



Overview of 2024 Draft Avoided Costs for Oregon

UM 1893 Workshop Presentation

October 3rd, 2022

Avoided Cost Background

Avoided Costs Definition

- The costs a utility would have otherwise had to pay to provide energy through utility supply side resources and delivery infrastructure if demand side energy resources, such as energy efficiency, had not been brought into implementation.

What Are Avoided Costs?

- Stream of forecasted values over the next 20 years extended to cover the measure lives of the most long lived measures
- Different end uses have different values based on whether they save during utility peak periods
- They are the primary component of value in the numerator of the Benefit/Cost ratio we use to screen measures and programs for cost-effectiveness
- Energy Trust calculates blended avoided costs for gas and for electric to apply for cost-effectiveness screening throughout our territory

Avoided Costs Updates

- Energy Trust routinely updates avoided costs to reflect the current value of electric and gas energy efficiency
- We are in process of updating avoided costs for 2024 planning and reporting
- The last time we updated avoided costs for OR was in 2021 for 2023 planning
- We will update avoided costs again in Fall/Winter 2023/2024 for 2025 planning

Draft Electric Avoided Cost Updates

Key Components of Electric Avoided Costs

1. Energy Price Forecasts
 - includes embedded carbon value
2. Avoided Transmission & Distribution (T&D) capacity deferral value
3. Avoided generation capacity deferral value
4. Regional 10% conservation credit
5. Utility risk reduction value

Comparison of Electric Avoided Cost Inputs

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%	2.11%	2.11%	IRP
	Real Discount Rate	4.54%	4.63%	IRP	4.41%	4.25%	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%	90%	Current	50%	50%	50%	IRP
	Seasonal Capacity Split - Winter	50%	10%	Current	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
Other Values	Risk Reduction Value	\$3.88	\$3.05	IRP	\$3.00	\$3.00	\$3.00	IRP

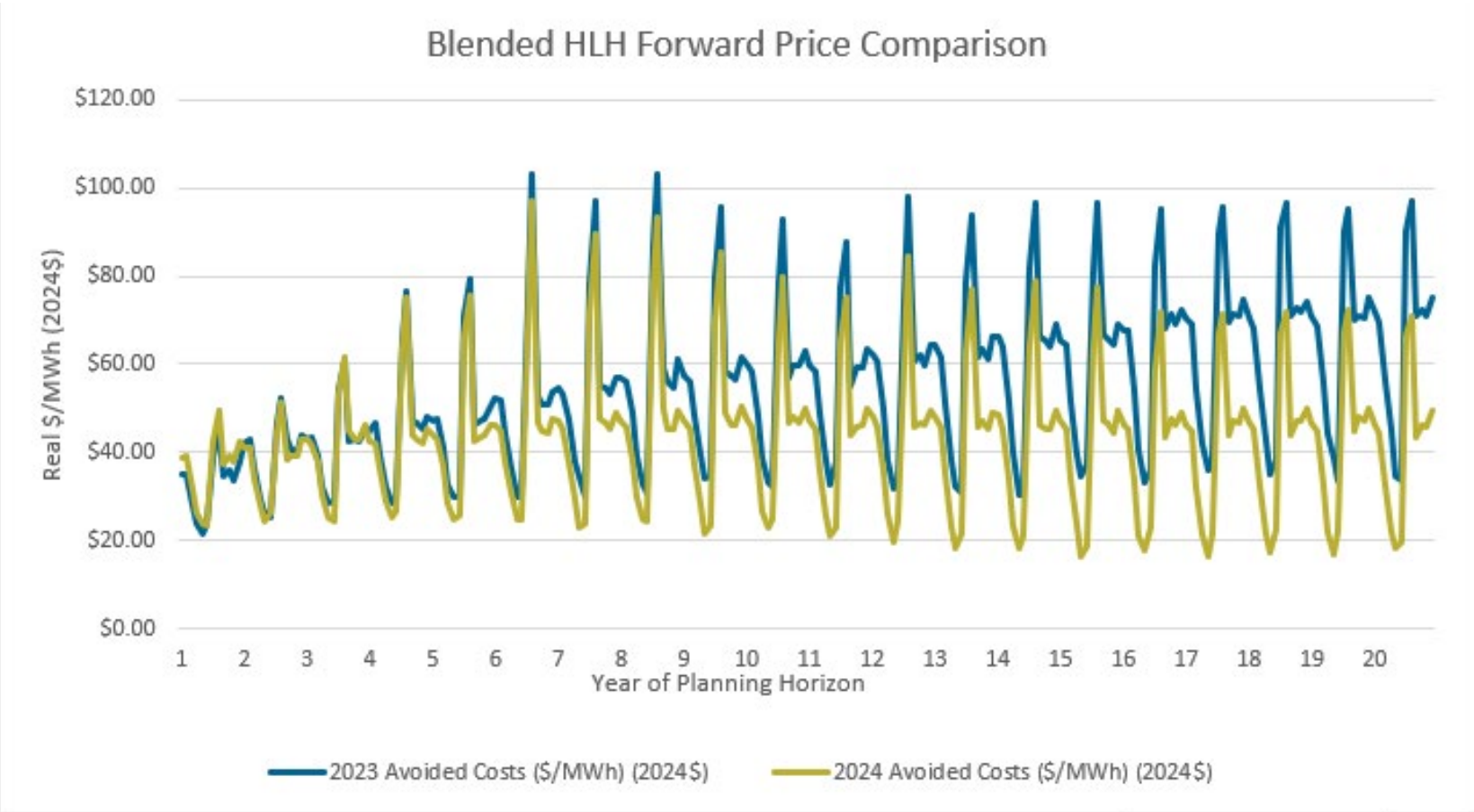
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Comparison of Electric Component Values from 2023 Avoided Costs and 2024 Draft Avoided Costs

Avoided Cost Component	2024 AC (Updated) Blended Value	2023 Blended Value	Percent Change
Inflation Rate	2.13%	2.14%	-1%
Real Discount Rate	4.50%	4.50%	0%
Northwest Power Act 10% Credit	10.00%	10.00%	0%
Risk Reduction Value (\$/MWh) (\$ 2024)	\$3.26	\$3.73	-13%
Transmission Loss Factor	2.68%	2.54%	5%
Transmission Loss Credit (\$/kW-yr.) (\$ 2024)	\$37.75	\$8.14	364%
Distribution Loss Factor, Commercial	3.89%	3.96%	-2%
Distribution Loss Factor, Industrial	2.45%	2.15%	14%
Distribution Loss Factor, Residential	4.30%	4.63%	-7%
Distribution Credit (\$/kW-yr.) (\$ 2024)	\$15.12	\$20.43	-26%
Generation Deferral Credit (\$/kW-yr.) (\$ 2024)	\$108.91	\$109.78	-1%

