ITEM NO. RA2

PUBLIC UTILITY COMMISSION OF OREGON
STAFF REPORT
PUBLIC MEETING DATE: April 30, 2024

REGULAR __X__ **CONSENT** ____ **EFFECTIVE DATE** __May 1, 2024__

DATE: April 22, 2024

TO: Public Utility Commission

FROM: Peter Kernan

THROUGH: JP Batmale and Sarah Hall **SIGNED**

SUBJECT: OREGON PUBLIC UTILITY COMMISSION STAFF:
(Docket No. UM 1893)
Request for approval of energy efficiency avoided cost data to be used by Energy Trust.

STAFF RECOMMENDATION:

The Public Utility Commission of Oregon (Commission) should approve the attached energy efficiency avoided cost data for use by Energy Trust of Oregon (Energy Trust).

DISCUSSION:

Issue

Whether to approve the attached energy efficiency avoided cost data for use by Energy Trust.

Applicable Rule or Law

OAR 860-030-0011(1) requires an energy utility to submit its data for calculation of energy efficiency avoided costs in the manner and method specified in a Commission-approved reporting form. The form must be submitted by October 15 of each year for use in the next energy efficiency program budget cycle. See OAR 860-030-0011(1).

Under OAR 860-030-0011(2), the Commission may approve, at its discretion, the use of data more recent than data used in the utility's last acknowledged Integrated Resource Plan (IRP) or general rate case in which the Commission has issued a final order.

Under OAR 860-030-0013, Energy Trust may not use utility-specific energy efficiency avoided cost data until it has been approved by the Commission. The Commission generally considers energy efficiency avoided cost data for approval within 60 days of submission.

Analysis

Staff's analysis is divided into three sections within this memo. Section I presents a summary of activities since the last report. Section II presents Staff's recommendations regarding data for use by Energy Trust for energy efficiency avoided cost calculations, first for electric and then gas utilities. Section III summarizes the results of the recommended energy efficiency avoided costs.

Additionally, Staff prepared Attachments 1 and 2 to summarize the recommended data for electric and gas avoided costs respectively. Attachments 1 and 2 do not include the alternate data submitted by utilities, which can be found in the respective dockets online.[1] Energy Trust then prepared its annual reports for Staff review and consideration by the Commission. Attachment 3 is the *Final 2025 Electric Avoided Cost Update Summary* and Attachment 4 is the *Final 2025 Gas Avoided Cost Update Summary.*

Section I: Summary of Activities

Avoided costs were last updated in December 2022 with Order No. 22-483.[2] In lieu of updates in 2023, Staff requested a waiver of OAR 860-030-0011, which requires utilities to file energy efficiency avoided cost reports by October 15 of each year. Staff requested, and the Commission approved with Order No. 23-362, a waiver to allow time to consider data changes in response to pending utility Integrated Resource Plans (IRPs).[3] For the first time, 2023 IRPs included planning to meet new state decarbonization policy including House Bill (HB) 2021 for electric utilities and the Climate Protection Program (CPP) for gas utilities. Staff noted in December 2022 that decarbonization driven changes "could have significant impacts on avoided cost values."[4]

[1] Utilities submit data in utility-specific dockets as follows: Avista RG 85; CNG RG 86; NWN RG 87; PacifiCorp RE 181; PGE RE 182.
[2] See Docket No. UM 1893, Order No. 22-483, (Dec. 14, 2022), https://apps.puc.state.or.us/orders/2022ords/22-483.pdf.
[3] See Docket No. UM 1893, Order No. 23-362, (Oct. 6, 2023), https://apps.puc.state.or.us/orders/2023ords/23-362.pdf.
[4] See Docket No. UM 1893, *Staff Memo: Request for approval of energy efficiency avoided cost data to be used by Energy Trust,* (Dec. 13, 2022), https://edocs.puc.state.or.us/efdocs/HAU/um1893hau15168.pdf.

In Order No. 23-362 the Commission required utilities to file their most recent avoided cost data on March 1, 2024. In December 2023, Staff published an update to Docket No. UM 1893 outlining a two-phase process for updating avoided costs in 2024 and an addition to the electric avoided cost data template. This memo represents the completion of Phase 1, establishing energy efficiency avoided costs for 2025.

December's data template update included a new worksheet tab, with Staff requesting utilities provide a forecast of avoided energy costs. Staff made this request reflecting discussions in electric IRPs which indicated that sole reliance on forward market prices did not capture utility planning needs to procure emissions-free power to meet HB 2021 requirements. After conversations between Staff and utilities, each utility submitted data for consideration in this avoided cost update representative of energy avoided costs instead of forward market prices. Staff will discuss the new avoided energy submissions in the second section of this memo.

The scope of this first phase addresses some of the initial issues identified in 2023 IRPs. However, Staff and utilities noted that additional changes to the methodology may be needed to modernize avoided costs in line with state decarbonization policy. This topic was particularly salient in PGE's 2023 IRP, leading to Staff's Recommendation 4 in Staff Comments:

> Direct PGE to work with Staff to propose a new method for calculating avoided costs in Docket No. UM 1893. The avoided cost proposal should resolve the shortcomings identified by PGE and Staff, including but not limited to the shift from one avoided capacity value to annual values, the impact of constraints observed in the model, and the need to procure clean electricity not captured by forward market prices.[5]

PGE agreed and the Commission adopted Staff's recommendation, stating that in addition to Staff' recommendation, Commissioners "direct PGE to collaborate with Staff and [Energy Trust] to modernize the approach to long-term energy efficiency planning to use the best currently available information on energy efficiency and technical potential in future IRP and CEP updates."[6] Staff appreciates PGE's willingness to collaborate on avoided cost methodology changes and looks forward to a proposal. Staff will launch Phase II after completion of Phase I to provide a discussion forum for additional necessary changes.

[5] See Docket No. LC 80, *Staff Report for Acknowledgement of 2023 Integrated Resource Plan and Clean Energy Plan,* (Dec. 14, 2024), p. 18, https://edocs.puc.state.or.us/efdocs/HAU/lc80hau325590032.pdf.
[6] See Docket No. LC 80, *Order No. 24-096,* (April 18, 2024), p. 21, https://apps.puc.state.or.us/orders/2024ords/24-096.pdf.

Section II: Data Recommendations

The utility data populating the updated UM 1893 worksheets comes from either the utilities' IRPs or most recent general rate case. In situations where alternate sets of data were provided, Staff checked to see if the alternate data had been reviewed previously by Staff. In cases where data had been reviewed and found reasonable, Staff recommends using the most recent alternate data. In some cases, Staff also recommends applying certain data decisions, rather than what has been submitted by the utilities. Staff's data recommendations below, start with those that are general and then become more fuel-specific.

General Recommendations for All Avoided Costs

Ten Percent Conservation Credit
While updating avoided costs, Energy Trust communicated to Staff that the existing calculations do not apply the 10 percent conservation credit to the risk mitigation credit. To maintain consistency with the Northwest Power and Conservation Council's methodology, Staff recommends applying the 10 percent credit to all avoided cost value streams including the risk mitigation credit.[7] This update applies to both gas and electric avoided costs. Risk mitigation credits are small, thus the impact of this change is minimal. Results presented in Staff's recommendation include the 10 percent conservation credit applied to the risk mitigation credit.

Discount Rates
Each utility submits a discount rate which comes from that utility's IRP. Energy Trust uses an organization-wide discount rate which is the revenue weighted average of each of the five utilities for which Energy Trust provides programming. Staff recommends maintaining a single Energy Trust discount rate with this update but welcomes alternate suggestions in Phase II.

Electric Utility Data Recommendations

Seasonal Capacity Splits
In 2019, Energy Trust began applying the seasonal contribution of energy savings measures for generating capacity, transmission capacity, and distribution capacity, which may vary for a given utility. In prior avoided cost updates, seasonal contributions to peak were simplified based on utility estimates to one of: 100 percent winter contribution, 100 percent summer contribution, or a 50/50 split between winter and summer. PacifiCorp continues to submit values that are not rounded to the nearest

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[7] Northwest Power and Conservation Council's Method for Determining the Cost-Effectiveness Limit for Conservation, 2021 Power Plan, https://www.nwcouncil.org/2021powerplan_cost-effective-methodology/.

fiftieth percentile. Staff requested Energy Trust consider whether there was a computational reason for the rounding. Citing none, Staff recommends the use of the generating capacity, transmission capacity, and distribution capacity provided by each Company. Energy Trust applied the utility proposed capacity splits as summarized in Table 1.

Table 1: Seasonal Contributions Split to Transmission, Distribution, and Generation Capacity

		Pacific Power		Portland General Electric	
		Current 2024	Proposed 2025	Current 2024	Proposed 2025
Transmission Capacity	Summer	50%	39%	50%	50%
	Winter	50%	61%	50%	50%
Distribution Capacity	Summer	100%	90%	50%	50%
	Winter	0%	10%	50%	50%
Generation Capacity	Summer	100%	83%	50%	50%
	Winter	0%	17%	50%	50%

Forward Market Prices

As described in its IRP, PacifiCorp maintains and updates an Official Forward Price Curve (OFPC) which includes a blend of an operational forward price curve with a long-term fundamental forecast.[8] The first three years of the forecast are informed by the Company's operations team which receives bids from brokers for the 36-month period. Years 5-20 rely on a long-term fundamental forecast generated by an Aurora model which takes a regional perspective (Western Electricity Coordinating Council aka, WECC-wide) at resources and pricing for the planning period. Year four is an average of the operations market forecast and the fundamental forecast.

PacifiCorp submitted two OFPC's for Staff's consideration in this avoided cost update. The first submission reflects the OFPC which came from the Company's 2023 IRP and is dated September 2022. The alternative OFPC includes March 2023 values submitted and approved in Docket No. UM 1729, the Company's Standard Qualifying Facility (QF) pricing docket. The two OFPC submissions have different vintages but reflect the same process to generate the forecast.

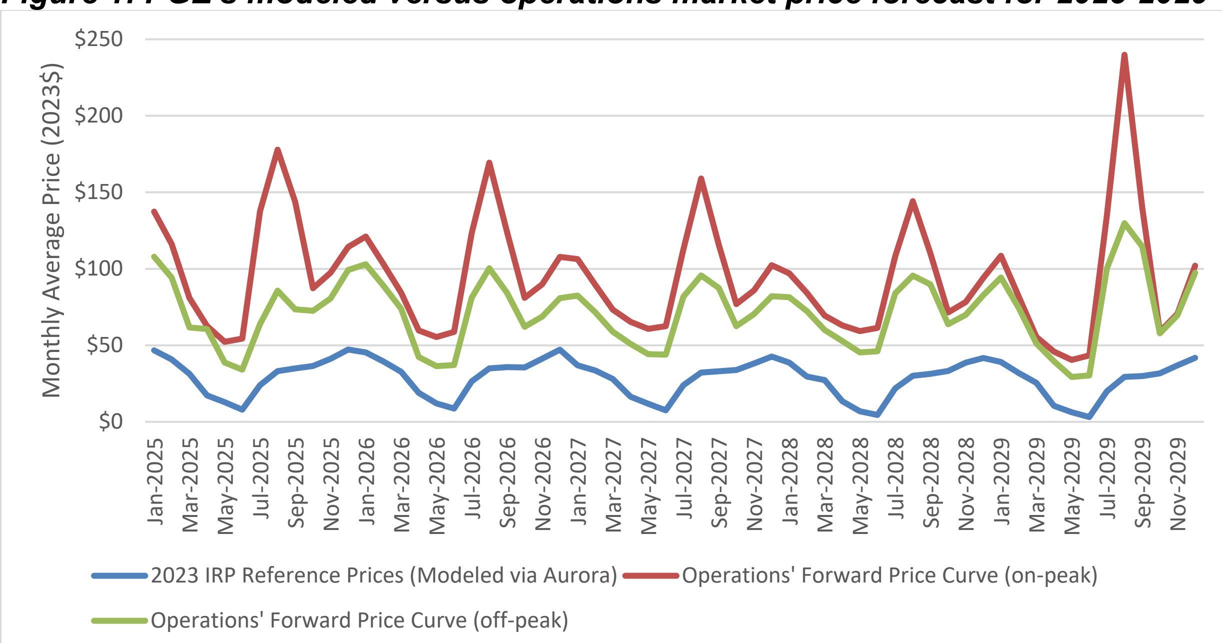
In prior updates to energy efficiency avoided costs, Staff was not directive about how to provide a forward price forecast. For comparison to PacifiCorp, PGE has not used an

[8] See Docket No. LC 82, *PacifiCorp 2023 Integrated Resource Plan: Volume I*, (May 31, 2023), p. 228, https://edocs.puc.state.or.us/efdocs/HAS/lc82has14323.pdf.

operational forward curve for the first years. In prior updates, PGE submitted forward market prices exclusively from the modeled output of its Aurora forecast.

Staff notes that reliance only on a modeled fundamental forecast may miss significant differences between the market and the model. To illustrate this point, Figure 1 demonstrates the difference; PGE's market price forecast from the IRP estimates average monthly market prices oscillating below $50/MWh for the entire period through 2029, while PGE's operations team forecasts average annual August peaks of $150/MWh or higher and off-season, off-peak lows around $50/MWh. On average, the operations forward curve forecast is two to three times higher than the modeled forecast from the IRP. Further, the shape and magnitude of PGE and PacifiCorp's operations market price forecasts are similar, increasing Staff's confidence in recommending those values for use in avoided costs.[9]

Figure 1: PGE's modeled versus operations market price forecast for 2025-2029[10]



Staff documented its skepticism of PGE's modeled market price values during review of PGE's 2023 IRP. In its final comments, Staff viewed, "the avoided energy cost represented by forward market prices to be unacceptable and will recommend against

[9] Figure 2 on page 8 of this memo shows PacifiCorp's OFPC 1 and 2.
[10] 2023 IRP Reference Prices from Docket No. LC 80, Figure 21, p. 81, https://edocs.puc.state.or.us/efdocs/HAA/lc80haa8431.pdf. Operations' Forward Curve values from data submitted by PGE in Docket No. RE 182, Alternative submission for forward prices, (Mar. 25, 2024), https://edocs.puc.state.or.us/efdocs/HAQ/re182haq327523114.pdf.

approval of data based on such costs in Docket No. UM 1893 if those values remain unchanged."[11] Staff's position was informed by two differing conclusions of PGE's 2023 IRP. First, in the least cost portfolio, PGE's model selected 53 additional average megawatts (aMW) of energy efficiency at levelized costs significantly higher than those supported by current avoided costs.[12] Meanwhile, when Staff requested Energy Trust model the impact of using PGE's 2023 forward market prices, the overall avoided cost value declined, more than offsetting increases to the transmission, distribution, and capacity avoided cost values.

Staff appreciates PGE's articulation of the matter in its 2023 IRP. The Company acknowledged the disconnect between current avoided cost values and the modeling results. The Company wrote, "This highlights a significant disconnect between resource planning using the current forecasts of costs and benefits in this IRP and resources that use previously calculated cost-effectiveness tests."[13] Staff notes that PGE's statement is not limited to a discussion of forward prices but raises the example as one area Staff noticed the data do not support the conclusion.

In March 2024, after reviewing PGE's initial data submission and noting the significant difference exhibited by Figure 1, Staff requested the company file an additional forward market price forecast that followed the OFPC format of PacifiCorp. PGE made the supplemental filing on March 25, 2024, which included PGE's operational power curve for years 2024-2028, an interpolation year in 2029, and the IRP curve for 2030-2043.[14] PGE's alternative submission is more aligned with PacifiCorp's forecast and the planning signal from PGE's 2023 IRP.

Staff recommends the use of PacifiCorp's more recent OFPC, dated March 2023, and PGE's alternative forward price submission which mirrors the PacifiCorp format. In future Docket No. UM 1893 updates, Staff intends to take the learnings from this cycle and request forward price data follow the OFPC format.

<u>Avoided Energy Cost</u>
In its updated data template published in December 2023, Staff requested PGE and PacifiCorp submit an alternative to forward market price forecasts. The genesis of this request was in partial response to the above discussion about how forward market prices for energy efficiency undermined the IRP modeling conclusion identifying a significant increase in energy efficiency for the least cost portfolio.

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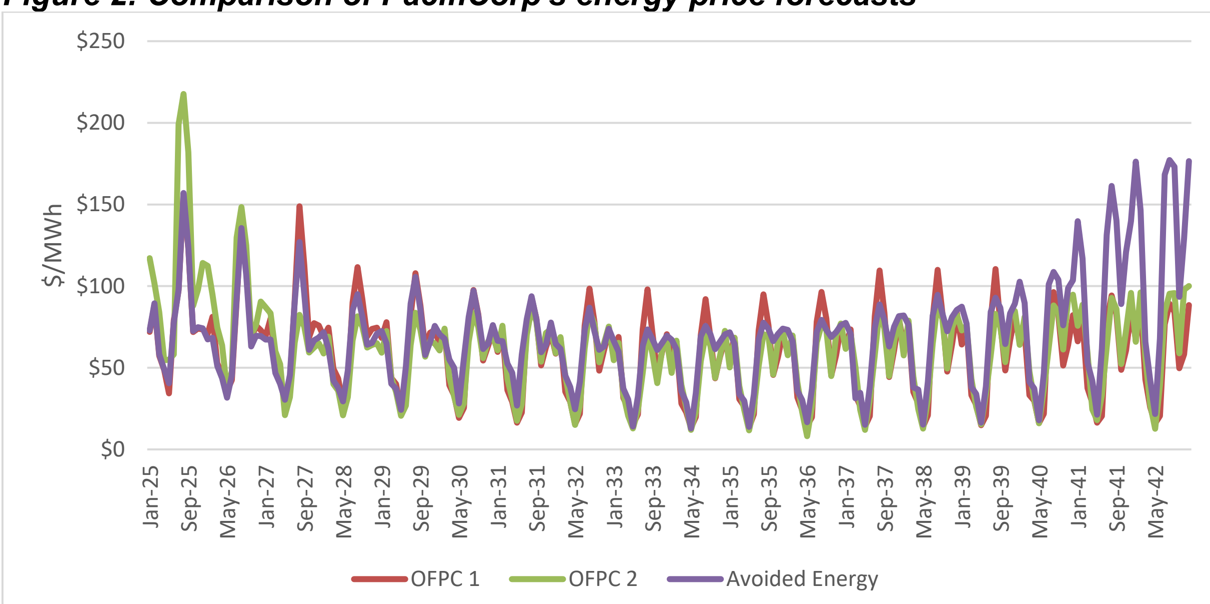
[11] See Docket No. LC 80. *OPUC Staff Round 2 Comments and Recommendations.* (Oct. 24, 2023), p. 8, https://edocs.puc.state.or.us/efdocs/HAC/lc80hac145648.pdf.
[12] Ibid, p. 8, PGE's model selected EE up to a levelized cost of $0.27/kWh.
[13] See Docket No. LC 80, p. 277.
[14] See Docket No. RE 182, Alternative submission for forward prices, (Mar. 25, 2024).

In its 2023 IRP, PGE discussed a new phenomenon it called the cost of clean energy, caused by Oregon's adoption of HB 2021.[15] In the Company's description, emissions constraints limit access to wholesale market purchases that have carbon emissions. As a result, the decision PGE faces to comply with HB 2021 may be to rely on "adding incremental generating resources to meet energy needs."[16] Therefore, from an avoided cost perspective, the market may not be the most representative or sole source in determining an avoided energy cost. PGE frames this new cost of clean energy as a value to resources that avoid it.

PacifiCorp submitted its Company's interpretation of an avoided energy cost based on the Staff guidance. PacifiCorp used locational marginal prices (LMP) for Oregon that came out of its 2023 IRP and adjusted prices in line with HB 2021 targets. For example, PacifiCorp adjusted LMP values to reflect a hydrogen peaker beyond 2030 to meet emissions requirements. While the avoided energy data closely mirror both PacifiCorp OFPC's to 2040, there is an interesting divergence beyond 2040 where the emissions constraints are applied to the avoided energy stream of values but not the OFPCs.

Figure 2: Comparison of PacifiCorp's energy price forecasts

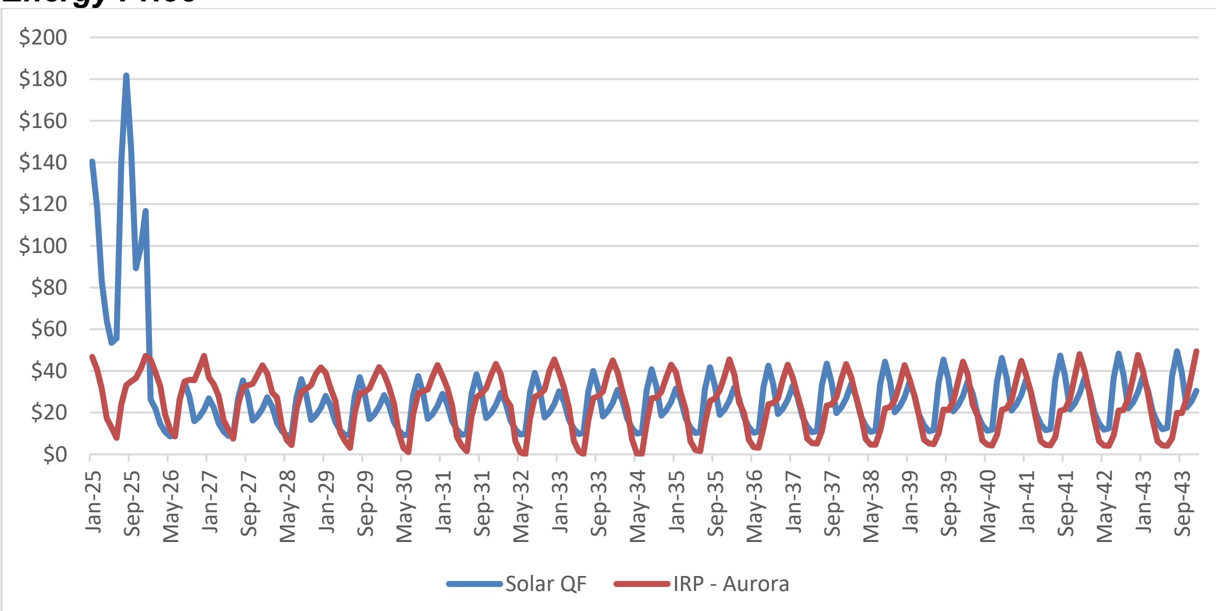


PGE also submitted its interpretation of an avoided energy cost based on Staff's guidance. PGE relied on data that the Company already prepares for Docket No. UM 1728, which is the Public Utility Regulatory Policies Act (PURPA) QF avoided

[15] See Docket No. LC 80, Section 10.7 Cost of Clean Energy, p. 246.
[16] Ibid, p. 246.

cost docket. PGE submitted the avoided energy price value for a renewable Solar QF. Figure 3 compares the avoided energy values PGE submitted (Solar QF) to the 2023 IRP Aurora forecast. Staff notes that besides 2025, the shape and magnitude of both datasets are similar.

