

**PUBLIC UTILITY COMMISSION OF OREGON
STAFF REPORT
PUBLIC MEETING DATE: December 13, 2022**

REGULAR **CONSENT** **EFFECTIVE DATE** _____ **N/A**

DATE: December 5, 2022

TO: Public Utility Commission

FROM: Anna Kim

THROUGH: Bryan Conway, 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 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. Section I presents a summary of activities since the last report. Section II presents Staff's recommendations on data to approve for use by Energy Trust for energy efficiency avoided cost calculations. Section III provides a brief description of results to energy efficiency avoided costs.

Section I: Summary of Activities

In 2022, no changes were made to the data collection workbook.

Starting last year, Energy Trust has been directed to apply the social cost of carbon at a 2.5 percent discount rate as the future cost of compliance for natural gas utilities as provided by the Oregon Department of Environmental Quality (DEQ). Energy Trust continues to use DEQ numbers this year.

Based on discussions last year, electric utilities did not provide explicit assumptions about compliance costs associated with carbon or greenhouse gases (GHGs). These assumptions are embedded in the forward energy prices, and it is unclear to what extent these forecasts incorporate the cost of carbon associated with changes in state law.

In early 2022, Staff worked with Lawrence Berkeley National Laboratory (LBNL) to discuss options for improving the calculation of carbon reduction value for energy efficiency, specifically with electric utilities. Ultimately LBNL recommended that the best approach was to focus on properly designed decarbonization scenarios in compliance with the Clean Energy Plan. LBNL believed these scenarios would provide the information necessary to update energy efficiency contributions. Staff expects the 2023 IRPs will provide more accurate information that will be used by Energy Trust going forward.

Staff notes that in 2023, Staff will be reviewing multiple IRPs, including the first electric IRPs developed concurrently with the subject utilities' Clean Energy Plans under House Bill 2021. The outcomes of these IRPs may have significant impacts to avoided cost numbers. Both electric and gas IRPs in 2023 will more accurately reflect strategies to comply with the state's carbon reduction goals. Staff anticipates that there will be more

information about what the ultimate carbon compliance needs are, what carbon-compliant resources – including transmission – are being avoided, the annual and cumulative value of avoided contingency and regulating reserves, and how commodity forecasts are impacted by policy and current events.

While this year's data submissions were due October 14, 2022, Staff requested that utilities voluntarily submit data by September 15, 2022 so that all parties could have more time to review the data. All five utilities voluntarily submitted the requested data by September 15 for Staff review using the template approved by the Commission.

After data was submitted, Staff held a stakeholder workshop open to the public on October 3, 2022, for Energy Trust to provide an initial look at the resulting avoided costs using the submitted data.

In the workshop, Staff requested that stakeholders consider these questions when reviewing the numbers:

- Are any of these numbers inconsistent with what you had submitted?
- Does anything stand out that you think Staff should investigate?
- Are there alternate numbers to which Staff should give particular consideration?

In reviewing these data, stakeholders had questions about some of the information provided. Some utilities identified a few items for Energy Trust to follow up on later. The data submitted here reflect the resulting additional clarifications.

Section II: Data Recommendations

Staff reviewed the submitted utility data. For the most part, data came from the utilities' Integrated Resource Plans. In situations where alternate sets of data were provided, Staff checked to see if the alternate data had been reviewed previously by Staff in this docket or in other dockets. In cases where data had been reviewed and found reasonable, Staff recommends using the more recent alternate data.

In some cases, Staff also recommends applying certain data decisions specified in the past, rather than what has been submitted by the utilities. An example of this is the rounding seasonal capacity value splits to the nearest fifty percent (0/100 split or 50/50 split) to reflect Energy Trust's use of these values. a. These recommendations are separated by fuel type, starting with general decisions and then utility-specific recommendations.

Staff notes that there is increased uncertainty around commodity prices for both electric and gas. At the same time, renewables and statewide carbon reduction targets continue to change the electric market. Updated forecasts may be moving in different directions.

Please note that there are some changes to outputs from year to year because of the shift in timeframe. All final recommended values are attached as Attachment 2.

Electric Utility Data

In 2019, as an outcome of UM 1893, Energy Trust began applying the seasonal contribution of energy savings measures for generating capacity, transmission capacity, and distribution capacity. Generation, transmission, and distribution capacity values may experience different seasonal patterns for a given utility. Seasonal contributions to peak are 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

PacifiCorp submitted values from its acknowledged 2021 IRP. PacifiCorp also submitted some alternate values used in the most recent filing in UM 1729, application to Update Schedule 37 Qualifying Facility Information which included new analysis that PacifiCorp felt was applicable. Last year, PacifiCorp's main submission was based off numbers from the 2019 IRP Update. Many numbers were updated as a result of switching to the 2021 IRP as the source of the main submission.

Staff notes that based on this update, PAC's forward market prices decreased. This forecast does not reflect supply disruptions from the war in Ukraine however the forecast reflected the information available at the time. The next update may have a different trajectory. PAC also made significant updates to transmission and distribution numbers based recent new analyses on these numbers, resulting in overall increases for these values. Distribution capacity values transitioned from a 50/50 split to being primarily summer, resulting in increased values for summer-peaking measures.

Staff recommends accepting the main submission values with the exception of alternate forward market energy prices to use the most up-to-date market numbers, and the seasonal split of capacity values (50/50 split for transmission, 100 percent summer for generation and distribution), and to the generating capacity deficiency year based on the decisions described above.

Energy Trust has previously been directed to use a generation capacity deficiency start year as the first year values will be used (2023) based on the action plan to acquire wind resources for that year. Staff recommends continuing with this practice at this

time.. These recommendations result in moderate change to some numbers from those used last year, particularly forward market prices, transmission, and distribution.

Portland General Electric

Based on the review of electric utility data, PGE submitted values from its acknowledged 2019 IRP Update with additional information from its most recently settled General Rate Case (UE 394) as the main submission. PGE also submitted alternate values from its 2022 GRC and DSP filings. Staff notes that PGE introduced new studies for transmission and distribution values in UE 394 that are an update from values submitted last year.

PGE made significant updates to transmission and distribution numbers based on recent new analyses on these numbers, resulting in a large increase for transmission capacity value.

Staff recommends accepting the main submission values with the exceptions described above to the seasonal split of capacity values for generation, transmission, and distribution). Overall, these recommendations result in minimal changes to values from last year except for the increase in transmission capacity value.

Natural Gas Utility Data

IRP modeling for natural gas utilities has undergone changes in recent years as new practices are being adopted over time. There are some cases where a utility has not calculated certain values in past IRPs. In these cases, Staff has directed Energy Trust to represent these values as a weighted average of values provided by other utilities. Staff points out where there are or were missing values and recommends using this practice unless otherwise noted.

Starting in 2019, this docket began to include distribution peak hour values. Utilities have provided estimates that were created through different methods. These methods continue to evolve.

Regarding carbon compliance costs, while all gas utilities submitted carbon compliance values consistently, Staff has directed Energy Trust to use the DEQ values for carbon compliance costs at a 2.5 percent discount rate applied to the utilities' carbon intensities. In 2021, Energy Trust used DEQ's draft numbers.¹ Since then, DEQ has

¹ *In the Matter of Investigation Into the Methodology and Process for Developing Avoided Costs Used in Energy Efficiency Cost-Effectiveness Tests*, Docket UM 1896, Order No. 21-476, Appendix A at 32 (December 20, 2021). See also DEQ Notice of Proposed Rulemaking, available at: <https://www.oregon.gov/deq/rulemaking/Documents/ghgcr2021div71.pdf>.

established final numbers which are twenty-eight percent higher than the draft numbers previously used by Energy Trust. Energy Trust will be using these final DEQ numbers this year.² The DEQ update results in a twenty-eight percent increase in carbon compliance costs over last year for all gas utilities.

Avista

Avista submitted values from its acknowledged 2021 IRP as the main submission. Avista included alternate values from its 2023 IRP which has not yet been filed, as well as commodity and transport costs that were used in UG 438.