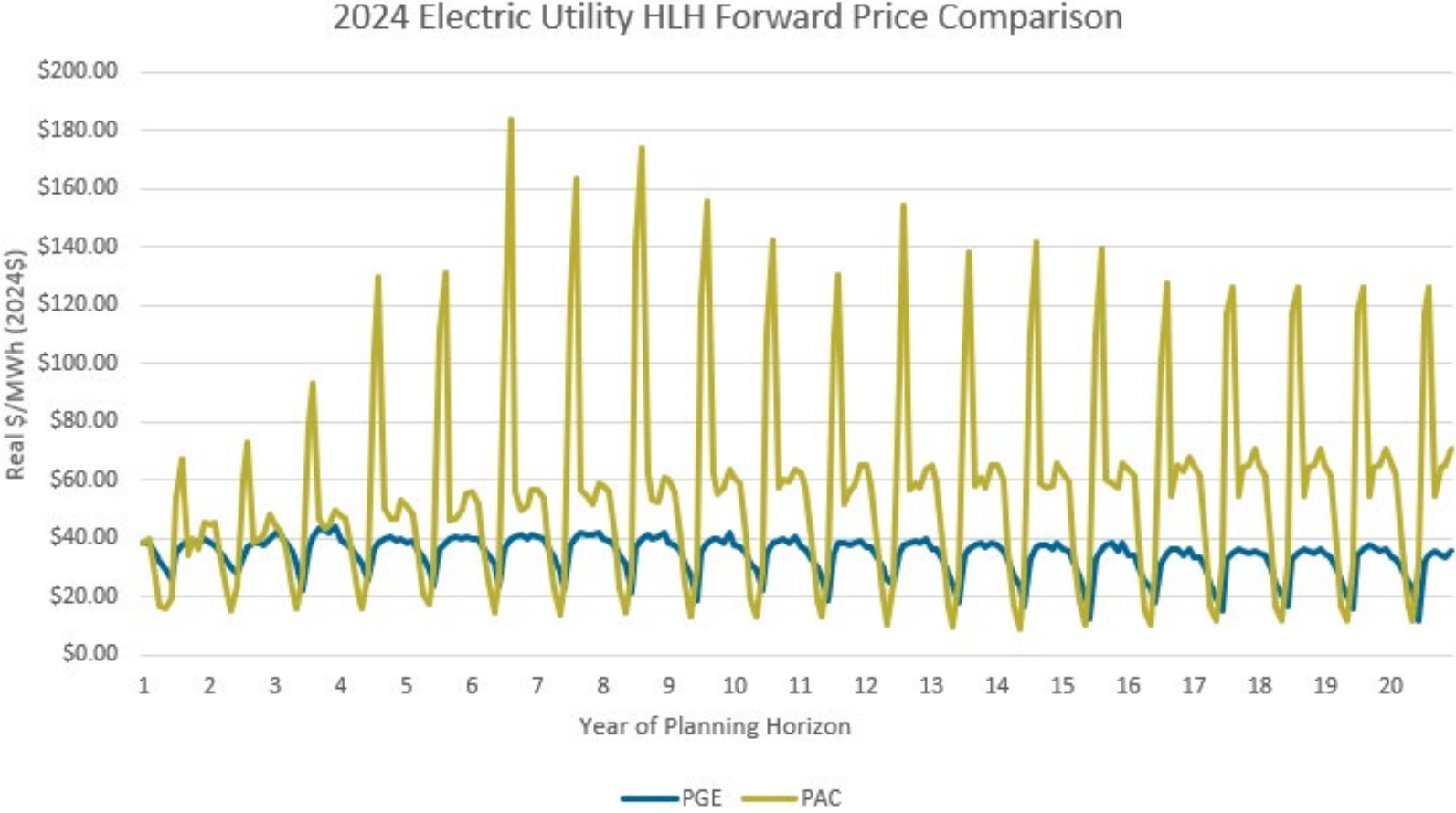
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Blended High Load Hours Forward Price Comparison



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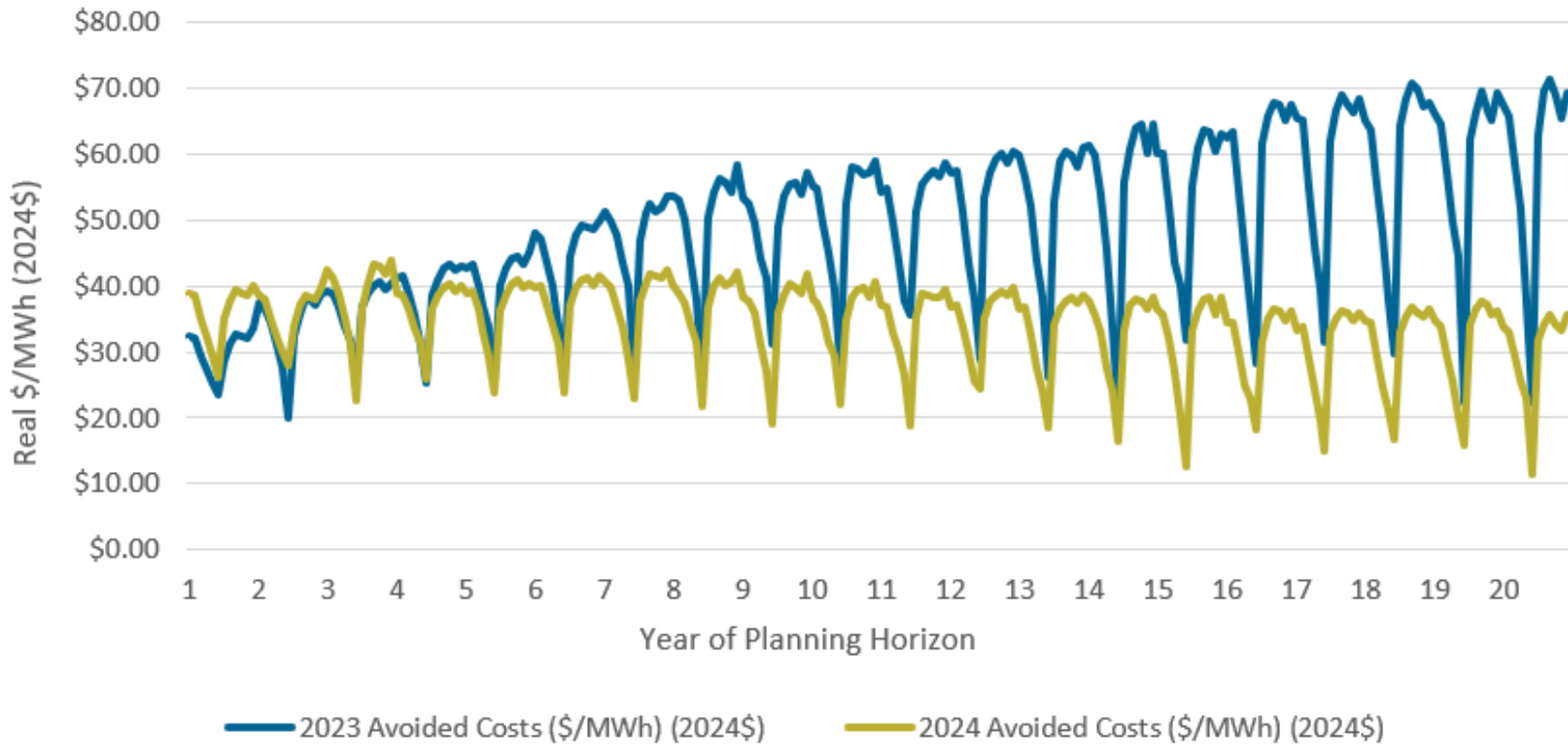
Electric Utility HLH Forward Price Comparison for 2024 Avoided Costs



