2025 CONSERVATION POTENTIAL ASSESSMENT

NW Natural Gas

June 1, 2025

Prepared by:

LIGHTHOUSE ENERGY CONSULTING

ANCHOR BLUE

Nauvoo Solutions

Table of Contents

List of Figures

List of Tables

Executive Summary

Overview

This report describes the methodology and results of the 2025 Washington Conservation Potential Assessment (CPA) developed by Lighthouse Energy Consulting, Anchor Blue, and Nauvoo Solutions (the project team) for NW Natural. The CPA estimated the economic energy efficiency savings potential for the period of 2026 to 2050 for NW Natural's service area in Washington in compliance with Washington's RCW 80.28.380 (House Bill 1257). Note that Energy Trust of Oregon performs a separate assessment to determine the conservation potential in NW Natural's Oregon service area. This CPA can be used to inform NW Natural's 2027 Integrated Resource Plan (IRP) and set energy efficiency targets for its biennial energy efficiency plan.

RCW 80.28.380 requires natural gas companies to "identify and acquire all conservation measures that are available and cost-effective",[1] establishing a target every two years based on CPA conducted by an independent third party and approved by Washington's Utilities and Transportation Commission. Additionally, this CPA incorporates the required values for the cost of greenhouse gas emissions (GHG) from RCW 80.28.380 and follows the methodology used by the NW Power & Conservation Council in developing its regional power plans.

This project team developed this assessment using a combination of customer, measure and economic information. The customer data was developed using a combination of NW Natural customer data, regional stock assessments, and Census data, making the data as specific to NW Natural's Washington service area as possible. Measure data was developed from a variety of sources, including current program offerings and measure assumptions from Energy Trust and the Regional Technical Forum (RTF). Economic assumptions, including avoided costs, were provided by NW Natural.

Results

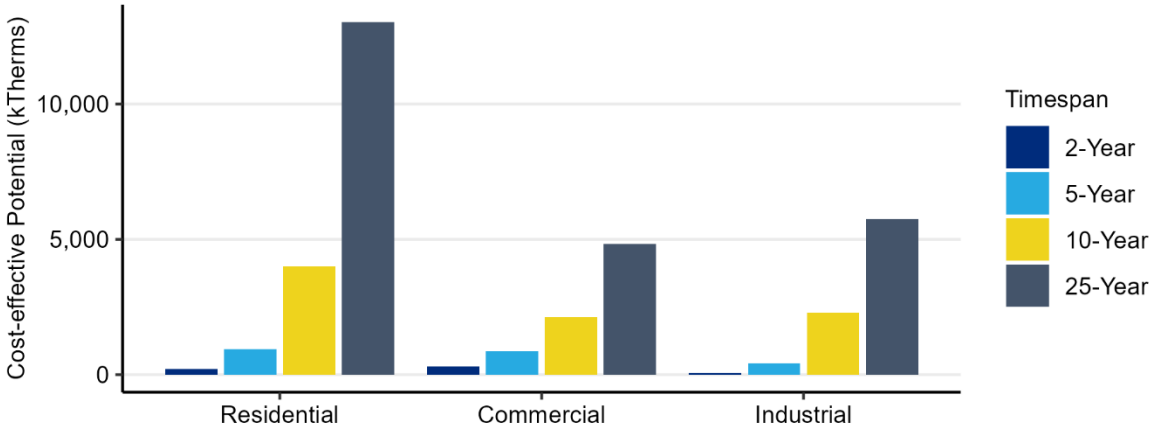
Table 1 and Figure 1 show the cost-effective energy efficiency potential by sector over two-, five-, 10-, and 25-year periods. Over the 25-year planning period, NW Natural has more than 23 million therms of cost-effective savings potential, which represents approximately 21% of its estimated 2050 load. Nearly 60% of the long-term potential is in the residential sector, which roughly aligns with the sector's share of overall load.

[1] RCW 80.28.380. Accessed on May 14, 2025. https://app.leg.wa.gov/RCW/default.aspx?cite=80.28.380.

Table 1: Cost-Effective Energy Savings Potential by Sector (Therms)

Sector	2-Year	5-Year	10-Year	25-Year
Residential	207,073	936,642	3,996,404	13,023,913
Commercial	295,390	864,656	2,134,553	4,828,715
Industrial	68,974	421,093	2,284,630	5,751,086
Total	**571,436**	**2,222,391**	**8,415,587**	**23,603,714**

Figure 1: Cost-Effective Energy Savings Potential by Sector



This assessment does not specify how the energy efficiency potential will be achieved. Possible mechanisms include:

- Energy efficiency programs implemented by the Energy Trust of Oregon
- NW Natural's behavior program
- Market transformation driven by the Northwest Energy Efficiency Alliance (NEEA)
- State building codes
- State or federal product standards.

Often, the savings associated with a measure will be acquired by several of the above mechanisms over the course of its technological maturity. For example, this assessment includes savings potential estimates for gas-fired heat pumps used for space and water heating. These are currently emerging technologies that NEEA is working on bringing to the market. Eventually, this technology could become a part of NW Natural's energy efficiency programs and one day be required by state building codes or federal product standards.

Energy efficiency also contributes to reductions in peak demand for natural gas. This assessment used daily and hourly peak factors from NW Natural to identify each measure's contribution to reductions in peak daily and hourly demand. The cost-effective savings potential identified in this assessment will result in more than 330 thousand therms of peak day savings over the 25-year planning period, as shown in Table 2.

Table 2: Peak Day Savings from Cost-Effective Savings Potential (Therms)

Sector	2-Year	5-Year	10-Year	25-Year
Residential	3,970	17,634	73,264	220,857
Commercial	5,042	14,311	32,930	63,285
Industrial	474	3,106	18,126	48,734
Total	**9,486**	**35,051**	**124,319**	**332,875**

This CPA used ramp rates to identify the share of the potential available in each year that could be acquired. The ramp rates are based on those used by the Council for the 2021 Power Plan and reflect the market and program maturity of each measure. For this CPA, the project team selected ramp rates that would align the near-term potential of each measure with recent and expected program achievements. Energy Trust staff provided recent program achievement data, which the project team used to assign appropriate ramp rates for each measure so that the future acquisition of energy efficiency was aligned with this program data while allowing for the acquisition of all cost-effective energy efficiency over the planning period.

The estimate of annual energy efficiency potential by sector is shown in Figure 2. The available cost-effective potential starts at approximately 260 thousand therms in 2026 and grows to a maximum of nearly 1.9 million therms in 2037. After that point, the annual potential declines through the remainder of the study period as the remaining available opportunities for energy efficiency are acquired.

Figure 2: Annual Incremental Energy Efficiency Potential

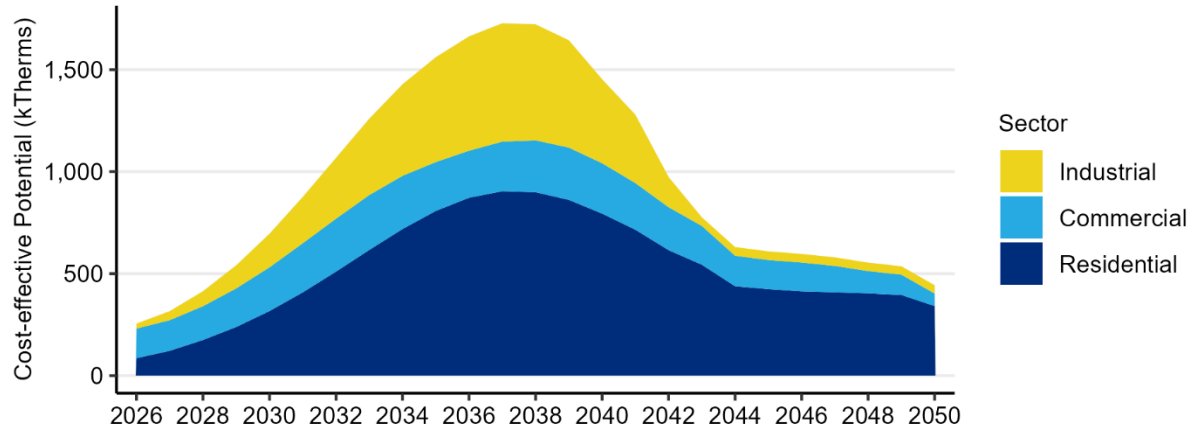
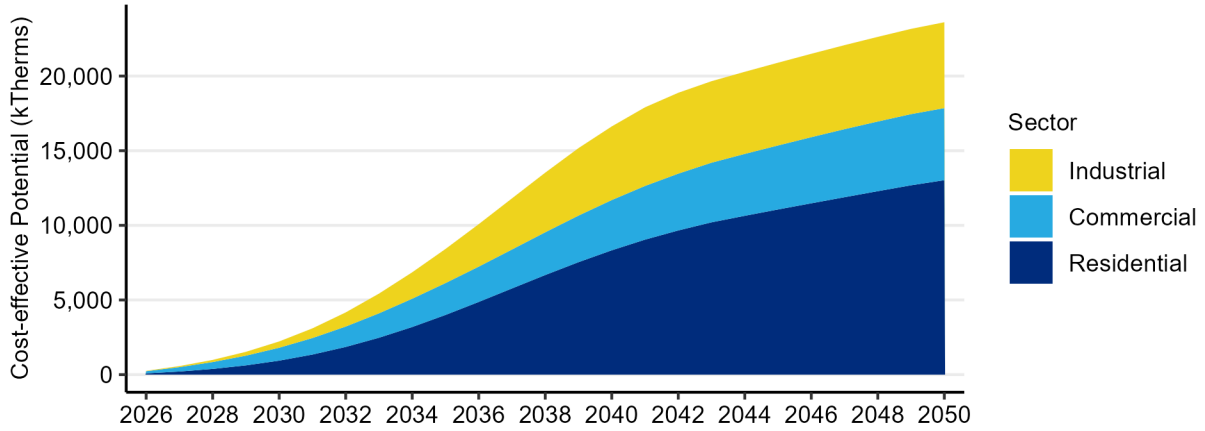


Figure 3 shows how the energy efficiency potential grows on a cumulative basis through the study period, totaling more than 23 million therms over the 25-year planning period.

Figure 3: Annual Cumulative Energy Efficiency Potential



Comparison to 2023 CPA

Table 3 shows a comparison of the two-, 10-, and 20-year cost-effective potential by sector as quantified by NW Natural's 2023 CPA completed by the Applied Energy Group and this 2025 CPA. In the short term, the 2025 CPA estimates a decrease in potential across all sectors of 35%, but in the long term, the total 20-year cost-effective potential is 74% greater.