Staff recommends accepting the main submission with exceptions for carbon compliance costs, as described above, distribution capacity, and alternative submission for commodity and transport costs. Staff proposes to continue applying a weighted average of Northwest Natural and Cascade's distribution capacity costs to represent Avista. Staff also proposes using alternative commodity and transport costs as the forecast used in UE 438 is more up-to-date. These recommendations result in a sharp increase in long-term commodity prices which causes the blended average commodity price to increase by about thirty-four percent. This forecast takes into account the war on Ukraine.

Cascade

Cascade submitted values from its acknowledged 2020 IRP as the main submission. Cascade included alternate values from its 2023 IRP which has not yet been filed.

Staff recommends accepting the main submission values with the exception of carbon compliance costs as described above, and alternative submission for distribution capacity values. Cascade has updated its methodology for calculation distribution capacity values and these changes have been discussed with Energy Trust and Staff. This new methodology appears to be more representative of distribution costs using information from anticipated projects. These recommendations result in a notable increase in distribution capacity values for Cascade, contributing to a minor increase in blended costs.

Northwest Natural

Northwest Natural submitted values from its acknowledged 2018 IRP Update as the main submission. Northwest Natural submitted alternate values from its 2022 IRP which is currently under review.

² [OAR 340-271-9000](#).

Staff recommends accepting the main submission values with the exception of carbon compliance costs as described above. These recommendations result in minimal changes in values from last year and this year.

Section III: 2022 Filing Results for 2023 Planning

To facilitate the review of data and provide a draft preview of the impacts of changes to energy efficiency avoided cost data, Energy Trust used the data recommended in this memo to produce generalized high-level estimates on impacts for 2024 planning.

Electric costs have changed only slightly by increasing about one percent overall from the costs that were calculated in 2021. While transmission and distribution costs increased significantly, it was offset by the decrease in forward market prices. This resulted in projecting increases to some end uses and some decreases. As an example, commercial exterior lighting increased by an estimated twenty-one percent due to increases in transmission capacity values. There were also increases for irrigation, heat pump water heaters, and residential air conditioning.

Natural gas costs have overall increased significantly by roughly thirty-two percent. This is due primarily to increases in commodity costs and carbon compliance costs. These changes impacted all measures and should lead to opportunities for accelerated savings through increased incentives under higher avoided costs.

Please see Attachment 3 and Attachment 4 for more details.

Conclusion

Based on this analysis, Staff believes the attached data are ready for Commission approval and for use by Energy Trust in planning for 2024 activities and for the preparation for the 2024 budget.

PROPOSED COMMISSION MOTION:

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

Global Assumptions Natural Gas

		Avista	Cascade	Northwest Natural
Avoided Cost Element	Units	Value	Value	Value
Discount Rate (Company's Real after-tax weighted average cost of capital (WACC))	Percent	4.36%	7.33%	4.54%
Inflation Rate	Percent	2.00%	See next page	varies by year- avg of 2.25% over 30 year period
Regional Act Credit	Percent	10.00%	10.00%	10.00%
Forecast Period Calendar Start Year	Year	2020	2021	2021
Real Dollar Base Year	Year	N/A	2019	2019
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	0.0095	0.0513	
System Peak Coincident Hour Factor (if needed)	Peak Hour/Annual Load Ratio	0.0004	0.0005	

* Denotes numbers specified by Staff

Cascade Inflation Rate

Inflation Rate - 2021	Percent	2.66%
Inflation Rate - 2022	Percent	2.86%
Inflation Rate - 2023	Percent	3.01%
Inflation Rate - 2024	Percent	3.18%
Inflation Rate - 2025	Percent	3.32%
Inflation Rate - 2026	Percent	3.45%
Inflation Rate - 2027	Percent	3.56%
Inflation Rate - 2028	Percent	3.65%
Inflation Rate - 2029	Percent	3.73%
Inflation Rate - 2030	Percent	3.79%
Inflation Rate - 2031	Percent	3.83%
Inflation Rate - 2032	Percent	3.85%
Inflation Rate - 2033	Percent	3.86%
Inflation Rate - 2034	Percent	3.88%
Inflation Rate - 2035	Percent	3.89%
Inflation Rate - 2036	Percent	3.90%
Inflation Rate - 2037	Percent	3.91%
Inflation Rate - 2038	Percent	3.92%
Inflation Rate - 2039	Percent	3.92%
Inflation Rate - 2040	Percent	3.93%
Inflation Rate - 2041	Percent	3.93%
Inflation Rate - 2042	Percent	3.94%
Inflation Rate - 2043	Percent	3.94%
Inflation Rate - 2044	Percent	3.94%
Inflation Rate - 2045	Percent	3.94%
Inflation Rate - 2046	Percent	3.94%
Inflation Rate - 2047	Percent	3.94%
Inflation Rate - 2048	Percent	3.95%
Inflation Rate - 2049	Percent	3.94%
Inflation Rate - 2050	Percent	3.95%

Draft Memo

To: Anna Kim, Oregon PUC
From: Ben Cartwright, Energy Trust of Oregon
Date: December 1, 2022
Re: Final 2024 Electric Avoided Cost Update Summary

This memo provides a summary of the updates to Energy Trust's Final 2024 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 2023 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 2024 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 (Alternative Column). Table 1 shows the values currently utilized in 2023 Avoided Costs, the inputs provided by each electric utility from their most recently acknowledged IRPs, and alternative submissions for consideration in 2024 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 2024 Avoided Costs; these values are also highlighted in gold.

Table 1. Utility Inputs Pursuant to AR 621 for use in the Final Energy Trust 2024 Blended Avoided Costs

	Avoided Cost Element	Pacific Power			Portland General Electric			
		PAC Current (2023 AC)	PAC "IRP" Submission	Final Inputs for 2023 Avoided Cost	PGE Current (2023 AC)	PGE "IRP" Submission	PGE Alternative Submission	Final Inputs for 2023 Avoided Cost
Global Assumptions	Inflation Rate	2.28%	2.16%	IRP	2.05%	2.05%	2.11%	IRP
	Real Discount Rate	4.54%	4.63%	IRP	4.41%	4.41%	4.25%	IRP
	Regional Act Credit	10.00%	10.00%	IRP	10.00%	10.00%	10.00%	IRP
T&D Line Losses	Transmission Loss Factor	3.50%	3.50%	IRP	1.90%	2.13%	2.13%	IRP
	Distribution Loss Factor, Commercial	3.69%	3.69%	IRP	4.15%	4.02%	4.02%	IRP
	Distribution Loss Factor, Industrial	3.20%	3.20%	IRP	1.45%	1.96%	1.96%	IRP
	Distribution Loss Factor, Residential	4.46%	4.46%	IRP	4.74%	4.20%	4.20%	IRP
Transmission Capacity Value	Transmission Deferral Credit	\$4.16	\$6.34	IRP	\$9.38	\$55.93	\$55.93	IRP
	Seasonal Capacity Split - Summer	50%	39%	Current	50%	50%	50%	IRP
	Seasonal Capacity Split - Winter	50%	61%	Current	50%	50%	50%	IRP
	Deficiency start year	2018	2021	IRP	2022	2024	2024	IRP
Distribution Capacity Value	Distribution Deferral Credit	\$9.20	\$13.38	IRP	\$24.39	\$14.85	\$14.85	IRP
	Seasonal Capacity Split - Summer	50%	100%	IRP	50%	50%	50%	IRP
	Seasonal Capacity Split - Winter	50%	0%	IRP	50%	50%	50%	IRP
	Deficiency start year	2018	2021	IRP	2022	2024	2024	IRP
Generation Capacity Value	Generation Capacity Credit	\$83.76	\$85.71	IRP	\$109.74	\$109.74	\$143.29	IRP
	Seasonal Capacity Split - Summer	100.0%	83%	Current	50.0%	50%	N/A	IRP
	Seasonal Capacity Split - Winter	0.0%	17%	Current	50.0%	50%	N/A	IRP
	Deficiency start year	2022	2026	Current	2022	2022	2024	IRP

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 2024 electric utility expenditures from Energy Trust's Round 1 2023-2024 budget.