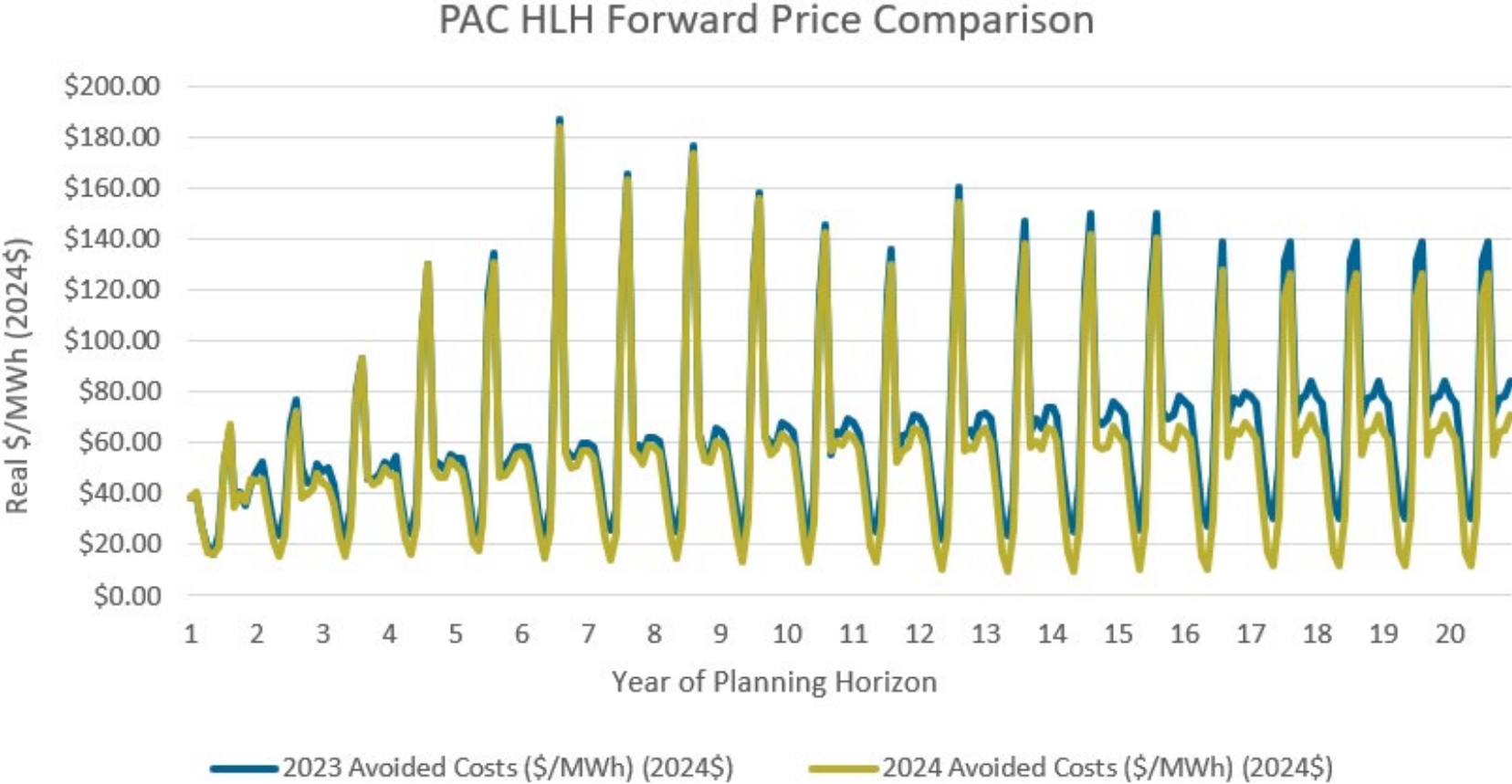
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PGE HLH Forward Price Comparison

PGE HLH Forward Price Comparison



PAC HLH Forward Price Comparison



Electric Generation Capacity Deferral Value

- Blended values selected for draft calculations
 - Went down by 1% compared to 2023 avoided costs.
- Assumed
 - PGE system represents a 50% summer/50% winter split.
 - PacifiCorp system represents 100% summer/0% winter split.

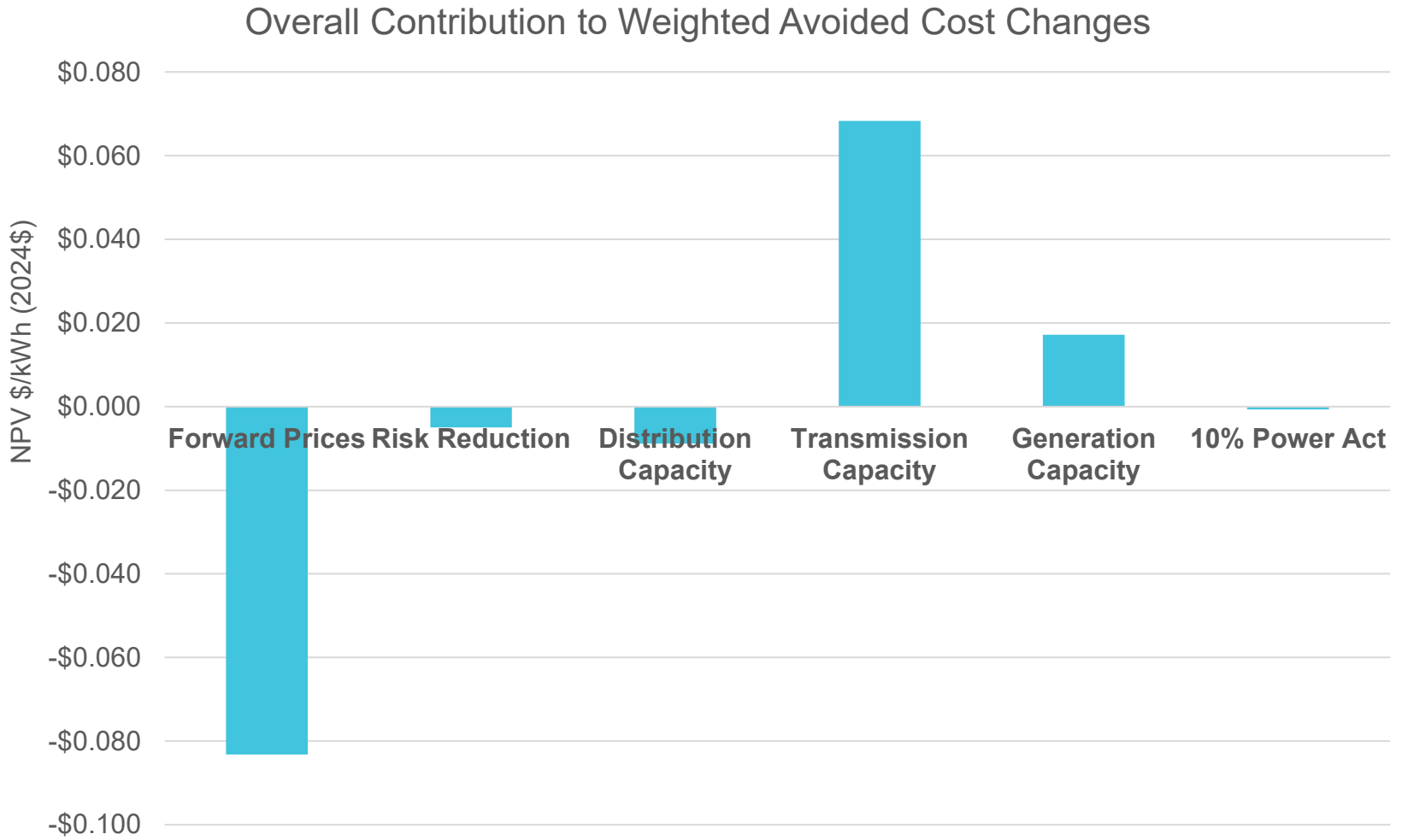
Electric Transmission and Distribution Capacity Deferral Value

