Thurston Climate Mitigation Collaborative

Residential Energy Efficiency & Electrification Campaign

Market Assessment and Incentive Program Research

2024 TCMC Regional Initiative, Phase I - Campaign Design and Planning
Step 2: Background Research and Stakeholder Engagement

Deliverable #1

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1. BACKGROUND

The Thurston Climate Mitigation Collaborative (TCMC) is an ongoing partnership among Thurston County and the cities of Lacey, Olympia, and Tumwater to identify and implement actions to reduce locally generated greenhouse gas (GHG) emissions. The Thurston Climate Mitigation Plan (TCMP) includes 22 strategies across five sectors which aim to meet GHG emission reduction targets in alignment with established community goals. According to the TCMC's new Regional Implementation Guidance (2023), implementation of TCMP actions is led by individual Jurisdiction Parties, but each year the Collaborative selects a Regional Initiative to advance in a coordinated way.

For 2024, the TCMC selected two Regional Initiatives, both of which help to implement TCMP *Strategy B1: Reduce energy use in existing residential buildings*. Based on the TCMC's most recent (2022) greenhouse gas (GHG) emissions inventory, residential energy use accounted for 26% of countywide emissions, the second largest source of emissions after transportation (36%). Emissions from residential natural gas consumption increased 31% from 2015 to 2022, while residential electricity use increased by only 3%. Natural gas use was the largest increase in emission-generating activities in Thurston County 2015–2022. These data underscore the importance of transitioning homes away from fossil fuels to electricity as soon as possible if we are to meet our emission reduction goals.

In 2024- 2025, the TCMC is embarking on two major regional initiatives targeting GHG emissions in the residential energy sector. These initiatives are:

- Design a Residential Energy Efficiency and Electrification Campaign (E3 Campaign)
- Develop a Home Energy Score Model Ordinance (HES Policy)

This Report contributes to the design of the E3 Campaign. The HES Policy development is taking place separately and in parallel to this initiative. Specifically, this Report serves as a deliverable for the completion of two tasks under Step 2 of the E3 Campaign Project Plan:

Step 2: Background Research and Stakeholder Engagement
- 2.2 Market Assessment
- 2.3 Program and Incentive Research

Key Terms

Area Median Income (AMI): A metric used to calculate the midpoint of a specific area's income distribution.

Backup Heating & Cooling: An auxiliary heating system may be used when the primary heat pump struggles to achieve the desired temperature in extremely cold weather.

Boiler: An appliance used to heat a home by using an energy source, typically natural gas or oil, to heat water to then push the resulting steam through pipes throughout the home.

Building Envelope: Consists of all parts of the physical separator between the conditioned and unconditioned environments of a building, such as windows, doors, roof, floor, foundation, and insulation.

Energy Efficiency and Conservation Block Grant (EECBG) Program: A federal Department of Energy (DOE) grant program funded by the Bipartisan Infrastructure Law designed to assist states, local governments, and Tribes in implementing strategies to reduce energy use, to reduce fossil fuel emissions, and to improve energy efficiency.

Electrification: The process of powering appliances, systems, or sectors using electricity, often converting from fossil fuels.

Energy Burden: One indicator to measure energy insecurity or the percentage of household income that goes toward energy costs.

Furnace: An appliance used to heat a home by heating air that is then distributed to the home through a series of ductwork and vents.

Greenhouse gas (GHG): Gases that absorb infrared radiation in the atmosphere. The most significant GHGs emitted are carbon dioxide (CO2), methane (CH4), and nitrous oxide (N20).

Home Electrification and Appliance Rebate (HEAR) Program: A program in the state of Washington providing rebates to households and small businesses to purchase and install high efficiency electric equipment and appliances.

Heat Pump Space Conditioning or Air Source Heat Pump (ASHP): A HVAC system designed to use electricity to transfer heat around your home. These systems can consist of a ducted heat pump, which transfers heat between your house and the outside through ductwork, or a ductless heat pump, that does not require the use of ducts to operate.

Heat Pump Water Heater (HPWH): A highly efficient water heating system that uses electricity to move heat from the air to the water.

Heating, Ventilation Air Conditioning (HVAC): Systems that control temperature, humidity, and purity of the air.

Kilowatt Hour (kWh): A unit of energy used to measure electricity consumption, defined as the power consumption of 1,000 watts for 1 hour.

Low-to-Moderate Income (LMI): A classification of a household income compared to the AMI. This campaign will use LMI to equal <120% AMI.

Manufactured Homes: A type of prefabricated housing that is assembled in a controlled factory and is later transferred to the home lot.

Natural Gas: A naturally occurring gaseous resource and fossil fuel widely used as a fuel for heating, cooking, and electricity generation.

Oil (or Crude Oil): A naturally occurring liquid resource and fossil fuel widely used as a fuel for heating, cooking, and electricity generation.