Figure 3: Comparison of PGE's IRP Aurora Forecast and Renewable Solar QF Energy Price[17]



Staff appreciates both companies' willingness to explore alternative data and notes the submissions provide new perspectives on an energy value stream that is not reliant on forward market price forecasts. However, the submissions did not solve the challenge as presented by Docket No. LC 80 for identifying a cost of clean energy. PacifiCorp's submission illuminated the possibility of using LMPs and applying emissions constraints to available resources. PGE's submission was informative for clarifying energy price values that the Company would buy power from Solar QF's seeking to interconnect. However, PGE's submission lacks the connection to avoiding observed market issues and addressing the resource need demonstrated in the IRP.

PGE's 2023 IRP illuminated that other proxy resources, such as solar plus transmission from Nevada, are those that functionally set the avoided cost in the Company's modeling. PGE was specific about this phenomenon in response to Staff data request (DR) 200 in Docket No. LC 80, in which PGE wrote,

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[17] Staff used Monthly IRP – Aurora values are from Figure 21 of PGE's 2023 IRP because only annual values were submitted in UM 1893. Monthly Solar QF values were submitted in RE 182.

> Resource needs in the medium term are primarily driven by energy needs. Thus, when we compare the net cost of capacity on a $/MWh basis, we see that EE bins 1 through 3 have a lower net cost of capacity to meet energy needs than the net cost of energy of the Nevada solar transmission expansion option and consequently the generic resources, resulting in selection of EE bins 1 through 3 when available.[18]

Staff notes that the net cost of energy provided in OPUC DR 200 for the Nevada solar transmission expansion option was $165/MWh for 2026. This expensive energy alternative is illustrative of why PGE's IRP model selected so much additional energy efficiency, and why avoided energy costs below $50/MWh are not representative.

As a result of the above discussion, Staff does not recommend the use of the avoided energy cost submissions from either PGE or PacifiCorp in this avoided cost update. Staff will continue to consider learnings in the Phase II update, and whether data other than forward market prices will better reflect utility decisions in meeting energy needs.

<u>Capacity Deferral Value</u>
Utilities provide a value in $/kW-yr to reflect the cost of generation capacity to the utility's system. In the recent past, both PGE and PacifiCorp relied on a gas single cycle combustion turbine (SCCT) as the capacity resource to set the avoided cost. Gas SCCT are commonly viewed as a pure capacity resource; in theory, those resources do not operate unless there is a capacity need. Plus, when there is a capacity need, the SCCT is not energy limited—it has an effective load carrying capacity (ELCC) approaching 100 percent. The result is that the fixed cost of a SCCT reflects the capacity deferral value.

After the passage of HB 2021, PGE transitioned to the use of a four-hour battery as the capacity resource acknowledging that the Company would not build a new SCCT resource. In addition, PGE is pursuing 475 MW of stationary storage from the 2021 request for proposals (RFP) and the 2023 IRP Action Plan includes additional storage in the form of Hybrid resources.[19]

In its 2023 IRP, PGE provided a net cost of capacity calculation to value the capacity deferral value. Four-hour batteries' value is different to utility systems than SCCT in two important ways. First, batteries provide system benefits beside capacity. For example, batteries can cycle daily to absorb inexpensive renewable energy and dispatch during daily peaks of more expensive and carbon-intense hours. This arbitrage results in an

[18] See Docket No. LC 80, OPUC DR 200.
[19] See Docket No. LC 80, *2023 Clean Energy Plan and Integrated Resource Plan Addendum: Portfolio Analysis Refresh*, p. 25, Table 8, https://edocs.puc.state.or.us/efdocs/HTB/lc80htb16164.pdf.

energy benefit for batteries. Utilities can also monetize tax credits from batteries to reduce their fixed cost. Second, batteries are energy limited, meaning the battery may not contribute its nameplate capacity for an entire event. To correct for this limitation, the cost of capacity for a battery is divided by the ELCC to estimate a final, net cost of capacity. Figure 4 comes directly from PGE's 2023 IRP to demonstrate the process used to derive a net cost of capacity.

Figure 4: PGE's Net Cost of Capacity Derivation[20]

For the March 1, 2024, data submission, PGE submitted a four-hour battery with a net cost of capacity of $228/kW-yr.[21] PacifiCorp submitted the fixed cost for a SCCT of $105.36/kW-yr.[22] The result of the weighted average is a capacity deferral credit of $186.86, a 65 percent increase over the 2024 avoided cost value of $113.34.[23]

In preparation for the April 4, 2024, electric avoided cost workshop, Staff directed Energy Trust to consider one alternate scenario where a four-hour battery was applied to PacifiCorp's capacity credit. Staff discussed this question with PacifiCorp on a March 19, 2024, coordination call and subsequently over email. In the absence of a net cost of capacity for PacifiCorp, Staff directed Energy Trust to use a $197.05 fixed cost

[20] See Docket No. LC 80, PGE's 2023 CEP/IRP, p. 244, Figure 72.
[21] See Docket No. RE 182, *PGE's Energy Efficiency Avoided Cost Submission*, (Mar. 1, 2024), https://edocs.puc.state.or.us/efdocs/HAQ/re182haq327077054.pdf.
[22] See Docket No. RE 181, *PacifiCorp's 2023 Energy Efficiency Avoid Cost Report*, (Mar. 1, 2024), https://edocs.puc.state.or.us/efdocs/HAQ/re181haq327053054.pdf.
[23] See Energy Trust Memo, *Final 2025 Electric Avoided Cost Update Summary*, included as Attachment 3.

of capacity, which came from PacifiCorp's 2023 IRP.[24] PacifiCorp highlighted limitations to using a four-hour battery including that net benefits reduce fixed costs and that a lower battery ELCC increases net cost, phenomena observed in Figure 4. For these reasons, PacifiCorp stated that the fixed cost is not a great representation of a four-hour battery's avoided capacity cost.

After the April 4, 2024, stakeholder workshop, PGE contacted Staff and submitted supplemental energy efficiency avoided cost information. PGE posited that an incorrect generation capacity credit was submitted with the March 1, 2024, data. PGE cited two factors leading to the change. First, the ELCC values used to calculate the net cost of capacity did not account for a contract extension with the Grant Public Utility District. Second, PGE highlighted that the March 1, 2024, filing value used an average tuned ELCC based on the IRP's planning horizon. In the supplemental filing, PGE stated that a, "tuned ELCC based on 2026 more appropriately estimates the ELCC value in PGE's current preferred portfolio."[25]

PGE's proposed changes result in the four-hour battery ELCC increasing to 43 percent compared to 33 percent. Thus, the capacity deferral credit decreased from $228/kW-yr to $175/kW-yr. The ELCC changes also impacted the avoided energy cost submission. Since Staff is not recommending use of the avoided energy submission, that element has no impact to final, recommended avoided cost data. Staff requested Energy Trust model the impact of a reduction in PGE's capacity deferral credit to $175/kW-yr. Instead of an overall avoided cost increase of 37.6 percent, avoided costs would increase by 29 percent, an eight percentage point decrease based on this input alone.

In PGE's response to Staff's Round 1 comments in LC 80, the Company wrote:

> The UM 1893 method uses a single value for capacity usually based on the cost of capacity in the first year of deficiency, 2026 in this CEP/IRP. This approach does not capture two dynamics that have become more prominent in this IRP: the decreasing capacity contribution of the marginal resource that can provide capacity over the planning horizon, which impact the cost of capacity, and more importantly, the impact of transmission and other constraints that limit the type of resource available

[24] See Docket No. LC 82, PacifiCorp's 2023 Integrated Resource Plan, (May 31, 2023), p. 184, Table 7.2, Li-Ion 4-hour, 200 MW total fixed cost $/kW-yr, https://edocs.puc.state.or.us/efdocs/HAS/lc82has14323.pdf.

[25] See Docket No. RE 182, *PGE's Supplemental Energy Efficiency Avoided Cost Submission*, (April 9, 2024), https://edocs.puc.state.or.us/efdocs/HAQ/re182haq327794055.pdf.

> to meet capacity needs, which do not bind/limit resource selection until after the 2-3 years of the analysis.[26]

Staff's interpretation of PGE's suggested change to a capacity deferral value of $175/kW-yr from one at $228/kW-yr, is that it is primarily driven by the one-year snapshot versus one reflecting the entire IRP planning horizon. Staff conclude this based on similar data submitted by PGE in Docket No. UM 1728. On April 8, 2024, PGE revised the 2026 ELCC value for a four-hour battery to 43 percent from 42 percent.[27] By contrast, citing the same Grant PUD contract extension and the use of an IRP planning horizon ELCC, PGE proposed an ELCC change from 33 percent to 43 percent in its April 8, 2024, Docket No. UM 1893 supplemental filing. Since Staff knows the pre-Grant PUD extension ELCC value for 2026 was 42 percent, Staff concludes that the magnitude of the change comes from the proposal to use a single year value versus one representing the planning horizon.

Therefore, Staff finds that the value which includes an ELCC representing the IRP planning horizon may be more relevant and accurate than a single year value and aligns with Staff direction in other dockets. Staff's Straw Proposal in the PURPA investigation, Docket No. UM 2000, published March 7, 2024, recommends, "Capturing the capacity contribution over the life of the resource by moving away from a snapshot ELCC."[28] While it may have been past practice to submit a single year value in Docket No. UM 1893, Staff does not see a formal rule or informal guidance that a single year is the preferred method. As a result of the discussion in Docket No. LC 80, Staff recommends the Commission adopt the use of the initial value PGE provided, of $228/kW-yr. Staff intends to discuss single year versus planning horizon values further in Phase II and will consider updating the Docket No. UM 1893 guidance to direct the use of Tuned ELCCs reflecting the planning horizon.

With respect to PacifiCorp, Staff recommends accepting the SCCT value provided by the Company of $105.36/kW-yr. While Staff directed Energy Trust to compose an alternate scenario that applied a $197.05 capacity credit to reflect PacifiCorp's fixed cost of a four-hour battery, Staff does not recommend adoption due to the Company's articulation of limits to using battery fixed cost. However, Staff will direct PacifiCorp to provide a net cost of capacity for a non-emitting capacity resource, most likely a four-hour battery, in Phase II. Staff interprets the preferred portfolio inclusion of significant

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[26] See Docket No. LC 80, *PGE's Reply to Round 1 Comments*, (Sept. 6, 2023), p. 31-32, https://edocs.puc.state.or.us/efdocs/HAC/lc80hac131341.pdf.
[27] See Docket No. UM 1728, *Supplemental Application to Update Schedule 201 Qualifying Facility Information*, (Apr. 8, 2024), https://edocs.puc.state.or.us/efdocs/HAQ/um1728haq327777055.pdf.
[28] See Docket No. UM 2000, *Broad Investigation of PURPA Phase 1 Proposal*, (March 7, 2024), https://edocs.puc.state.or.us/efdocs/HAH/um2000hah327167023.pdf.

four-hour battery storage capacity for Oregon in the 2023 IRP Update to indicate a four-hour battery is a more appropriate capacity resource for avoided costs moving forward.[29]

Remaining Electric Avoided Cost Values

Staff recommends accepting the remaining electric avoided costs values as submitted by utilities. These include the risk reduction value, transmission deferral credit, and distribution deferral credit.

PGE submitted updated values for each based on its 2023 IRP, with increases to transmission and distribution deferral credits and a slight decrease to the risk reduction value. PacifiCorp submitted updated values from its 2023 IRP, which reflected decreases to all three value streams. Table 2 comes directly from Energy Trust's *Final 2025 Electric Avoided Cost Update Summary*, included as Appendix 3, to Staff and summarizes the proposed changes to each of the avoided cost values.[30]

[29] See Docket No. LC 82, Oregon Clean Energy Planning Supplement, (April 1, 2024), p. 4, https://edocs.puc.state.or.us/efdocs/HAD/lc82had327671023.pdf.

[30] PGE and PacifiCorp's values are blended based on a weighted average of 2025 electric utility expenditures from Energy Trust's 2024-2025 budget.

Table 2: Summary of Revenue Weighted Electric Avoided Cost Changes[31]

Avoided Cost Component	2024 Blended Value	2025 (Updated) Blended Value	Percent Change
Inflation Rate	2.09%	2.17%	3.7%
Real Discount Rate	4.50%	4.11%	-8.7%
Northwest Power Act 10% Credit	10.00%	10.00%	0.0%
Risk Reduction Value ($/MWh) ($ 2025)	$3.39	$2.79	-17.6%
Transmission Loss Factor	2.68%	2.65%	-1.1%
Transmission Loss Credit ($/kW-yr.) ($ 2025)	$39.30	$55.13	40.3%
Distribution Loss Factor, Commercial	3.89%	3.89%	-0.1%
Distribution Loss Factor, Industrial	2.45%	2.46%	0.3%
Distribution Loss Factor, Residential	4.30%	4.31%	0.0%
Distribution Credit ($/kW-yr.) ($ 2025)	$15.75	$14.98	-4.9%
Generation Deferral Credit ($/kW-yr.) ($ 2025)	$113.34	$186.86	64.9%

Gas Utility Data Recommendations

As noted in prior Staff memos, gas IRP modeling continues to change, and there remain values which certain utilities do not calculate. In these cases, Staff directed Energy Trust to represent values as a weighted average of values provided by other utilities. For example, the distribution capacity value was not submitted by Avista, and Staff directed Energy Trust to use a blend of the Northwest Natural (NWN) and Cascade Natural Gas (CNG) values. Overall, distribution capacity increased 10 percent to $433.81/therm-yr.

For the supply capacity avoided cost, Avista and CNG submitted values of $0.00/therm-yr. Avista wrote that the values previously provided for supply capacity avoided costs

[31] See Energy Trust's *Final 2025 Electric Avoided Cost Update Summary*, included as Attachment 3.

are now included in the commodity and transport values. Supply capacity values are averaged with NWN's avoided cost to set an overall value of $3.17/therm-yr, a 31 percent increase over 2024.

There was also an increase to the risk reduction value in this update from $0.05/therm to $0.09/therm. NWN's value increased to $0.10/therm and CNG submitted a value of $0.02/therm, which was previously set at $0.00/therm. Avista submitted a risk reduction value of $0.00/therm.

Utilities submitted peak factors to determine the amount of gas consumption that occurs on a peak day or peak hour. Energy Trust updated its methodology in 2024 and maintained that method in conducting analysis for 2025 gas avoided costs. The peak day and peak hour coincidence factors vary by end-use load shape with data from NWN and the Northwest Power and Conservation Council. The 2025 update included increases of around 12 percent to the peak day and peak hour factors for residential and commercial space heating end uses.

Commodity and Transport Costs

Each gas utility provided commodity and transport costs from its most recent IRP. For NWN, the most current was the 2022 IRP, and for CNG and Avista, each company filed a 2023 IRP. All three forecasts for commodity and transport cost depict a uniform view of the near term and longer term horizon. In the near term prices decline from 2025 into 2027 then climb consistently and modestly to 2044.

Staff considered alternate data if provided. Avista did not provide an alternate forecast. NWN provided an alternate set of data which was the 2022 IRP values adjusted from 2021 dollars to 2023 dollars. Per standard practice with avoided cost updates, Energy Trust adjusted all values to 2025 dollars for analysis, so the two data sets were the same. CNG provided an alternate commodity and transport cost forecast from its 2023 IRP which reflected a high commodity cost future. CNG's alterative values depicted a significantly more expensive future than the other utilities' primary forecasts. Staff recommends accepting the main submissions from each utility.

Carbon Compliance Costs

All gas utilities submitted carbon compliance costs amidst uncertainty. On December 20, 2023, in NW Natural Gas Company v. Environmental Quality Commission, the Oregon Court of Appeals issued an opinion deeming the Climate Protection Plan (CPP) rules invalid.[32] In response, the Oregon Department of

[32] See NW Natural Gas Company v. Environmental Quality Commission, Oregon Court of Appeals, A178246, Opinion,

Environmental Quality (DEQ) will conduct a rulemaking process in 2024, with the goal of reestablishing a program by the start of 2025. New program designs are unknown at this point, so Staff recommends a consistent and conservative value for carbon costs with 2025 avoided costs. This aligns with NWN's suggestion to use the social cost of carbon, for which the Company provided Washington Utilities and Transportation Commission (WA UTC) values for alternate consideration.

Staff recommends the use of the CCI schedule published by DEQ in 2021, for which the values closely mirror those of the WA UTC.[33] Despite the pause of the CPP, CCI values are consistent with Staff recommendations since 2021 and are lower than alternative values submitted by utilities in this update. The higher values proposed by utilities reflect additional CPP compliance criteria such as a cap on CCI reliance. Reliance on modeling to capture a changing carbon compliance cost may be more appropriate in 2025 once a CPP program is reestablished. Until new program requirements are published, the continued use of CCI credits provides a consistent path forward for gas avoided costs. In this update, carbon compliance costs increased 11 percent in line with the CCI schedule.

Section III: Results of Recommended Avoided Costs Updates

Energy Trust applied Staff's proposed data recommendations in this memo to produce high-level estimates on impacts to 2025 avoided costs. Electric avoided costs are projected to increase significantly by 37.6 percent compared to values used for 2024. While the magnitude is large, Staff finds that it is expected based on the electric utilities' 2023 IRPs. Further, Staff sees evidence from IRP modeling that could justify an even higher value. Some of that evidence was included in this memo and will be explored in future updates to energy efficiency avoided costs.

Staff highlights a definitive conclusion of electric avoided cost updates that coincident energy efficiency with capacity needs is more valuable than ever. Figure 5 below, from Energy Trust's *Final 2025 Electric Avoided Cost Update Summary* illustrates measures that have a significant increase in benefit to utilities' systems by reducing capacity needs, such as residential central air conditioning.

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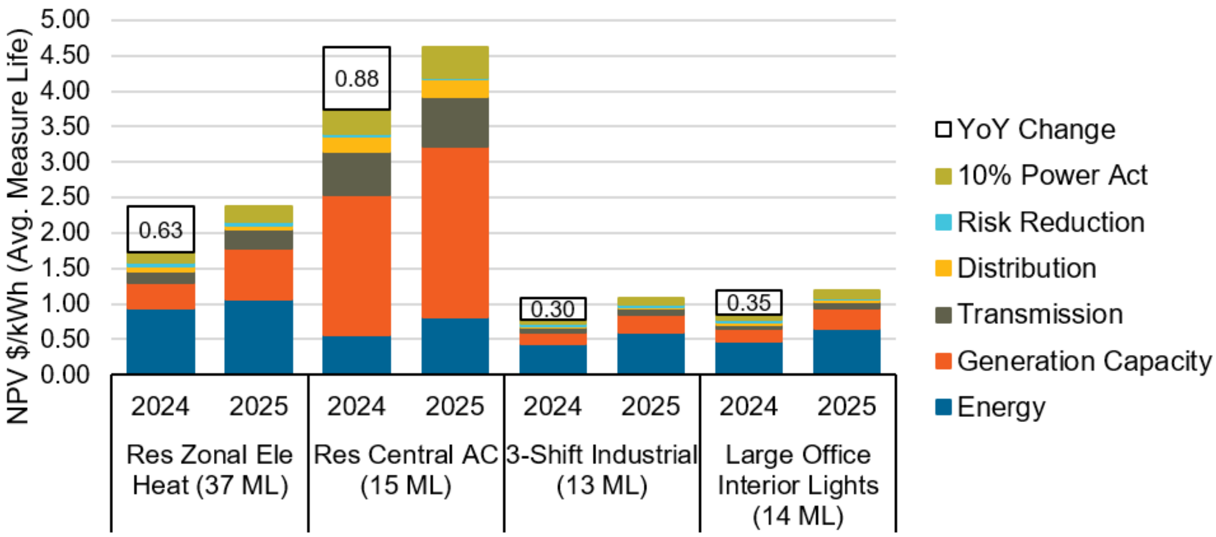
https://ojd.contentdm.oclc.org/digital/pdf.js/web/viewer.html?file=/digital/api/collection/p17027coll5/id/35371/download#page=1&zoom=auto.

[33] OAR 340-271-9000, CCI credit contribution amount, Table 7, https://www.oregon.gov/deq/rulemaking/Documents/ghgcr2021div71.pdf.

Figure 5: Comparison of Load Shape Value by Component[34]



Gas avoided costs are projected to increase by 13 percent compared to 2024 avoided costs. Increases to avoided costs for supply capacity, distribution capacity, carbon compliance and risk reduction were partially offset by a decrease in forward prices. The increases in supply and distribution capacity values result in higher overall system value for gas heating measures which have coincidence with capacity needs.

Please see Energy Trust's Attachment 3, *Final 2025 Electric Avoided Cost Update Summary,* and Attachment 4, *Final 2025 Gas Avoided Cost Update Summary* for more details.

<u>Conclusion</u>

Energy Trust's reports show that implementing the avoided cost data recommended results in increases for both electric (37.6 percent) and gas (13 percent) avoided costs. Electric avoided costs received particular attention in this update due to the significance of electric utilities submitting inaugural IRPs and Clean Energy Plans, which sought to meet the clean energy obligations of HB 2021. This first 2024 update helped inform many topics that will be discussed further in a second phase later this year. In addition, the significant electric avoided cost increase better aligns with the planning signals of PGE and PacifiCorp's respective 2023 IRPs.