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 2024\$ for use in the 2024 Avoided Costs.
- 2) The PacifiCorp seasonal capacity split value for Transmission is labeled as 'Current' because the OPUC directed Energy Trust to use a 50/50 split for 2024 Avoided Costs.
- 3) PacifiCorp did not provide alternative global input values for 2024 Avoided Costs.

Table 2 below provides a comparison of the blended 2023 Avoided Cost Component Values to the updated final 2024 Avoided Cost Component values and their percent change from 2023.

Table 2: Comparison of Component Values from 2023 Avoided Costs to the blended Final 2024 Avoided Costs Values

Avoided Cost Component	2024 AC (Updated) Blended Value	2023 Blended Value	Percent Change
Inflation Rate	2.09%	2.14%	-2.3%
Real Discount Rate	4.50%	4.50%	0.0%
Northwest Power Act 10% Credit	10.00%	10.00%	0.0%
Risk Reduction Value (\$/MWh) (\$ 2024)	\$3.25	\$3.73	-12.8%
Transmission Loss Factor	2.68%	2.54%	5.5%
Transmission Loss Credit (\$/kW-yr.) (\$ 2024)	\$37.71	\$8.14	363.4%
Distribution Loss Factor, Commercial	3.89%	3.96%	-1.9%
Distribution Loss Factor, Industrial	2.45%	2.15%	14.2%
Distribution Loss Factor, Residential	4.30%	4.63%	-7.0%
Distribution Credit (\$/kW-yr.) (\$ 2024)	\$15.11	\$20.43	-26.0%
Generation Deferral Credit (\$/kW-yr.) (\$ 2024)	\$108.74	\$109.78	-0.9%

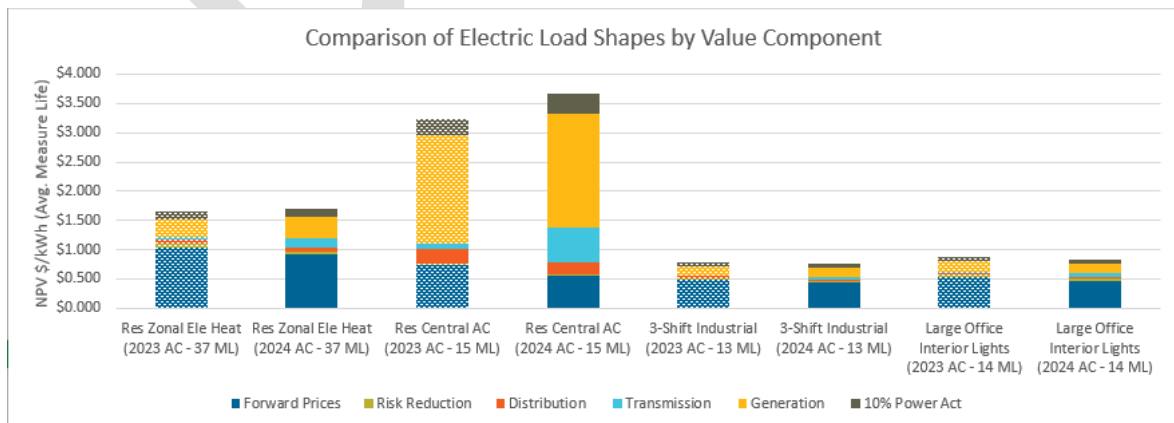
Final Results Summary

Once the updated values provided by Electric Utilities were blended, Energy Trust compared each of the 319 electric load shapes updated in the 2024 Avoided Costs to the current 2023 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 2021 and 2022 YTD. **Overall, final 2024 electric Avoided Costs increased slightly with overall increases of ~1.09 percent or \$0.010/kWh** compared to current 2023 Avoided Costs, when weighted by the 2021 and 2022 YTD savings achievements with overall weighted average Avoided Cost values going from \$0.951/kWh in 2023 to \$0.961/kWh in 2024.

The increase in transmission deferral credit values that were used as inputs to avoided cost calculations is the largest driver of the increase in Avoided Costs. However, the decrease in forward prices offset a large portion of the impact of increasing transmission deferral credit values.

Figure 1 below shows the impact of the individual component parts for both the 2024 and 2023 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 1. Comparison of Load Shape Value by Component



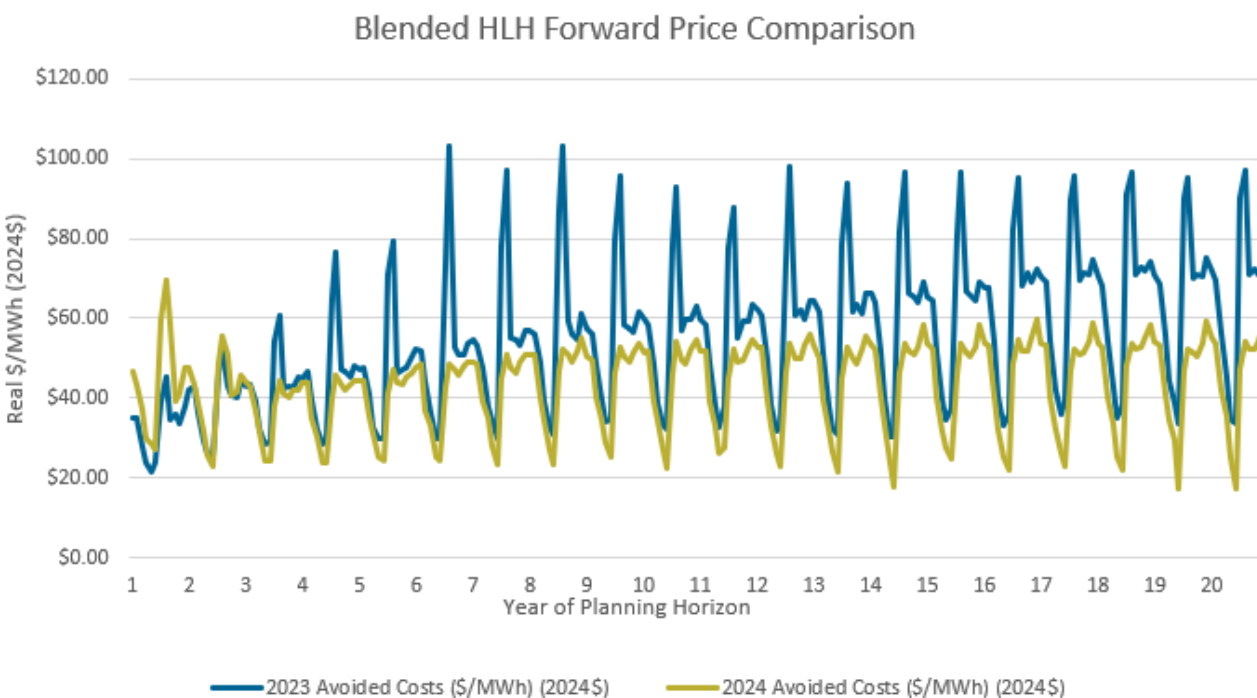
The next section of this memo details the changes to each component of the Avoided Costs update.

Final 2024 Electric Avoided Cost Component Changes and Impacts

Forward Market Prices

On average Heavy Load Hours price comparison went down in 2024 compared to 2023 as reflected in Figure 2 below.

Figure 2. Blended Forward Price Comparison - Heavy Load Hours



Transmission, Distribution and Generation Values

Compared to 2023, the blended transmission deferral credit value that was used as an input to 2024 avoided cost calculations went up 363%. The distribution and generation deferral credit values that were used as inputs in the 2024 avoided cost calculations decreased 26% and 1% respectively. The large increase in the transmission deferral credit value was offset by the decreases in forward market prices.