Plug Loads: Accounts for all energy used by products that are powered from an outlet. Generally, excludes major end uses of a building such as HVAC, lighting, and water heating.

Propane: A gas resource that is present in natural gas and can be used as a fuel in the home.

Puget Sound Energy (PSE): The local utility company providing the majority of Thurston County residents with electric and natural gas services.

Request for Proposal (RFP): A business document that publicly defines the project and solicits bids from qualified contractors to complete it.

Site Built Home: A home that is constructed on the property where it will remain.

Campaign Goals and Structure

The TCMC's Energy Efficiency and Electrification Campaign (E3 Campaign) will be a multifaceted outreach and incentive program to advance electrification and energy efficiency in existing residential buildings throughout the Thurston region. By working together to design, plan, and implement an E3 campaign in 2024-2025, the TCMC aims to achieve the following goals:

- Build and evaluate a foundational, holistic program to accelerate residential building electrification and energy efficiency in support of Thurston Climate Mitigation Plan (TCMP) goals and targets.
- Deliver a compelling and accessible educational campaign to raise awareness of the climate, health, and economic benefits of building electrification and energy efficiency among broad segments of the Thurston community.
- Support energy equity by prioritizing program benefits to LMI residents, renters, and members of overburdened communities.
- Launch and evaluate the effectiveness of an energy advisory service that provides residents personalized, step-by-step technical guidance and support for home energy upgrades.
- Connect a quantifiable number of residents with information about technologies, incentives, and advisory support services *(specific target numbers TBD based on final program design and budget).*
- Implement a quantifiable number of home electrification and efficiency improvements across the participating jurisdictions during the campaign period *(specific target numbers TBD based on final program design and budget).*
- Maintain program flexibility to respond and adapt to regional, state, and national clean energy programs and investments, with the aim of ensuring ongoing benefits to Thurston residents.

To meet these goals, the TCMC aims to advance a Residential E3 Campaign consisting of four components (Figure 1):

1. **Web-Based Information Hub** to provide education about home electrification/energy efficiency and provide location-based resources
2. **Local Incentives** to reduce financial barriers to home energy upgrades
3. **Advisory Support Service** to answer technical questions and support consumer action
4. **Outreach and Marketing Campaign** to raise awareness, direct people to the website, and tie the whole campaign together