Table 3: Comparison of 2023 and 2025 CPA Cost-Effective Potential (kTherms)

Sector	2-Year Potential			10-Year Potential			20-Year Potential		
	2023 CPA	2025 CPA	% Change	2023 CPA	2025 CPA	% Change	2023 CPA	2025 CPA	% Change
Residential	387	207	-47%	3,081	3,996	30%	7,281	11,063	52%
Commercial	324	295	-9%	1,854	2,135	15%	3,493	4,288	23%
Industrial	164	69	-58%	792	2,285	188%	1,238	5,544	348%
Total	**876**	**571**	**-35%**	**5,727**	**8,416**	**47%**	**12,012**	**20,894**	**74%**

The 2025 CPA utilized a differing modeling methodology and source data from the 2023 CPA for items such as customer characteristics and avoided costs that are likely driving some of the differences. The near-term potential in the 2025 CPA was aligned with recent program history, which has declined somewhat in recent years. This is likely a key driver for the decrease in near-term potential. Over the longer term, the 2025 CPA included emerging technologies which were not included in the 2023 CPA. The 2023 CPA also included assumptions that resulted in significantly lower gas consumption over time, resulting in lower potential over the long-term.

Without an in-depth review of all modeling assumptions and methods from the 2023 CPA, the project team can only offer these high level drivers of change between the studies.

Conclusion

This report summarizes the CPA conducted for NW Natural for the 2026 to 2050 timeframe. The CPA identified the economic potential available in NW Natural's Washington service territory and provided it to NW Natural for inclusion in their IRP modeling process and energy efficiency target setting for the biennial energy efficiency plan. The study follows the criteria and meets the requirements outlined in

RCW 80.28.380 and follows common best practices in conservation potential assessments, including the methodology used by the Council in its regional power plans.

Introduction

Objectives

This report describes the methodology and results of a CPA conducted for NW Natural by the project team. The CPA estimated the cost-effective energy savings potential available in NW Natural's Washington service territory over the period of 2026 to 2050. This report describes the results of the full 25-year study period, with additional details on the two-year period that is the focus of Washington's RCW 80.28.380.

The results of this assessment can be used to assist NW Natural in planning its energy efficiency programs by identifying the amount of cost-effective energy savings available in various sectors, end uses, and measures.

Background

NW Natural's provides natural gas to over 90,000 residential customers and more than 8,000 non-residential customers in Washington. Its Washington service territory includes the southwestern portion of Washington along the Columbia River. Washington's RCW 80.28.380 (HB 1257) requires all gas utilities to identify and acquire all conservation measures that are available and cost-effective, setting a target every two years based on a CPA conducted by an independent third party and approved by the Utilities and Transportation Commission. The utilities must demonstrate that the target will result in the acquisition of all resources identified as available and cost-effective, and the cost-effectiveness analysis must include specific values for the cost of greenhouse gas emissions.

This CPA was conducted in a consistent manner with the requirements of RCW 80.28.380. It incorporates the required values for the cost of greenhouse gas (GHG) emissions and follows the methodology used by the NW Power & Conservation Council in developing its regional power plans.

The project team also incorporated the impact of current policies, including state building codes. Based on Ecotope's analysis of the impacts of Washington's state energy code conducted for NEEA, Washington's state building codes are encouraging new homes to predominantly use electricity for space and water heating, although they may still include gas fireplaces. NW Natural is conducting a separate analysis on electrification, and so electrification was not explicitly included as a part of this assessment beyond the trend described above.

Study Uncertainties

There are uncertainties inherent in any long-term planning effort. While this assessment makes use of the latest forecasts of customers, loads, commodity prices, and other variables, these are still subject to uncertainties and limitations. These uncertainties include, but are not limited to:

- Customer Characteristic Data: This assessment used the best available data to reflect NW Natural's customers. In some cases, however, the assessment relied upon data beyond NW Natural's service territory due to limitations of available data and adequate sample sizes. There are uncertainties, therefore, related to the extent that this data is reflective of NW Natural's customer base.
- Measure Data: Estimates of measure savings and costs are based on values prepared by the Energy Trust, the Council, and RTF. These estimates will vary across the region due to local

climate variations and market conditions. Additionally, some measure inputs such as applicability are based on limited data or professional judgement.

- Market Price Forecasts: This assessment uses a long-term forecast of market prices. Market prices and forecasts are continually changing.
- Utility System Assumptions: Measures in this CPA receive cost credits based on their ability to provide capacity in regional supply and local distribution gas pipelines. The actual value of these credits is dependent on local conditions, which may vary across NW Natural's service territory.
- Load and Customer Growth Forecasts: This CPA projects future customer growth over a 25-year period. Any forecast over a similar time period will inherently include a significant level of uncertainty.

Due to these uncertainties and the continually changing planning environment, Washington law requires gas utilities to complete a new CPA every two years to reflect the best available data and latest market conditions.

Report Organization

The remainder of this report is organized into the following sections:

- Methodology
- Customer Characteristics
- Results
- Summary
- References & Appendices

Methodology

This section provides an overview of the methodology used to develop the estimate of cost-effective conservation potential for NW Natural's Washington service area.

High-level Methodology

The methodology used for this assessment is illustrated in Figure 4. At a high level, the process combines data for individual energy efficiency measures and economic assumptions using the Council's ProCost tool. This tool calculates the present values of the different benefits and costs associated with each energy efficiency measure. These benefit and cost values are then used to calculate economic metrics for each measure.

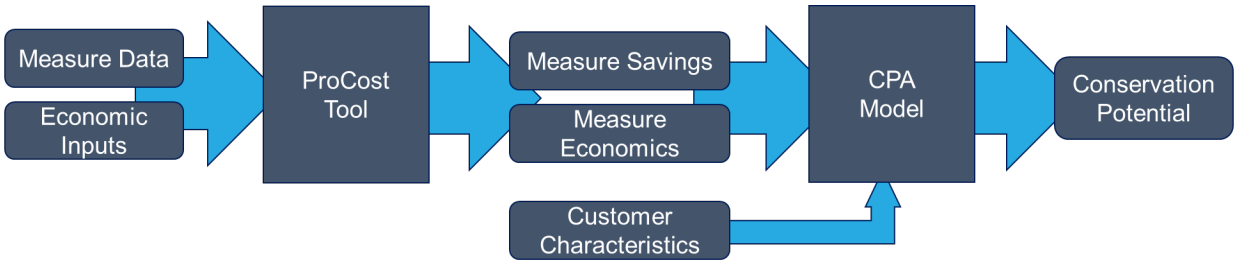
For this study, the project team evaluated cost-effectiveness using two cost perspectives:

- **Total Resource Cost (TRC)** includes all costs and benefits incurred by the program participant and the utility when installing a conservation measure.
- **Utility Cost (UCT)** includes only the costs and benefits incurred by the utility.

This methodology section details the cost and benefits included in each of these tests, but the economic potential reported throughout the report is based on the TRC perspective. This approach is widely used by utilities in the Northwest when assessing cost-effectiveness and aligns with the Council's 2021 Power Plan. Results based on the UCT perspective are included in Appendix IV: Energy Efficiency Potential by End Use.

The measure savings and economic results are combined with customer data in Lighthouse's CPA model, which quantifies the number of remaining implementation opportunities. The savings associated with each of these opportunities are aggregated in the CPA model to determine the overall potential.

Figure 4: Conservation Potential Assessment Methodology



Each of the major inputs is described in greater detail below.

Economic Inputs

The project team worked closely with NW Natural staff to define the value of the economic inputs that were used in this CPA as well as how they should be applied. The treatment of these inputs varies based on the customer type. Natural gas service can be provided in several ways, outlined below.

1. **Sales/Transport**
    a. Sales customers purchase natural gas directly from NW Natural.

b. Transport customers purchase gas from a third party but pay NW Natural to have it delivered through NW Natural's distribution system.

2. Firm/Interruptible

a. Firm customers have service that cannot be interrupted.
b. Interruptible customers pay a lower rate in exchange for service that can be interrupted at times of peak demand.

Depending on the customer type and cost test perspective (TRC or UCT), the avoided costs may vary. For example, natural gas savings at sites with interruptible accounts do not contribute to pipeline capacity, as service to these customers is likely to be interrupted at times of peak demand. Commodity cost savings are not included in the UCT-perspective for transport customers since they purchase gas from a third party, but they are included in the TRC perspective. Appendix V: Treatment of Benefits and Costs includes a table that summarizes the treatment of costs and benefits based on the cost test perspective and customer type. The benefits and costs considered are discussed in greater detail below.

Avoided Commodity Costs

Avoided commodity costs represent the value of the natural gas saved. Commodity costs are typically higher in the winter months due to the higher demand from space heating, so measures that have higher levels of savings in the winter months receive higher benefits. As noted above, avoided commodity costs are excluded from consideration for transport customers in UCT-perspective calculations.

Avoided Capacity Costs

Natural gas savings that coincide with peak demands for natural gas can free up capacity on regional supply and local distribution systems, whereas this capacity must be procured to supply additional natural gas. The project team used factors provided by NW Natural to translate the annual savings of each measure to the savings that were coincident with peak demands on the supply and distribution systems.

Avoided Greenhouse Gas Compliance Costs

RCW 80.28.380 requires gas utilities to use specific values for the social cost of greenhouse gas emissions. This assessment uses those values as well as an assumption, provided by NW Natural that estimates the carbon intensity of the natural gas it delivers.

Risk Mitigation

Energy efficiency has been found to reduce utility risks, since it is purchased in small increments over time instead of the large, singular purchases that utilities make in resource procurement. Energy efficiency can also reduce risks through avoided exposure to market volatility. This assessment uses a risk reduction value provided by NW Natural.

Northwest Power Act Credit

The project team also included a 10% credit for energy efficiency measures. This benefit is specified in the Northwest Electric Power Planning and Conservation Act and has been widely adopted in utility planning by electric and gas utilities across the Northwest.

Program Administration & Incentive Costs

Using program achievement and cost data provided by Energy Trust, the project team calculated average administrative and incentive costs on a dollars per therm basis for each sector. These are identified in the table below.