Consistent with updates in UM1893 proceedings for 2023 Avoided Costs, a seasonal 50% summer/50% winter split of the transmission values were again utilized in the updated 2024 Avoided Costs. PAC seasonal distribution capacity splits are using rounded IRP values for a 100% summer split. Finally, generation capacity splits remained the same in 2024 with a seasonal 50% summer/50% winter split applied for PGE and a 100% summer split applied for PacifiCorp.

Risk Reduction & NW Power Act Credit

Risk Reduction values that were used as inputs to avoided cost calculations decreased about 13% in the 2024 Avoided Costs. The same NW Power Act Credit value was also utilized in the 2024 Avoided Costs as the 2023 Avoided Costs and therefore there was no change in this value. This credit is applied to each of the Avoided Cost components (except risk reduction) and therefore its impact is relative to the changes in other individual components of each load shape.

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

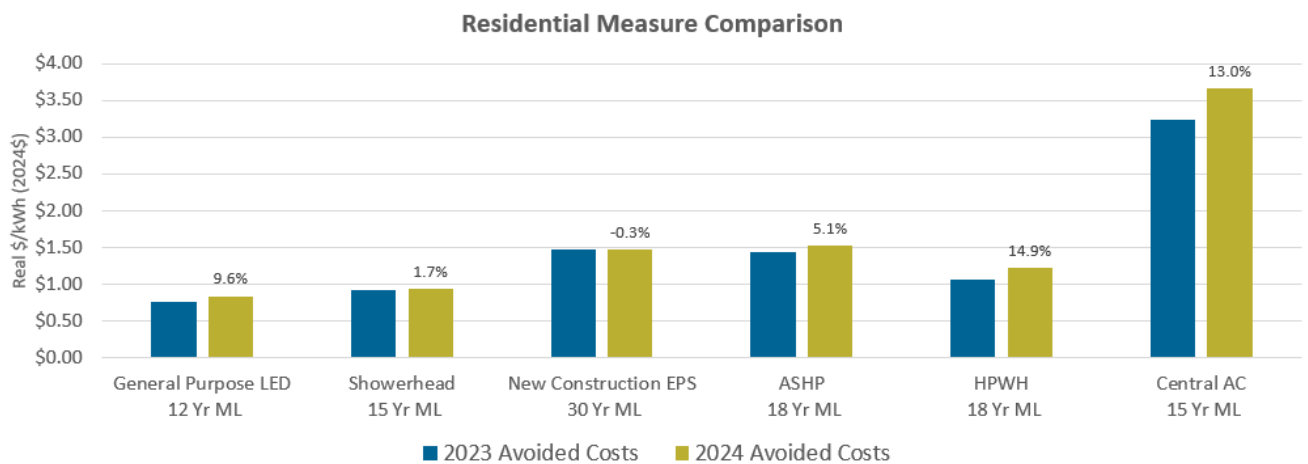


Figure 4. Commercial Avoided Cost Comparison of Representative Measures

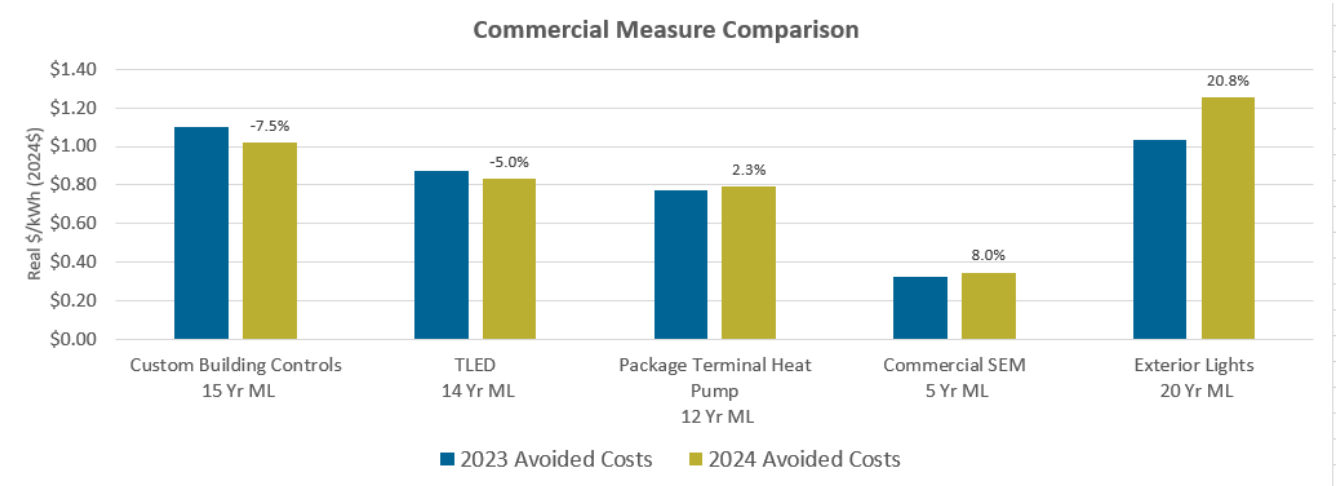
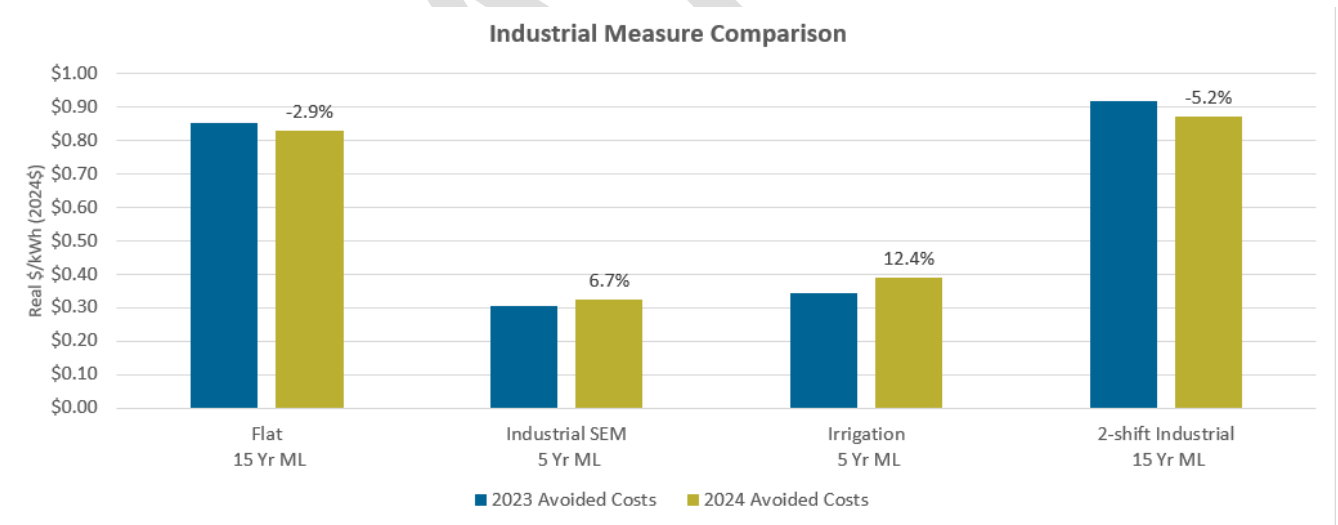


Figure 5. Industrial Avoided Cost Comparison of Representative Measures



Memo

To: Anna Kim, Oregon PUC
From: Gina Saraswati, Energy Trust of Oregon
Date: November 11, 2022
Re: 2024 Natural Gas Avoided Cost Update Summary

This memo provides a summary of the updates to Energy Trust's 2024 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 2023 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 2024 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 2023 Avoided Costs, the inputs provided by each gas utility from their most recent IRPs and updated utility submissions for consideration in 2024 Avoided Costs. The table also shows the values that Energy Trust used in 2024 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 2023 vintage with the blended values used to calculate Avoided Costs for the 2024 vintage.