[34] See Energy Trust's *Final 2025 Electric Avoided Cost Update Summary*, included as Attachment 3.

Based on this analysis, Staff believes the attached data are ready for Commission approval and for use by Energy Trust in planning for 2025 activities and for the preparation of the 2025 budget.

PROPOSED COMMISSION MOTION:

Approve the attached energy efficiency avoided cost data for use by Energy Trust.

RA2 Docket No. UM 1893

Global Assumptions Electric

Avoided Cost Element	Units	PacifiCorp Value	PacifiCorp Dollar Year	PGE Value	PGE Dollar Year
Inflation Rate	Percent	2.27%	N/A	2.10%	N/A
Real Discount Rate	Percent	4.40%	N/A	4.02%	N/A
Regional Act Credit	Percent	10%	N/A	10%	N/A
Transmission Loss Factor	Percent	3.50%	N/A	2.079% (summer); 2.04% (winter)	N/A
Distribution Loss Factor, Commercial	Percent	3.69%	N/A	4.02%	N/A
Distribution Loss Factor, Industrial	Percent	3.20%	N/A	1.96%	N/A
Distribution Loss Factor, Residential	Percent	4.46%	N/A	4.20%	N/A
Risk Reduction Value	$/MWh	*$1.92*	2023	$3.00	2020
Transmission Deferral Credit	$/kW-yr	$5.09*	2022	$87.34	2024
Seasonal Capacity Split - Summer	Percent	39.00%	N/A	50%	N/A
Seasonal Capacity Split - Winter	Percent	61.00%	N/A	50%	N/A
Summer Peak Period Definition	Month/Day/Hour	Trans. 12x24 profile	N/A	N/A	N/A
Winter Peak Period Definition	Month/Day/Hour	Trans. 12x24 profile	N/A	N/A	N/A
Deficiency start year	Year	2021	N/A	2026	N/A
Distribution Deferral Credit	$/kW-yr	$10.46	2022	$17.21	2024
Seasonal Capacity Split - Summer	Percent	90.00%	N/A	50%	N/A
Seasonal Capacity Split - Winter	Percent	10.00%	N/A	50%	N/A
Summer Peak Period Definition	Month/Day/Hour	Dist. 12x24 profile	N/A	N/A	N/A
Winter Peak Period Definition	Month/Day/Hour	Dist. 12x24 profile	N/A	N/A	N/A
Deficiency start year	Year	2023	N/A	2026	N/A
Generation Capacity Credit	$/kW-yr	$105.36		$228**	2023
Seasonal Capacity Split - Summer	Percent	83.00%	N/A	50%	N/A
Seasonal Capacity Split - Winter	Percent	17.00%	N/A	50%	N/A
Deficiency start year	Year	2025	N/A	2026	N/A

* PAC's Transmission deferral credit was incorrectly stated in the PAC-supplied workbook. Staff retrieved this value from the IRP and verified it with PAC. It decreased from what PAC supplied

** See Staff memo for discussion of the $228/kW-yr value for PGE's capacity. It is the value initially supplied by PGE.

Forward Market Prices Electric

PAC's 2a) Forward Prices (Alt 2)

Date	PacifiCorp HLH Total ($/MWh)	PacifiCorp LLH Total ($/MWh)
1/1/2023	137.38	141.52
2/1/2023	81.90	71.81
3/1/2023	77.05	80.75
4/1/2023	85.79	71.50
5/1/2023	66.62	55.44
6/1/2023	73.12	41.62
7/1/2023	165.74	71.57
8/1/2023	266.05	100.40
9/1/2023	224.94	94.03
10/1/2023	82.55	63.44
11/1/2023	94.62	79.13
12/1/2023	133.81	101.48
1/1/2024	130.30	103.46
2/1/2024	108.98	90.67
3/1/2024	68.08	55.14
4/1/2024	55.75	51.26
5/1/2024	49.04	41.94
6/1/2024	57.79	43.50
7/1/2024	191.98	84.12
8/1/2024	236.99	114.13
9/1/2024	182.85	83.06
10/1/2024	78.19	56.17
11/1/2024	93.44	69.91
12/1/2024	131.60	101.63
1/1/2025	117.07	96.44
2/1/2025	101.74	84.26
3/1/2025	84.08	70.37
4/1/2025	54.68	50.68
5/1/2025	54.83	45.25
6/1/2025	58.16	46.10
7/1/2025	199.09	89.44
8/1/2025	217.66	101.05
9/1/2025	181.97	84.93
10/1/2025	87.97	74.52
11/1/2025	97.83	82.25
12/1/2025	114.13	96.03
1/1/2026	112.36	88.63
2/1/2026	94.72	77.50
3/1/2026	74.64	63.97
4/1/2026	63.71	51.98
5/1/2026	35.99	36.89
6/1/2026	48.02	41.75

PGE's 2a) Forward Prices (Alt 1)

Year	PGE HLH Total ($/MWh)	PGE LLH Total ($/MWh)
1/1/2024	244.51	190.61
2/1/2024	85.00	68.00
3/1/2024	69.00	59.50
4/1/2024	66.50	57.50
5/1/2024	53.50	38.00
6/1/2024	68.50	40.00
7/1/2024	144.00	61.00
8/1/2024	201.00	80.00
9/1/2024	152.00	69.00
10/1/2024	78.00	64.00
11/1/2024	93.00	75.00
12/1/2024	134.00	104.00
1/1/2025	137.49	107.97
2/1/2025	116.25	94.29
3/1/2025	80.96	61.76
4/1/2025	62.71	60.67
5/1/2025	52.35	38.75
6/1/2025	54.39	34.05
7/1/2025	137.64	63.96
8/1/2025	177.93	85.77
9/1/2025	143.68	73.54
10/1/2025	87.34	72.57
11/1/2025	97.51	80.68
12/1/2025	114.28	99.26
1/1/2026	121.13	103.00
2/1/2026	102.95	88.89
3/1/2026	84.41	73.91
4/1/2026	59.72	42.30
5/1/2026	55.41	36.42
6/1/2026	58.72	37.06
7/1/2026	123.29	81.13
8/1/2026	169.33	100.35
9/1/2026	123.96	84.26
10/1/2026	81.01	62.13
11/1/2026	89.95	68.84
12/1/2026	107.77	80.86
1/1/2027	106.31	82.48
2/1/2027	89.56	71.58
3/1/2027	73.25	58.88
4/1/2027	65.31	50.88
5/1/2027	60.78	44.28
6/1/2027	62.51	43.89

7/1/2026	129.78	74.31	7/1/2027	112.63	81.73
8/1/2026	148.42	82.67	8/1/2027	159.07	95.68
9/1/2026	124.95	72.10	9/1/2027	115.85	87.48
10/1/2026	69.82	66.42	10/1/2027	76.91	62.55
11/1/2026	76.14	69.64	11/1/2027	85.90	70.45
12/1/2026	90.49	78.89	12/1/2027	102.34	82.11
1/1/2027	87.14	71.74	1/1/2028	97.01	81.45
2/1/2027	83.41	69.43	2/1/2028	84.24	72.37
3/1/2027	60.14	57.27	3/1/2028	69.41	60.00
4/1/2027	52.18	48.49	4/1/2028	63.06	52.82
5/1/2027	20.99	27.90	5/1/2028	59.24	45.39
6/1/2027	32.00	34.77	6/1/2028	61.32	46.15
7/1/2027	65.44	54.82	7/1/2028	108.14	84.00
8/1/2027	82.36	62.74	8/1/2028	144.23	95.56
9/1/2027	75.17	56.67	9/1/2028	110.14	89.79
10/1/2027	59.38	57.97	10/1/2028	71.47	63.75
11/1/2027	62.41	57.79	11/1/2028	78.31	70.00
12/1/2027	64.96	58.77	12/1/2028	94.09	82.81
1/1/2028	58.73	52.51	1/1/2029	108.51	94.31
2/1/2028	69.05	60.49	2/1/2029	81.83	74.46
3/1/2028	40.07	47.38	3/1/2029	55.55	51.18
4/1/2028	35.97	38.40	4/1/2029	45.86	39.66
5/1/2028	20.89	26.27	5/1/2029	40.47	29.29
6/1/2028	31.99	34.97	6/1/2029	43.36	30.28
7/1/2028	66.73	56.37	7/1/2029	134.85	100.31
8/1/2028	81.50	64.17	8/1/2029	239.87	129.82
9/1/2028	75.25	59.33	9/1/2029	139.89	114.62
10/1/2028	62.35	57.29	10/1/2029	58.90	57.78
11/1/2028	63.99	58.77	11/1/2029	70.71	69.65
12/1/2028	65.02	60.08	12/1/2029	102.09	97.49
1/1/2029	59.26	57.75	1/1/2030	46.00	42.71
2/1/2029	72.48	65.53	2/1/2030	38.24	37.05
3/1/2029	43.94	50.53	3/1/2030	26.62	30.95
4/1/2029	35.11	38.97	4/1/2030	11.82	12.07
5/1/2029	20.63	26.58	5/1/2030	2.94	4.45
6/1/2029	26.77	35.92	6/1/2030	1.10	1.38
7/1/2029	64.00	54.85	7/1/2030	21.99	22.93
8/1/2029	83.69	63.84	8/1/2030	34.46	33.32
9/1/2029	73.29	59.68	9/1/2030	37.31	32.67
10/1/2029	56.79	56.08	10/1/2030	36.70	35.21
11/1/2029	66.44	59.66	11/1/2030	44.72	41.95
12/1/2029	64.87	64.44	12/1/2030	51.54	47.29
1/1/2030	60.60	58.10	1/1/2031	45.48	43.11
2/1/2030	73.95	66.54	2/1/2031	38.25	36.94
3/1/2030	44.29	50.02	3/1/2031	26.63	29.02
4/1/2030	32.40	39.45	4/1/2031	9.41	10.10
5/1/2030	21.20	26.38	5/1/2031	4.68	5.09

6/1/2030	28.24	34.91	6/1/2031	1.04	2.57
7/1/2030	66.11	57.19	7/1/2031	22.17	20.98
8/1/2030	83.47	66.90	8/1/2031	33.85	30.80
9/1/2030	74.90	63.37	9/1/2031	34.90	33.89
10/1/2030	55.89	59.31	10/1/2031	38.50	36.14
11/1/2030	66.09	61.67	11/1/2031	47.12	42.74
12/1/2030	69.03	72.07	12/1/2031	52.43	49.76
1/1/2031	60.68	56.99	1/1/2032	47.31	44.92
2/1/2031	75.68	65.19	2/1/2032	33.15	31.36
3/1/2031	43.23	46.96	3/1/2032	27.70	28.49
4/1/2031	31.10	38.92	4/1/2032	7.11	8.41
5/1/2031	17.57	27.45	5/1/2032	0.19	2.60
6/1/2031	27.78	37.58	6/1/2032	(0.65)	0.52
7/1/2031	70.15	58.89	7/1/2032	21.23	19.87
8/1/2031	86.40	69.14	8/1/2032	33.59	33.05
9/1/2031	78.37	65.81	9/1/2032	35.05	34.53
10/1/2031	53.72	59.96	10/1/2032	38.62	36.18
11/1/2031	71.35	65.73	11/1/2032	49.50	47.15
12/1/2031	73.56	68.76	12/1/2032	55.91	53.77
1/1/2032	59.00	56.09	1/1/2033	49.17	47.60
2/1/2032	68.76	63.60	2/1/2033	39.01	39.73
3/1/2032	45.03	53.05	3/1/2033	27.92	27.25
4/1/2032	29.14	39.95	4/1/2033	6.62	9.79
5/1/2032	15.01	25.15	5/1/2033	1.52	2.68
6/1/2032	26.35	37.00	6/1/2033	(0.20)	0.39
7/1/2032	61.85	60.59	7/1/2033	20.63	20.11
8/1/2032	84.61	66.68	8/1/2033	33.03	33.57
9/1/2032	76.87	65.26	9/1/2033	33.92	35.06
10/1/2032	53.35	58.16	10/1/2033	36.38	38.37
11/1/2032	64.92	66.09	11/1/2033	49.33	46.78
12/1/2032	75.22	69.60	12/1/2033	56.42	54.61
1/1/2033	54.69	48.87	1/1/2034	50.64	48.93
2/1/2033	65.28	55.26	2/1/2034	36.75	39.55
3/1/2033	33.69	45.80	3/1/2034	26.21	28.91
4/1/2033	20.62	33.24	4/1/2034	8.37	9.86
5/1/2033	12.90	20.32	5/1/2034	0.05	0.56
6/1/2033	24.14	37.25	6/1/2034	0.25	0.33
7/1/2033	46.86	51.05	7/1/2034	19.60	18.98
8/1/2033	72.56	59.49	8/1/2034	32.84	35.27
9/1/2033	58.92	58.21	9/1/2034	33.85	34.82
10/1/2033	40.61	51.06	10/1/2034	37.18	38.60
11/1/2033	60.78	52.92	11/1/2034	46.51	46.17
12/1/2033	67.04	65.67	12/1/2034	56.04	51.89
1/1/2034	46.87	45.98	1/1/2035	51.36	49.99
2/1/2034	66.63	62.97	2/1/2035	38.39	37.34
3/1/2034	39.44	44.15	3/1/2035	26.29	29.35
4/1/2034	25.97	34.06	4/1/2035	6.71	9.55

5/1/2034	11.96	16.59	5/1/2035	2.25	3.22
6/1/2034	22.82	37.43	6/1/2035	1.76	2.19
7/1/2034	54.07	57.93	7/1/2035	19.05	20.28
8/1/2034	70.05	59.15	8/1/2035	32.38	33.93
9/1/2034	63.67	61.95	9/1/2035	33.76	35.46
10/1/2034	43.82	52.55	10/1/2035	39.46	39.88
11/1/2034	57.15	54.71	11/1/2035	49.09	47.34
12/1/2034	72.62	70.41	12/1/2035	60.51	56.33
1/1/2035	50.27	57.38	1/1/2036	51.13	49.53
2/1/2035	68.33	65.91	2/1/2036	32.08	33.60
3/1/2035	38.83	44.87	3/1/2036	24.19	28.58
4/1/2035	24.16	24.18	4/1/2036	8.21	10.53
5/1/2035	11.72	16.42	5/1/2036	4.34	4.87
6/1/2035	25.45	37.97	6/1/2036	4.06	4.26
7/1/2035	50.98	49.32	7/1/2036	15.06	19.05
8/1/2035	70.56	58.26	8/1/2036	30.86	32.59
9/1/2035	69.46	61.31	9/1/2036	31.55	33.65
10/1/2035	45.90	53.80	10/1/2036	34.27	37.19
11/1/2035	66.64	60.39	11/1/2036	48.33	46.44
12/1/2035	72.53	68.27	12/1/2036	56.48	56.68
1/1/2036	57.65	50.42	1/1/2037	49.99	48.80
2/1/2036	69.77	58.69	2/1/2037	37.07	39.31
3/1/2036	41.13	38.25	3/1/2037	26.14	27.37
4/1/2036	22.98	28.43	4/1/2037	9.39	11.00
5/1/2036	8.12	13.28	5/1/2037	7.04	7.40
6/1/2036	26.25	39.32	6/1/2037	6.76	7.04
7/1/2036	65.51	52.33	7/1/2037	14.44	15.64
8/1/2036	76.25	63.20	8/1/2037	31.61	31.31
9/1/2036	73.40	62.24	9/1/2037	30.56	34.37
10/1/2036	44.89	56.32	10/1/2037	35.14	38.97
11/1/2036	69.55	58.95	11/1/2037	48.92	48.38
12/1/2036	77.13	68.70	12/1/2037	59.09	56.92
1/1/2037	61.63	51.84	1/1/2038	51.25	50.60
2/1/2037	70.80	59.13	2/1/2038	37.02	39.43
3/1/2037	50.43	49.31	3/1/2038	24.48	29.32
4/1/2037	24.27	33.42	4/1/2038	9.21	11.45
5/1/2037	11.98	20.07	5/1/2038	6.15	6.76
6/1/2037	30.21	45.39	6/1/2038	6.40	6.12
7/1/2037	57.64	55.56	7/1/2038	14.58	16.76
8/1/2037	85.40	73.45	8/1/2038	28.57	32.46
9/1/2037	73.93	68.71	9/1/2038	29.56	33.06
10/1/2037	44.90	60.43	10/1/2038	33.81	38.16
11/1/2037	65.96	60.83	11/1/2038	45.55	48.18
12/1/2037	80.82	70.38	12/1/2038	59.50	57.46
1/1/2038	57.54	51.10	1/1/2039	51.77	49.68
2/1/2038	78.84	72.94	2/1/2039	37.65	42.32
3/1/2038	44.64	48.17	3/1/2039	24.71	27.04

4/1/2038	24.66	35.52	4/1/2039	9.57	10.17
5/1/2038	12.73	20.13	5/1/2039	7.13	7.78
6/1/2038	30.45	44.52	6/1/2039	6.82	6.62
7/1/2038	64.52	67.63	7/1/2039	13.50	14.98
8/1/2038	89.90	70.48	8/1/2039	29.84	30.41
9/1/2038	79.78	68.46	9/1/2039	27.00	33.63
10/1/2038	49.51	64.92	10/1/2039	32.77	39.09
11/1/2038	74.37	74.01	11/1/2039	48.92	48.52
12/1/2038	82.60	74.31	12/1/2039	62.09	62.67
1/1/2039	72.84	55.67	1/1/2040	54.49	55.39
2/1/2039	76.03	62.56	2/1/2040	33.92	34.42
3/1/2039	43.17	56.08	3/1/2040	23.48	30.56
4/1/2039	26.16	39.38	4/1/2040	8.67	10.61
5/1/2039	15.40	22.94	5/1/2040	6.11	7.15
6/1/2039	33.71	47.59	6/1/2040	5.88	6.33
7/1/2039	57.45	67.91	7/1/2040	13.02	13.99
8/1/2039	82.94	68.59	8/1/2040	29.59	31.89
9/1/2039	74.92	69.53	9/1/2040	31.10	32.36
10/1/2039	53.48	66.50	10/1/2040	35.79	39.31
11/1/2039	82.41	68.22	11/1/2040	49.58	53.37
12/1/2039	84.73	82.43	12/1/2040	64.55	63.58
1/1/2040	64.01	50.53	1/1/2041	55.80	55.27
2/1/2040	81.15	75.74	2/1/2041	41.54	46.19
3/1/2040	47.65	52.46	3/1/2041	23.07	27.02
4/1/2040	30.49	28.43	4/1/2041	8.65	10.01
5/1/2040	16.01	20.43	5/1/2041	5.93	7.54
6/1/2040	36.67	47.86	6/1/2041	5.97	6.67
7/1/2040	62.49	63.24	7/1/2041	11.65	12.89
8/1/2040	88.15	76.24	8/1/2041	30.42	30.71
9/1/2040	84.08	76.47	9/1/2041	29.68	33.85
10/1/2040	61.22	65.01	10/1/2041	37.79	40.44
11/1/2040	92.71	81.06	11/1/2041	54.59	54.73
12/1/2040	94.72	85.60	12/1/2041	70.68	69.67
1/1/2041	75.77	61.19	1/1/2042	60.11	59.70
2/1/2041	88.53	66.48	2/1/2042	43.19	45.43
3/1/2041	59.11	55.80	3/1/2042	23.15	26.51
4/1/2041	24.49	36.18	4/1/2042	8.38	10.82
5/1/2041	17.97	15.16	5/1/2042	5.53	7.31
6/1/2041	33.03	46.04	6/1/2042	5.48	6.82
7/1/2041	62.46	74.92	7/1/2042	13.35	14.01
8/1/2041	92.80	80.49	8/1/2042	32.15	30.49
9/1/2041	85.98	80.49	9/1/2042	29.01	35.28
10/1/2041	52.31	61.93	10/1/2042	38.53	41.67
11/1/2041	72.67	71.44	11/1/2042	55.49	55.27
12/1/2041	95.82	97.32	12/1/2042	72.09	70.05
1/1/2042	65.92	54.68	1/1/2043	60.99	60.78
2/1/2042	96.10	60.55	2/1/2043	43.05	48.03

3/1/2042	56.74	45.18	3/1/2043	21.76	29.07
4/1/2042	27.53	30.56	4/1/2043	8.65	10.81
5/1/2042	12.66	13.01	5/1/2043	5.66	7.60
6/1/2042	39.27	58.47	6/1/2043	5.73	6.87
7/1/2042	84.26	64.78	7/1/2043	11.23	12.34
8/1/2042	95.34	79.13	8/1/2043	29.69	31.07
9/1/2042	95.75	77.82	9/1/2043	28.87	31.90
10/1/2042	58.81	66.30	10/1/2043	39.61	42.49
11/1/2042	97.82	74.66	11/1/2043	56.90	59.85
12/1/2042	100.00	81.55	12/1/2043	75.93	74.60

Loss of Load Probability Heat Map Input Electric

PacifiCorp

Source and page #: 2021 IRP: Support for Appendix K - Capacity Contribution

Source Link or File Name: 2030 ENS results index 13668 CONF.xlsb

WEEKDAYS & WEEKENDS

Count	31	28	31	30	31	30	31	31	30	31	30	31
Hr Ending	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.003	0.005	0.000	0.000	0.000
2	0.000	0.000	0.000	0.000	0.000	0.004	0.005	0.004	0.013	0.000	0.000	0.000
3	0.000	0.000	0.000	0.000	0.000	0.001	0.003	0.003	0.006	0.000	0.000	0.000
4	0.000	0.000	0.000	0.000	0.000	0.001	0.003	0.004	0.006	0.000	0.000	0.000
5	0.000	0.000	0.000	0.000	0.000	0.003	0.003	0.005	0.014	0.000	0.000	0.000
6	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.009	0.023	0.000	0.000	0.000
7	0.020	0.013	0.000	0.000	0.000	0.001	0.000	0.005	0.023	0.000	0.000	0.004
8	0.029	0.013	0.000	0.000	0.000	0.001	0.000	0.004	0.009	0.000	0.000	0.006
9	0.022	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
10	0.010	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.001
11	0.008	0.000	0.000	0.000	0.000	0.000	0.003	0.001	0.001	0.000	0.000	0.001
12	0.001	0.000	0.000	0.000	0.000	0.000	0.003	0.001	0.001	0.000	0.000	0.001
13	0.001	0.000	0.000	0.000	0.000	0.000	0.004	0.001	0.003	0.000	0.000	0.000
14	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.006	0.003	0.000	0.000	0.000
15	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.006	0.000	0.000	0.000	0.000
16	0.000	0.000	0.000	0.000	0.000	0.001	0.008	0.008	0.003	0.000	0.000	0.000
17	0.001	0.000	0.000	0.000	0.000	0.001	0.004	0.013	0.009	0.000	0.000	0.001
18	0.003	0.000	0.000	0.000	0.000	0.003	0.005	0.027	0.037	0.000	0.000	0.000
19	0.004	0.000	0.000	0.000	0.000	0.009	0.020	0.034	0.036	0.000	0.000	0.001
20	0.001	0.013	0.000	0.000	0.000	0.020	0.046	0.037	0.031	0.000	0.000	0.001
21	0.001	0.013	0.000	0.000	0.000	0.020	0.045	0.034	0.027	0.000	0.000	0.000
22	0.000	0.000	0.000	0.000	0.000	0.009	0.029	0.031	0.018	0.000	0.000	0.000
23	0.000	0.000	0.000	0.000	0.000	0.001	0.006	0.013	0.005	0.000	0.000	0.000
24	0.000	0.000	0.000	0.000	0.000	0.001	0.006	0.011	0.005	0.000	0.000	0.000

Note: This information is provided to Energy Trust to identify peak definitions.