- Blended values selected for draft calculations
 - Transmission deferral value went up 360% compared to 2023 avoided costs.
 - Distribution deferral value went down 26% compared to 2023 avoided costs.

Risk Reduction and NW Power Act Credit

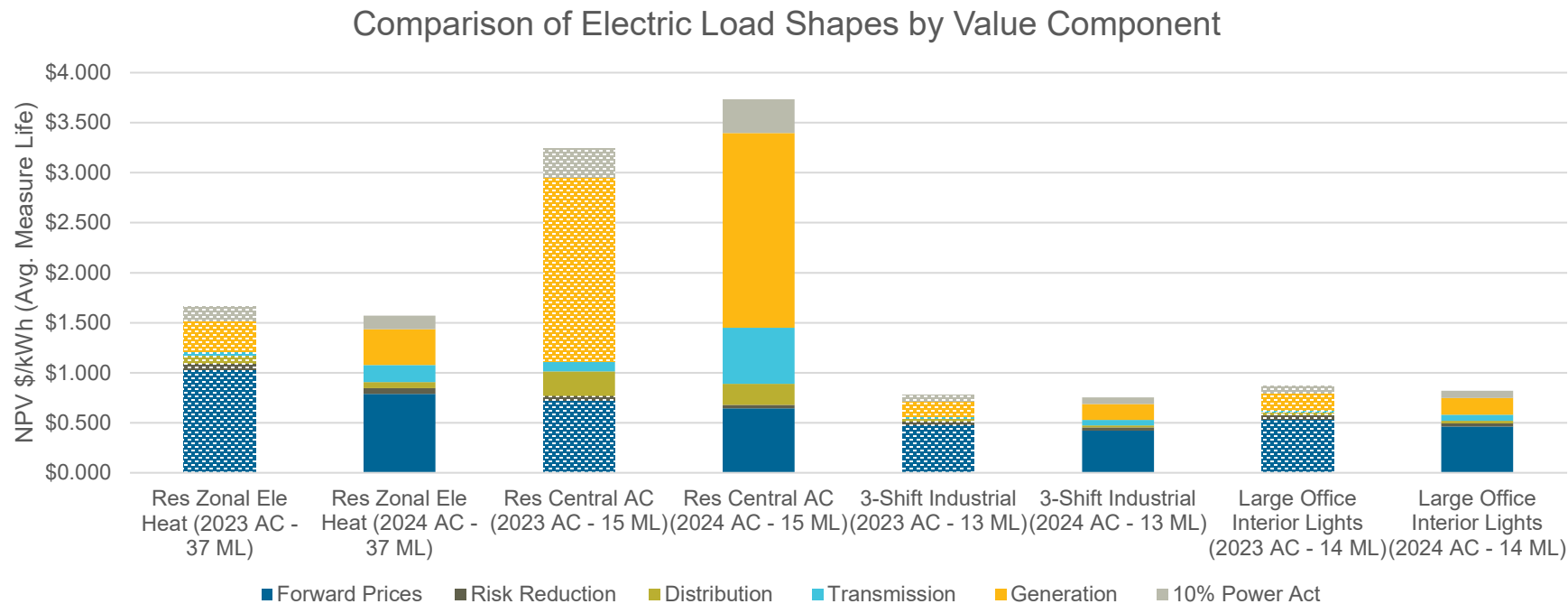
- Blended risk reduction values went down by 13% compared to 2023 avoided costs
- NW Power Act Credit adds 10% to all values except for Risk Reduction Value

Electric - Contribution of Each Component to Overall Weighted Average 2024 Avoided Cost Changes



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Comparison of Electric Load Shapes by Value Component



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Draft Gas Avoided Cost Updates

Key Components of Gas Avoided Costs

1. Gas Price Forecasts
2. Supply and Distribution Capacity Costs
3. Oregon State Carbon Policy Adder
4. Regional 10% conservation credit
5. Utility risk reduction value

Comparison of Gas Avoided Cost Inputs

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 (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(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 (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%	\$0.27	\$382.37	\$0.06	\$0.67	\$0.00
2024 Avoided Cost Input Source	2021 IRP	2021 IRP	2021 IRP	2021 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%	\$0.34	\$382.37	\$2.35	\$0.67	\$0.05
Percent Difference	0%	0%	0%	0%	2%	4%	28%	6%