Table 1. Utility Inputs for use in Energy Trust 2024 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 2023 Avoided Cost (2024\$)	2.25%	4.54%	10%	\$0.35	\$433.34	\$2.32	\$0.52	\$0.06
Current Submission - 2018 IRP Update (2024\$)	2.25%	4.54%	10%	\$0.35	\$432.76	\$2.31	\$0.54	\$0.06
Current Submission ALT - 2022 IRP(2024\$)	2.85%	3.40%	10%	\$0.35	\$438.78	\$3.48	\$0.66	\$0.10
Selected Input for 2024 Avoided Cost (2024\$)	2.25%	4.54%	10%	\$0.35	\$432.76	\$2.31	\$0.67	\$0.06
2024 Avoided Cost Input Source	2018 IRP Update	2018 IRP Update	2018 IRP Update	2018 IRP Update	2018 IRP Update	2018 IRP Update	DEQ	2018 IRP Update
Cascade Natural Gas								
Selected Input for 2023 Avoided Cost (2024\$)	3.72%	7.33%	10%	\$0.33	\$1.46	\$3.84	\$0.52	\$0.00
Current Submission - 2020 IRP (2024\$)	3.70%	7.33%	10%	\$0.36	\$1.38	\$4.37	\$0.37	-\$0.14
Current Submission ALT - 2023 IRP (2024\$)	3.27%	7.27%	10%	\$0.37	\$11.15	\$0.00	\$0.62	\$0.14
Selected Input for 2024 Avoided Cost (2024\$)	3.70%	7.33%	10%	\$0.36	\$11.15	\$4.37	\$0.67	\$0.00
2024 Avoided Cost Input Source	2020 IRP	2020 IRP	2020 IRP	2020 IRP	ALT - 2023 IRP	2020 IRP	DEQ	2020 IRP
Avista								
Selected Input for 2023 Avoided Cost (2024\$)	2.00%	4.36%	10%	\$0.35	\$376.44	\$0.06	\$0.52	\$0.00
Current Submission - 2021 IRP (2024\$)	2.00%	4.36%	10%	\$0.27	N/A	\$0.06	\$0.24	\$0.00
Current Submission ALT - 2023 IRP (2024\$)	2.00%	4.71%	N/A	\$1.65	N/A	#N/A	\$0.59	#N/A
Selected Input for 2024 Avoided Cost (2024\$)	2.00%	4.36%	10.00%	\$1.65	\$382.37	\$0.06	\$0.67	\$0.00
2024 Avoided Cost Input Source	2021 IRP	2021 IRP	2021 IRP	ALT - 2023 IRP	Blended NWN & CNG Value	2021 IRP	DEQ	2021 IRP
Energy Trust								
Old Blended Input for 2023 Avoided Cost (2024\$)	2.40%	4.50%	10%	\$0.35	\$376.44	\$2.26	\$0.52	\$0.04
New Blended Input for 2024 Avoided Cost (2024\$)	2.39%	4.50%	10%	\$0.46	\$382.37	\$2.35	\$0.67	\$0.05
Percent Difference	0%	0%	0%	34%	2%	4%	28%	6%

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 2024 gas utility expenditures from Energy Trusts Round 1 2023-2024 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 2024\$ for use in the 2024 Avoided Costs.
- 2) 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 weighted average of values from the other two respective utilities for input.
- 3) The carbon compliance value selected are based on the Community Climate Investment (CCI) credit values published by DEQ as part of the adopted 2021 rules in [OAR 340-271-990](#) and the carbon intensity of each respective utility.

Table 2 below provides a comparison of the blended 2023 Avoided Cost Component Values to the updated 2024 Avoided Cost Component values and their percent change from 2023.

Table 2: Comparison of Component Values from 2023 Avoided Costs to 2024 Avoided Costs

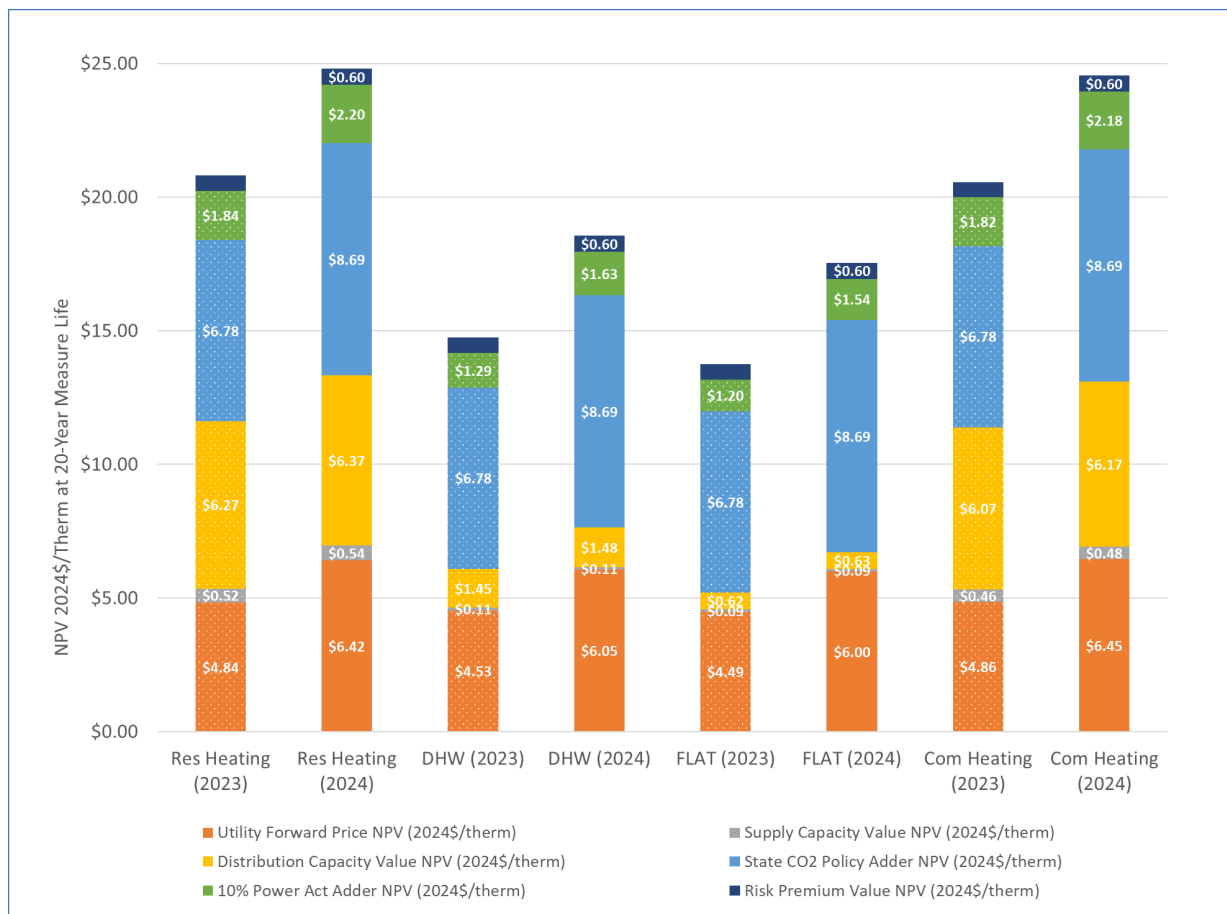
Avoided Cost Component	2023 AC Blended Value	2024 AC (Updated) Blended Value	% Change
Inflation rate	2.40%	2.39%	0%
Real Discount rate	4.50%	4.50%	0%
Regional Act Credit	10%	10%	0%
Commodity and Transport Prices - 2024\$/Therm	\$0.35	\$0.46	34%
Distribution Capacity - 2024\$/Therm/Year	\$376.44	\$382.37	2%
Supply Capacity - 2024\$/Therm/Year	\$2.26	\$2.35	4%
CO2 Compliance - 2024\$/Therm	\$0.52	\$0.67	28%
Risk Reduction - 2024\$/Therm	\$0.04	\$0.05	6%

Results Summary

Once the updated values provided by Gas Utilities were blended, Energy Trust compared the respective value components of the Avoided Costs for updated 2024 Avoided Costs to the current 2023 iteration of Avoided Costs and compared the overall impact of the changes using the mix of projects from 2021 program savings achievements as a proxy for end uses and related load profiles associated with specific avoided cost calculation outputs. **Overall, 2024 natural gas Avoided Costs increased by 23 percent** compared to current 2023 Avoided Costs, when weighted by the project mix from the last full year of savings achieved in 2021.