PGE

Source and page #: 2023 IRP Updated Analysis

Source Link or File Name: 2026_LOLPHeatmap_.xlsx

WEEKDAYS & WEEKENDS

Count	31	28	31	30	31	30	31	31	30	31	30	31
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
6	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
7	0.004	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.010
8	0.007	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.015
9	0.007	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.015
10	0.007	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.002	0.015
11	0.007	0.001	0.000	0.000	0.000	0.000	0.001	0.002	0.000	0.000	0.002	0.015
12	0.007	0.001	0.000	0.000	0.000	0.001	0.002	0.005	0.000	0.000	0.002	0.015
13	0.007	0.001	0.000	0.000	0.000	0.001	0.005	0.009	0.000	0.000	0.002	0.014
14	0.006	0.001	0.000	0.000	0.000	0.001	0.008	0.014	0.000	0.000	0.002	0.013
15	0.007	0.001	0.000	0.000	0.000	0.002	0.011	0.020	0.001	0.000	0.002	0.014
16	0.008	0.002	0.000	0.000	0.000	0.002	0.012	0.025	0.002	0.000	0.004	0.020
17	0.009	0.002	0.000	0.000	0.000	0.002	0.014	0.030	0.002	0.000	0.004	0.022
18	0.010	0.002	0.000	0.000	0.000	0.002	0.014	0.032	0.003	0.000	0.005	0.024
19	0.010	0.003	0.000	0.000	0.000	0.003	0.016	0.045	0.005	0.000	0.005	0.024
20	0.011	0.003	0.000	0.000	0.000	0.003	0.022	0.052	0.005	0.000	0.005	0.025
21	0.011	0.003	0.000	0.000	0.000	0.003	0.020	0.046	0.004	0.000	0.006	0.026
22	0.010	0.003	0.000	0.000	0.000	0.002	0.005	0.016	0.001	0.000	0.005	0.024
23	0.003	0.001	0.000	0.000	0.000	0.001	0.000	0.003	0.000	0.000	0.002	0.005
24	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001

Note: This information is provided to Energy Trust to identify peak definitions.

PacifiCorp

WEEKDAYS ONLY

Count	31	28	31	30	31	30	31	31	30	31	30	31
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.003	0.004	0.000	0.000	0.000
2	0.000	0.000	0.000	0.000	0.000	0.004	0.005	0.004	0.009	0.000	0.000	0.000
3	0.000	0.000	0.000	0.000	0.000	0.001	0.003	0.003	0.006	0.000	0.000	0.000
4	0.000	0.000	0.000	0.000	0.000	0.001	0.003	0.004	0.006	0.000	0.000	0.000
5	0.000	0.000	0.000	0.000	0.000	0.003	0.003	0.005	0.014	0.000	0.000	0.000
6	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.009	0.020	0.000	0.000	0.000
7	0.020	0.013	0.000	0.000	0.000	0.001	0.000	0.005	0.023	0.000	0.000	0.004
8	0.029	0.013	0.000	0.000	0.000	0.001	0.000	0.004	0.009	0.000	0.000	0.006
9	0.022	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
10	0.010	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.001
11	0.008	0.000	0.000	0.000	0.000	0.000	0.003	0.001	0.001	0.000	0.000	0.001
12	0.001	0.000	0.000	0.000	0.000	0.000	0.003	0.001	0.001	0.000	0.000	0.001
13	0.001	0.000	0.000	0.000	0.000	0.000	0.004	0.001	0.003	0.000	0.000	0.000
14	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.006	0.003	0.000	0.000	0.000
15	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.006	0.000	0.000	0.000	0.000
16	0.000	0.000	0.000	0.000	0.000	0.001	0.008	0.006	0.003	0.000	0.000	0.000
17	0.001	0.000	0.000	0.000	0.000	0.001	0.004	0.011	0.009	0.000	0.000	0.001
18	0.003	0.000	0.000	0.000	0.000	0.003	0.005	0.024	0.031	0.000	0.000	0.000
19	0.004	0.000	0.000	0.000	0.000	0.006	0.019	0.033	0.029	0.000	0.000	0.001
20	0.001	0.013	0.000	0.000	0.000	0.011	0.040	0.036	0.024	0.000	0.000	0.001
21	0.001	0.013	0.000	0.000	0.000	0.010	0.041	0.032	0.018	0.000	0.000	0.000
22	0.000	0.000	0.000	0.000	0.000	0.003	0.029	0.029	0.013	0.000	0.000	0.000
23	0.000	0.000	0.000	0.000	0.000	0.001	0.006	0.011	0.005	0.000	0.000	0.000
24	0.000	0.000	0.000	0.000	0.000	0.001	0.006	0.010	0.005	0.000	0.000	0.000

Note: This information is provided to Energy Trust to identify peak definitions.

PGE

WEEKDAYS ONLY

Count	31	28	31	30	31	30	31	31	30	31	30	31
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	**0.000**	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	**0.000**	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3	**0.000**	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4	**0.000**	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5	**0.000**	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
6	**0.001**	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
7	**0.004**	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.010
8	**0.007**	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.015
9	**0.007**	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.016
10	**0.007**	0.002	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.002	0.015
11	**0.007**	0.002	0.000	0.000	0.000	0.000	0.001	0.002	0.000	0.000	0.002	0.015
12	**0.007**	0.002	0.000	0.000	0.000	0.001	0.002	0.005	0.000	0.000	0.002	0.015
13	**0.006**	0.001	0.000	0.000	0.000	0.001	0.006	0.009	0.000	0.000	0.002	0.014
14	**0.006**	0.001	0.000	0.000	0.000	0.001	0.009	0.015	0.000	0.000	0.002	0.014
15	**0.007**	0.001	0.000	0.000	0.000	0.001	0.011	0.021	0.001	0.000	0.002	0.014
16	**0.008**	0.002	0.000	0.000	0.000	0.002	0.013	0.026	0.002	0.000	0.004	0.020
17	**0.009**	0.002	0.000	0.000	0.000	0.002	0.014	0.031	0.003	0.000	0.005	0.022
18	**0.010**	0.002	0.000	0.000	0.000	0.002	0.014	0.032	0.003	0.000	0.005	0.023
19	**0.010**	0.003	0.000	0.000	0.000	0.002	0.016	0.045	0.005	0.000	0.005	0.024
20	**0.010**	0.003	0.000	0.000	0.000	0.003	0.021	0.050	0.005	0.000	0.006	0.025
21	**0.011**	0.003	0.000	0.000	0.000	0.003	0.020	0.046	0.004	0.000	0.006	0.025
22	**0.010**	0.003	0.000	0.000	0.000	0.001	0.005	0.017	0.001	0.000	0.005	0.024
23	**0.003**	0.001	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.002	0.004
24	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001

Note: This information is provided to Energy Trust to identify peak definitions.

PacifiCorp

WEEKENDS ONLY

Count	31	28	31	30	31	30	31	31	30	31	30	31
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000
3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000
7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
14	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000
17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000
18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.006	0.000	0.000	0.000
19	0.000	0.000	0.000	0.000	0.000	0.003	0.001	0.001	0.006	0.000	0.000	0.000
20	0.000	0.000	0.000	0.000	0.000	0.009	0.006	0.001	0.006	0.000	0.000	0.000
21	0.000	0.000	0.000	0.000	0.000	0.010	0.004	0.003	0.009	0.000	0.000	0.000
22	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.001	0.005	0.000	0.000	0.000
23	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000
24	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000

Note: This information is provided to Energy Trust to identify peak definitions.

PGE

WEEKENDS ONLY

Count	31	28	31	30	31	30	31	31	30	31	30	31
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
2	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
3	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
5	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
6	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
7	0.004	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007
8	0.005	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010
9	0.007	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011
10	0.007	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.011
11	0.007	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.012
12	0.007	0.001	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.014
13	0.008	0.001	0.000	0.000	0.000	0.003	0.000	0.001	0.000	0.000	0.000	0.014
14	0.008	0.001	0.000	0.000	0.000	0.005	0.002	0.002	0.000	0.000	0.001	0.011
15	0.008	0.001	0.000	0.000	0.000	0.007	0.004	0.006	0.000	0.000	0.001	0.012
16	0.009	0.001	0.000	0.000	0.000	0.008	0.006	0.010	0.001	0.000	0.001	0.024
17	0.011	0.002	0.000	0.000	0.000	0.009	0.008	0.014	0.001	0.000	0.002	0.028
18	0.013	0.002	0.000	0.000	0.000	0.011	0.010	0.021	0.002	0.000	0.002	0.031
19	0.013	0.002	0.000	0.000	0.000	0.012	0.017	0.055	0.006	0.000	0.002	0.032
20	0.013	0.003	0.000	0.000	0.000	0.015	0.030	0.072	0.006	0.000	0.003	0.034
21	0.013	0.003	0.000	0.000	0.000	0.013	0.018	0.046	0.002	0.000	0.002	0.032
22	0.011	0.002	0.000	0.000	0.000	0.012	0.003	0.006	0.000	0.000	0.002	0.031
23	0.005	0.001	0.000	0.000	0.000	0.009	0.000	0.000	0.000	0.000	0.000	0.008
24	0.003	0.001	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.004

Note: This information is provided to Energy Trust to identify peak definitions.

Global Assumptions Natural Gas

Avoided Cost Element	Units	Avista Value	Cascade Value	Northwest Natural Value
Discount Rate (Company's Real after-tax weighted average cost of capital (WACC)	Percent	4.52%	3.79%	3.40%
Inflation Rate	Percent	2.00%	3.36%	2.85%
Regional Act Credit	Percent	10.00%	10.00%	10.00%
Forecast Period Calendar Start Year	Year	2023	2023	2022
Real Dollar Base Year	Year	2022	2021	2021
System Peak Definition	Calendar Month/Day/Hour	February 28th & December 20th	Day	Day for Gas Supply, Hour for Distribution System Planning
System Peak Coincident Day Factor (if needed)	Peak Day/Annual Load Ratio	0.0094	0.0086	
System Peak Coincident Hour Factor (if needed)	Peak Hour/Annual Load Ratio	0.0004	0.0005	

Cascade Inflation Rate

Inflation Rate - 2021	Percent	**2.50%**
Inflation Rate - 2022	Percent	**2.65%**
Inflation Rate - 2023	Percent	**2.80%**
Inflation Rate - 2024	Percent	**2.93%**
Inflation Rate - 2025	Percent	**3.05%**
Inflation Rate - 2026	Percent	**3.13%**
Inflation Rate - 2027	Percent	**3.21%**
Inflation Rate - 2028	Percent	**3.27%**
Inflation Rate - 2029	Percent	**3.30%**
Inflation Rate - 2030	Percent	**3.33%**
Inflation Rate - 2031	Percent	**3.35%**
Inflation Rate - 2032	Percent	**3.36%**
Inflation Rate - 2033	Percent	**3.37%**
Inflation Rate - 2034	Percent	**3.38%**
Inflation Rate - 2035	Percent	**3.40%**
Inflation Rate - 2036	Percent	**3.40%**
Inflation Rate - 2037	Percent	**3.40%**
Inflation Rate - 2038	Percent	**3.41%**
Inflation Rate - 2039	Percent	**3.42%**
Inflation Rate - 2040	Percent	**3.41%**
Inflation Rate - 2041	Percent	**3.42%**
Inflation Rate - 2042	Percent	**3.42%**
Inflation Rate - 2043	Percent	**3.42%**
Inflation Rate - 2044	Percent	**3.43%**
Inflation Rate - 2045	Percent	**3.42%**
Inflation Rate - 2046	Percent	**3.42%**
Inflation Rate - 2047	Percent	**3.43%**
Inflation Rate - 2048	Percent	**3.42%**

Avista

Gas Commodity and Transportation/Storage Costs - ($/Dth)

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2023	$8.53	$8.93	$6.74	$4.92	$4.78	$4.80	$4.96	$4.96	$4.47	$4.83	$5.19	$5.42
2024	$5.28	$6.29	$4.38	$3.91	$3.88	$4.11	$4.18	$4.09	$3.94	$4.21	$4.49	$4.86
2025	$4.30	$5.05	$3.82	$3.52	$3.41	$3.31	$3.31	$3.30	$3.30	$3.21	$3.52	$3.95
2026	$3.52	$4.31	$3.31	$3.03	$2.98	$3.01	$3.01	$3.02	$2.91	$3.02	$3.31	$3.56
2027	$3.30	$3.83	$3.07	$2.95	$2.89	$2.92	$2.91	$2.91	$2.73	$2.80	$3.23	$3.47
2028	$3.27	$4.07	$2.98	$2.97	$2.90	$2.91	$2.91	$2.89	$2.77	$2.85	$3.24	$3.49
2029	$3.47	$3.95	$3.05	$3.10	$3.03	$3.05	$3.01	$3.04	$2.87	$2.93	$3.32	$3.56
2030	$3.50	$3.87	$3.16	$3.21	$3.14	$3.15	$3.10	$3.12	$2.90	$2.97	$3.39	$3.65
2031	$3.61	$3.89	$3.17	$3.31	$3.20	$3.24	$3.20	$3.21	$3.07	$3.20	$3.53	$3.90
2032	$3.72	$4.10	$3.40	$3.35	$3.28	$3.30	$3.28	$3.31	$3.05	$3.15	$3.70	$4.10
2033	$3.97	$4.35	$3.56	$3.48	$3.43	$3.45	$3.40	$3.44	$3.26	$3.35	$3.88	$4.14
2034	$4.04	$4.37	$3.65	$3.60	$3.50	$3.54	$3.50	$3.48	$3.26	$3.39	$3.86	$4.17
2035	$4.12	$4.35	$3.92	$3.71	$3.60	$3.64	$3.59	$3.59	$3.40	$3.55	$4.01	$4.30
2036	$4.25	$4.69	$3.72	$3.77	$3.70	$3.72	$3.70	$3.69	$3.45	$3.57	$4.18	$4.56
2037	$4.50	$4.66	$4.05	$3.90	$3.79	$3.81	$3.78	$3.75	$3.52	$3.64	$4.26	$4.60
2038	$4.54	$4.79	$4.13	$4.00	$3.90	$3.93	$3.90	$3.86	$3.64	$3.76	$4.31	$4.71
2039	$4.70	$4.84	$4.24	$4.13	$4.04	$4.08	$4.04	$4.01	$3.74	$3.88	$4.52	$5.03
2040	$5.08	$5.24	$4.31	$4.32	$4.23	$4.26	$4.22	$4.21	$3.90	$4.04	$4.79	$5.36
2041	$5.41	$5.37	$4.66	$4.49	$4.38	$4.41	$4.38	$4.34	$4.02	$4.16	$4.93	$5.46
2042	$5.53	$5.44	$4.80	$4.65	$4.54	$4.57	$4.54	$4.49	$4.19	$4.32	$5.15	$5.62
2043	$5.71	$5.59	$4.88	$4.93	$4.83	$4.87	$4.83	$4.78	$4.49	$4.66	$5.48	$5.88
2044	$5.98	$5.86	$5.07	$5.03	$4.91	$4.91	$4.89	$4.80	$4.51	$4.65	$5.55	$5.99
2045	$6.10	$5.89	$5.15	$5.25	$5.11	$5.14	$5.12	$5.01	$4.75	$4.87	$5.80	$6.15

Cascade

Gas Commodity and Transportation/Storage Costs - (Real 2019$/Dth)

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2023	$10.11	$9.61	$6.80	$4.40	$4.02	$4.16	$4.39	$4.38	$4.27	$4.26	$5.00	$5.79
2024	$5.67	$5.31	$4.39	$3.27	$3.13	$3.23	$3.39	$3.37	$3.35	$3.43	$4.04	$4.45
2025	$4.40	$4.17	$3.67	$2.95	$2.91	$2.99	$3.07	$3.07	$3.07	$3.10	$3.54	$3.85
2026	$3.82	$3.61	$3.38	$2.85	$2.83	$2.90	$2.92	$2.90	$2.91	$2.96	$3.24	$3.47
2027	$3.43	$3.24	$3.07	$2.76	$2.67	$2.72	$2.74	$2.73	$2.76	$2.78	$3.09	$3.30
2028	$3.30	$3.16	$3.07	$2.74	$2.75	$2.79	$2.79	$2.78	$2.82	$2.86	$3.11	$3.35
2029	$3.40	$3.27		$2.78	$2.79	$2.85	$2.83	$2.83	$2.86	$2.90	$3.14	$3.39
2030	$3.44	$3.22	$3.25	$3.07	$3.10	$3.08	$3.00	$2.89	$2.91	$2.93	$3.08	$3.29
2031	$3.31	$3.17	$3.22	$3.09	$3.13	$3.11	$3.03	$2.92	$2.93	$2.95	$3.09	$3.29
2032	$3.36	$3.26	$3.29	$3.17	$3.21	$3.20	$3.12	$3.01	$3.03	$3.05	$3.18	$3.38
2033	$3.44	$3.42	$3.46	$3.22	$3.28	$3.27	$3.18	$3.08	$3.10	$3.12	$3.24	$3.45
2034	$3.43	$3.38	$3.41	$3.23	$3.27	$3.26	$3.18	$3.07	$3.10	$3.11	$3.24	$3.45
2035	$3.50	$3.52	$3.55	$3.28	$3.33	$3.33	$3.25	$3.13	$3.16	$3.17	$3.30	$3.50
2036	$3.57	$3.53	$3.57	$3.33	$3.38	$3.37	$3.30	$3.20	$3.22	$3.20	$3.31	$3.42
2037	$3.45	$3.34	$3.41	$3.31	$3.39	$3.35	$3.31	$3.21	$3.22	$3.21	$3.31	$3.37
2038	$3.46	$3.39	$3.46	$3.39	$3.45	$3.44	$3.38	$3.30	$3.30	$3.27	$3.44	$3.50
2039	$3.58	$3.47	$3.52	$3.43	$3.52	$3.49	$3.45	$3.35	$3.37	$3.32	$3.49	$3.54
2040	$3.59	$3.54	$3.58	$3.49	$3.58	$3.58	$3.49	$3.40	$3.44	$3.39	$3.53	$3.47
2041	$3.55	$3.49	$3.58	$3.59	$3.67	$3.67	$3.63	$3.54	$3.53	$3.52	$3.65	$3.72
2042	$3.80	$3.75	$3.79	$3.67	$3.76	$3.78	$3.70	$3.63	$3.64	$3.63	$3.72	$3.81
2043	$3.85	$3.71	$3.79	$3.63	$3.71	$3.71	$3.66	$3.55	$3.57	$3.58	$3.68	$3.77
2044	$3.81	$3.73	$3.87	$3.63	$3.72	$3.74	$3.67	$3.56	$3.58	$3.57	$3.70	$3.80
2045	$3.86	$3.82	$3.86	$3.67	$3.75	$3.79	$3.73	$3.62	$3.66	$3.62	$3.72	$3.83
2046	$3.86	$3.81	$3.84	$3.65	$3.75	$3.77	$3.71	$3.60	$3.62	$3.60	$3.71	$3.84
2047	$3.88	$3.90	$3.95	$3.73	$3.79	$3.81	$3.75	$3.68	$3.70	$3.68	$3.76	$3.97
2048	$4.06	$4.01	$4.09	$3.78	$3.85	$3.87	$3.79	$3.73	$3.74	$3.73	$3.82	$3.99
2049	$4.02	$4.05	$4.12	$3.79	$3.85	$3.88	$3.82	$3.74	$3.75	$3.73	$3.82	$4.11
2050	$4.16	$4.18	$4.22	$3.83	$3.89	$3.93	$3.85	$3.77	$3.79	$3.79	$3.89	$4.22
2051	$4.20	$4.22	$4.27	$3.87	$3.93	$3.96	$3.89	$3.81	$3.83	$3.83	$3.93	$4.27
2052	$4.25	$4.27	$4.31	$3.91	$3.97	$4.00	$3.93	$3.85	$3.87	$3.87	$3.97	$4.31
2053	$4.29	$4.31	$4.35	$3.95	$4.01	$4.04	$3.97	$3.88	$3.91	$3.91	$4.01	$4.35
2054	$4.33	$4.35	$4.39	$3.99	$4.05	$4.09	$4.00	$3.92	$3.95	$3.95	$4.05	$4.40
2055	$4.38	$4.40	$4.44	$4.03	$4.09	$4.13	$4.04	$3.96	$3.99	$3.99	$4.09	$4.44
2056	$4.42	$4.44	$4.48	$4.07	$4.13	$4.17	$4.09	$4.00	$4.03	$4.03	$4.13	$4.48
2057	$4.46	$4.48	$4.53	$4.11	$4.17	$4.21	$4.13	$4.04	$4.07	$4.07	$4.17	$4.53
2058	$4.51	$4.53	$4.57	$4.15	$4.21	$4.25	$4.17	$4.08	$4.11	$4.11	$4.21	$4.57
2059	$4.55	$4.57	$4.62	$4.19	$4.25	$4.29	$4.21	$4.12	$4.15	$4.15	$4.25	$4.62
2060	$4.60	$4.62	$4.66	$4.23	$4.30	$4.34	$4.25	$4.16	$4.19	$4.19	$4.29	$4.67
2061	$4.64	$4.67	$4.71	$4.27	$4.34	$4.38	$4.29	$4.21	$4.23	$4.23	$4.34	$4.71
2062	$4.69	$4.71	$4.76	$4.32	$4.38	$4.42	$4.34	$4.25	$4.27	$4.28	$4.38	$4.76
2063	$4.74	$4.76	$4.81	$4.36	$4.43	$4.47	$4.38	$4.29	$4.32	$4.32	$4.42	$4.81
2064	$4.79	$4.81	$4.85	$4.40	$4.47	$4.51	$4.42	$4.33	$4.36	$4.36	$4.47	$4.86
2065	$4.83	$4.86	$4.90	$4.45	$4.51	$4.56	$4.47	$4.38	$4.40	$4.41	$4.51	$4.90
2066	$4.88	$4.90	$4.95	$4.49	$4.56	$4.60	$4.51	$4.42	$4.45	$4.45	$4.56	$4.95
2067	$4.93	$4.95	$5.00	$4.54	$4.61	$4.65	$4.56	$4.47	$4.49	$4.49	$4.60	$5.00

