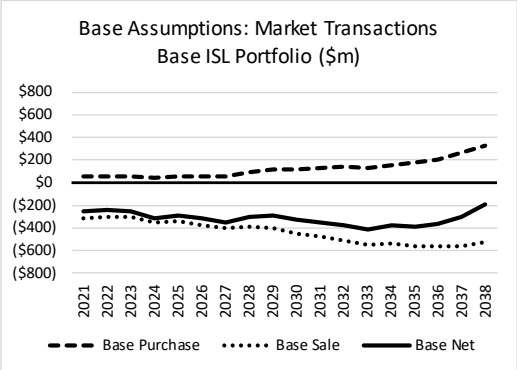


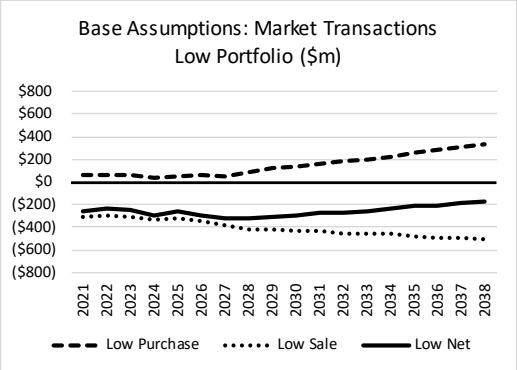


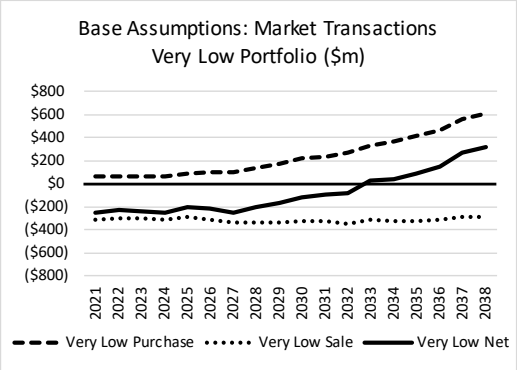


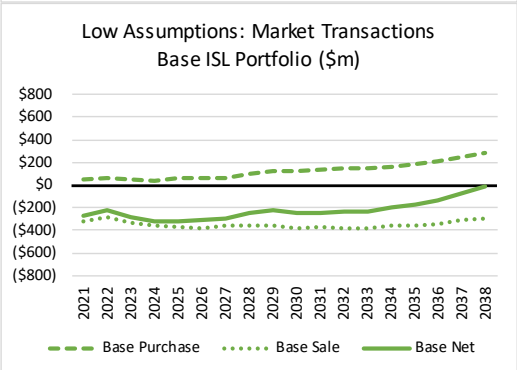


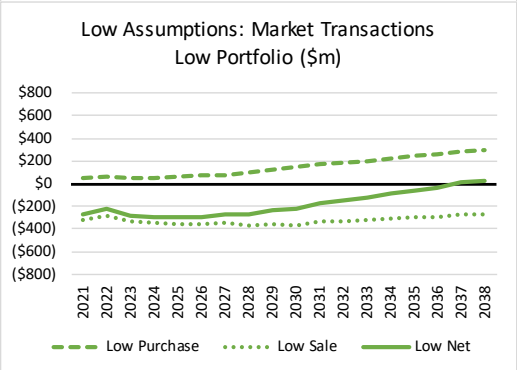
Market Purchase and Sales Data (Value in $ million)