Table 4: Program Administration and Incentive Cost Assumptions

	Program Administration ($/therm)	Incentive ($/therm)
Residential	$4.28	$5.68
Commercial & Industrial	$3.97	$3.43

Discount Rate

In addition, this assessment makes use of an assumed discount rate to convert future costs and benefits to present-year values so that values occurring in different years can be compared. This assessment uses a real discount rate of 3.85% provided by NW Natural.

Measure Characterization

Measure characterization is the process of defining each individual measure, including the savings, cost, lifetime, non-energy impacts, and a load or savings shape that defines when the savings occur.

The project team selected and characterized measures to align with the current measures offered in Washington by Energy Trust of Oregon and then expanded the measure list beyond those offerings to show the total potential in NW Natural's Washington territory. The measure list was created by comparing the current measures offered by Energy Trust in WA, the measures in Energy Trust's Oregon CPA model, RTF measures, and NW Natural's previous Washington CPA measure list. The measure inputs align with the following source hierarchy:

1) Energy Trust's Washington program measures
2) Energy Trust of Oregon CPA model measures
3) Regional Technical Forum measures
4) Prior NW Natural Washington CPA Model
5) Energy350 Industrial Savings Reports
6) Other Sources as necessary

Appendix III: Measure List details the measures included in the CPA and their presence in the sourcing hierarchy above. The measure list closely aligns with the Energy Trust data sources with very few measures sourced from other sources. Energy Trust measures follow RTF measure protocols wherever there is an RTF measure available and the measures were modified to be WA territory specific wherever possible.

Table 5 below shows the emerging technologies that were included in the CPA. The industrial sector includes a custom HVAC measure within the conventional measures that may be inclusive of the individual emerging technologies below. Therefore, no HVAC emerging technologies are delineated in the industrial sector. Savings from these emerging technologies were excluded from the initial years of the study and given slower adoption rates given their level of technological and market maturity.

Table 5: Included Emerging Technologies and Sector Applicability

Emerging Technology	End Use	Measure Category	Applicable Sector		
			Res	Com	Ind
Gas Fired Heat Pump for Space Heating (~ 140% EFF)	HVAC	Gas furnace	X	X	
Condensing Gas RTU (>90% Eff)	HVAC	Gas RTU		X	
Gas-Fired Absorption Heat Pump Water Heater (UEF > 1.06)	Water Heat	Tank water heater	X	X	X
Thin Triple Pane Windows - U < .20	Weatherization	Windows	X	X	
Ceiling/Attic Insulation >= R60	Weatherization	Ceiling insulation	X		
Wall Insulation >= R30	Weatherization	Wall insulation	X		

These measure characteristics, along with the economic assumptions, are used as inputs to the Council's ProCost tool.

Customer Characteristics

The assessment of customer characteristics is used to determine the number of available measure installation opportunities for each measure. This includes both the number of opportunities overall, as well as the share, or saturation, which have already been completed. In this process, the project team relied on data specific to NW Natural's WA service area to the greatest extent possible. Table 6 provides a summary of the data sources used to characterize each customer sector.

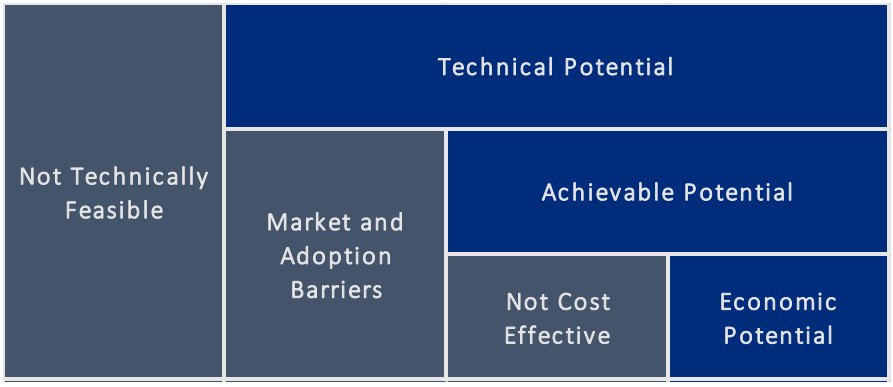
Table 6: Primary Customer Characterization Data Sources by Sector

Item	Residential	Commercial	Industrial
Customer Forecast	NW Natural Customer Forecast (by vintage)	NW Natural Customer Forecast	NW Natural Customer Forecast
Sales Forecast	NW Natural Load Forecast	NW Natural Load Forecast	NW Natural Load Forecast
Segmentation	NW Natural Premise Data and 2023 5-Year American Community Survey (ACS)	NW Natural Customer Database	NW Natural Customer Database
Equipment Saturations	2022 ACS & 2022 Residential Building Stock Assessment (RBSA)	N/A	N/A

Energy Efficiency Potential

The energy efficiency measure data and customer characteristics are combined in Lighthouse's CPA model. The model calculates the economic or cost-effective potential by progressing through the types of energy efficiency potential shown in Figure 5. Each is discussed in further detail below.

Figure 5: Types of Energy Efficiency Potential



First, technical potential is the theoretical maximum of energy efficiency available, regardless of cost or market constraints. It is determined by multiplying the measure savings by the number of remaining feasible installation opportunities.

The model then applies several filters that incorporate market and adoption barriers, resulting in the achievable potential. These filters include an assumption about the maximum potential adoption and the pace of annual achievements. Energy efficiency planners generally assume that not all measure opportunities will be installed; some portion of the technically possible measure opportunities will remain unavailable due to unsurmountable barriers. In the Northwest, planners have historically assumed that 85% of all measure opportunities can be achieved. This assumption came from a pilot program conducted in Hood River, Oregon, where home weatherization measures were offered at no cost. The pilot was able to reach over 90% of homes and complete 85% of identified measure opportunities. In the 2021 Power Plan, the Council took a more nuanced approach to this assumption. Measures that are likely to be subject to future codes or product standards have higher maximum achievability assumptions. This CPA follows the Council's new approach.

In addition to the factors that consider the maximum possible achievement, ramp rates are used to identify the portion of the available potential that can be acquired each year. The selection of ramp rates incorporates the different levels of program and market maturity as well as the practical constraints of what utility programs can accomplish each year.

Finally, economic, or cost-effective potential is determined by limiting the achievable potential to those measures that pass an economic screen. This assessment uses the total resource and utility cost test to determine economic potential. The TRC evaluates all measure costs and benefits, regardless of who pays the cost or receives the benefit. The costs and benefits include the full incremental capital cost of the measure, any operations and maintenance costs, program administrative costs, avoided energy and carbon costs, deferred capacity costs, and quantifiable non-energy impacts. Because the TRC test considers the full cost of energy efficiency measures, NW Natural could pay up to the full cost of measures with its incentives without needing to reevaluate the cost-effectiveness of the measure, although practical constraints such as program budgets and rate impacts may limit this. The cost-effective potential provided in this report is based on measures that have a TRC benefit-cost ratio of one or more.

Customer Characteristics

This section describes the characterization of NW Natural's customer base. As a part of this process, the project team utilized NW Natural provided customer data to group customers based on their sector and building type. This step allows for the appropriate, cost-effective efficiency opportunities to be identified for each customer. In this study, the project team applied different economic assumptions, measure applicability, and adoption assumptions based on the customer's sector, rate type, and building type.

The project team began by segmenting NW Natural's 2026 Washington load forecast into five primary sectors,[2] as shown in Table 7, where transport customers are considered as either commercial or industrial depending on the customer's building type (detailed in the commercial and industrial customer characteristics sections). The load forecast was further divided between firm and interruptible loads based on the 2024 database of customer accounts and rate classifications provided by NW Natural.

Table 7: 2026 Load Forecast by Sector

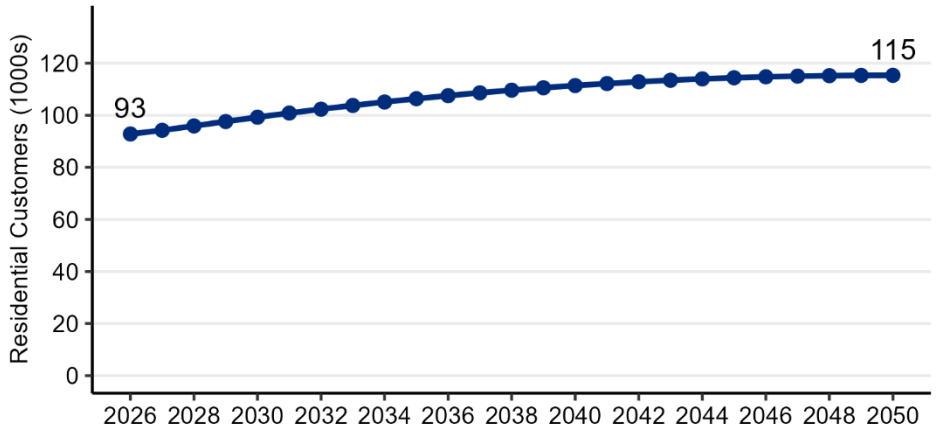
Sector	2026 Firm Load (kTherms)	2026 Interruptible Load (kTherms)
Residential	58,616	0
Commercial	24,050	973
Commercial - Transport	1,387	0
Industrial	5,072	176
Industrial – Transport	6,843	10,049
Total	**95,968**	**11,198**

Residential

The residential sector is NW Natural's largest sector in terms of customers and sales. To align with NW Natural's forecast data, the project team based its forecasts of residential customers and sales on forecast data provided by NW Natural in early 2025. Figure 6 shows the residential customer forecast over the study horizon, which indicates a compound annual growth rate (CAGR) of 0.9% between 2026 and 2050. The customer forecast accounts for the new home and existing home conversion forecast provided by NW Natural.