Northwest Natural

Gas Commodity and Transportation/Storage Costs (Real 2019$/Dth)

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2022	$5.20	$5.00	$4.70	$5.43	$5.44	$5.46	$5.35	$5.37	$4.96	$5.11	$4.92	$5.32
2023	$5.10	$4.76	$4.19	$3.86	$3.80	$3.79	$3.80	$3.82	$3.91	$4.30	$3.54	$3.79
2024	$3.62	$3.35	$3.02	$2.79	$2.74	$2.72	$2.77	$2.78	$2.88	$3.15	$3.84	$4.11
2025	$3.96	$3.59	$3.34	$3.08	$3.03	$3.01	$3.05	$3.04	$3.16	$3.38	$3.60	$3.84
2026	$3.65	$3.33	$3.09	$2.80	$2.76	$2.75	$2.77	$2.77	$2.88	$3.17	$3.52	$3.75
2027	$3.57	$3.25	$3.03	$2.77	$2.76	$2.73	$2.77	$2.76	$2.86	$3.19	$3.67	$3.89
2028	$3.76	$3.41	$3.11	$2.83	$2.79	$2.78	$2.81	$2.81	$2.93	$3.27	$3.71	$4.04
2029	$3.92	$3.42	$3.21	$2.96	$2.91	$2.89	$2.91	$2.91	$3.01	$3.31	$3.71	$3.97
2030	$3.79	$3.34	$3.14	$2.91	$2.88	$2.86	$2.89	$2.90	$3.00	$3.30	$3.80	$4.00
2031	$3.83	$3.46	$3.21	$2.95	$2.92	$2.89	$2.92	$2.92	$3.03	$3.34	$3.77	$3.99
2032	$3.82	$3.42	$3.23	$3.00	$2.97	$2.95	$2.97	$2.97	$3.09	$3.46	$3.82	$4.08
2033	$3.92	$3.46	$3.26	$3.06	$3.02	$3.02	$3.06	$3.05	$3.18	$3.50	$3.84	$4.13
2034	$3.97	$3.59	$3.36	$3.10	$3.07	$3.05	$3.08	$3.08	$3.20	$3.46	$3.77	$3.96
2035	$3.77	$3.37	$3.16	$3.00	$2.98	$2.96	$3.00	$3.01	$3.15	$3.45	$3.85	$4.04
2036	$3.83	$3.48	$3.29	$3.00	$2.97	$2.95	$2.98	$2.99	$3.11	$3.38	$3.89	$4.08
2037	$3.90	$3.52	$3.36	$3.10	$3.08	$3.06	$3.11	$3.10	$3.24	$3.57	$3.80	$4.05
2038	$3.89	$3.46	$3.27	$3.12	$3.09	$3.08	$3.12	$3.13	$3.26	$3.49	$3.84	$4.10
2039	$3.91	$3.53	$3.35	$3.13	$3.10	$3.07	$3.10	$3.10	$3.21	$3.43	$3.90	$4.12
2040	$3.94	$3.51	$3.34	$3.17	$3.15	$3.15	$3.21	$3.23	$3.38	$3.66	$3.98	$4.17
2041	$3.95	$3.51	$3.35	$3.14	$3.12	$3.09	$3.14	$3.17	$3.31	$3.57	$4.02	$4.25
2042	$4.07	$3.68	$3.52	$3.29	$3.27	$3.24	$3.29	$3.30	$3.44	$3.68	$4.11	$4.38
2043	$4.19	$3.76	$3.56	$3.40	$3.38	$3.39	$3.46	$3.49	$3.64	$3.88	$4.18	$4.42
2044	$4.22	$3.84	$3.65	$3.43	$3.41	$3.40	$3.45	$3.47	$3.63	$3.86	$4.26	$4.51
2045	$4.32	$3.88	$3.69	$3.53	$3.51	$3.50	$3.57	$3.58	$3.75	$4.00	$4.21	$4.49
2046	$4.32	$3.89	$3.73	$3.52	$3.50	$3.49	$3.53	$3.55	$3.69	$3.89	$4.33	$4.60
2047	$4.41	$4.00	$3.78	$3.58	$3.56	$3.55	$3.62	$3.66	$3.84	$4.08	$4.39	$4.67
2048	$4.47	$4.05	$3.85	$3.67	$3.64	$3.65	$3.73	$3.77	$3.96	$4.25	$4.48	$4.72
2049	$4.55	$4.11	$3.95	$3.72	$3.70	$3.69	$3.75	$3.78	$3.95	$4.20	$4.42	$4.74
2050	$4.57	$4.12	$3.93	$3.71	$3.69	$3.68	$3.72	$3.76	$3.92	$4.14	$4.90	$5.23

Environmental Compliance Natural Gas - Carbon Intesity (MTCO2e/Dth)

Staff recommended use of values from OAR 340-271-9000, CCI credit contribution amount, Table 7, https://www.oregon.gov/deq/rulemaking/Documents/ghgcr2021div71.pdf. Values below are for reference to what utilities submitted, but are not recommended for use by Energy Trust

Year	Avista	Cascade	Northwest Natural	
2022			$5.733	
2023	$1.520	$4.801	$5.786	
2024	$5.788	$4.875	$5.839	
2025	$6.245	$5.023	$5.892	
2026	$6.491	$5.097	$5.946	
2027	$6.709	$5.170	$5.999	
2028	$6.943	$5.244	$10.100	
2029	$10.910	$5.318	$10.422	
2030	$11.455	$5.392	$10.677	
2031	$12.005	$5.466	$10.663	
2032	$12.360	$5.540	$10.624	
2033	$13.074	$5.614	$7.275	
2034	$20.205	$5.687	$6.907	
2035	$21.046	$5.761	$6.580	
2036	$20.810	$5.835	$12.751	
2037	$21.026	$5.983	$12.308	
2038	$21.053	$6.057	$11.874	
2039	$19.407	$6.131	$11.414	
2040	$17.593	$6.204	$10.836	
2041	$15.915	$6.278	$10.350	
2042	$14.302	$6.352	$9.887	
2043	$12.426	$6.426	$9.336	
2044	$10.752	$6.500	$8.871	
2045	$9.036	$6.574	$8.283	
2046		$6.648	$7.706	
2047		$6.795	$7.262	
2048		$6.869	$6.824	
2049		$6.943	$6.336	
2050		$7.017	$5.832	
2051		$7.091		
2052		$7.165		
2053		$7.239		
2054		$7.312		
2055		$7.386		
2056		$7.460		
2057		$7.534		
2058		$7.608		
2059		$7.682		
2060		$7.756		
2061		$7.829		
2062		$7.903		
2063		$7.977		

2064		$8.051		
2065		$8.125		
2066		$8.206		
2067		$8.288		

Infrastructure Costs Natural Gas

	Avista			Cascade			Northwest Natural		
Year	**Supply**	**Dist Peak Day**	**Dist Peak Hour**	**Supply (Real 2021$/ Dth/Day)**	**Distribution Peak DAY (Real 2021$/ Dth/Day)**	**Distribution Peak HOUR (Real 2021$/ Dth/Hour)**	**Supply (Real 2021$/ Dth/Day)**	**Distribution Peak DAY (Real 2021$/ Dth/Day)**	**Distribution Peak HOUR (Real 2021$/ Dth/Hour)**
2022	Note from Avista: Prior versions included per day costs of Jackson priarie O&M/Capital for Avista's share of owned storage; however, these costs are now embedded in the results found on tab 2) Commodity & Transport - IRP.						$0.089	N/A	$0.469
2023				$0.000	$2.017	$0.084	$0.089	N/A	$0.469
2024				$0.000	$6.176	$0.257	$0.089	N/A	$0.469
2025				$0.000	$1.409	$0.059	$0.089	N/A	$0.469
2026				$0.000	$1.966	$0.082	$0.089	N/A	$0.469
2027				$0.000	$1.363	$0.057	$0.089	N/A	$0.469
2028				$0.000	$0.984	$0.041	$0.089	N/A	$0.469
2029				$0.000	$0.881	$0.037	$0.089	N/A	$0.469
2030				$0.000	$1.009	$0.042	$0.089	N/A	$0.469
2031				$0.000	$1.266	$0.053	$0.089	N/A	$0.469
2032				$0.000	$1.155	$0.048	$0.089	N/A	$0.469
2033				$0.000	$0.734	$0.031	$0.089	N/A	$0.469
2034				$0.000	$0.520	$0.022	$0.089	N/A	$0.469
2035				$0.000	$0.468	$0.019	$0.089	N/A	$0.469
2036				$0.000	$0.545	$0.023	$0.089	N/A	$0.469
2037				$0.000	$0.711	$0.030	$0.089	N/A	$0.469
2038				$0.000	$0.438	$0.018	$0.089	N/A	$0.469
2039				$0.000	$0.398	$0.017	$0.089	N/A	$0.469
2040				$0.000	$0.274	$0.011	$0.089	N/A	$0.469
2041				$0.000	$0.325	$0.014	$0.089	N/A	$0.469
2042				$0.000	$0.443	$0.018	$0.089	N/A	$0.469
2043				$0.000	$0.400	$0.017	$0.089	N/A	$0.469
2044				$0.000	$0.240	$0.010	$0.089	N/A	$0.469
2045				$0.000	$0.160	$0.007	$0.089	N/A	$0.469
2046				$0.000	$0.144	$0.006	$0.089	N/A	$0.469
2047				$0.000	$0.173	$0.007	$0.089	N/A	$0.469
2048				$0.000	$0.249	$0.010	$0.089	N/A	$0.469
2049				$0.000	$0.142	$0.006	$0.089	N/A	$0.469
2050				$0.000	$0.127	$0.005	$0.089	N/A	$0.469
2051				$0.000	$0.084	$0.004			
2052				$0.000	$0.063	$0.003			
2053				$0.000	$0.173	$0.007			
2054				$0.000	$0.249	$0.010			
2055				$0.000	$0.142	$0.006			
2056				$0.000	$0.127	$0.005			
2057				$0.000	$0.084	$0.004			
2058				$0.000	$0.063	$0.003			
2059				$0.000	$0.173	$0.007			
2060				$0.000	$0.249	$0.010			
2061				$0.000	$0.142	$0.006			
2062				$0.000	$0.127	$0.005			

2063				$0.000	$0.084	$0.004			
2064				$0.000	$0.063	$0.003			
2065				$0.000	$0.173	$0.007			
2066				$0.000	$0.249	$0.010			
2067				$0.000	$0.142	$0.006			

Risk Reduction Value Natural Gas

	Avista	Cascade	Northwest Natural
Year	Risk Reduction Value ($/Dth)	Risk Reduction Value (Real 2019$/Dth)	Risk Reduction Value (Real 2019$/Dth)
2022			$0.149
2023	$0.000	-$0.010	$0.363
2024	$0.000	-$0.011	$0.520
2025	$0.000	-$0.018	$0.605
2026	$0.000	-$0.013	$0.659
2027	$0.000	$0.001	$0.765
2028	$0.000	$0.014	$0.727
2029	$0.000	$0.046	$0.798
2030	$0.000	$0.077	$0.816
2031	$0.000	$0.175	$0.810
2032	$0.000	$0.239	$0.908
2033	$0.000	$0.204	$0.899
2034	$0.000	$0.146	$0.967
2035	$0.000	$0.125	$1.039
2036	$0.000	$0.256	$1.036
2037	$0.000	$0.235	$0.953
2038	$0.000	$0.168	$1.062
2039	$0.000	$0.225	$1.043
2040	$0.000	$0.263	$1.106
2041	$0.000	$0.296	$1.103
2042	$0.000	$0.296	$1.119
2043			$1.120
2044			$1.143
2045			$1.154
2046			$1.264
2047			$1.208
2048			$1.273
2049			$1.248
2050			$1.282

Note: Negative values will be applied as zero.

End Use Load Profiles Natural Gas

This information is provided for Energy Trust to have available. Energy Trust determines what source to use for load profiles.
Avista

					OR Peak Day	OR Peak Hour									
End Use Profiles	**Monthly Share of Normal Weather Annual Load**			**2023**	**90,114**	**3,999**								**Peak to Annual Normal Weather Usage Ratios**	
End Use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2023	Peak Day	Peak Hour
Com-New	0.0026	0.0031	0.0037	0.0054	0.0086	0.0119	0.0131	0.0127	0.0117	0.0060	0.0035	0.0023	3,855	0.0094	0.0004
NEEA-MartetTX	0.0029	0.0036	0.0042	0.0061	0.0097	0.0135	0.0148	0.0144	0.0132	0.0068	0.0039	0.0026	4,362		
Com-ROB	0.0012	0.0014	0.0017	0.0024	0.0039	0.0054	0.0060	0.0058	0.0053	0.0027	0.0016	0.0011	1,754		
Com-SEM	0.0005	0.0006	0.0007	0.0010	0.0016	0.0022	0.0024	0.0023	0.0021	0.0011	0.0006	0.0004	697		
Com-RET	0.0072	0.0089	0.0105	0.0152	0.0242	0.0336	0.0369	0.0358	0.0330	0.0168	0.0097	0.0066	10,868		
Ind-RET	0.0045	0.0055	0.0066	0.0094	0.0150	0.0209	0.0230	0.0223	0.0205	0.0105	0.0061	0.0041	6,762		
Ind-SEM	-	-	-	-	-	-	-	-	-	-	-	-	-		
Ind-ROB	-	-	-	-	-	-	-	-	-	-	-	-	-		
Res-ManufNH	0.0006	0.0007	0.0009	0.0013	0.0020	0.0028	0.0030	0.0030	0.0027	0.0014	0.0008	0.0005	897		
Res-NewHomes	0.0018	0.0022	0.0026	0.0037	0.0059	0.0082	0.0090	0.0088	0.0081	0.0041	0.0024	0.0016	2,661		
Res-MarketTx	0.0089	0.0110	0.0130	0.0187	0.0299	0.0416	0.0457	0.0443	0.0408	0.0208	0.0120	0.0081	13,431		
Res-Tstat	0.0020	0.0025	0.0029	0.0042	0.0067	0.0093	0.0102	0.0099	0.0091	0.0047	0.0027	0.0018	3,010		
Res-TstatOpt	0.0000	0.0000	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0001	0.0000	0.0000	55		
Res-WaterHeat	0.0002	0.0002	0.0002	0.0004	0.0006	0.0008	0.0009	0.0008	0.0008	0.0004	0.0002	0.0002	253		
Res-Shell	0.0012	0.0015	0.0017	0.0025	0.0040	0.0055	0.0060	0.0059	0.0054	0.0028	0.0016	0.0011	1,779		
Res-Heat-ROB	0.0009	0.0012	0.0014	0.0020	0.0031	0.0044	0.0048	0.0047	0.0043	0.0022	0.0013	0.0009	1,415		
MF-RET	0.0001	0.0002	0.0002	0.0003	0.0004	0.0006	0.0007	0.0006	0.0006	0.0003	0.0002	0.0001	194		
MF-ROB	0.0005	0.0006	0.0008	0.0011	0.0017	0.0024	0.0026	0.0026	0.0024	0.0012	0.0007	0.0005	775		
Large-Project Adder	-	-	-	-	-	-	-	-	-	-	-	-	-		
Com-Cooking	0.0012	0.0015	0.0018	0.0026	0.0042	0.0058	0.0063	0.0062	0.0057	0.0029	0.0017	0.0011	1,868		
Total	1,508,248	1,226,557	1,032,032	716,392	449,619	323,232	294,167	303,319	329,330	645,657	1,116,457	1,652,419			

This information is provided for Energy Trust to have available. Energy Trust determines what source to use for load profiles.
Cascade

	Monthly Share of Normal Weather Annual Load												**Peak to Annual Normal**	
End Use	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Peak Day**	**Peak Hour**
All	0.1589	0.1304	0.1105	0.0728	0.0445	0.0308	0.0277	0.0281	0.0339	0.0736	0.1212	0.1676	N/A	N/A

This information is provided for Energy Trust to have available. Energy Trust determines what source to use for load profiles.
Northwest Natural

	Monthly Share of Normal Weather Annual Load												**Peak to Annual Normal Weather**	
End Use	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Peak Day**	**Peak Hour**
Residential Space Heating	0.204	0.145	0.123	0.070	0.033	0.006	0.000	0.001	0.008	0.062	0.129	0.218	0.0176	0.0010
Residential Hearths and Fireplaces	0.204	0.145	0.123	0.070	0.033	0.006	0.000	0.001	0.008	0.062	0.129	0.218	0.0176	0.0005
Commercial Space Heating	0.204	0.145	0.123	0.070	0.033	0.006	0.000	0.001	0.008	0.062	0.129	0.218	0.0157	0.0012
Water Heating	0.101	0.096	0.092	0.088	0.083	0.079	0.073	0.068	0.069	0.073	0.081	0.095	0.0033	0.0003
Cooking	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.0036	0.0007
Process Load	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.0027	0.0001

Draft Memo

EnergyTrust of Oregon

To: Peter Kernan, Oregon PUC

From: Brian Conlon, Energy Trust of Oregon

Date: April 12, 2024

Re: Final 2025 Electric Avoided Cost Update Summary

This memo provides a summary of the updates to Energy Trust's Final 2025 Electric Avoided Cost buildup, including an overview of the utility inputs provided, a discussion of the results, and a comparison of the final updated blended values to current 2024 Avoided Cost values.

Utility Provided Inputs and PUC Direction

Pursuant to AR 621, each funding utility provides Energy Trust with Avoided Cost inputs for use in the Energy Trust Final 2025 Blended Avoided Costs. Each utility provides the individual components in Table 1 below from the most recently acknowledged IRP (IRP Column) and an optional additional input for the OPUC to consider (Update Column). Table 1 shows the values currently utilized in 2024 Avoided Costs, the inputs provided by each electric utility from their most recently acknowledged IRPs, and alternative submissions for consideration in 2025 Avoided Costs. The last column for each utility identifies the direction from OPUC staff as to which of the various submittals Energy Trust should incorporate into the final 2025 Avoided Costs; these values are also highlighted in gold.

Table 1. Utility Inputs Pursuant to AR 621 for use in the Final Energy Trust 2025 Blended Avoided Costs

		Pacific Power				Portland General Electric			
		Current	IRP	Update	Selection	Current	IRP	Update	Selection
Avoided Cost Element		PAC Current (2024 AC)	PAC IRP Submission	PAC Updated Submission	Final Inputs for 2025 Avoided Cost	PGE Current (2024 AC)	PGE IRP Submission	PGE Updated Submission	Final Inputs for 2025 Avoided Cost
Global Assumptions	Inflation Rate	2.16%	2.16%	2.27%	Update	2.05%	2.10%	0.00%	IRP
	Real Discount Rate	4.63%	4.63%	4.40%	Update	4.41%	4.02%	0.00%	IRP
	Regional Act Credit	10.00%	10.00%	10.00%	Update	10.00%	10.00%	10.00%	IRP
T&D Line Losses	Transmission Loss Factor	3.50%	3.50%	0.00%	IRP	2.13%	2.07%	0.00%	IRP
	Distribution Loss Factor, Commercial	3.69%	3.69%	0.00%	IRP	4.02%	4.02%	0.00%	IRP
	Distribution Loss Factor, Industrial	3.20%	3.20%	0.00%	IRP	1.96%	1.96%	0.00%	IRP
	Distribution Loss Factor, Residential	4.46%	4.46%	0.00%	IRP	4.20%	4.20%	0.00%	IRP
Transmission Capacity Value	Transmission Deferral Credit	$6.90	$6.34	$5.09	Update	$58.25	$87.34	$0.00	IRP
	Seasonal Capacity Split - Summer	50%	39%	0%	IRP	50%	50%	0%	IRP
	Seasonal Capacity Split - Winter	50%	61%	0%	IRP	50%	50%	0%	IRP
	Deficiency start year	2024	2021	2021	Update	2024	2026	0	IRP
Distribution Capacity Value	Distribution Deferral Credit	$14.57	$13.38	$10.46	Update	$15.46	$17.21	$0.00	IRP
	Seasonal Capacity Split - Summer	100%	90%	0%	IRP	50%	50%	0%	IRP
	Seasonal Capacity Split - Winter	0%	10%	0%	IRP	50%	50%	0%	IRP
	Deficiency start year	2024	2021	2023	Update	2024	2026	0	IRP
Generation Capacity Value	Generation Capacity Credit	$93.34	$85.71	$105.36	Alt 1	$119.01	$228.00	$175.00	IRP
	Seasonal Capacity Split - Summer	100.0%	83%	0%	IRP	50.0%	50%	0%	IRP
	Seasonal Capacity Split - Winter	0.0%	17%	0%	IRP	50.0%	50%	0%	IRP
	Deficiency start year	2024	2026	2025	Update	2024	2026	0	IRP
Other Values	Risk Reduction Value	$3.25	$3.05	$1.92	Update	$3.25	$3.00	$0.00	IRP
	Forward Market Prices				Alt 2				Alt 2

Energy Trust took these inputs and blended them into electric Avoided Cost values that can be used throughout Energy Trust territory. The blended values are weighted averages where the weighting is based on forecasted 2025 electric utility expenditures from Energy Trust's 2024-2025 budget. For consistency with the natural gas avoided costs, Energy Trust uses a single discount rate, which weights utility-submitted discount rates by the forecasted expenditures for the two electric and three natural gas investor-owned utilities in Oregon.