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 1 below illustrates and compares the differential impact of the individual component parts of 2023 and 2024 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 an assumed 20 year measure life. This figure does not represent the proportional contribution of each loadshape to Energy Trust's overall portfolio.

Figure 1. 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

Forward Market Prices

Figure 2 compares blended commodity and transport prices from 2023 Avoided Cost inputs and 2024 Avoided Cost inputs. Overall blended commodity and transport prices increased by 34%.

Figure 2. Blended Commodity and Transport Price Comparison

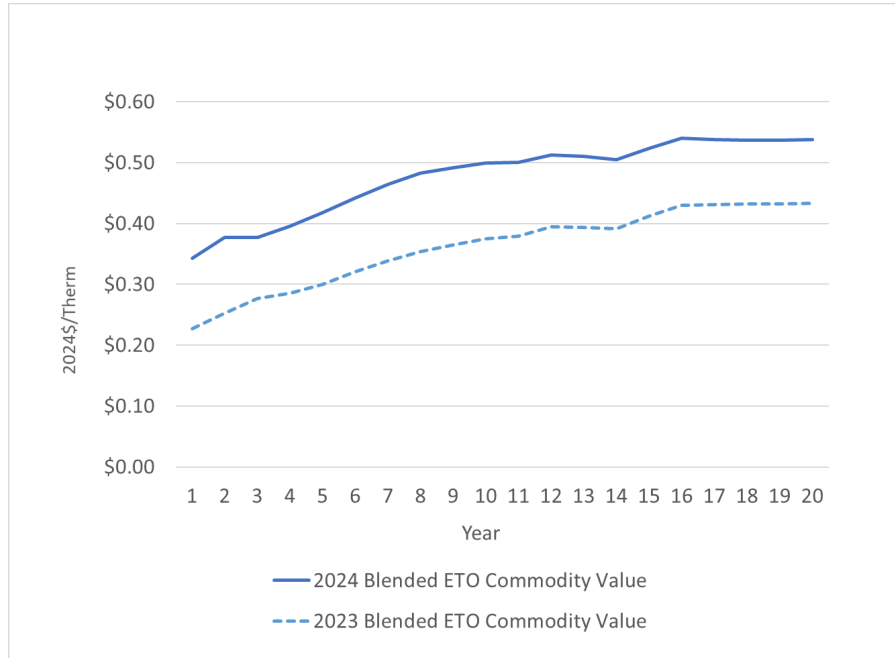
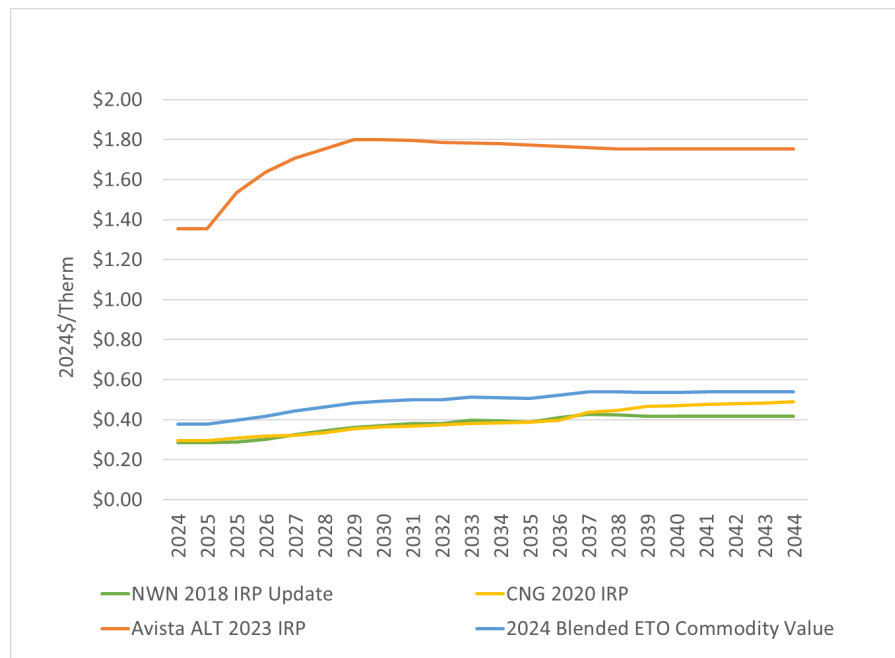


Figure 3. Comparison of Utility Specific Commodity and Transport Price for 2024 Avoided Costs



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 utilizes 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. For 2024 Avoided Costs, Energy Trust uses the same peak hour factors and peak day factors that were used for 2023 Avoided Costs.

Historically, Energy Trust relied on peak hour factors that were calculated separately 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 from the 2021 Avoided Costs, Energy Trust altered its method for calculating 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 2023 Avoided Costs and is also applied to the 2024 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 (NWPPCC) and Northwest Natural regression modeling. Table 3 and 5 show each of the peak factors used in 2024 Avoided Costs and their respective sources.

Table 3 – Daily Peak Factors for 2024 and 2023 Avoided Costs

End-Use Load Shape	2024 Peak Day Factor	Peak Day Factor Source	2023 Peak Day Factor	Peak Day Factor Source
Residential Space Heating	0.0176	Northwest Natural 2018 IRP Update 3	0.0176	Northwest Natural 2018 IRP Update 3
Commercial Space Heating	0.0157	Northwest Natural 2018 IRP Update 3	0.0157	Northwest Natural 2018 IRP Update 3
Domestic Hot Water	0.0036	NWPPCC	0.0036	NWPPCC
Flat	0.0030	NWPPCC	0.0030	NWPPCC
Clotheswasher	0.0020	NWPPCC	0.0020	NWPPCC

Table 4 – Proportion of Hourly Consumption Used to Derive Space Heating Peak Hour Factors

End-Use Load Shape	% of hourly usage on a peak day	Source	Analog Profile
Residential Space Heating	7.27%	NWPPCC GLS Shapes	R-All-HVAC-ER-All-All-E
Commercial Space Heating	7.90%	NWPPCC GLS Shapes	C-All-HVAC-ER-All-All-E

Table 5 – Hourly Peak Factors for 2024 and 2023 Avoided Costs

End-Use Load Shape	2024 Peak Hour Factor	Peak Hour Factor Source	2023 Peak Hour Factor	Peak Hour Factor Source
Residential Space Heating	0.00128	NWPPCC & Northwest Natural 2018 IRP Update 3	0.00128	NWPPCC & Northwest Natural 2018 IRP Update 3
Commercial Space Heating	0.00124	NWPPCC & Northwest Natural 2018 IRP Update 3	0.00124	NWPPCC & Northwest Natural 2018 IRP Update 3
Domestic Hot Water	0.00030	NWPPCC	0.00030	NWPPCC
Flat	0.00013	NWPPCC	0.00013	NWPPCC
Clotheswasher	0.00024	NWPPCC	0.00024	NWPPCC

Supply Capacity

The blended supply capacity values that were used as inputs to avoided cost calculations increased by 4% from the prior round of Avoided Costs submissions. Utility values used in the 2024 avoided cost calculation are illustrated in Figure 4.