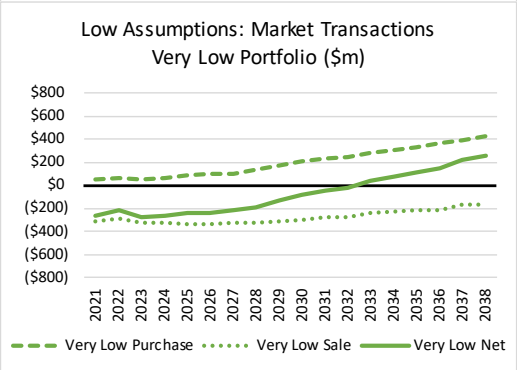


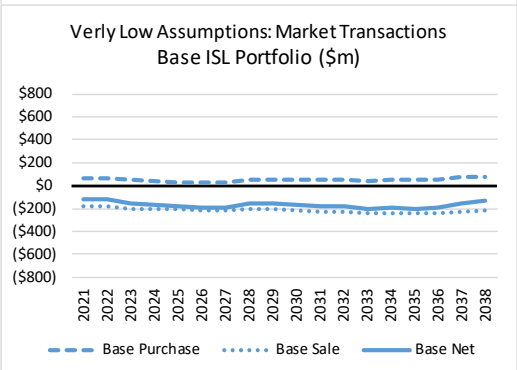


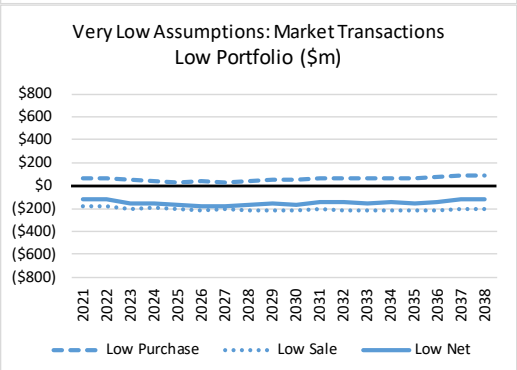


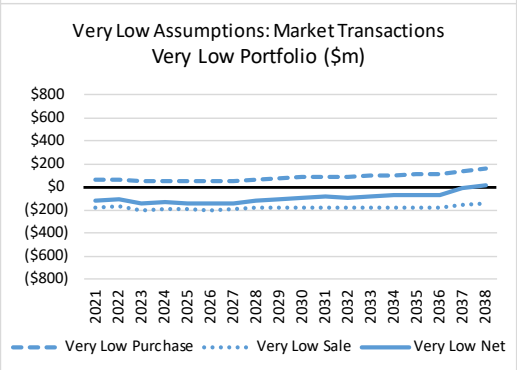












Market Purchase and Sales Data

		% of Total Costs		
Portfolio	**Assumptions**	**Sales**	**Purchase**	**ENS**
Base ISL Portfolio	Base	19%	5%	1.1%
	Low	16%	4%	1.0%
	Very Low	12%	3%	0.2%
Low Sensitivity Portfolio	Base	18%	5%	2.3%
	Low	15%	5%	2.2%
	Very Low	12%	3%	1.6%
Very Low Sensitivity Portfolio	Base	15%	8%	3.2%
	Low	13%	7%	3.1%
	Very Low	11%	5%	0.4%

- Total cost does not include fixed costs of existing resources and transmission
- Sales revenue range from 11% to 19% of total PVRR
  - Even under Very Low price conditions, sales revenue remains significant
- Purchase costs range from 3% to 8% of total PVRR
  - The studies didn't include a high market price future, where purchase costs would be greater
- ENS costs range from 0.2% to 3.2% of total PVRR
  - The cost of resources to ensure reliability may be higher than the reported cost of ENS