Some additional notes on Table 1:

1) The values provided in this table are in the dollar years provided by the utility. These values will be inflated to 2025$ for use in the 2025 Avoided Costs.
2) The values in the PAC IRP Submission column largely come from their 2021 IRP, while the non-zero values in the PAC Updated Submission column are from the 2023 IRP.
3) The table does not include all options for generation capacity credit and forward prices. These are described below.
4) PGE did not provide alternative global input values for 2025 Avoided Costs.

Table 2 below provides a comparison of the blended 2024 Avoided Cost Component Values to the updated final 2025 Avoided Cost Component values and their percent change from 2024.

Table 2: Comparison of Component Values from 2024 Avoided Costs to the blended Final 2025 Avoided Costs Values (2025 $)

Avoided Cost Component	2025 (Updated) Blended Value	2024 Blended Value	Percent Change
Inflation Rate	2.17%	2.09%	3.7%
Real Discount Rate	4.11%	4.50%	-8.7%
Northwest Power Act 10% Credit	10.00%	10.00%	0.0%
Risk Reduction Value ($/MWh) ($ 2025)	$2.79	$3.39	-17.6%
Transmission Loss Factor	2.65%	2.68%	-1.1%
Transmission Loss Credit ($/kW-yr.) ($ 2025)	$55.13	$39.30	40.3%
Distribution Loss Factor, Commercial	3.89%	3.89%	-0.1%
Distribution Loss Factor, Industrial	2.46%	2.45%	0.3%
Distribution Loss Factor, Residential	4.31%	4.30%	0.0%
Distribution Credit ($/kW-yr.) ($ 2025)	$14.98	$15.75	-4.9%
Generation Deferral Credit ($/kW-yr.) ($ 2025)	$186.86	$113.34	64.9%

Final Results Summary

Once the updated values provided by electric utilities were blended, Energy Trust compared each of the 184 electric load shapes updated in the 2025 Avoided Costs to the current 2024 iteration of Avoided Costs and compared the overall impact of the changes based on end use load profiles from the Energy Trust measure mix from 2022 and 2023. This savings portfolio-weighted average was $1.277/kWh for 2025 Avoided Costs. **Compared to the $0.928/kWh NPV weighted average from the 2024 Avoided Costs, this is an increase of 37.6 percent or $0.349/kWh.**

As shown in Figure 1, the overall increase relative to the 2024 avoided costs is attributable to relatively large increases in the value of energy, generation capacity, and transmission capacity. Distribution capacity and risk reduction value were slightly lower than 2024. The overall change in avoided costs is mirrored by the 10% Power Act credit, which is applied to the other values.

Figure 1. Changes in avoided cost components relative to 2024 – weighted average based on 2022-23 measure mix

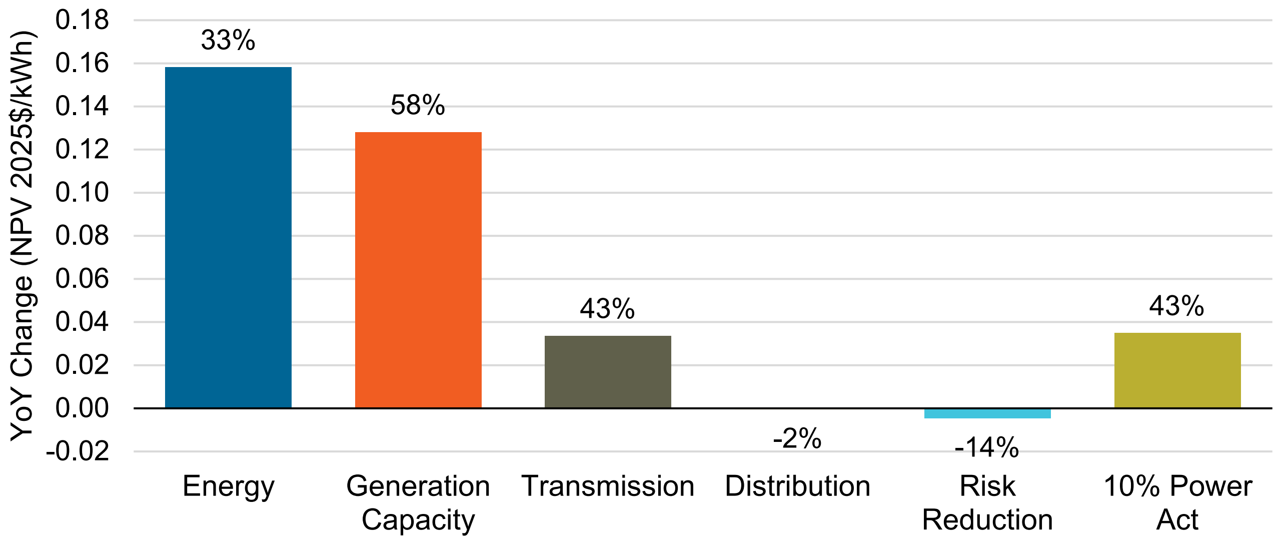
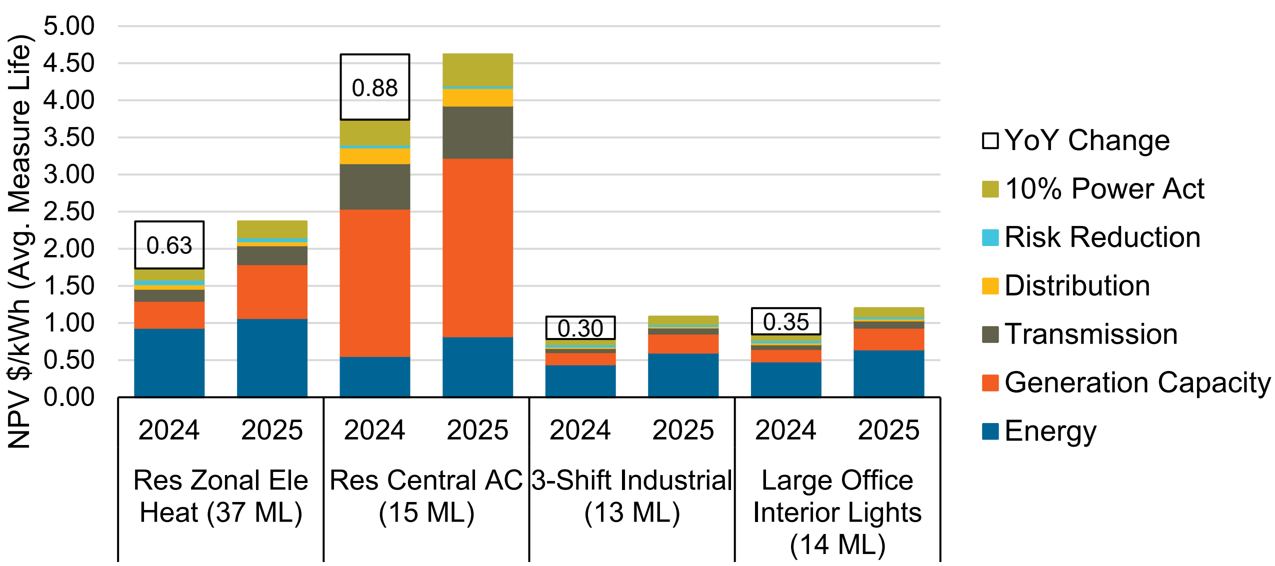


Figure 2 below shows the impact of the individual component parts for both the 2025 and 2024 Avoided Costs based on a sample of illustrative end use load profiles. These load shapes are used for illustrative purposes and do not necessarily represent end uses that make up large portions of Energy Trust's portfolio.

Figure 2. Comparison of Load Shape Value by Component



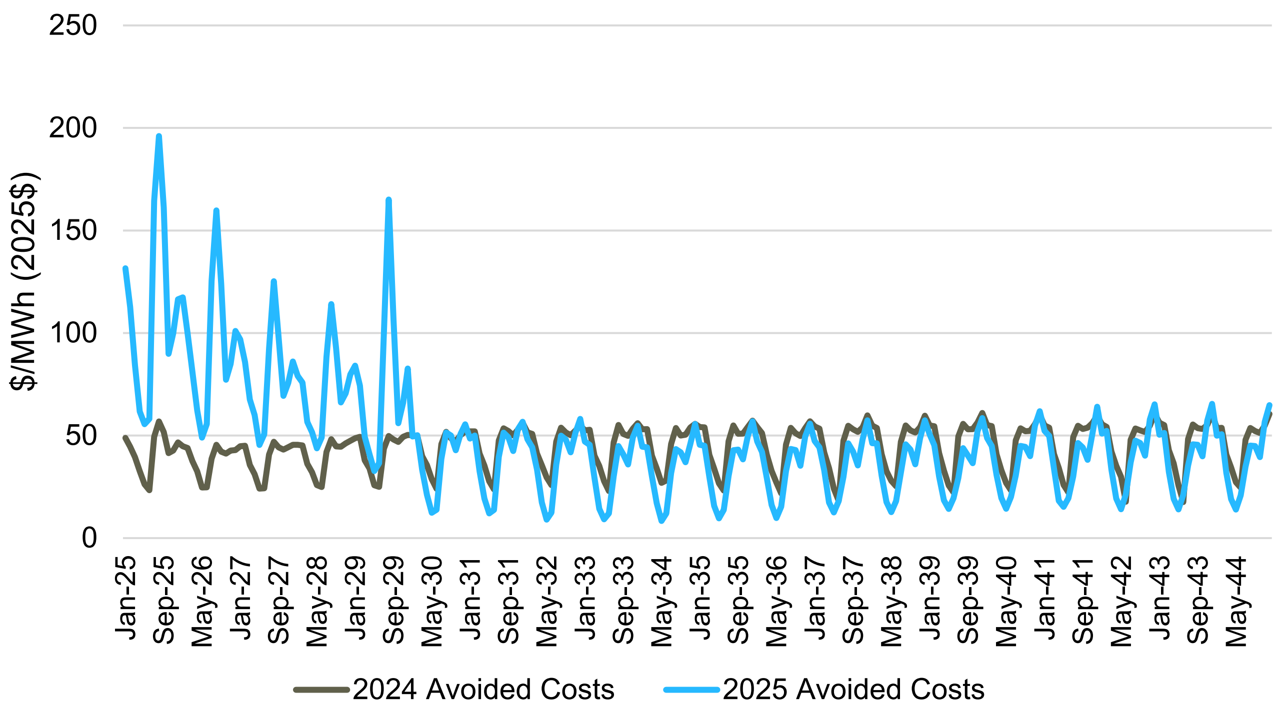
The next section of this memo details the changes to each component of the Avoided Costs update.

Final 2025 Electric Avoided Cost Component Changes and Impacts

Forward Market Prices

On average the forward market energy prices went up in 2025 compared to 2024 – particularly in the first five years, as reflected in Figure 3.

Figure 3. Blended Forward Price Comparison - Heavy Load Hours



Utilities submitted a number of options to be considered for forward market energy value. Table 3 summarizes the underlying methodology, along with the mean and range of monthly prices for the first twenty years of the forecast horizon. As indicated by the ranges, month-to-month variability increases significantly in most cases. While the selected PGE values are lower than 2024 on average, this decrease is outweighed by the large increase in PAC's forward prices.

Table 3. Summary of forward market energy price series submitted by utilties (2025 $/MWh)

			HLH 2025-44		LLH 2025-44	
Utility	Scenario	Description	Mean	Range	Mean	Range
PAC	2024	Values used in 2024 Avoided Costs	33.92	81.00	35.72	57.19
	2021 IRP	Medium Gas, Medium CO2 electricity market prices used in 2021 IRP	58.02	177.44	38.48	51.36
	Alt 1	Medium Gas, Medium CO2 electricity market prices used in 2023 IRP	49.82	146.08	49.83	74.57
	Alt 2*	Medium Gas, Zero CO2 electricity market prices used in Standard QF Pricing effective 9/22/23	63.77	203.92	58.80	83.28
	Alt 3	Avoided Energy Submission. LMP values from 2023 IRP. Starting in 2030, LMPs adjusted to reduction target under HB2021, 80% in 2030 rising to 100% in 2040.	59.65	146.55	65.98	123.10
PGE	2024	Values used in 2024 Avoided Costs	51.43	52.55	49.57	50.43
	2023 IRP	PNW Wholesale Electricity Prices modeled in the 2023 IRP	24.93	30.30	24.86	24.56
	Alt 1	Avoided Energy Submission. Renewable Solar Qualified Facility filed via Docket No. UM 1728	20.84	174.99	13.72	106.76
	Alt 2*	2025-2028: operational forward curve 2029: interpolation 2030: IRP long-term fundamental energy forecast	40.08	219.83	34.86	118.40

**Selected forward price series for weighted average blend*

Generation, Transmission, and Distribution Capacity Values

PGE's generation capacity deferral value increased by 96% relative to 2024 avoided costs. Traditionally, a simple-cycle natural gas combustion turbine is used as the proxy marginal resource to value generation capacity. For the 2025 avoided costs, PGE submitted a capacity value based on a 4-hour lithium-ion battery, accounting for the increase. As utilities seek to meet decarbonization goals, cleaner resources are being used for capacity expansion planning and the battery is representative of PGE's movement in this direction.

Compared to 2024, the blended transmission deferral credit value that was used as an input to 2025 avoided cost calculations went up 40%. The blended distribution credit input value in the 2025 avoided cost calculations decreased 5%.

Instead of the rounded values that were used in previous avoided cost cycles to allocate PAC's generation, transmission, and distribution capacity value between summer and winter, ratios from PAC's IRP were integrated into the calculations. Consistent with updates in UM 1893 proceedings for 2024 Avoided Costs, a seasonal 50% summer/50% winter split was used for PGE generation, transmission, and distribution capacity value.

Risk Reduction & NW Power Act Credit

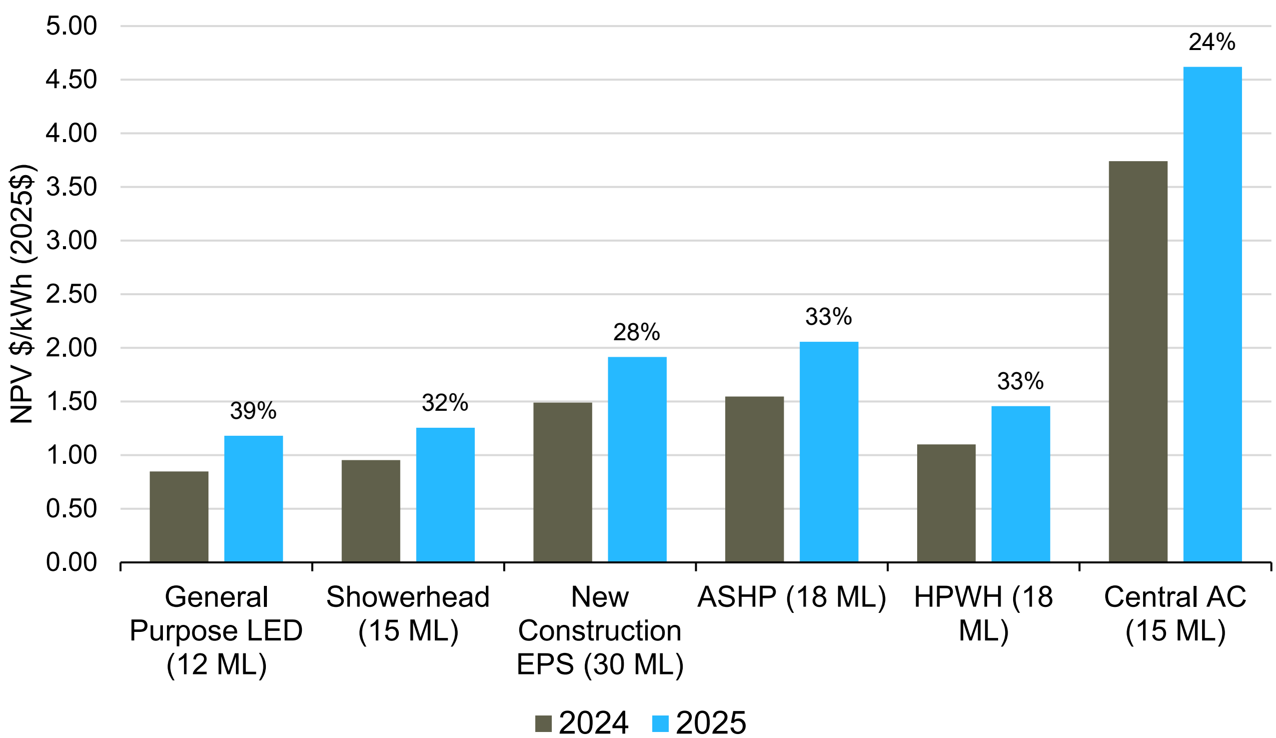
Risk Reduction values that were used as inputs to avoided cost calculations decreased about 16% in the 2025 Avoided Costs. The same 10% NW Power Act Credit value was also utilized in the 2025 Avoided Costs. This credit is applied to each of the Avoided Cost components and therefore its impact is relative to the changes in other individual components of each load shape. While the 10% adder was not applied to the risk reduction value in previous cycles, the credit is now applied to all of the Avoided Cost Components, including the risk reduction value, consistent with the methodology used by the Northwest Power and Conservation Council.[1]

Measure Level Impacts

On a measure level, the overall impact of the input changes varies by measure and load profile due to changes in the submitted values. Currently the peak coincident factors for transmission and distribution are specific to each utility and then blended.

The following figures show changes in NPV Avoided Costs per unit of savings for representative measures across each sector. The NPV is shown according to each measure's typical measure life. The measures shown in these graphs are meant to show differential impacts across end uses and do not necessarily represent measures that make up most of the savings within each sector.

Figure 3. Residential Avoided Cost Comparison of Representative Measures



[1] https://www.nwcouncil.org/2021powerplan_cost-effective-methodology/

Figure 4. Commercial Avoided Cost Comparison of Representative Measures

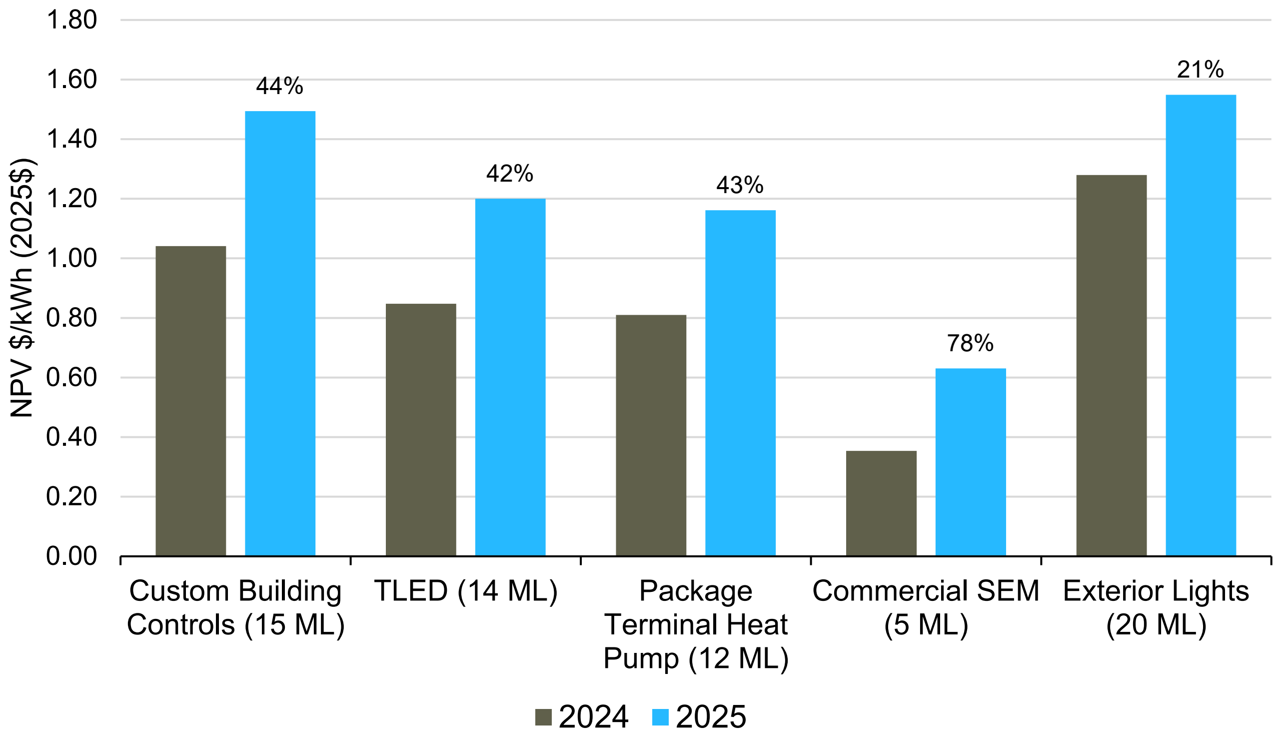
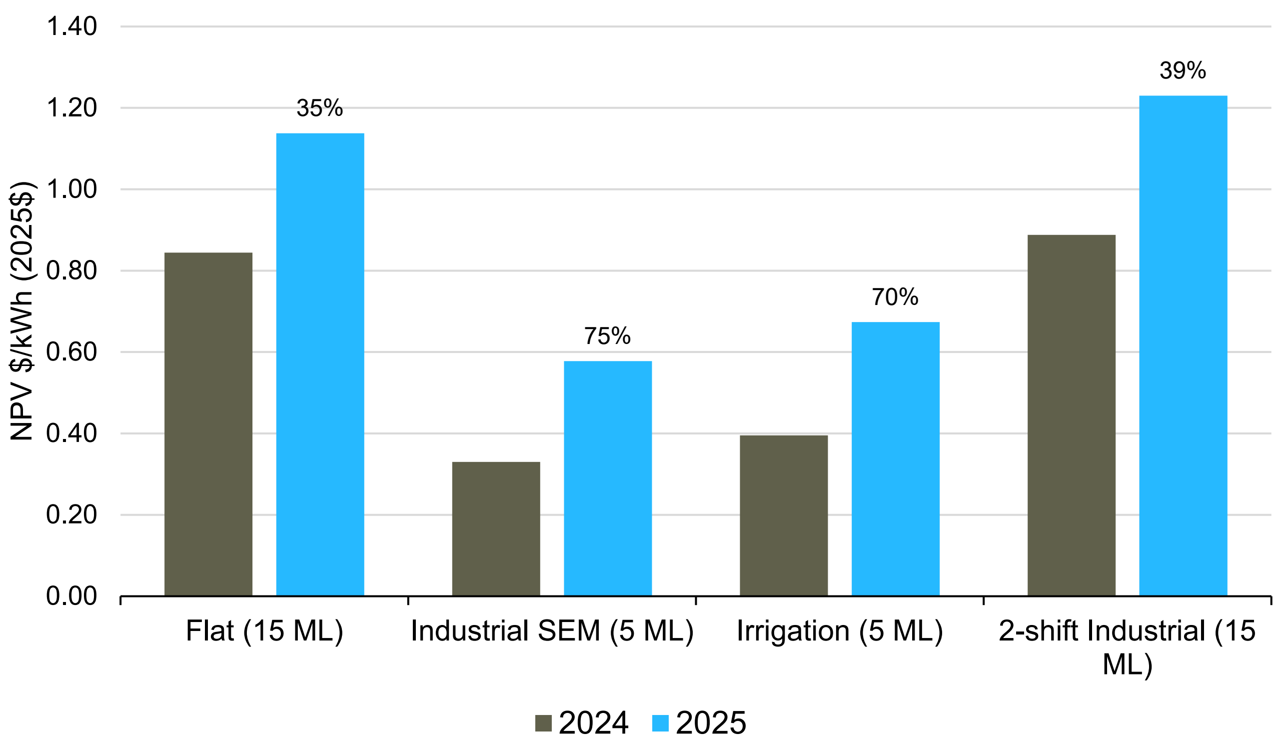