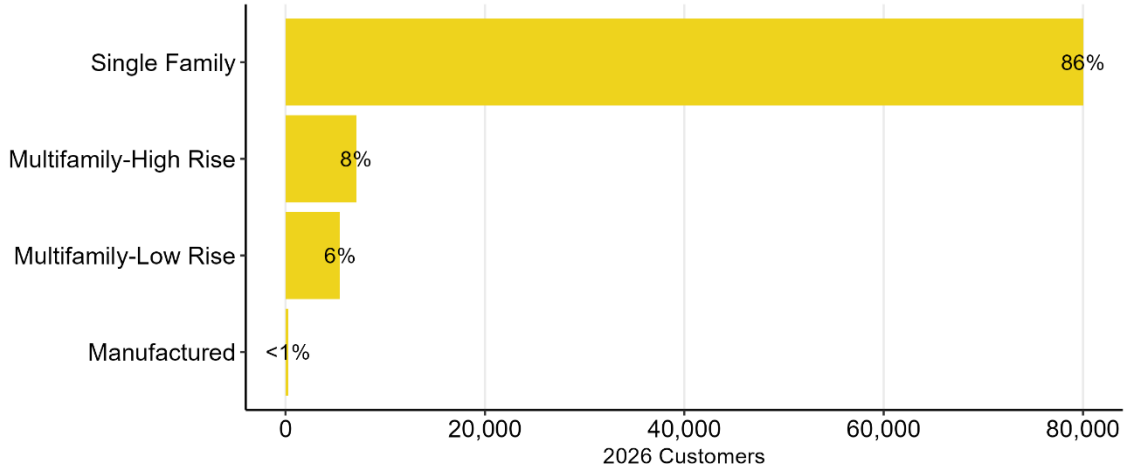
[2] Sector definitions are based on the NW Power and Conservation Council's sector definitions for evaluating energy efficiency and demand response measures. These definitions may vary from utility rate class definitions.

Figure 6: Residential Customer Forecast



The project team further delineated the residential customer forecast based on building type and income criteria. Figure 7 shows the distribution of housing types in the residential sector with the total number of customers forecasted for 2026 along the x-axis and percentages indicating each home type's share of the overall total.

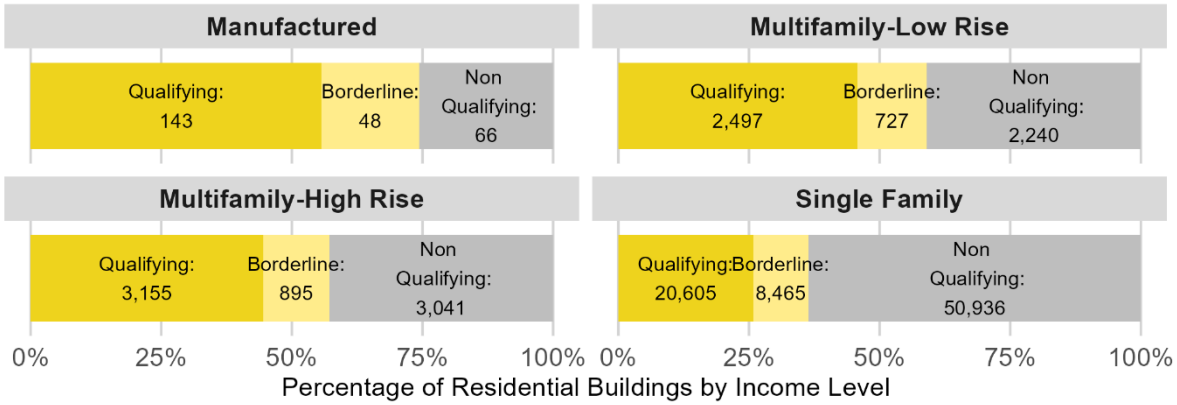
Figure 7: 2026 Residential Homes by Building Type



The building types considered in this CPA are shown in Figure 8 with the income group distribution identified for each building type.[3] For this study, the project team utilized the income designations defined in the 2024 NW Natural Energy Burden Assessment where households in the 2023 ACS identified with incomes of less than 80% of the Area Median Income (AMI) for Clark County, WA are considered income qualifying. Those households between 80% and 100% of the county AMI are categorized as borderline income qualifying, and the remaining homes are considered non-qualifying.

The type and number of energy efficiency measures applicable to each home is dependent on the type of home. The CPA does not vary assumptions about cost-effectiveness or adoption based on the income criteria provided in this memo. The data is used to provide context around how the conservation potential is distributed.

Figure 8: 2026 Residential Customer Distribution by Building Type and Income Group



One of the key metrics informing conservation potential in the residential sector is the saturation of end use appliances such as space and water heating equipment. Table 8 summarizes the equipment saturations by building type and construction vintage for the CPA.

[3]To maintain consistency with the Council, the project team includes duplexes, triplexes, and quadplexes in the single-family segment.

Table 8: Residential Equipment Saturations

Building Type	Single Family	Multifamily-Low Rise	Multifamily-High Rise	Manufactured
Heating Equipment - New Construction				
Natural Gas Furnace	30%	50%	0%	30%
Natural Gas Boiler	0%	40%	0%	0%
Natural Gas Fireplace	73%	30%	46%	73%
Heating Equipment - Existing Buildings				
Natural Gas Furnace	82%	50%	0%	82%
Natural Gas Boiler	0%	40%	0%	0%
Natural Gas Fireplace	73%	30%	46%	73%
Water Heating & Appliances - New Construction				
Natural Gas Water Heaters	15%	27%	0%	15%
Natural Gas Clothes Dryers	3%	0%	0%	3%
Washing Machine w/ Gas WH	15%	22%	0%	15%
Water Heating & Appliances - Existing Construction				
Natural Gas Water Heaters	80%	27%	0%	80%
Natural Gas Clothes Dryers	3%	0%	0%	3%
Washing Machine w/ Gas WH	80%	22%	0%	80%

While the existing home saturations were determined based on the 2022 NEEA RBSA,[4] the new construction single family space and water heating saturations were adjusted based on NEEA's 2023 evaluation of the 2018 Washington State Energy Code and its findings on new construction space and water heating equipment fuel.

Commercial

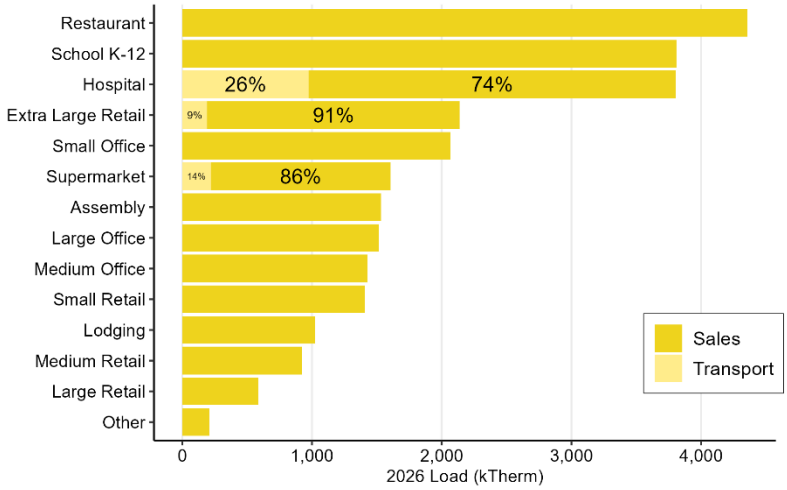
Unlike the residential sector, where customer counts inform the potential, conservation opportunities in the commercial sector are largely based on floor area. To estimate the commercial floor area and develop estimates of sales by building type in NW Natural's service territory, the project team used the NW Natural load forecast data supplemented with the commercial and industrial rate and customer segment database. Based on the 2019 Commercial Building Stock Assessment's (CBSA) energy use intensity (EUI) data, the project team converted the sales to an estimated floor area by building type. This resulted in a total floor area of 75.4 million square feet in 2026. The floor area growth over the study period is based on the load forecast CAGR of 1.1%.

To understand the opportunities for energy efficiency measure adoption, the project team disaggregated the load forecast shown in shown in Table 7 into the applicable commercial building

[4] For single family saturations, the project team was able to use the 35 observations of NW Natural WA site data. For multifamily low rise and high rise there was not sufficient site data from the RBSA for NW Natural's service area, so the project team used Washington specific multifamily low rise sites for multifamily low rise and all RBSA sites for mid and high rise for the multifamily high rise saturations. Sites without gas service were excluded. There was only one site with gas service for manufactured homes in the RBSA, so the project team utilized the single family saturations for manufactured homes.

segments and customer types. The distributions of 2026 forecasted load are shown in Figure 9 with the portion of sales and transport load provided for each segment.

Figure 9. 2026 Commercial Load by Building and Customer Type (kTherms)



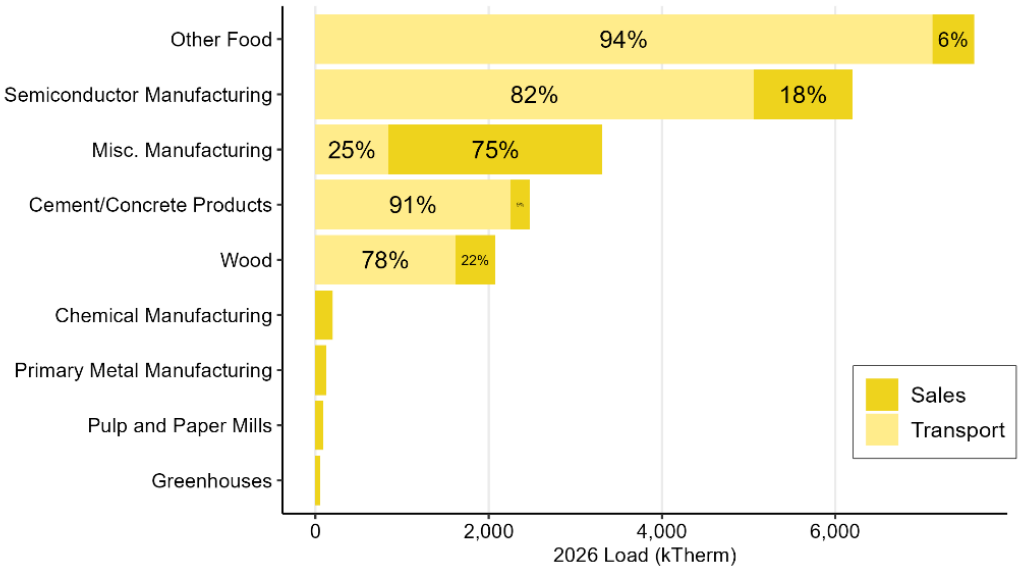
Industrial

In the industrial sector, potential is quantified using a top-down approach that uses the annual energy consumption within individual industrial segments. Savings for individual measures are calculated by applying an assumed savings percentage to the consumption within each industrial segment.

The forecast for industrial sales in 2026 is estimated to be 22.1 million therms with a compound annual growth rate of -0.77% over the study period. The forecast is based on NW Natural's commercial and industrial load forecast, divided between the commercial and industrial sectors using the distributions from the 2023 database for non-residential customers by rate and segment.