Appendix





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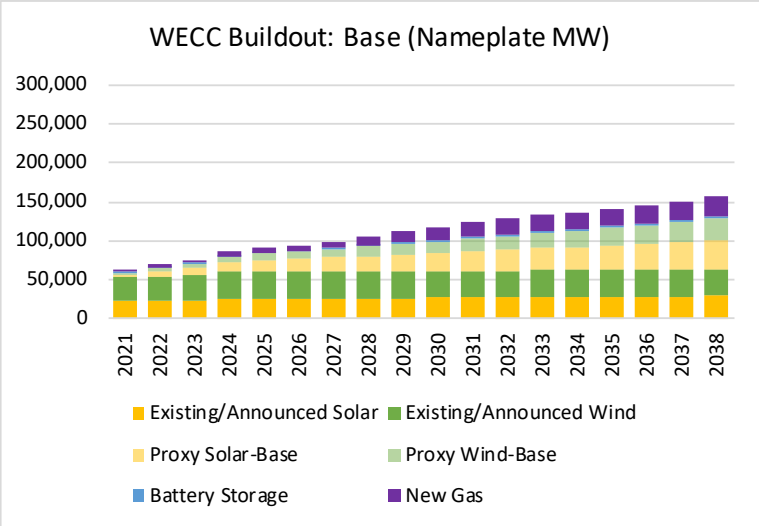
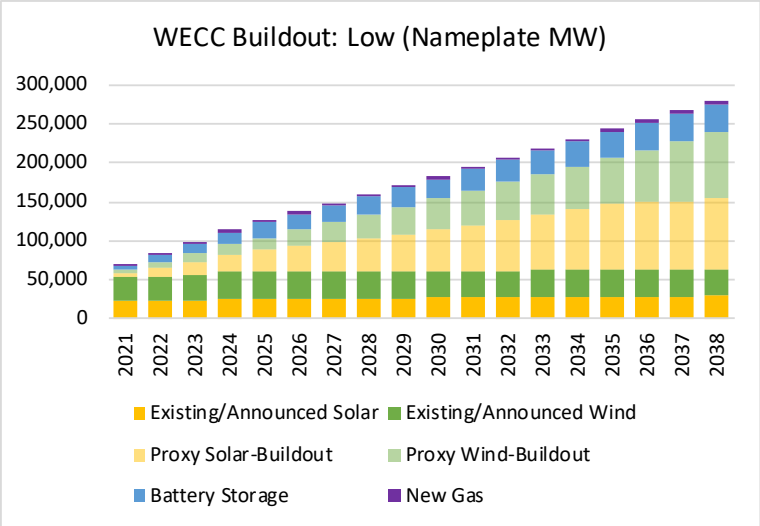
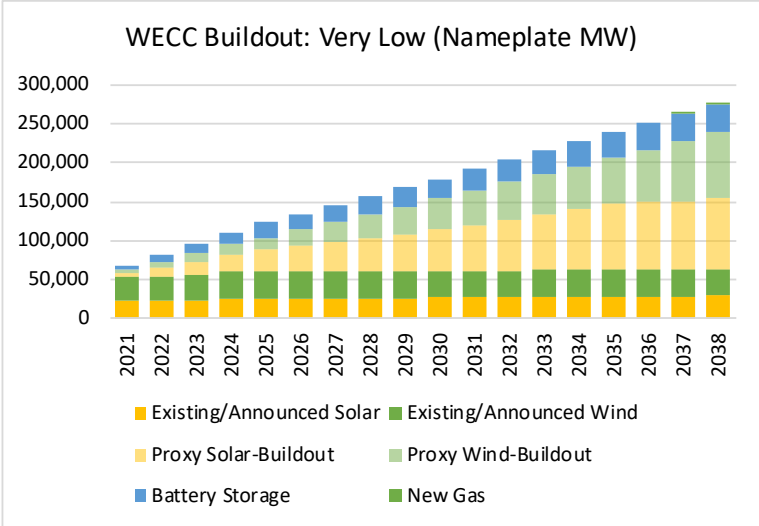
Summary of Assumptions (WECC Buildout)