Figure 4. Utility Supply Capacity Values for 2024 Avoided Costs

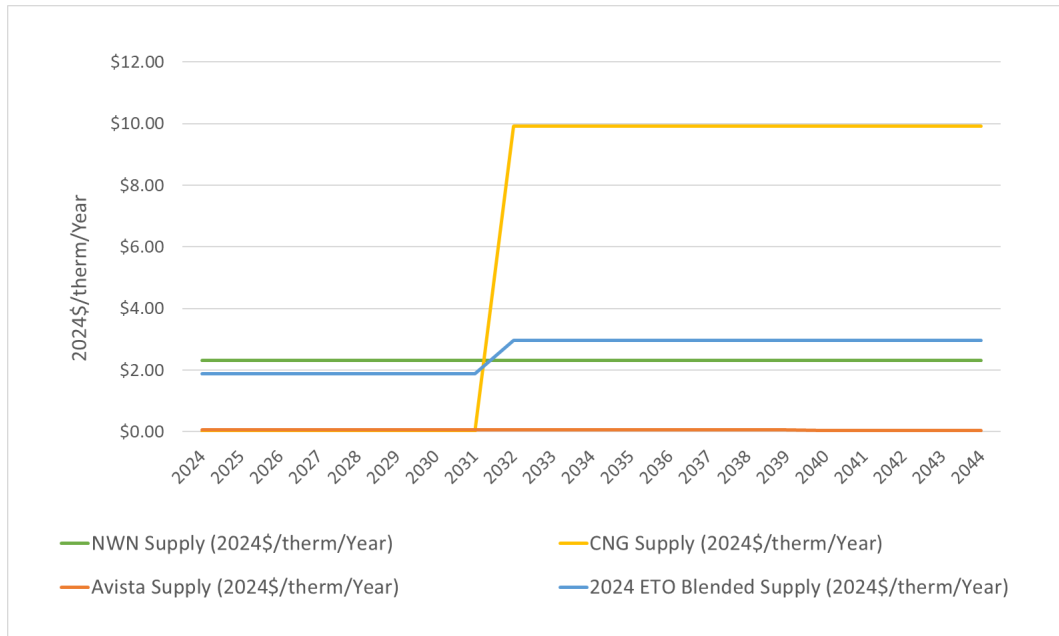
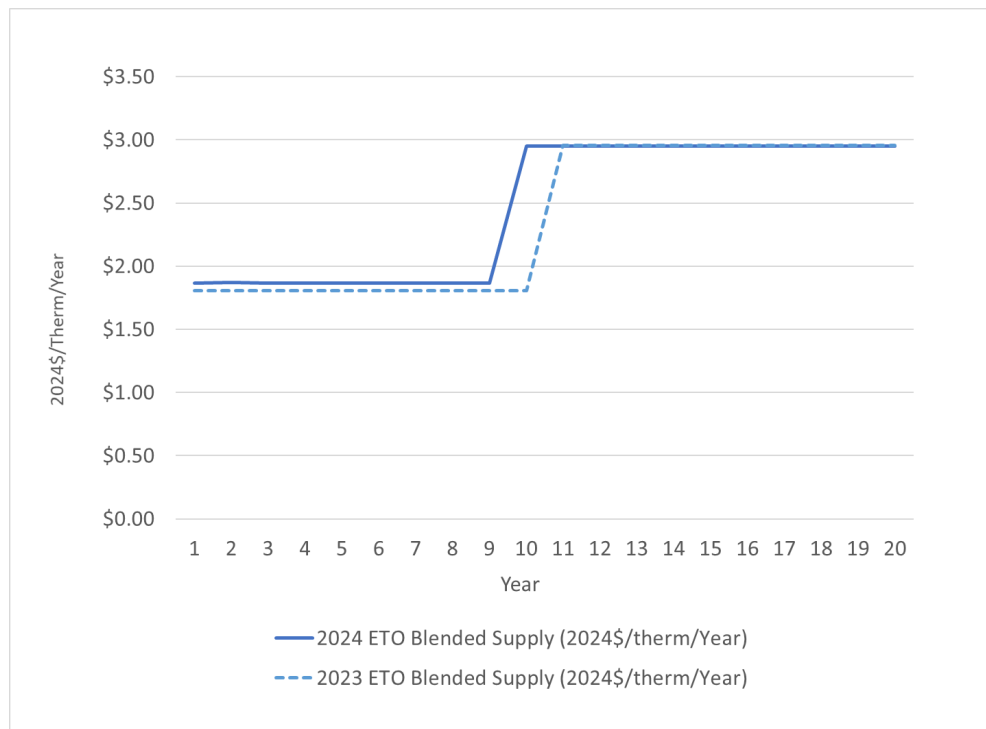


Figure 5 Blended Supply Capacity Values for 2024 and 2023 Avoided Costs



Distribution Capacity

The blended distribution capacity values that were used as inputs to avoided cost calculations increased by 2% from the prior round of Avoided Costs submissions.

Table 6 illustrates the change in distribution capacity costs for each end use load profile from 2023 blended Avoided Costs to the current 2024 blended avoided cost.

Table 6. 70 Year Average Blended Distribution Capacity Value by Loadshape

	DHW	FLAT	Res Heating	Com Heating	Clotheswasher
2023 Blended Avoided Costs	\$1.19	\$0.50	\$5.11	\$4.95	\$0.95
2024 Blended Avoided Costs	\$1.23	\$0.52	\$5.31	\$5.15	\$0.99

Carbon Policy Compliance Value

Carbon compliance values increased by 28% from the prior blended value of \$0.52 per therm to \$0.67 per therm.

To calculate carbon value in 2024 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 Program¹. The dollar per metric ton schedule starts at \$107 in 2023 and can be found in Table 7 of the Division 271 Rules². The adopted values increased from the proposed rulemaking draft values used in the 2023 Avoided Costs.

Each gas utility submitted utility-specific carbon intensity values (MTCO_{2e}/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 2024 Avoided Costs.

Table 7. Utility-Specific Carbon Intensity Values

	Carbon Intensity (MTCO _{2e} /Dth)
Northwest Natural	0.053100
Cascade Natural Gas	0.057757
Avista	0.053061
Energy Trust Blended	0.053606

Additionally, each gas utility provided primary and alternative carbon cost submissions. The alternative carbon costs submission closely mirrors the carbon values published by DEQ as part of their adopted 2021 rules. 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.

¹ [Department of Environmental Quality : Greenhouse Gas Emissions Program 2021 : Rulemaking at DEQ : State of Oregon](#)

² [Division 271 Rules](#)