The distribution of the industrial sales by segment and customer type is summarized in Figure 10 where the proportion within segment that is sales or transport is provided as a percentage on the corresponding segment bar.

Figure 10. 2026 Industrial Sales by Building Segment (kTherms)



Results

This section discusses the results of the 2025 CPA. It begins with a discussion of the high-level achievable and economic conservation potential and then covers the economic potential within individual sectors and end uses.

Achievable Conservation Potential

The achievable conservation potential is the amount of energy efficiency available without considering the cost-effectiveness of measures. It considers market barriers and the practical limits of acquiring energy savings by efficiency programs, but not the cost.

Figure 11 shows the supply curve of achievable potential over the 25-year study period. A supply curve depicts the cumulative potential available against the levelized cost of energy savings, with the measures sorted in order of ascending cost. No economic screening is applied. Levelized costs are used to make the costs comparable across measures with different lifetimes as well as supply-side resources considered in utility integrated resource plans.

The figure includes supply curves that reflect the gross and net TRC costs. The gross cost includes measure costs, O&M costs or savings, and any non-energy benefits. The net cost includes credits for deferred supply and distribution system costs, risk reduction values, carbon costs, and a 10% credit for conservation that is analogous to the credit specified in the NW Power Act and included in regional power planning. With these credits, many of the measures have a net levelized cost that is negative, meaning that the credits exceed the measure costs.

Figure 11: 25-Year Supply Curve

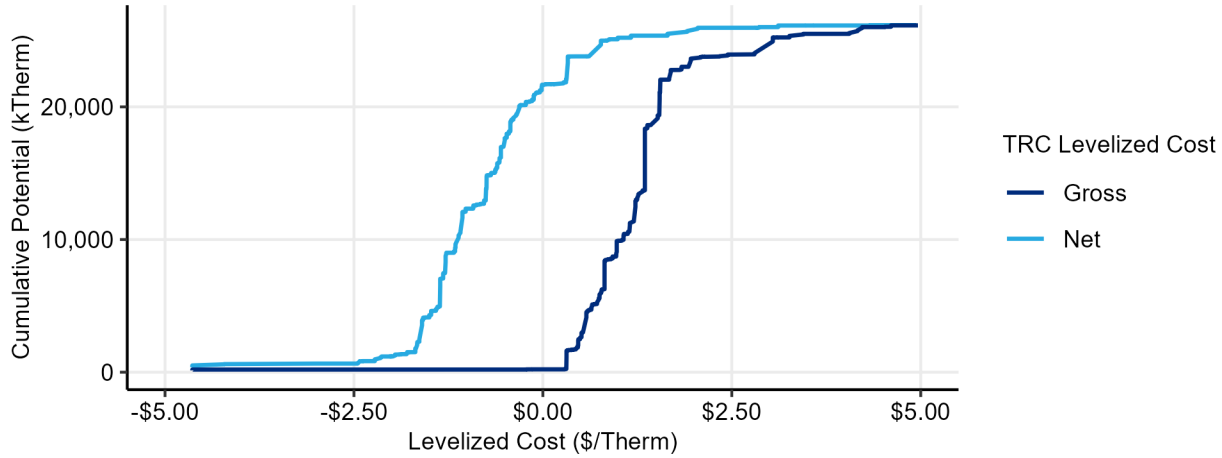


Figure 11 shows that approximately 10 million therms of potential are available at a gross levelized cost at or below $1/therm. When including the credits discussed above, this level of potential is available at a net levelized cost of -$1.25/therm. A total of more than 26 million therms is available in NW Natural's service territory over the 25-year period, but only the potential below $5/therm is shown in the supply curve. At the higher costs, the supply curves flatten and small increases in potential come at increasingly higher costs.

Supply curves based on levelized cost are limited in that not all energy savings are equally valued. For example, two measures could have the same gross or net levelized cost but provide different reductions in capacity on the gas system or higher savings in the winter months, when natural gas is more expensive. An alternative to the supply curve based on levelized cost is one based on the benefit-cost ratio. This is shown below in Figure 12.

Figure 12: 25-Year Benefit-Cost Ratio Supply Curve

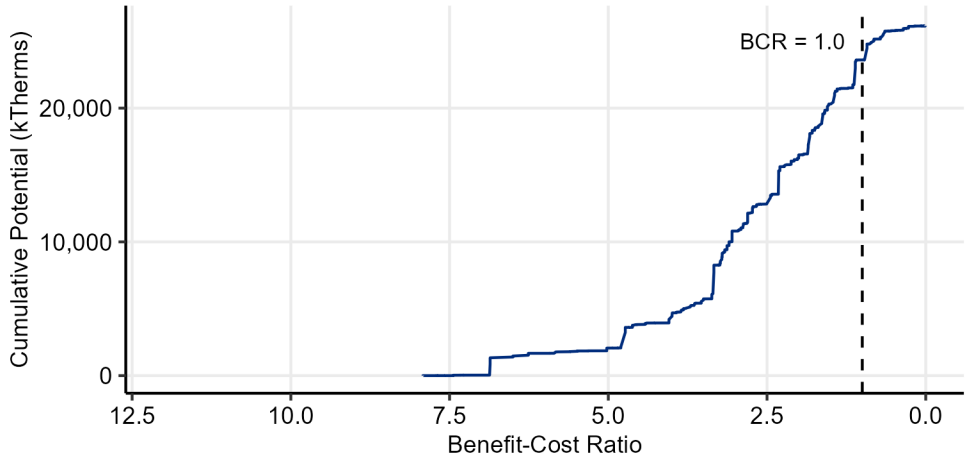


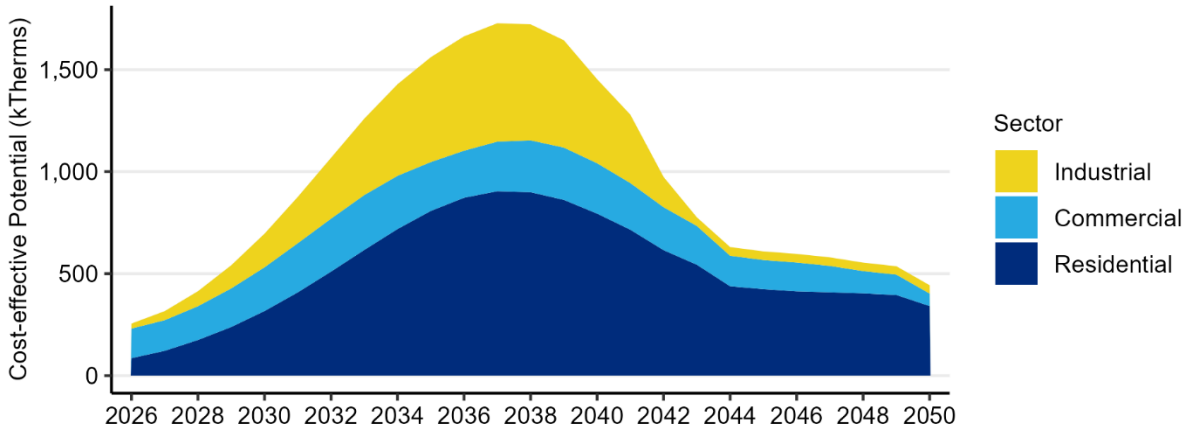
Figure 12 includes a dashed line where the benefit-cost ratio is equal to one. There are more than 23 million therms of cost-effective savings potential to the left of this line, with benefit-cost ratios greater than one. This is the 25-year cost-effective potential identified earlier in this report. The slope of the line is fairly flat to the right the point where the benefit-cost ratio is equal to 1, after a small vertical step. This suggests that increases in avoided costs, which would effectively shift the dashed line to the right, would not add significantly to the cost-effective potential. Nearly 90% of the achievable potential is already cost-effective, so there is a limited amount of achievable potential that could become cost effective with higher avoided costs. Decreases in avoided costs may have more significant impacts, as the curve shows another vertical step with notable increases in potential just left of the point where the benefit-cost ratio equals 1.0. This potential is associated with the residential behavior measure.

The economic or cost-effective potential is described further below.

Cost-Effective Conservation Potential

Figure 13 shows the economic potential by sector on an annual basis. Most of the potential is in NW Natural's residential sector (58%), followed by the industrial sector (23%) and the commercial sector (19%).

Figure 13: Annual Cost-Effective Potential by Sector



The project team used the ramp rates from the 2021 Power Plan were used to establish reasonable rates of acquisition for all sectors. This included making modifications to the assigned ramp rates for some measures to align the near-term potential with recent and expected savings in each sector. Retrofit potential is acquired by 2044 while potential from new construction and lost opportunity measures continues to be available through 2050.

Sector Summary

The sections below describe the cost-effective potential within each sector.

Residential

The residential sector provides the greatest opportunity for economic potential with more than 13 million therms of cumulative energy efficiency potential identified over the study period. Table 9 details the breakdown of the cumulative potential by timestep and residential customer income group.[5] Of the 25-year total cost-effective potential 37% is for homes with household incomes below 100% of the area median income and 63% is for households with incomes greater than the area median income.

[5] The potential assessment does not incorporate different adoption assumptions between the residential income groups.

Table 9. Cumulative Economic Residential Potential by Income Group (Therms)

	2-Year	5-Year	10-Year	25-Year
Income Qualifying *(<80% AMI)*	55,036	249,881	1,068,581	3,475,447
Borderline Income Qualifying *(80-100% AMI)*	22,153	100,323	428,415	1,395,181
Non-Income Qualifying *(>100% AMI)*	129,883	586,438	2,499,408	8,153,284
Total	**207,073**	**936,642**	**3,996,404**	**13,023,913**

Figure 14 shows the annual incremental, economic potential by end use in the residential sector. Of the 25-year cumulative potential, 83% of the savings potential is in the HVAC end use, 16% is in the water heating end use, and less than 1% is in the appliance and whole building end uses. In this figure, weatherization measures are included in the HVAC category. The whole building end use includes behavior programs, as behavior programs may result in savings across multiple end uses. The savings potential for these programs was limited to prevent double-counting savings that could be achieved by behavior savings and other measures, such as smart thermostats.