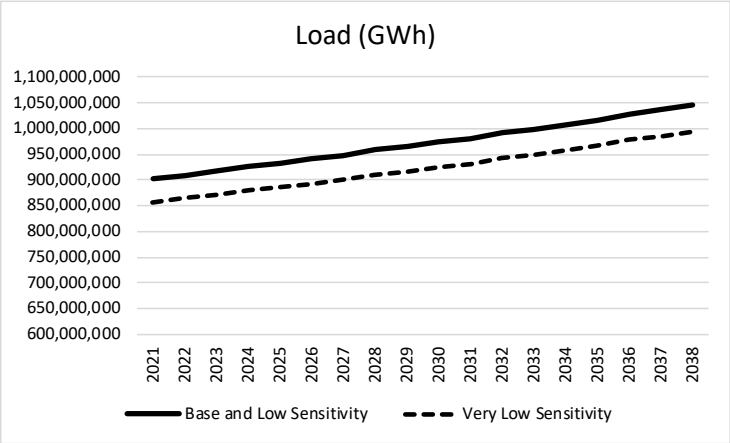


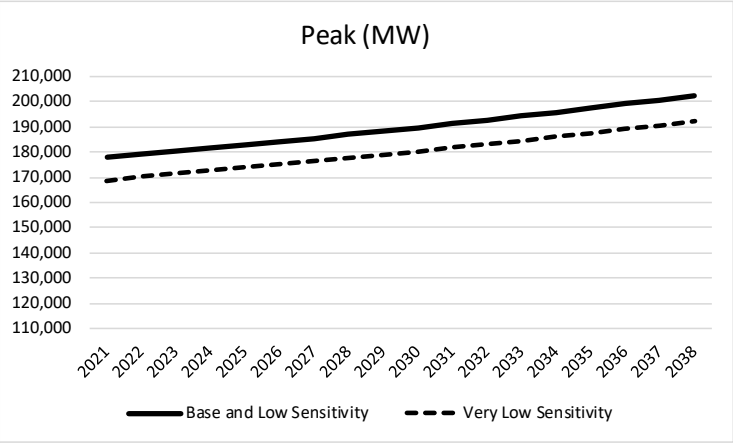




- In the low and very low sensitivities, there is an increase in assumed wind, solar and BESS capacity consistent with assumptions identified by staff
- New gas resources are significantly reduced (totaling only 3,734 MW by 2038 in the low sensitivity and 858 MW in the very low sensitivity)
- No new gas resources are added in Oregon or Washington

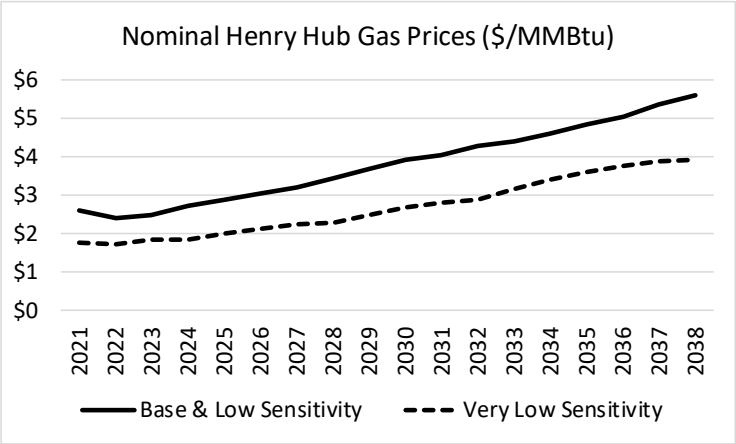
Summary of Assumptions (WECC Load)

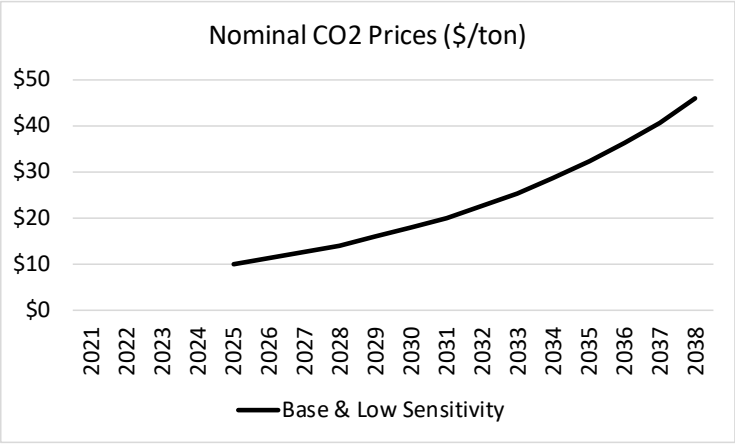




- WECC load projections (inclusive of WECC loads in Canada) were reduced by 5% from the load projection used in the base and low sensitivity
- The reduction is consistent with the percentage change between PacifiCorp's base and low load forecast in the 2019 IRP