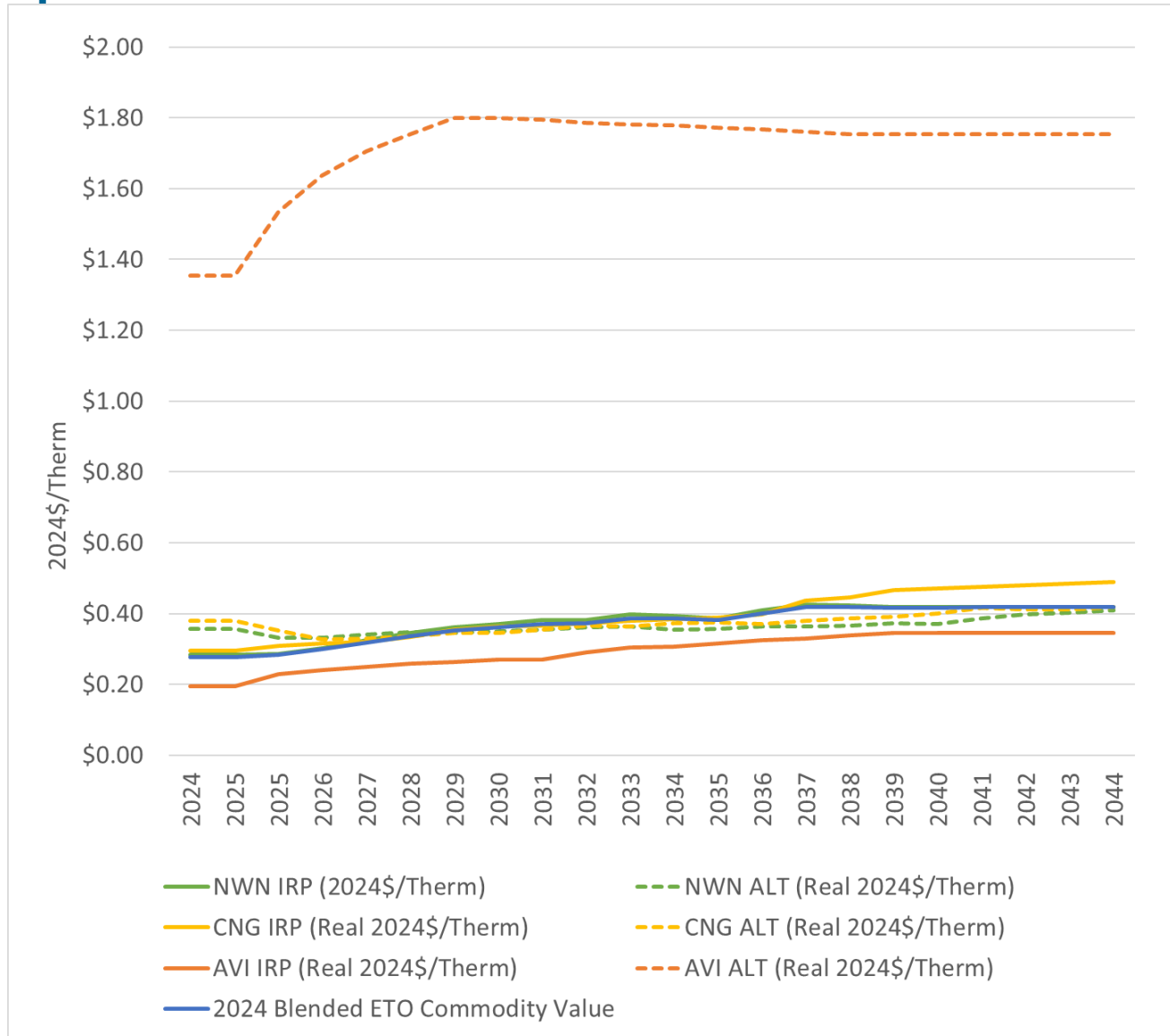
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Comparison of Gas Component Values from 2023 Avoided Costs and 2024 Draft Avoided Costs

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	\$0.34	0%
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%

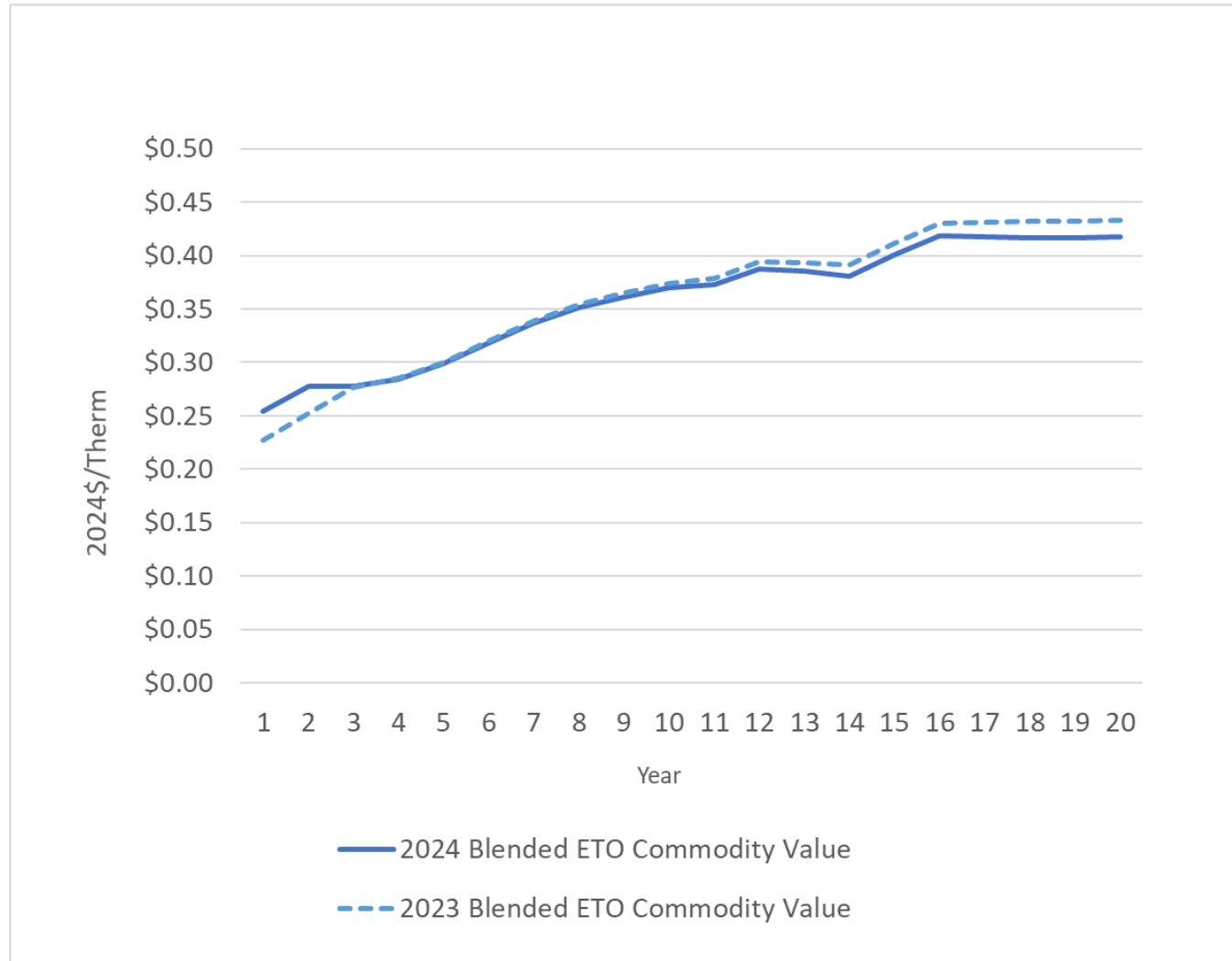
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Gas Utility Commodity and Transport Price Comparison for 2024 Avoided Cost