Figure 14: Incremental Economic Residential Potential by End Use

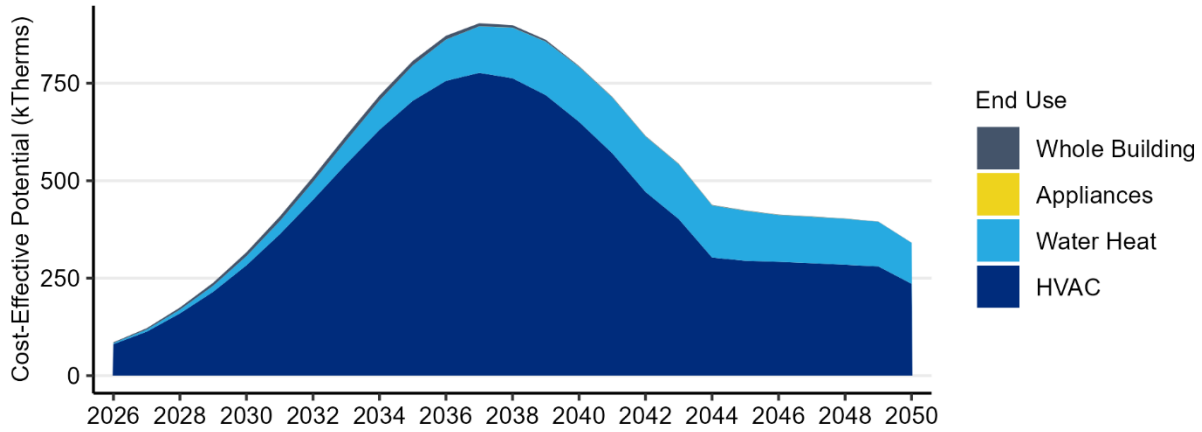
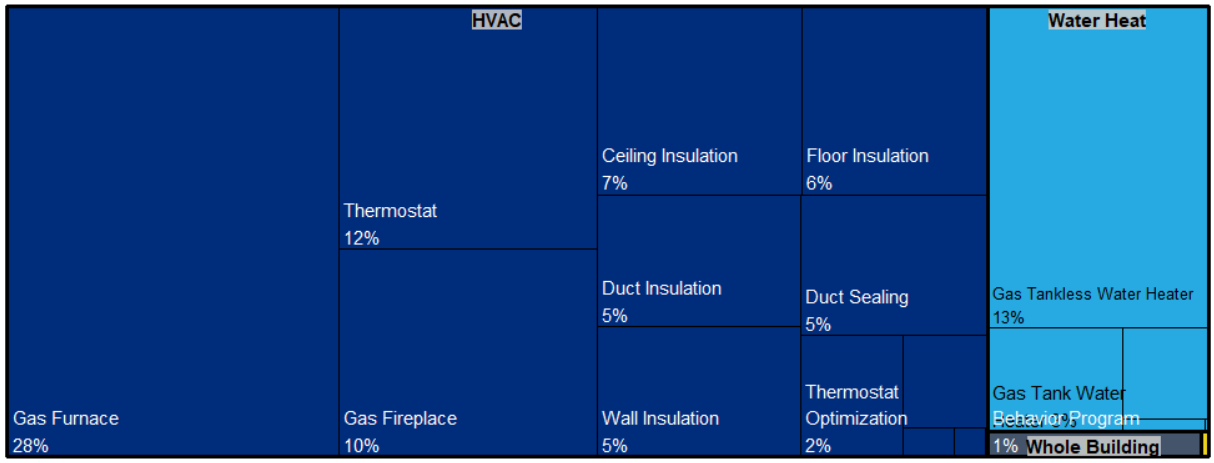


Figure 15 shows how the 25-year potential breaks down into end uses and measure categories. The area of each block represents its share of the overall residential potential. In alignment with the consumption of natural gas, most of the savings potential is related to measures impacting the HVAC end use, with less potential from water heating, whole building, and appliance measures. In the HVAC end use, measures with the highest potential include gas furnaces, smart thermostats, and gas fireplaces. In the water heating end use, the savings are primarily from efficient water heaters.

Figure 15: Residential Economic Potential by End Use and Measure Category



Commercial

The commercial sector accounts for 20% of the cost-effective 25-year potential. Within this sector, the HVAC end use is the primary source of savings and represents 45% of the total commercial sector potential. The whole building end use also contributes a significant amount of savings (22%). The savings potential here includes commercial Strategic Energy Management (SEM) programs, but these savings could also be accomplished through building operator certification programs or retrocommissioning programs. The recent program achievement is high in this area, so these savings were given a faster ramp rate, concentrating the remaining savings potential in the early years of the study. The appliance category includes traditional appliances like laundry equipment, but also commercial cooking equipment and pool heaters.

Figure 16: Incremental Economic Commercial Potential by End use

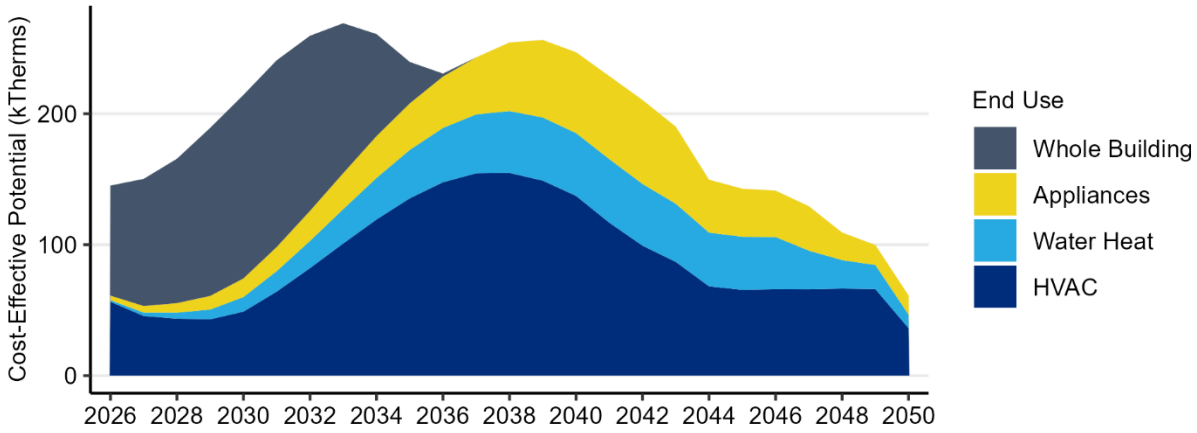
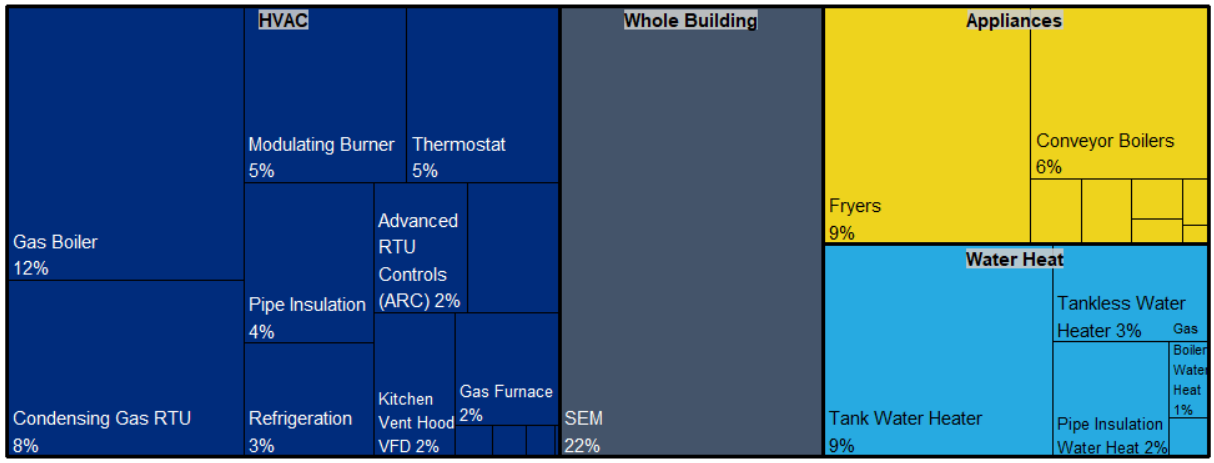


Figure 17 shows the breakdown of commercial potential by end use and measure category. The HVAC end use includes savings from a variety of systems including boilers, rooftop units, and furnaces, reflecting the diversity of system types across commercial buildings.

Figure 17: Commercial Economic Potential by End Use and Measure Category



Industrial

In the industrial sector, natural gas use is primarily split between space and process heating end uses. This is reflected in the industrial cost-effective savings potential where 88% of the 25-year industrial potential is represented by process and HVAC measures. Whole building measures like SEM and O&M measures can impact all end uses. The incremental savings potential shown in Figure 18 includes potential from both sales and transport customers. This figure shows most of the potential being acquired by 2043, with a small amount of potential available after that associated with the turnover of space and water heating equipment that could not be acquired earlier in the planning period.