Figure 5. Industrial Avoided Cost Comparison of Representative Measures



Memo

To: Peter Kernan, Oregon PUC

From: Brian Conlon, Energy Trust of Oregon

Date: April 12, 2024

Re: 2025 Natural Gas Avoided Cost Update Summary

This memo provides a summary of the updates to Energy Trust's 2025 Natural Gas Avoided Cost buildup, including an overview of the utility inputs provided, a discussion of the results, and a comparison of the updated blended values to current 2024 Avoided Cost values.

Utility Provided Inputs and PUC Direction

Pursuant to UM 1893, each funding utility provides Energy Trust with Avoided Cost inputs for use in 2025 Blended Avoided Costs. Each utility provides each component in the table below from the most recently acknowledged IRP and an optional additional input for the OPUC to consider. Table 1 below shows the values currently utilized in 2024 Avoided Costs, the inputs provided by each gas utility from their most recent IRPs and updated utility submissions for consideration in 2025 Avoided Costs. The table also shows the values that Energy Trust used in 2025 Avoided Cost calculations as directed by OPUC staff; these values are identified in their own rows as well as being highlighted in orange. Finally, Table 1 compares the blended values used to calculate Avoided Costs for the current 2024 vintage with the blended values used to calculate Avoided Costs for the 2025 vintage.

Table 1. Utility Inputs for use in Energy Trust 2025 Blended Avoided Costs

Input Vintage Description	Avoided Cost Element							
	Inflation Rate	Discount Rate	Regional Act Credit	Commodity & Transport	Distribution Capacity - Hourly	Supply Capacity	CO2 Compliance	Risk Reduction
	Percentage	Percentage	Percentage	$/Therm	$/Therm/Year	$/Therm/Year	$/Therm	$/Therm
Northwest Natural								
Selected Input for 2024 Avoided Cost (2025$)	2.25%	4.54%	10%	$0.36	$445.09	$2.38	$0.69	$0.06
Current Submission - IRP (2025$)	2.85%	3.40%	10%	$0.37	$459.28	$3.64	$1.03	$0.10
Current Submission - ALT (2025$)	2.78%	3.39%	10%	$0.40	$485.56	$3.86	$0.73	$0.11
Selected Input for 2025 Avoided Cost (2025$)	**2.85%**	**3.40%**	**10%**	**$0.39**	**$485.56**	**$3.86**	**$0.76**	**$0.10**
2025 Avoided Cost Input Source	**2022 IRP**	**2022 IRP**	**2022 IRP**	**2022 IRP**	**2022 IRP**	**2022 IRP**	**2022 IRP**	**2022 IRP**
Cascade Natural Gas								
Selected Input for 2024 Avoided Cost (2025$)	3.70%	7.33%	10%	$0.37	$11.52	$4.52	$0.69	$0.00
Current Submission - IRP (2025$)	3.36%	3.79%	10%	$0.37	$7.70	$0.00	$0.64	$0.02
Current Submission - ALT (2025$)	3.19%	3.96%	10%	$0.44	$0.00	$0.00	$3.02	$0.00
Selected Input for 2025 Avoided Cost (2025$)	**3.36%**	**3.79%**	**10%**	**$0.37**	**$7.70**	**$0.00**	**$0.76**	**$0.00**
2025 Avoided Cost Input Source	**2023 IRP**	**2023 IRP**	**2023 IRP**	**2023 IRP**	**2023 IRP**	**2023 IRP**	**2023 IRP**	**2023 IRP**
Avista								
Selected Input for 2024 Avoided Cost (2025$)	2.00%	4.36%	10%	$1.68	$390.02	$0.06	$0.68	$0.00
Current Submission - IRP (2025$)	2.00%	4.52%	10%	$0.32	N/A	$0.00	$1.10	$0.00
Current Submission - ALT (2025$)	N/A	0.00%	N/A	$0.00	N/A	$0.00	$0.00	$0.00
Selected Input for 2025 Avoided Cost (2025$)	**2.00%**	**4.52%**	**10.00%**	**$0.32**	**$433.81**	**$0.00**	**$0.76**	**$0.00**
2025 Avoided Cost Input Source	**2023 IRP**	**2023 IRP**	**2023 IRP**	**2023 IRP**	**2023 IRP**	**2023 IRP**	**2023 IRP**	**2023 IRP**
Energy Trust								
Old Blended Input for 2024 Avoided Cost (2025$)	**2.39%**	**4.50%**	**10%**	**$0.47**	**$393.21**	**$2.41**	**$0.69**	**$0.05**
New Blended Input for 2025 Avoided Cost (2025$)	**2.83%**	**4.10%**	**10%**	**$0.38**	**$433.81**	**$3.17**	**$0.76**	**$0.09**
Percent Difference	**19%**	**-9%**	**0%**	**-19%**	**10%**	**31%**	**11%**	**88%**

Energy Trust took these inputs and blended them into gas Avoided Costs values that can be used throughout Energy Trust territory. The blended values are weighted averages where the weighting is based on forecasted 2025 gas utility expenditures from Energy Trusts 2024-2025 budget.

Some additional notes on Table 1.

1) The values provided by utilities were in dollar years specific to their source. These values were inflated to 2025$ for use in the 2025 Avoided Costs.
2) Submitted input values are multiyear forecasts. The first 20 years are levelized to produce the values in this table.
3) All values are sourced from each respective utility's IRP or alternate submission with the exception of Avista's hourly distribution value. These values rely on a utility expenditure-weighted average of values from the other two respective utilities for input.
4) The carbon compliance value selected are based on the Community Climate Investment (CCI) credit values published by DEQ as part of the adpoted 2021 rules in OAR 340-271-990 and the carbon intensity of each respective utility.

Table 2 below provides a comparison of the blended 2024 Avoided Cost Component Values to the updated 2025 Avoided Cost Component values and their percent change from 2024.

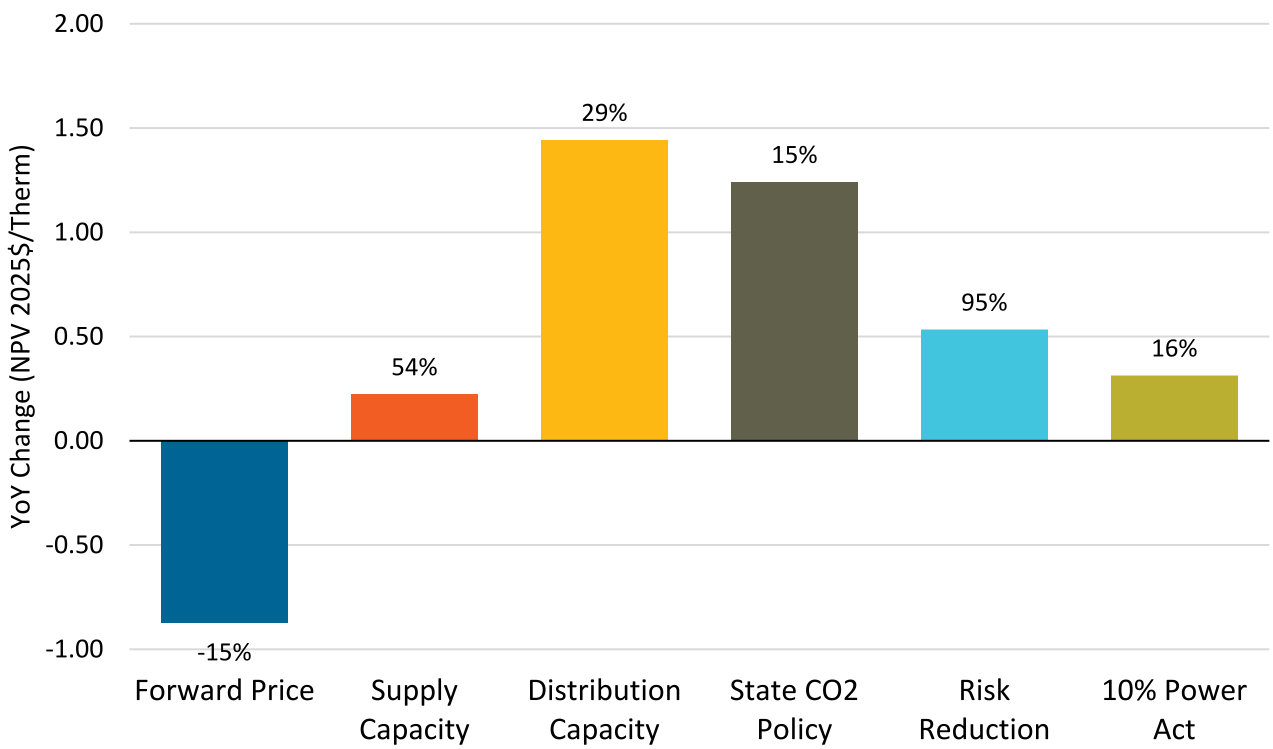
Table 2. Comparison of Component Values from 2024 Avoided Costs to 2025 Avoided Costs

Avoided Cost Component	2024 AC Blended Value	2025 AC (Updated) Blended Value	% Change
Inflation rate	2.39%	2.83%	19%
Real Discount rate	4.50%	4.10%	-9%
Regional Act Credit	10%	10%	0%
20-year Levelized Value (2025$/Therm)			
Commodity and Transport Prices	$0.47	$0.38	-19%
Distribution Capacity	$393.21	$433.81	10%
Supply Capacity	$2.41	$3.17	31%
CO2 Compliance	$0.69	$0.76	11%
Risk Reduction	$0.05	$0.09	88%

Results Summary

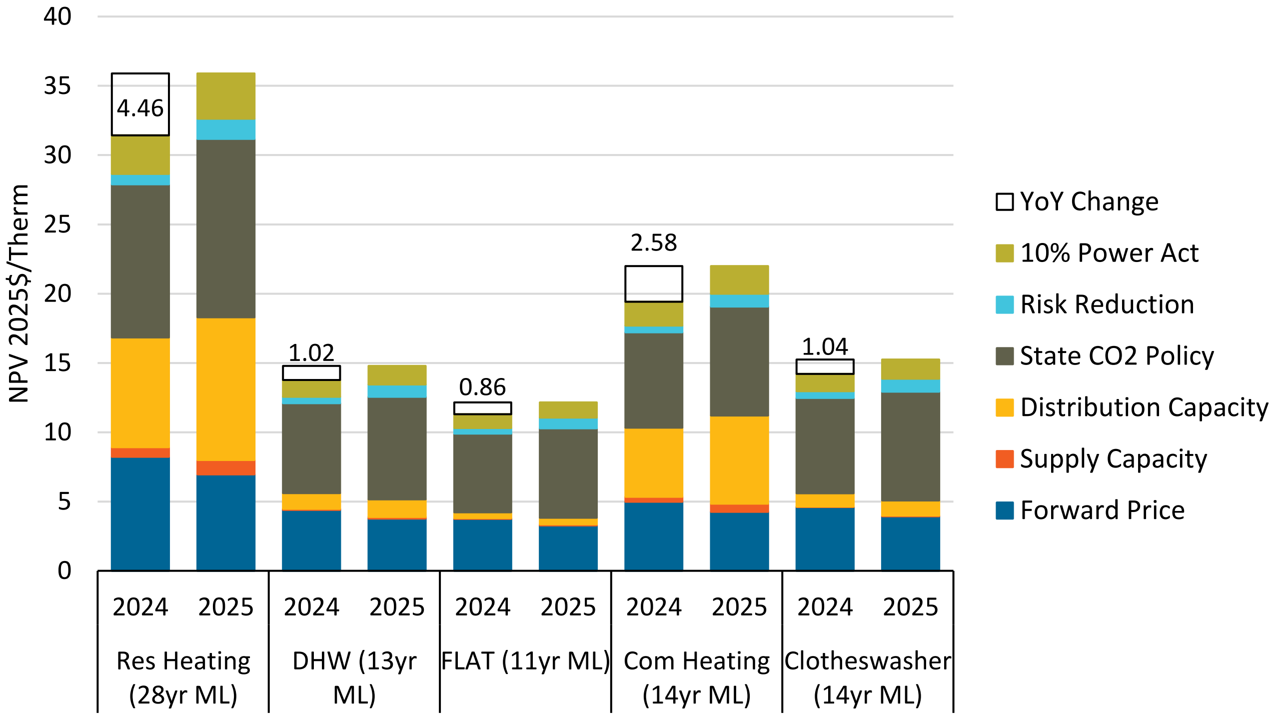
Once the updated values provided by the gas utilities were blended, Energy Trust compared the respective value components of the updated 2025 Avoided Costs to the current 2024 iteration of Avoided Costs. To gauge an overall impact of the changes, the avoided costs were weighted by the Energy Trust measure mix from 2022 and 2023. **Overall, the weighted NPV 2025 natural gas Avoided Costs increased by 13 percent or $2.88/Therm** compared to current 2024 Avoided Costs. Figure 1 shows the underlying components of this change.

Figure 1. Changes in Avoided Cost Components Relative to 2024 – Weighted Average Based on 2022-23 Measure Mix



On an end use basis represented per loadshape, the contribution of each individual Avoided Cost component is different dependent on how much that loadshape coincides with defined utility peak periods. Figure 2 below illustrates the differential impact of the individual component parts of 2024 and 2025 Avoided Costs associated with specified end use load profiles. The contributions of the value components of the load profiles shown in this graph are based on characteristic measure lives. This figure does not represent the proportional contribution of each loadshape to Energy Trust's overall portfolio.

Figure 2. Comparison of Load Shape Value by Component



The next section of this memo details the changes to each component of the Avoided Costs update.

Natural Gas Avoided Cost Component Changes and Impacts

Commodity and Transport Forward Prices

Figure 3 compares blended commodity and transport forward prices from 2024 Avoided Cost inputs and 2025 Avoided Cost inputs. Overall blended commodity and transport prices decreased by 19%.

Figure 3. Blended Commodity and Transport Price Comparison

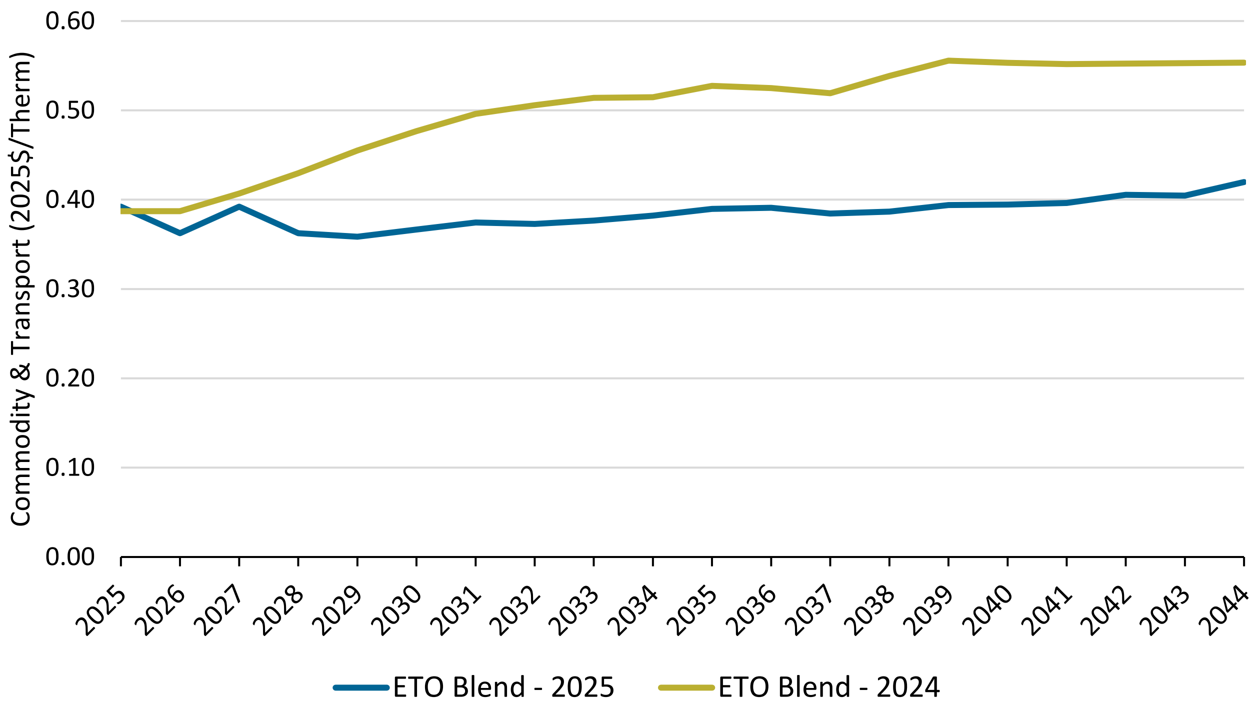
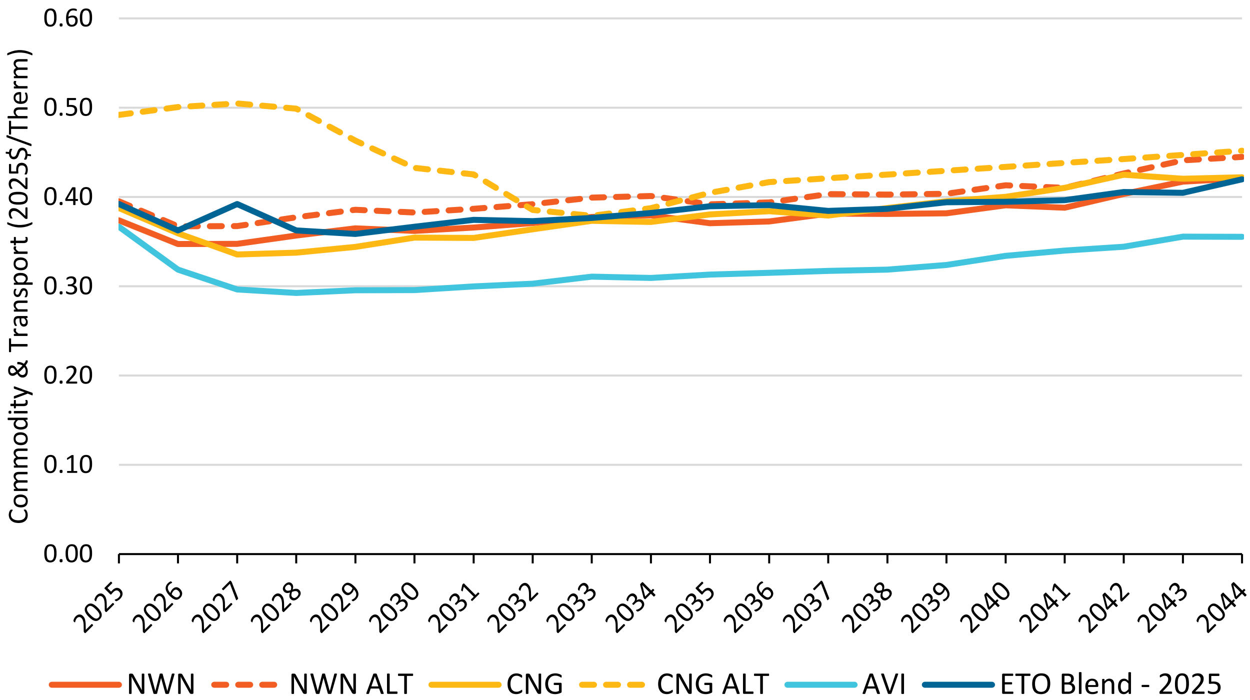


Figure 4. Comparison of Utility-specific Commodity and Transport Price for 2025 Avoided Costs



Peak Factors

Energy Trust uses peak factors to determine the proportion of end-use consumption that takes place on a peak day or a peak hour for natural gas utilities. Peak day and peak hour factors are defined for each of the end-use load profiles that Energy Trust utlizes in avoided cost calculations.