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Gas Blended Commodity and Transport Price Comparison



Peak Factors for 2024 Gas Avoided Costs

Daily Peak Factors for 2024 Avoided Costs

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

Hourly Peak Factors for 2024 Avoided Costs

End-Use Load Shape	2024 Peak Hour Factor	Peak Hour Factor Source
Residential Space Heating	0.00128	NWPCC and Northwest Natural
Commercial Space Heating	0.00124	NWPCC and Northwest Natural
Domestic Hot Water	0.00030	NWPCC
Flat	0.00013	NWPCC
Clotheswasher	0.00024	NWPCC

Gas Utility Supply Capacity Values for 2024 Avoided Costs



Gas Blended Supply Capacity Values for 2024 Avoided Costs



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Distribution Gas Capacity Values

Input Vintage Description	Distribution Capacity - Hourly
	\$/Therm/Year
Northwest Natural	
Selected Input for 2023 Avoided Cost (2024\$)	\$433.34
Current Submission - 2018 IRP Update (2024\$)	\$432.76
Current Submission - ALT (2024\$)	\$438.78
Selected Input for 2024 Avoided Cost (2024\$)	\$432.76
2024 Avoided Cost Input Source	2018 IRP Update
Cascade Natural Gas	
Selected Input for 2023 Avoided Cost (2024\$)	\$1.46
Current Submission - 2020 IRP (2024\$)	\$1.38
Current Submission - ALT(2024\$)	\$11.15
Selected Input for 2024 Avoided Cost (2024\$)	\$11.15
2024 Avoided Cost Input Source	ALT - 2023 IRP
Avista	
Selected Input for 2023 Avoided Cost (2024\$)	\$376.44
Current Submission - 2021 IRP (2024\$)	N/A
Current Submission - ALT (2024\$)	N/A
Selected Input for 2024 Avoided Cost (2024\$)	\$382.37
2024 Avoided Cost Input Source	Blended NWN & CNG Value
Energy Trust	
Old Blended Input for 2023 Avoided Cost (2024\$)	\$376.44
New Blended Input for 2024 Avoided Cost (2024\$)	\$382.37
Percent Difference	2%

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Calculating End Use Distribution Capacity

End-Use Load Shape	2024 Peak Hour Factor	Peak Hour Factor Source
Residential Space Heating	0.00128	NWPCC and Northwest Natural
Commercial Space Heating	0.00124	NWPCC and Northwest Natural
Domestic Hot Water	0.00030	NWPCC
Flat	0.00013	NWPCC
Clotheswasher	0.00024	NWPCC

Utility	Coincident System Peak Day Factor	Coincident System Peak Hour Factor
NWN	N/A	N/A
CNG	0.0513	0.0005371
AVI	0.0095	0.0004234

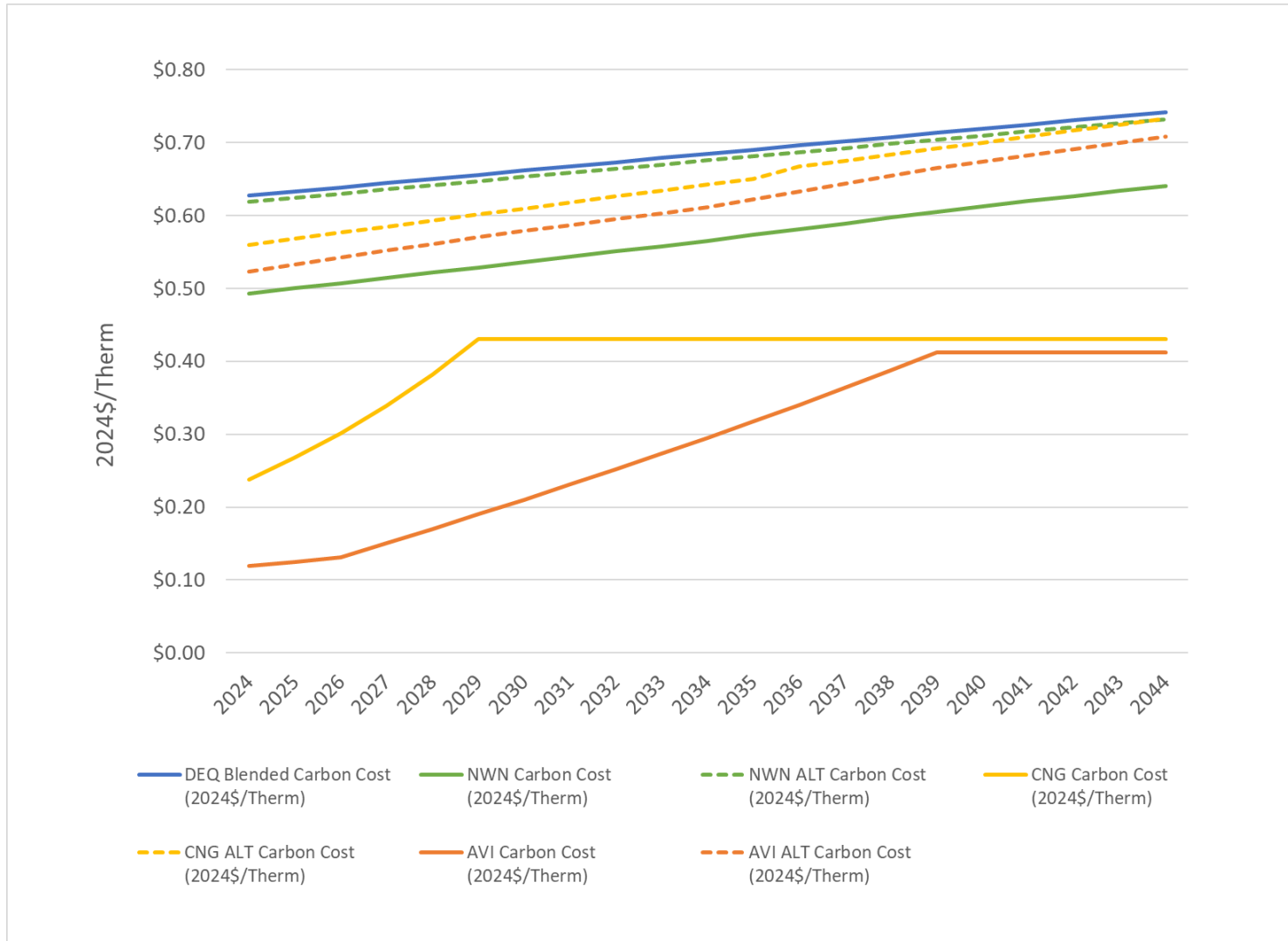
For end-use load profile i with a measure lifespan of t years:

- $End\ Use\ NWN\ Dist.\ Capacity\ Value_{i,t} = Peak\ Hour\ Value_t * 8760 * \frac{1}{10} * End\ Use\ Peak\ Hour\ Factor_i$
- $End\ Use\ CNG\ Dist.\ Capacity\ Value_{i,t} = \frac{CNG\ Peak\ Hour\ Value_t}{CNG\ Coincident\ System\ Peak\ Hour\ Factor} * \frac{1}{10} * End\ Use\ Peak\ Hour\ Factor_i$

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

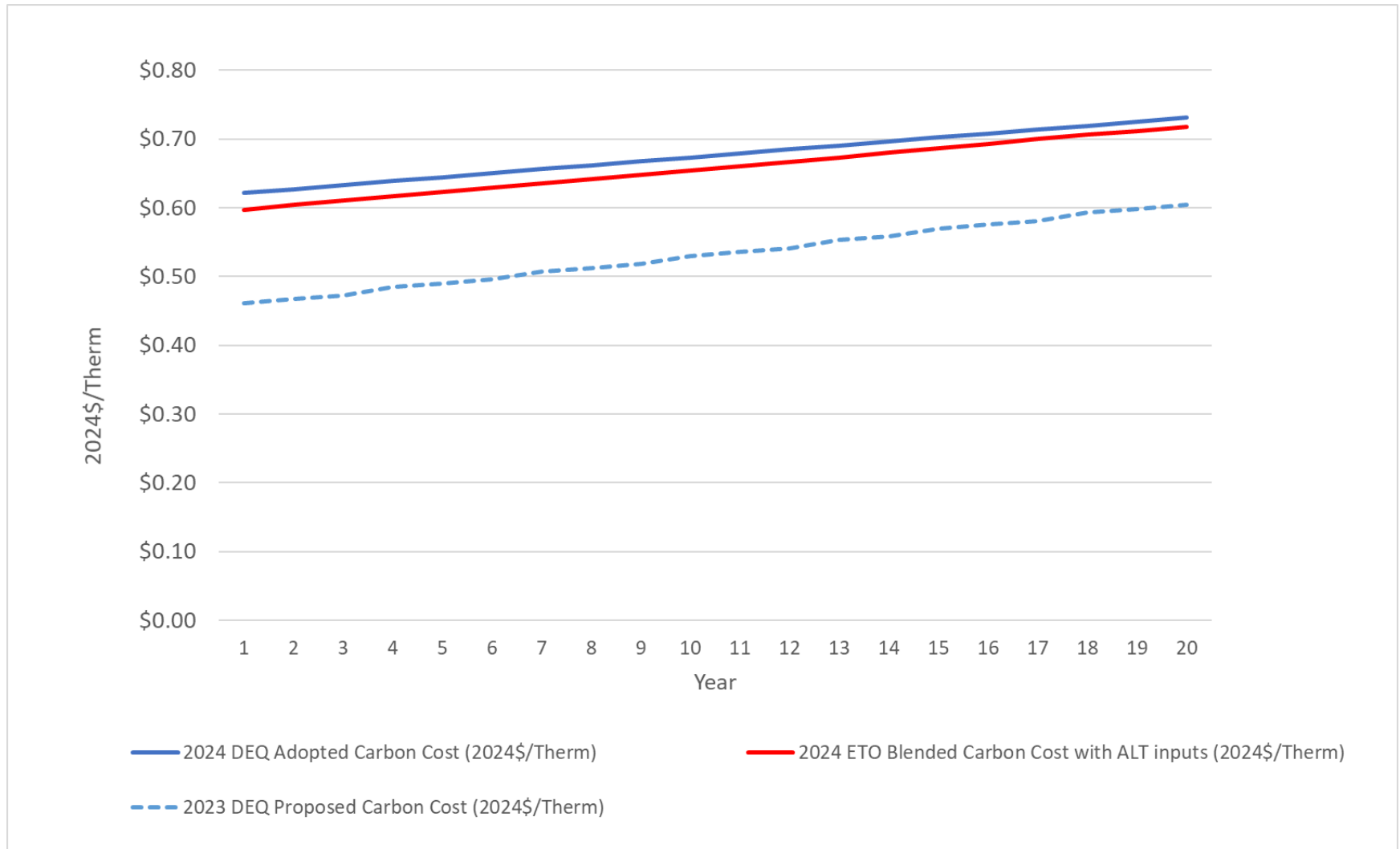
Gas Utility Carbon Compliance Values for 2024 Avoided Costs



DEQ values from Table 7 CCI credit contribution amount from [2021 Adopted Rules](#)

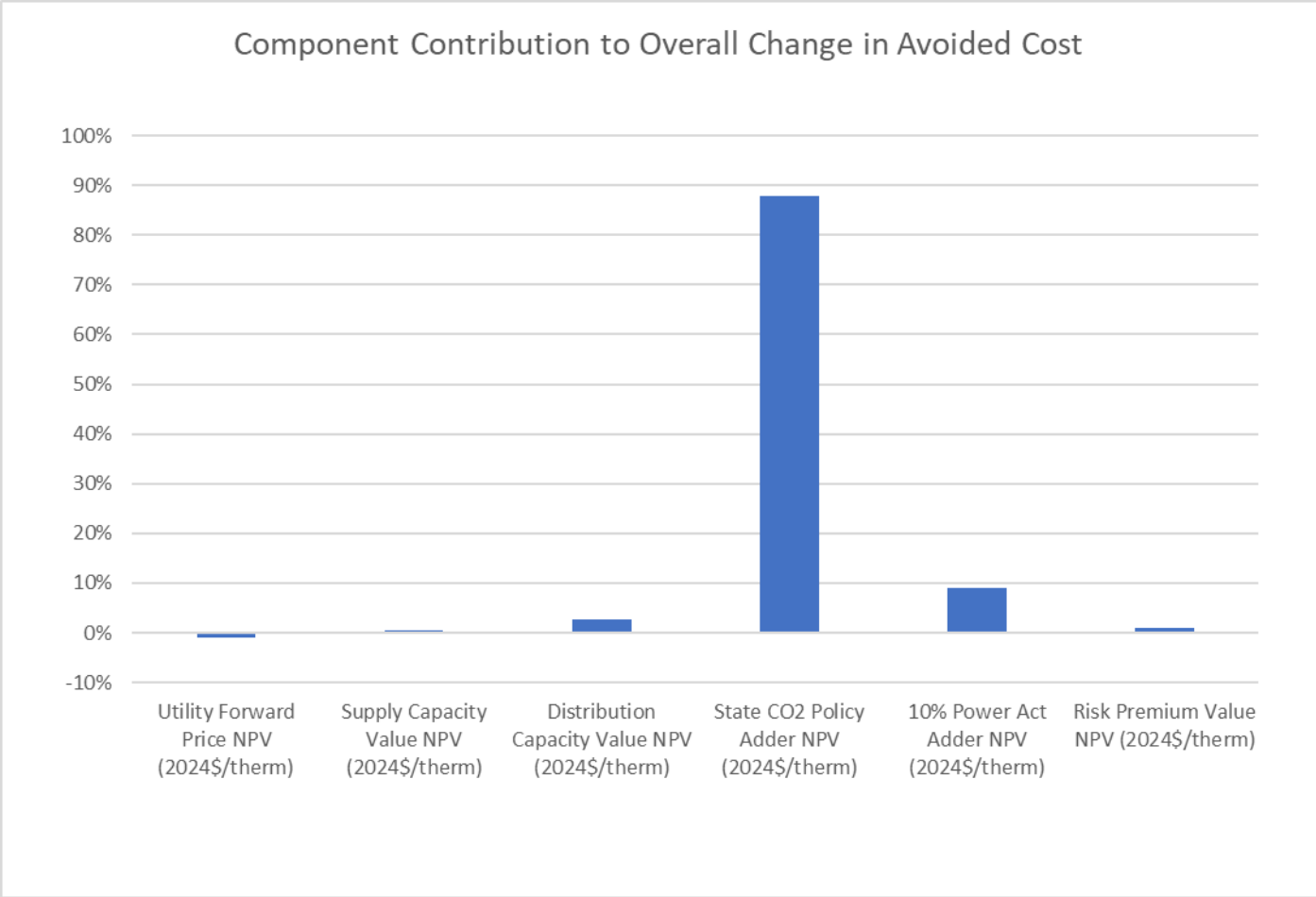
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Gas Utility Carbon Compliance Values for 2024 Avoided Costs