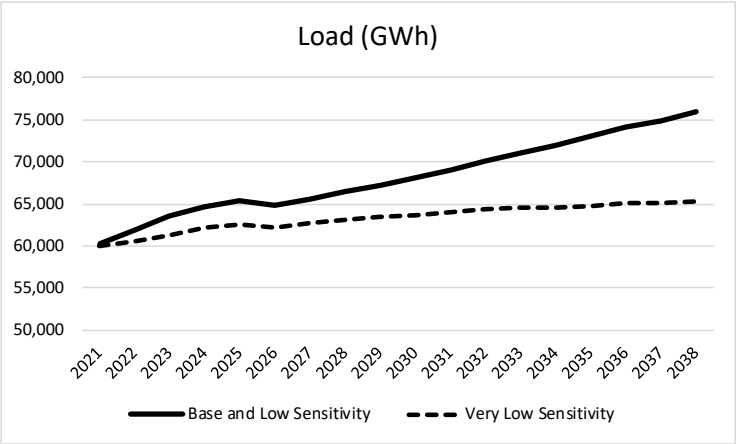
Summary of Assumptions (Natural Gas and CO_2)

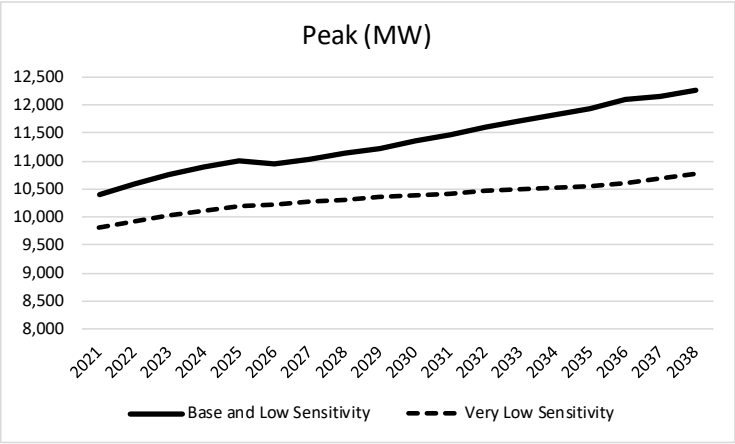


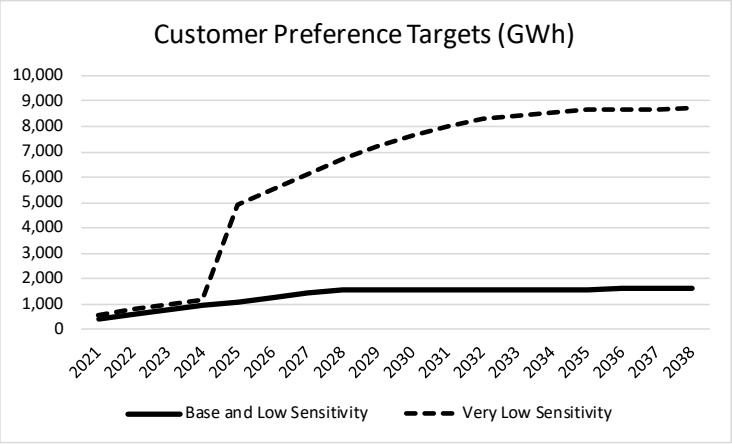


- Base and low sensitivity natural gas prices are from PacifiCorp's June 2020 official forward price curve, which was the price curve used to establish the initial shortlist
- The natural gas prices for the very low sensitivity are consistent with those proposed for use in the 2021 IRP and are derived from a third-party projection
- CO_2 price assumptions for the base and low sensitivity are aligned with the 2019 IRP, which PacifiCorp will maintain for the 2021 IRP—the very low sensitivity applies a zero CO_2 price assumption (not graphed) in Aurora and in the SO/PaR models

Summary of Assumptions (PacifiCorp Load and Customer Preference Volumes)







- Forecasts for all cases represent load and peak net of private generation but before incremental energy efficiency (which is available as a resource in the SO model when producing portfolios)
- Relative to the forecast used in the base and low sensitivity, the very low sensitivity assumes loads are down by 4% in 2024 and down by 14% by 2038—peak is down 7% (761 MW) in 2024 and down 12% (1,492 MW) by 2038
- Customer preference targets in the very low sensitivity are about 4.5 times higher than the base and low sensitivity in 2025 and nearly 5.5 times higher by 2038