Figure 18: Incremental Economic Industrial Potential by End Use

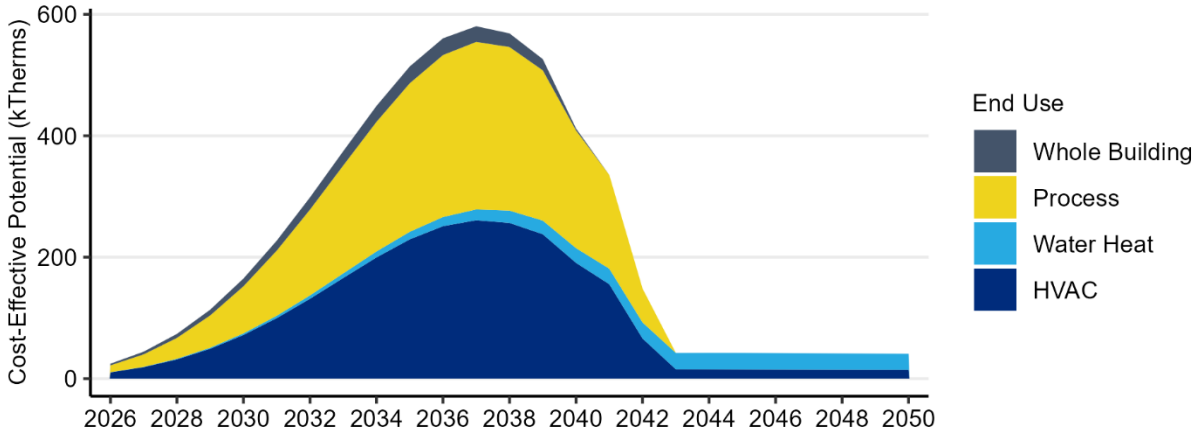
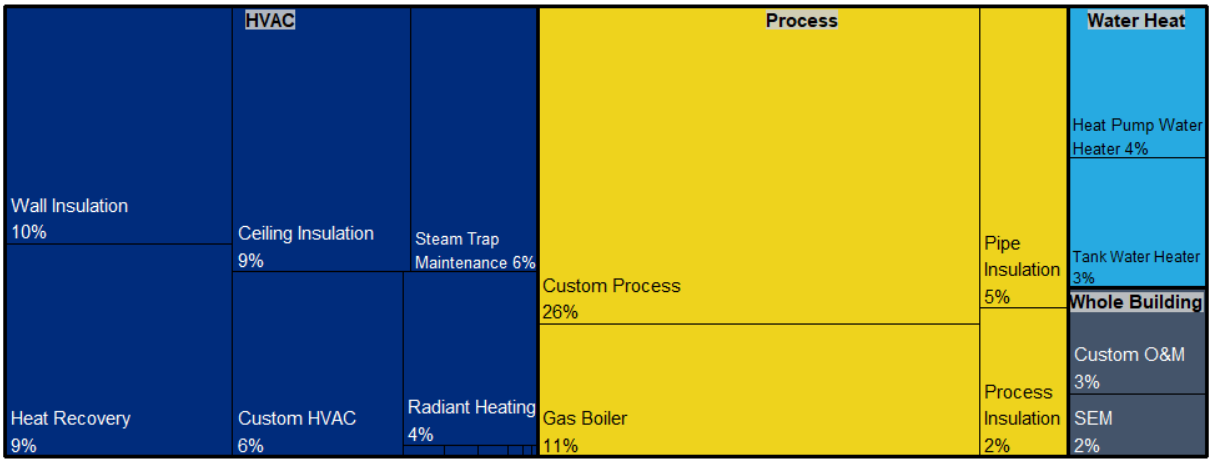


Figure 19 provides additional context around the portion of economic potential present in each of the four industrial end uses. Notably, the custom process measures account for 60% of the total process end use potential. Conversely, HVAC savings are more evenly broken out by measure categories such as wall insulation, steam trap maintenance, etc.

Figure 19: Industrial Economic Potential by End Use and Measure Category



Future Sensitivities & Scenarios

In addition to the results described above, NW Natural is evaluating several additional sensitivities and scenarios. Current planning for this work includes a sensitivity with higher avoided costs. The results of these were not available at the time of this report.

Summary

This report summarized the results of the 2025 CPA conducted for NW Natural's Washington service area. The assessment provided estimates of the economic energy savings potential for the 25-year period beginning in 2026, with details for the first two years to support of biennial energy efficiency planning in compliance with RCW 80.28.380. The assessment considered a wide range of measures that are available during the study period, as well as emerging technologies forecasted to be available later in the study period.

Furthermore, the CPA was conducted in a consistent manner with RCW 80.28.380. It incorporates the required values for the cost of greenhouse gas emissions and follows the methodology used by the NW Power & Conservation Council in developing its regional power plans.

Compared to NW Natural's 2023 CPA, the potential has decreased in the near term but increased over the mid- and long-term. Near-term savings decreases were based on alignment with recent program achievements, which have decreased slightly in recent years relative to NW Natural's 2023 CPA. The long-term potential is based on a higher load forecasts and includes emerging technologies in each sector that result in greater savings.

References

Applied Energy Group, Inc. (2023). 2023 NW Natural Washington Conservation Potential Assessment.https://apiproxy.utc.wa.gov/cases/GetDocument?docID=3&year=2023&docketNumber=230427

Ecotope, Inc. (2021). 2018 Washington Residential Code Energy Savings Analysis. https://neea.org/resource/2018-washington-residential-code-energy-savings-analysis/

Empower Dataworks. (2024). 2024 Energy Burden Assessment Findings. https://assets.ctfassets.net/416ywc1laqmd/1lR4a46k51WWBtKoANQ4Ls/dd0ef27d93bb5345368cdec09166939c/CBIAG_240626_Empower_Dataworks_EBA_Recomendations.pdf

Evergreen Economics. (2024). 2022 Residential Building Stock Assessment. Portland, OR: Northwest Energy Efficiency Alliance. https://neea.org/data/residential-building-stock-assessment

Cadmus Group. (2020). Commercial Building Stock Assessment 4 (2019) Final Report. Portland, OR: Northwest Energy Efficiency Alliance. https://neea.org/data/commercial-building-stock-assessments

Northwest Power and Conservation Council. (December 11, 2020). 2021 Power Plan Technical Information and Data. https://www.nwcouncil.org/2021-power-plan-technical-information-and-data.

Northwest Power and Conservation Council. (1980). Pacific Northwest Electric Power Planning and Conservation Act. https://www.nwcouncil.org/reports/northwest-power-act/

Washington State Legislature. RCW 80.28.380 Gas Companies Conservation Targets. Retrieved from: https://app.leg.wa.gov/RCW/default.aspx?cite=80.28.380

US Census Bureau. American Community Survey. https://www.census.gov/programs-surveys/acs.

Appendix I: Acronyms

AFUE	Annual Fuel Utilization Efficiency
ACS	American Community Survey
AMI	Area Median Income
ARC	Advanced Rooftop Control
CPA	Conservation Potential Assessment
CBSA	Commercial Building Stock Assessment
EEF	Energy Efficiency Factor
EUI	Energy Use Intensity
GHG	Greenhouse Gas
HPWH	Heat Pump Water Heater
HVAC	Heating, Ventilation, and Air Conditioning
IRP	Integrated Resource Plan
NEEA	Northwest Energy Efficiency Alliance
O&M	Operations and Maintenance
RCW	Revised Code of Washington
RBSA	Regional Building Stock Assessment
RTF	Regional Technical Forum
RTU	Rooftop Unit
SEM	Strategic Energy Management
TRC	Total Resource Cost
UCT	Utility Cost
UEF	Uniform Energy Factor
VFD	Variable Frequency Drive

Appendix II: Glossary

Achievable Potential	Conservation potential that includes considerations of market barriers and programmatic constraints, but not cost effectiveness. This is a subset of technical potential.
Avoided Cost	The costs avoided through the acquisition of energy efficiency.
Cost Effective	A measure is described as cost effective when the present value of its benefits exceeds the present value of its costs.
Economic Potential	Conservation potential that passes a cost-effectiveness test. This is a subset of achievable potential. In this report, a Total Resource Cost (TRC) test is used.
Levelized Cost	A measure of costs when they are spread over the life of the measure, like a car payment. Levelized costs enable the comparison of resources with different lifetimes.
Technical Potential	The set of possible conservation savings that includes all possible measures, regardless of market or cost barriers.
Therm	The energy content of approximately 100 cubic feet of natural gas at standard temperature and pressure.
Total Resource Cost (TRC) Test	A test for cost-effectiveness that considers all costs and benefits, regardless of who they accrue to. A measure passes this test if the present value of all benefits exceeds the present value of all costs. The TRC test is the predominant cost effectiveness test used throughout the Northwest and U.S.
Utility Cost (UCT) Test	A test for cost-effectiveness that considers the costs and benefits to the utility. A measure passes this test if the present value of all benefits exceeds the present value of all costs.

Appendix III: Measure List

This appendix provides a list of the measures that were included in this assessment and a comparison of sourcing for the measures. The main sources used for this study were measure assumptions from the Energy Trust of Oregon's current NW Natural WA program offerings, the Energy Trust of Oregon's NW Natural OR CPA Assessment, the Regional Technical Forum, the 2023 NW Natural WA CPA, and Industrial Energy Assessments completed for NW Natural by Energy 350. All measures were customized to make them specific to NW Natural's service territory and align closely with Energy Trust's current program offerings and the measures included in its Oregon CPA. This assessment used the most up to date information available when the CPA was developed.

This list is high-level and does not reflect the many variations for each individual measure. Instead, it summarizes measures by high-level categories. Many measures include variations specific to different home or building types, efficiency level, or other characterization. For example, attic insulation measures are differentiated by home type (e.g., single family, multifamily, manufactured home), heating system (e.g., heat pump or furnace), baseline insulation level (e.g., R0, R11, etc.) and maximum insulation possible (e.g., R22, R30, R38, R49). This differentiation allows for savings and cost estimates to be more precise.