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

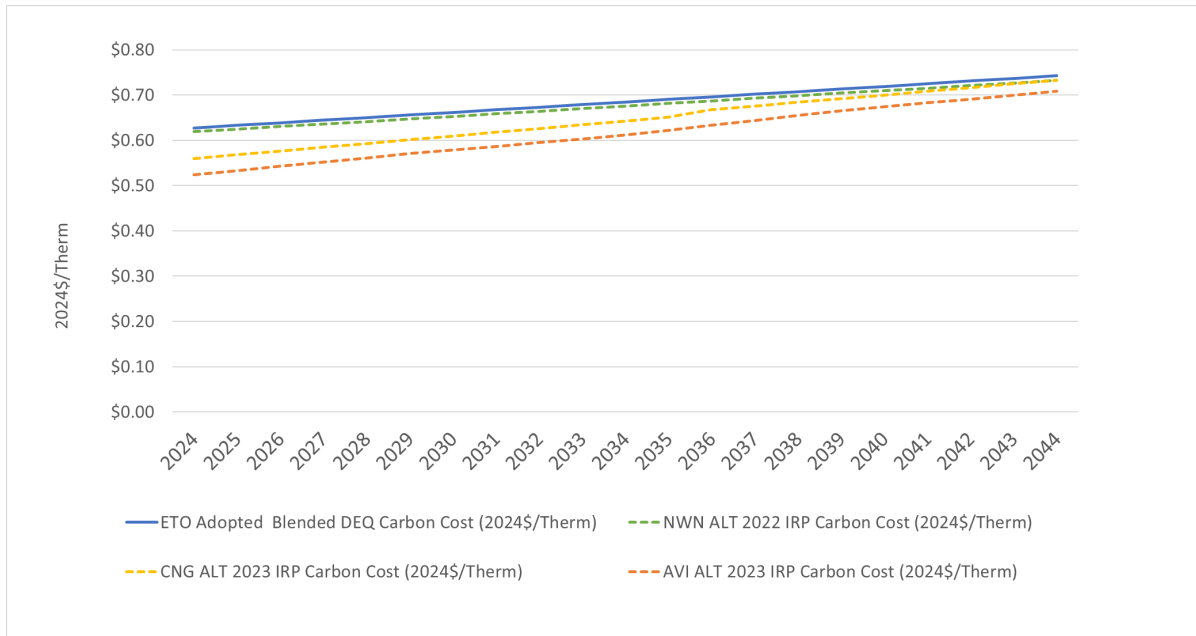
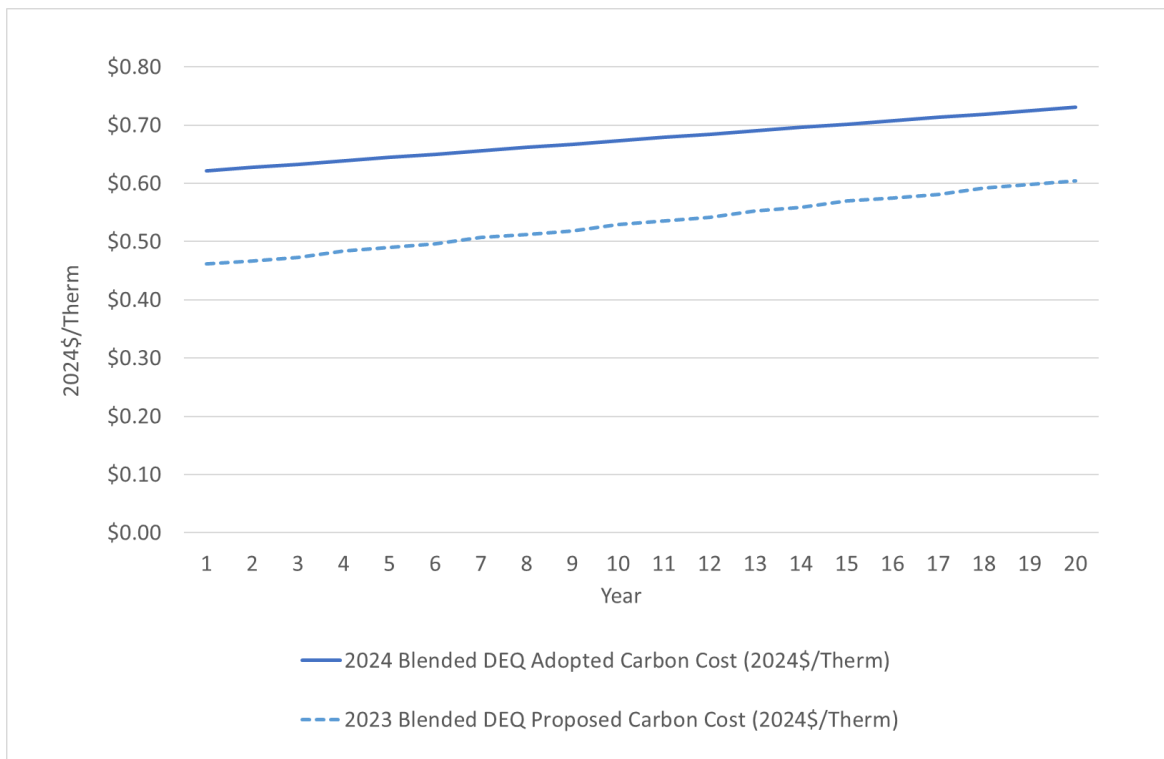


Figure 7 Blended Carbon Compliance Values for 2024 and 2023 Avoided Costs



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 2023 and 2024 Avoided Costs included positive risk reduction values.

Risk reduction increased by 6% from the 2023 Avoided Costs with a blended value of \$0.04 per therm to a blended value of \$0.05 per therm for 2024 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.

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 2023 to 2024 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

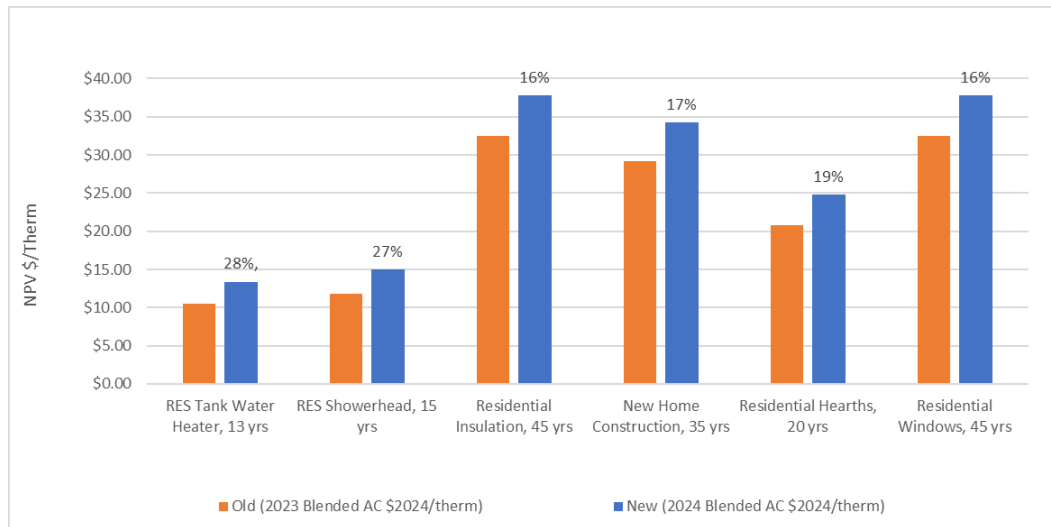


Figure 9. Commercial Avoided Cost Comparison of Representative Measures

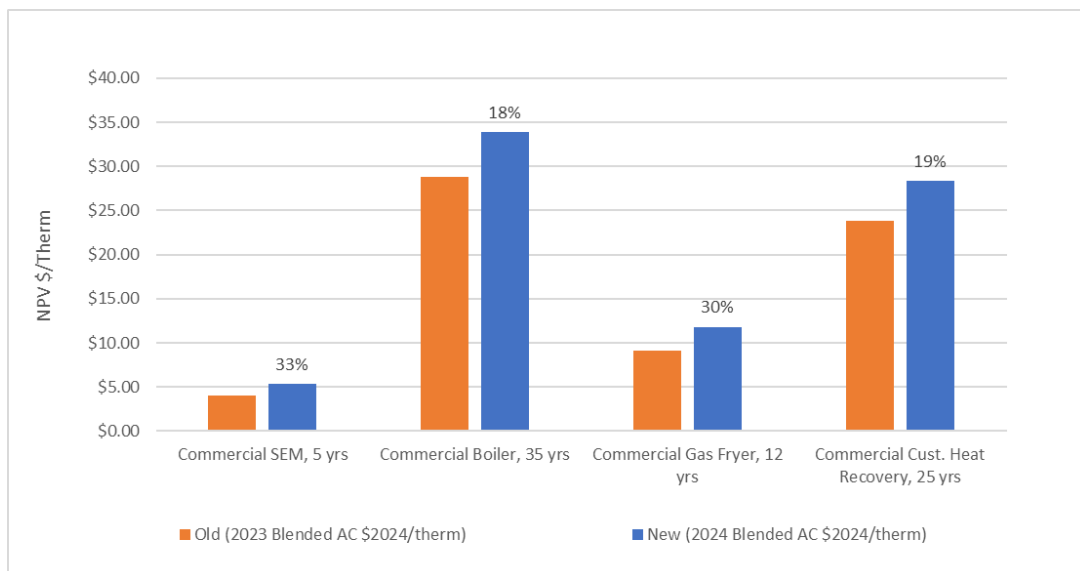


Figure 10. Industrial Avoided Cost Comparison of Representative Measures