Supply capacity values are shaped using peak day factors, which represent the proportion of annual end-use consumption that falls on a peak day. A peak day is assumed to be the maximum daily coincidence of end-use consumption on a December or January weekday. Distribution capacity values are shaped using peak hour factors, which represent the proportion of end-use consumption that falls on a peak hour.

Historically, Energy Trust relied on peak hour factors that were calculated seperately from peak day factors. This separate calculation resulted in some instances where the peak hour factor was less than 1/24th of a peak day factor. As a result, starting with the 2021 Avoided Costs, Energy Trust altered its method for calcuating peak hour factors for space heating end-uses. For space heating end-uses, a peak hour factor is calculated based on the proportion of consumption during the maximum hour on the peak day as characterized by peak day factors in Table 3. This method was applied for the 2024 Avoided Costs and is also applied to the 2025 Avoided Costs.

For non-space heating end-uses a peak hour is characterized as the maximum hourly coincidence of end-use consumption on a December or January weekday morning from 7-10 A.M. Peak day and peak hour factors are derived from a combination of electric analog end-use load profiles from the Northwest Power and Conservation Council (NWPCC) and Northwest Natural regression modeling. Table 3 and Table 4 show each of the peak factors used in 2025 Avoided Costs and their respective sources.

Table 3. Daily Peak Factors for 2025 and 2024 Avoided Costs

End-Use Load Shape	2025 Peak Day Factor	Peak Day Factor Source	2024 Peak Day Factor	Peak Day Factor Source
Residential Space Heating	0.0198	Northwest Natural 2022 IRP	0.0176	Northwest Natural 2018 IRP Update 3
Commercial Space Heating	0.0177	Northwest Natural 2022 IRP	0.0157	Northwest Natural 2018 IRP Update 3
Domestic Hot Water	0.0036	NWPCC	0.0036	NWPCC
Flat	0.0030	NWPCC	0.0030	NWPCC
Clotheswasher	0.0020	NWPCC	0.0020	NWPCC

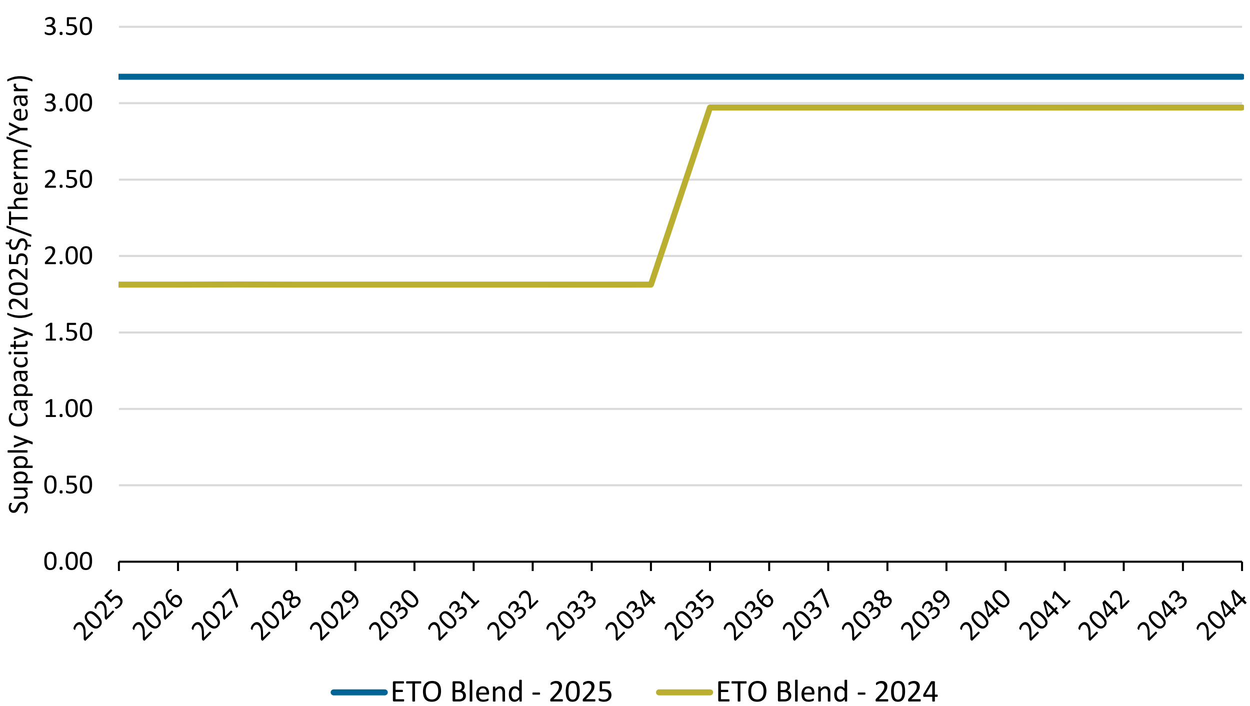
Table 4. Hourly Peak Factors for 2025 and 2024 Avoided Costs

End-Use Load Shape	2025 Peak Hour Factor	Peak Hour Factor Source	2024 Peak Hour Factor	Peak Hour Factor Source
Residential Space Heating	0.00144	NWPCC & Northwest Natural 2022 IRP	0.00128	NWPCC & Northwest Natural 2018 IRP Update 3
Commercial Space Heating	0.00140	NWPCC & Northwest Natural 2022 IRP	0.00124	NWPCC & Northwest Natural 2018 IRP Update 3
Domestic Hot Water	0.00030	NWPCC	0.00030	NWPCC
Flat	0.00013	NWPCC	0.00013	NWPCC
Clotheswasher	0.00024	NWPCC	0.00024	NWPCC

Supply Capacity

The blended supply capacity values that were used as inputs to avoided cost calculations increased by 31% from the prior round of Avoided Costs submissions. Blended supply capacity values used in the 2024 and 2025 avoided costs are illustrated in Figure 5.

Figure 5. Blended Supply Capacity Values for 2025 and 2024 Avoided Costs



Distribution Capacity

The blended distribution capacity values that were used as inputs to avoided cost calculations increased by 10% from the prior round of Avoided Costs submissions.

Table 5 illustrates the change in distribution capacity costs for each end use load profile from 2024 blended avoided costs to the current 2025 blended avoided cost. The increase in the blended distribution capacity deferral value is amplified by the changes in load shapes.

Table 5. 70-year Average Blended Distribution Capacity Value by Loadshape

Blended Avoided Costs	DHW	FLAT	Res Heating	Com Heating	Clotheswasher
2024 Vintage	$1.31	$0.56	$5.65	$5.47	$1.05
2025 Update	$1.51	$0.64	$7.33	$7.10	$1.21
Percent Change	15%	15%	30%	30%	15%

Carbon Policy Compliance Value

Carbon compliance values increased by 11% from the prior blended value of $0.69 per Therm to $0.76 per Therm.

To calculate carbon value in 2025 Avoided Costs, Energy Trust used the Community Climate Investment (CCI) credit schedule published by DEQ in the adopted 2021 rules for the Greenhouse Gas Emissions Program[1]. The dollar per metric ton schedule starts at $107 in 2023 and can be found in Table 7 of the Division 271 Rules[2]. The adopted values increased from the proposed rulemaking draft values used in the 2024 Avoided Costs. Per DEQ instruction, these values were escalated to 2025 dollars using the latest CPI-U West index relative to January 2021.

Each gas utility submitted utility-specific carbon intensity values (MTCO2e/Dth). Energy Trust calculated a blended carbon intensity using the values provided by the utilities. This blended carbon intensity value was then multiplied with the published DEQ schedule in order to calculate the final blended dollar per therm values for carbon compliance in the 2025 Avoided Costs. These values are shown in Table 6.

Table 6. Utility-specific Carbon Intensity Values

Utility	Carbon Intensity (MTCO2e/Dth)
Northwest Natural	0.053100
Cascade Natural Gas	0.057757
Avista	0.053061
Energy Trust Blended	0.053561

[1] Department of Environmental Quality : Greenhouse Gas Emissions Program 2021 : Rulemaking at DEQ : State of Oregon
[2] Division 271 Rules

Additionally, each gas utility provided primary and alternative carbon cost submissions. Figure 6 illustrates the respective carbon cost values provided by each natural gas utility and the blended value for use in Energy Trust avoided cost.

Figure 6. Comparison of ETO Adopted DEQ Carbon Costs with Utility Carbon Costs

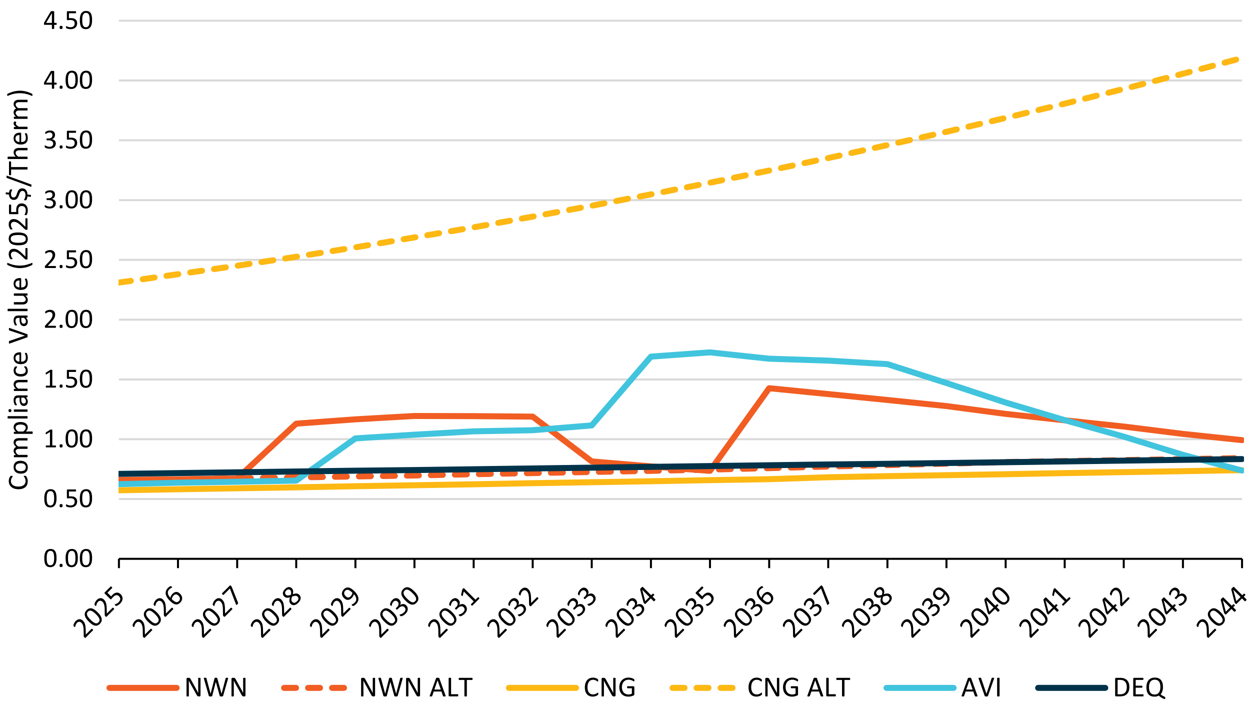
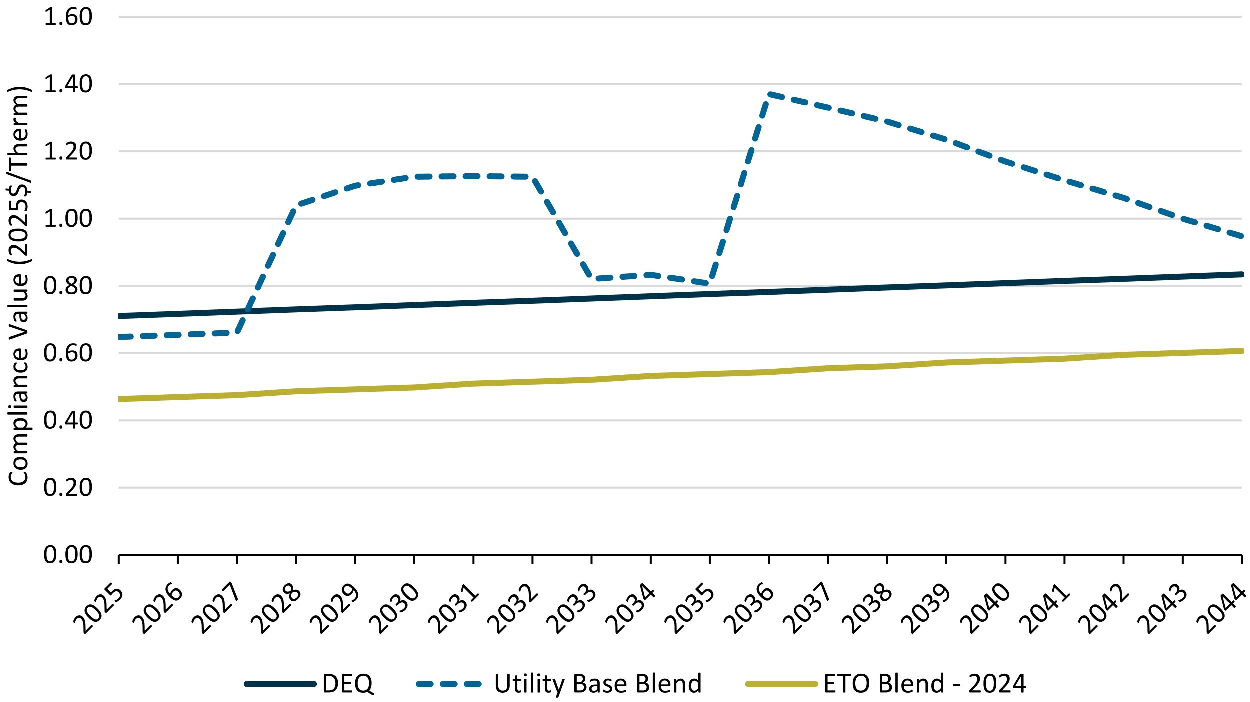


Figure 7. Blended Carbon Compliance Values for 2025 and 2024 Avoided Costs



Risk Reduction & NW Power Act Credit

Risk reduction has historically been $0/Therm due to previous agreement that $0 value will be applied in the blended avoided cost calculation if utilities submit negative risk reduction values. The submissions for 2024 and 2025 Avoided Costs included positive risk reduction values.

Risk reduction increased by 88% from the 2024 Avoided Costs with a blended value of $0.05 per therm to a blended value of $0.09 per therm for 2025 Avoided Costs.

The NW Power Act Credit is applied to each of the avoided cost components and therefore its impact is relative to the changes in other individual components of each loadshape. The NW Power Act Credit continues to be 10% of avoided cost value. While the 10% adder was not applied to the risk reduction value in previous cycles, the credit is now applied to all of the Avoided Cost Components, including the risk reduction value, consistent with the methodology used by the Northwest Power and Conservation Council.[3]

[3] https://www.nwcouncil.org/2021powerplan_cost-effective-methodology/

Measure Level Impacts

For some measures, particularly space heating measures, the change in Avoided Costs tend to be greater due to the increase in distribution capacity values relative to other profiles. These end-uses have higher peak hour coincident factors than other profiles, and therefore their value increased more from 2024 to 2025 avoided costs relative to other profiles.

The following figures show changes in NPV Avoided Costs per unit of savings for representative measures across each sector. The NPV is shown according to each measure's typical measure life. The measures shown in these graphs are meant to show differential impacts across end uses and do not necessarily represent measures that make up the majority of savings within each sector.

Figure 8. Residential Avoided Cost Comparison of Representative Measures

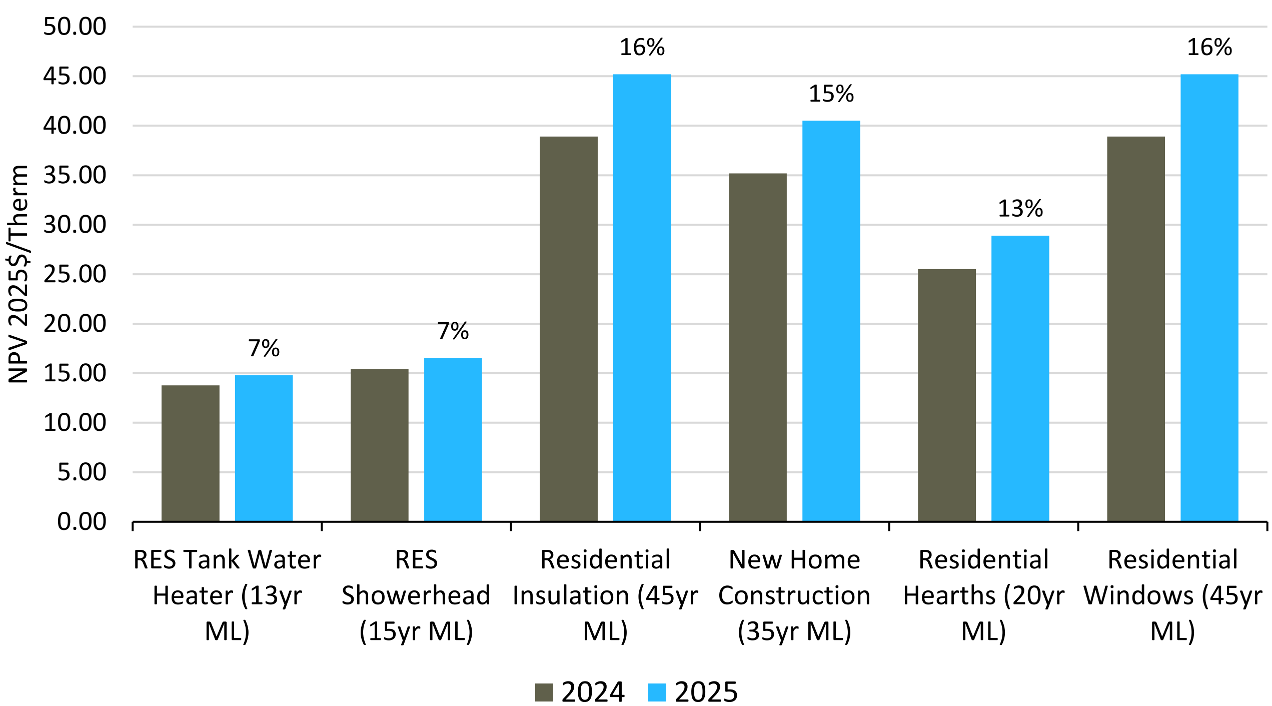


Figure 9. Commercial Avoided Cost Comparison of Representative Measures

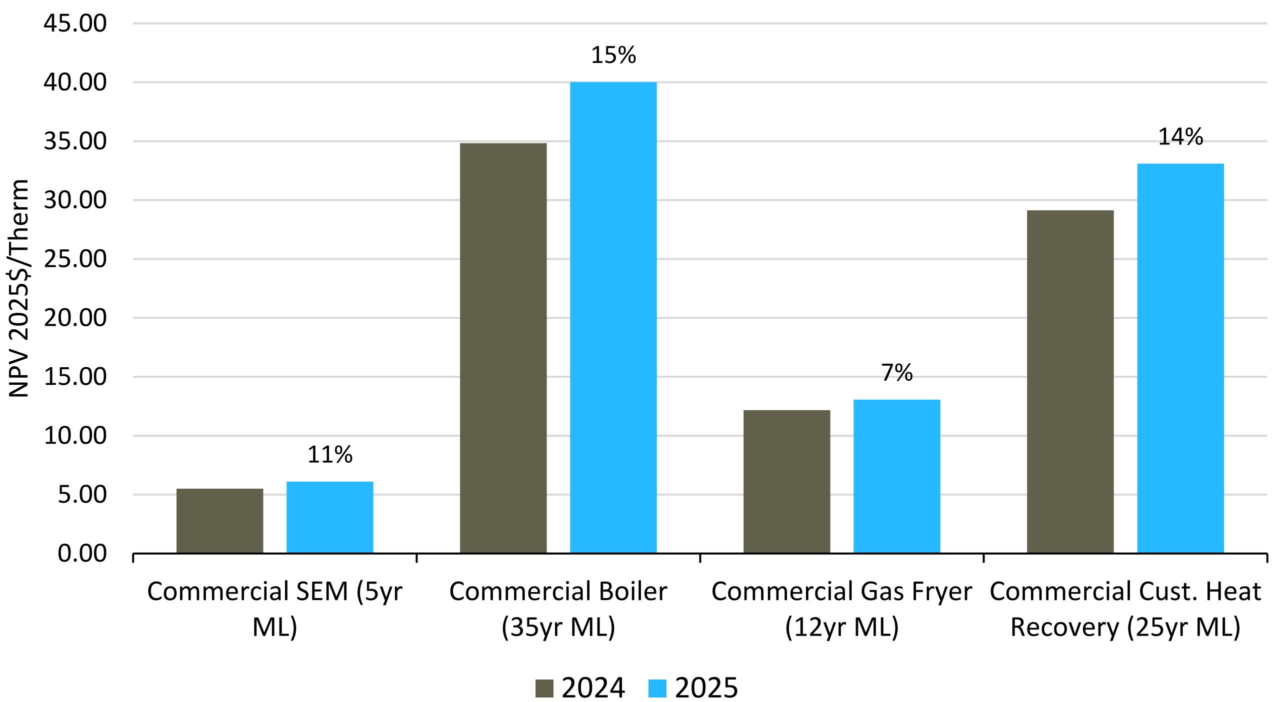


Figure 10. Industrial Avoided Cost Comparison of Representative Measures