Table 10: NWN WA CPA Measure Categories and Sourcing Comparison

Sector	End Use	Measure	In 2024 Energy Trust WA Program Offerings?	In Energy Trust of Oregon OR CPA Model?	In RTF?	In Prior CPA?	In E350 Report (Ind Only)
Residential	Appliance	Clothes Dryer	Yes	Yes	Yes	Yes	
Residential	Appliance	Clothes Washer (Gas WH)	No	Yes	Yes	Yes	
Residential	HVAC	Duct Sealing	No	Yes	No	Yes	
Residential	HVAC	Furnace Maintenance	No	No	No	Yes	
Residential	HVAC	Gas Boiler	Yes	Yes	No	Yes	
Residential	HVAC	Gas Fireplace	Yes	Yes	Yes	Yes	
Residential	HVAC	Gas Furnace	Yes	Yes	Yes	Yes	
Residential	HVAC	Steam Traps	No	Yes	No	Yes	
Residential	HVAC	Thermostat	Yes	Yes	Yes	Yes	
Residential	HVAC	Thermostat Optimization	Yes	Yes	No	Yes	
Residential	HVAC	Thermostatic Radiator Valve	No	Yes	No	Yes	
Residential	Water Heat	Boiler Maintenance	No	No	No	Yes	
Residential	Water Heat	Demand Controlled Recirculation Pump	No	Yes	Yes	Yes	
Residential	Water Heat	Gas Boiler	No	Yes	No	Yes	
Residential	Water Heat	Gas Tank Water Heater	Yes	Yes	Yes	Yes	
Residential	Water Heat	Gas Tankless Water Heater	Yes	Yes	Yes	No	
Residential	Water Heat	Pipe Insulation	No	Yes	No	Yes	
Residential	Water Heat	Thermostatic Shower Valve	No	No	Yes	Yes	
Residential	Weatherization	Ceiling Insulation	Yes	Yes	No	Yes	
Residential	Weatherization	Door	No	No	No	Yes	
Residential	Weatherization	Door Sweeps	No	No	Yes	No	
Residential	Weatherization	Floor Insulation	Yes	Yes	No	Yes	
Residential	Weatherization	Infiltration Reduction (Air Sealing)	No	No	No	Yes	
Residential	Weatherization	Wall Insulation	Yes	Yes	No	Yes	
Residential	Weatherization	Windows	Yes	Yes	No	Yes	
Residential	Whole Home	Behavior Program	Yes	No	No	Yes	
Industrial	Greenhouse	Gas Boiler - Greenhouse	Yes	Yes	NA	Yes	No
Industrial	Greenhouse	Greenhouse Controller	Yes	Yes	NA	No	No
Industrial	Greenhouse	IR Poly Film	Yes	Yes	NA	No	No
Industrial	Greenhouse	Thermal Shield	Yes	Yes	NA	No	No
Industrial	Greenhouse	Under Bench Heating	Yes	Yes	NA	No	No
Industrial	HVAC	Custom HVAC	NA	Yes	NA	No	Yes
Industrial	HVAC	Heat Recovery	NA	Yes	NA	Yes	No
Industrial	HVAC	HVAC Controls	NA	Yes	NA	No	Yes
Industrial	HVAC	Condensing Unit Heater	NA	Yes	NA	Yes	No
Industrial	Process Heating	Custom O&M	NA	Yes	NA	Yes	No
Industrial	Process Heating	Custom Process	NA	Yes	NA	No	No
Industrial	Process Heating	Gas Boiler - Process Heat	NA	Yes	NA	Yes	No
Industrial	Process Heating	Pipe Insulation	NA	Yes	NA	Yes	No
Industrial	Process Heating	Process Insulation	NA	Yes	NA	Yes	No
Industrial	Process Heating	Radiant Heating	NA	Yes	NA	Yes	Yes
Industrial	Process Heating	SEM	NA	Yes	NA	Yes	No
Industrial	Process Heating	Steam Traps	NA	Yes	NA	Yes	No
Industrial	Process Heating	Wall Insulation	NA	Yes	NA	Yes	No
Industrial	Water Heating	Gas Fired HPWH	NA	Yes	NA	No	No
Industrial	Water Heating	Tank Water Heater	NA	Yes	NA	No	No
Industrial	Weatherization	Ceiling Insulation	NA	Yes	NA	Yes	No
Industrial	Weatherization	Wall Insulation	NA	Yes	NA	Yes	No
Commercial	Appliance/Other	Clothes Dryer	Yes	Yes	Yes	No	
Commercial	Appliance/Other	Clothes Washer (Gas WH)	Yes	Yes	Yes	Yes	
Commercial	Appliance/Other	Ozone Laundry	Yes	Yes	No	Yes	
Commercial	Appliance/Other	Pool Cover	Yes	No	No	Yes	
Commercial	Appliance/Other	Pool Heater	Yes	No	No	Yes	
Commercial	Appliance/Other	Two Stage Valve for Clothes Dryer	Yes	Yes	No	No	
Commercial	Behavioral	SEM	Yes	Yes	No	Yes	
Commercial	Cooking	Gas Conveyor Broiler	Yes	Yes	No	Yes	
Commercial	Cooking	Gas Fryer	Yes	Yes	No	Yes	
Commercial	Cooking	Gas Griddle	Yes	Yes	No	Yes	
Commercial	Cooking	Gas Steam Cooker	Yes	Yes	No	Yes	
Commercial	HVAC	Advanced RTU Controls (ARC)	Yes	Yes	Yes	No	

Sector	End Use	Measure	In 2024 Energy Trust WA Program Offerings?	In Energy Trust of Oregon OR CPA Model?	In RTF?	In Prior CPA?	In E350 Report (Ind Only)
Commercial	HVAC	Condensing Gas RTU	No	Yes	No	Yes	
Commercial	HVAC	Gas Boiler	Yes	Yes	Yes	Yes	
Commercial	HVAC	Gas Furnace	Yes	Yes	No	Yes	
Commercial	HVAC	Heat Recovery Ventilator	No	No	No	Yes	
Commercial	HVAC	Kitchen Vent Hood VFD	Yes	Yes	No	Yes	
Commercial	HVAC	Modulating Burner	Yes	Yes	No	Yes	
Commercial	HVAC	Pipe Insulation	Yes	Yes	No	Yes	
Commercial	HVAC	Radiant Unit Heater	Yes	No	No	Yes	
Commercial	HVAC	Refrigeration - Retrofit Doors - HVAC Savings	Yes	Yes	No	No	
Commercial	HVAC	Retrocommissioning - HVAC	Yes	No	No	Yes	
Commercial	HVAC	Steam Traps	Yes	Yes	No	Yes	
Commercial	HVAC	Thermostat	Yes	Yes	Yes	yes	
Commercial	Water Heating	Gas Boiler	Yes	Yes	No	Yes	
Commercial	Water Heating	Pipe Insulation	Yes	Yes	No	Yes	
Commercial	Water Heating	Recirculation Pumps	Yes	Yes	Yes	Yes	
Commercial	Water Heating	Tank Water Heater	Yes	Yes	No	Yes	
Commercial	Water Heating	Tankless Water heater	Yes	Yes	No	Yes	
Commercial	Water Heating	Thermostatic Shower Valve	No	No	Yes	No	
Commercial	Weatherization	Ceiling Insulation	Yes	Yes	No	Yes	
Commercial	Weatherization	Secondary Window Glazing	No	Yes	Yes	No	
Commercial	Weatherization	Wall Insulation	Yes	No	No	Yes	
Commercial	Weatherization	Windows	Yes	Yes	No	Yes	

Appendix IV: Energy Efficiency Potential by End Use

The tables in this appendix document the economic energy efficiency savings potential by end use for each sector, using both the TRC and UCT cost tests.

Table 11: Residential TRC Cost-Effective Potential by End Use (Therms)

End Use	2-Year	5-Year	10-Year	25-Year
Appliances	5	39	366	4,147
HVAC	193,489	851,255	3,542,966	10,630,656
Water Heat	8,286	56,959	362,320	2,260,444
Whole Building	5,293	28,389	90,752	128,666
Total	**207,073**	**936,642**	**3,996,404**	**13,023,913**

Table 12: Residential UCT Cost-Effective Potential by End Use (Therms)

End Use	2-Year	5-Year	10-Year	25-Year
Appliances	11,496	39,711	103,242	203,528
HVAC	281,218	1,125,002	4,393,919	12,665,409
Water Heat	8,286	56,959	362,320	2,260,444
Whole Building	5,293	28,389	90,752	128,666
Total	**306,292**	**1,250,061**	**4,950,233**	**15,258,047**

Table 13: Commercial TRC Cost-Effective Potential by End Use (Therms)

End Use	2-Year	5-Year	10-Year	25-Year
Appliances	8,490	40,441	176,978	817,149
HVAC	181,118	559,865	1,060,187	1,062,411
Water Heat	101,921	237,288	739,029	2,219,388
Whole Building	3,861	27,061	158,359	729,766
Total	**295,390**	**864,656**	**2,134,553**	**4,828,715**

Table 14: Commercial UCT Cost-Effective Potential by End Use (Therms)

End Use	2-Year	5-Year	10-Year	25-Year
Appliances	9,977	48,797	221,687	945,003
HVAC	181,118	559,865	1,060,187	1,062,411
Water Heat	103,553	246,882	780,514	2,294,792
Whole Building	3,866	27,094	158,564	730,333
Total	**298,514**	**882,638**	**2,220,951**	**5,032,539**

Table 15: Industrial TRC Cost-Effective Potential by End Use (Therms)

End Use	2-Year	5-Year	10-Year	25-Year
HVAC	29,333	182,178	1,008,021	2,546,870
Process	31,859	196,987	1,081,636	2,545,344
Water Heat	645	5,991	45,216	411,597
Whole Building	7,137	35,937	149,757	247,275
Total	**68,974**	**421,093**	**2,284,630**	**5,751,086**

Table 16: Industrial UCT Cost-Effective Potential by End Use (Therms)

End Use	2-Year	5-Year	10-Year	25-Year
HVAC	37,220	222,680	1,182,373	2,850,986
Process	31,859	196,987	1,081,636	2,545,344
Water Heat	645	5,991	45,216	411,597
Whole Building	7,137	35,937	149,757	247,275
Total	**76,862**	**461,595**	**2,458,982**	**6,055,202**

Appendix V: Treatment of Benefits and Costs

The table below details the application of costs and benefits by customer type and test perspective. Note that the capital costs column is intended to reflect the complete measure costs, including the portions of measure costs covered by both the utility incentive and any remaining out of pocket customer costs. The utility incentive cost column is included separately to differentiate that, in the UCT perspective, utility-provided incentives are included.

Customer Type		Test Perspective	Commodity	Supply Capacity	Distribution Capacity	Regional Act Credit	Risk Mitigation	Carbon	Non-Energy Benefits	Capital Costs	Admin Costs	O&M	Periodic Replacement Costs	Utility Incentive Costs
Firm	Sales	TRC	Benefit	Benefit	Benefit	Benefit	Benefit	Benefit	Benefit	Cost	Cost	Cost	Cost	Excluded
Interruptible	Sales	TRC	Benefit	Excluded	Excluded	Benefit	Benefit	Benefit	Benefit	Cost	Cost	Cost	Cost	Excluded
Firm	Transport	TRC	Benefit	Benefit	Benefit	Benefit	Benefit	Benefit	Benefit	Cost	Cost	Cost	Cost	Excluded
Interruptible	Transport	TRC	Benefit	Excluded	Excluded	Benefit	Benefit	Benefit	Benefit	Cost	Cost	Cost	Cost	Excluded
Firm	Sales	UCT	Benefit	Benefit	Benefit	Benefit	Benefit	Benefit	Excluded	Excluded	Cost	Excluded	Excluded	Cost
Interruptible	Sales	UCT	Benefit	Excluded	Excluded	Benefit	Benefit	Benefit	Excluded	Excluded	Cost	Excluded	Excluded	Cost
Firm	Transport	UCT	Excluded	Benefit	Benefit	Benefit	Excluded	Benefit	Excluded	Excluded	Cost	Excluded	Excluded	Cost
Interruptible	Transport	UCT	Excluded	Excluded	Excluded	Benefit	Excluded	Benefit	Excluded	Excluded	Cost	Excluded	Excluded	Cost