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Gas – Average Percent Change of Each Avoided Cost Component



Comparison of Gas Load Shapes by Value Component



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Next Steps

Next Steps

- Stakeholders submit additional feedback
- Energy Trust receives direction from OPUC staff on which values to use in final 2023 avoided cost calculations for Oregon
- Energy Trust finalizes calculations



Questions?

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Appendix

Energy Trust Background

About us

Independent
nonprofit

Serving 1.6 million customers of
Portland General Electric,
Pacific Power, NW Natural,
Cascade Natural Gas and Avista

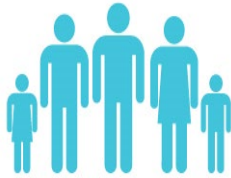
Providing access
to affordable
energy

Generating
homegrown,
renewable power

Building a
stronger Oregon
and SW
Washington

Clean and affordable energy since 2002

From Energy Trust's investment of \$1.8 billion in utility customer funds:



Nearly 718,000 sites transformed into energy efficient, healthy, comfortable and productive homes and businesses



14,500 clean energy systems generating renewable power from the sun, wind, water, geothermal heat and biopower



\$7.7 billion in savings over time on participant utility bills from their energy-efficiency and solar investments



29.3 million tons of carbon dioxide emissions kept out of our air, equal to removing 6 million cars from our roads for a year

A clean energy power plant

724 average megawatts saved

129 aMW generated

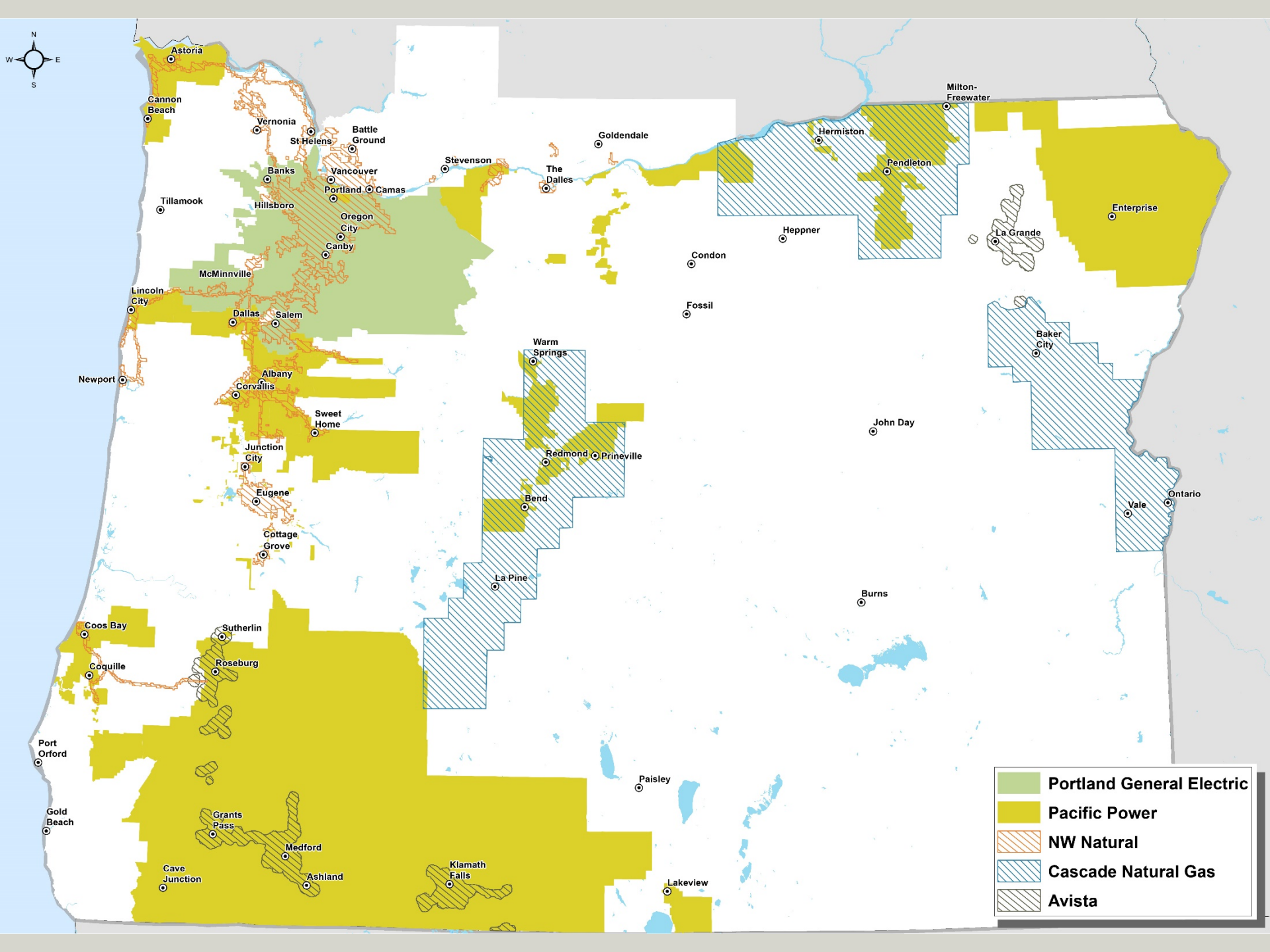
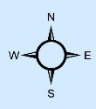
65 million annual therms saved

Enough energy to power **727,000** homes
and heat **129,000** homes for a year

Avoided **29.3** million tons of carbon dioxide

MAKING A COMMITMENT TO DIVERSITY, EQUITY AND INCLUSION





	Portland General Electric
	Pacific Power
	NW Natural
	Cascade Natural Gas
	Avista