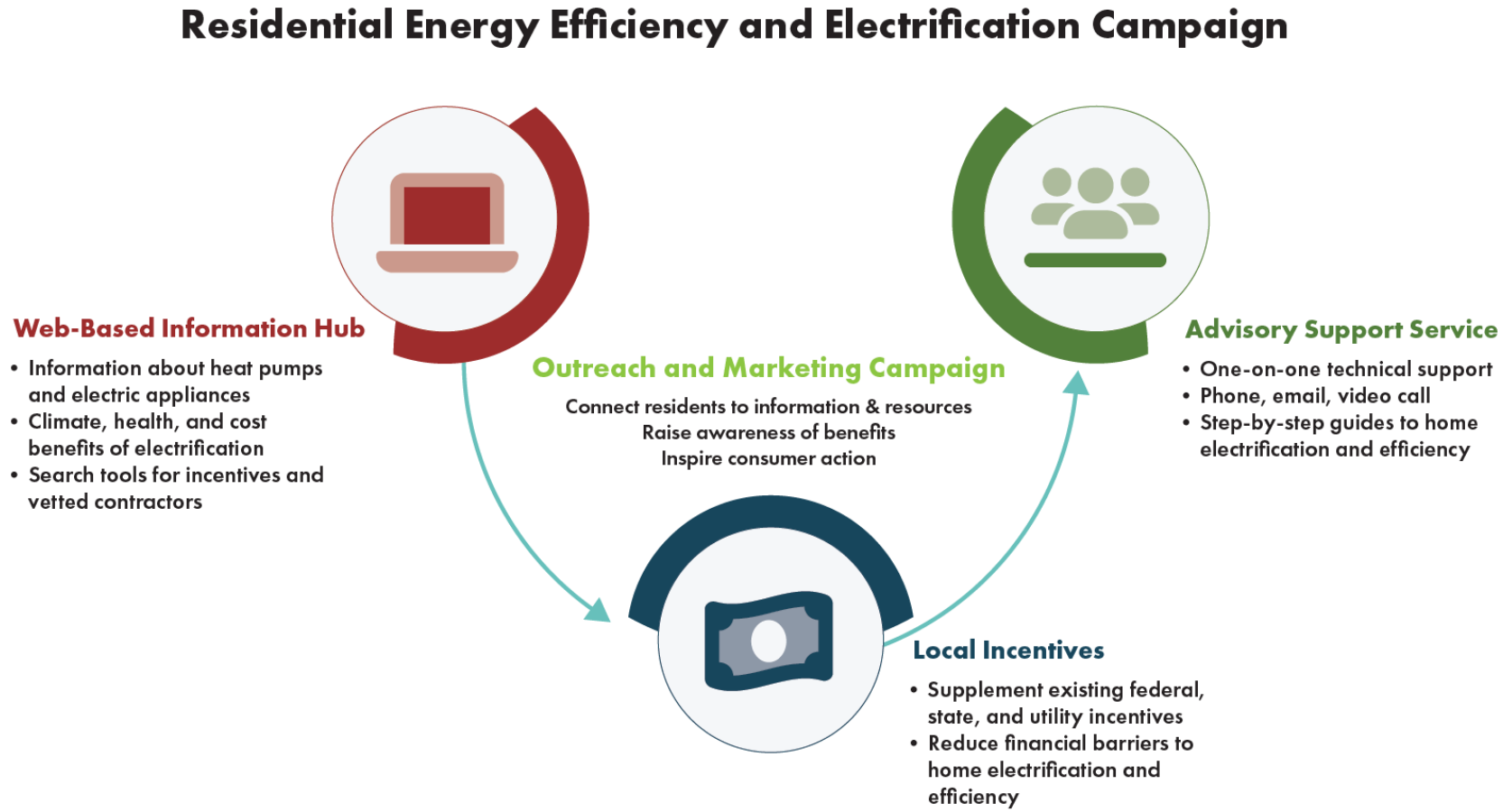

Figure 1. Proposed structure of a Residential Energy Efficiency and Electrification Campaign for the Thurston region.

Campaign Development Status

Prior work at the local and regional levels has established the foundation of the Thurston E3 Campaign. The following is a summary of the status of each campaign component.

Web-Based Information Hub

This foundational component of the E3 Campaign launched in February 2024 as the pilot "Switch Is On" (SIO) web platform (wa.switchison.org). The Building Decarbonization Coalition's SIO initiative aims to educate, inspire, and make switching to electricity easier for homeowners and renters. The SIO website includes educational resources about electric home appliances (heat pump space heaters, water heaters, induction stovetops, etc.), and search tools to connect users with location-based information about vetted contractors and incentives (local, state, federal, and utility). Thurston County and City of Olympia are financially supporting the SIO pilot along with Pierce County, King County, Seattle and Tacoma. All residents of Thurston County communities are able to access the resource. As the TCMC builds out the local incentive campaign and advisory support service in 2025, these components will be integrated into the foundational SIO platform.

Local Incentives

The E3 Campaign will provide financial incentives to offset the costs of home electrification upgrades with a focus on low- to moderate-income (LMI) households in Thurston County and the participating cities. The method for distributing local incentives will build on and expand the Energize Olympia program, which provided no-cost and reduced-cost ductless heat pump installations to City of Olympia residents in 2023 and 2024. Energize Olympia provided two pathways:

- LMI Pathway: provided fully subsidized ductless heat pump equipment and installations for LMI households with incomes 120% of Area Median Income (AMI) or less. This pathway also provided limited weatherization services through South Puget Sound Habitat for Humanity (SPSHFH).
- Market Rate Pathway: available to any City of Olympia resident, regardless of income; provided $600-$1000 group purchase discount, free site assessment, streamlined installation and customer support, and guidance on incentives and financing.

For the 2025 E3 Campaign, participant and equipment eligibility are determined in part by the available funding sources. TCMC jurisdictions each have one or more of the following three funding sources to provide incentives to their residents. Given the parameters of the state and federal grant funding, **the E3 Campaign will primarily focus on an LMI Pathway**. Only jurisdictions that have access to other funding sources may be able to also provide a market rate pathway.

Washington Home Electrification and Appliance Rebate (HEAR) Program

Thurston County and the cities of Olympia, Lacey, Tumwater, and Tenino have each been awarded funds through the state HEAR program that will be used to subsidize installations of eligible equipment for low- and moderate-income (LMI) households. The HEAR program specifies that eligible recipients must be LMI single- & multi-family households with income 150% of Area Median Income (AMI) or less. Eligible equipment for rebates and incentives includes, but is not limited to:

- Heat pumps for heating and cooling (i.e., air-source, ground-source)
- Residential and commercial induction cooking equipment
- Heat pump water heaters
- Heat pump clothes dryers

- Electric panel and wiring upgrades required for installation of new electric equipment

The jurisdictions plan to provide subsidized installations of eligible equipment for LMI households (<120% AMI). Whether they will also offer rebates/incentives for households earning 121-150% AMI is yet to be determined. Whether all or some of the eligible equipment will be included in the program is also yet to be determined.

Thurston County, Tumwater and Tenino plan to use their entire HEAR allocations for the 2025 Residential E3 Campaign, while Lacey and Olympia are splitting their allocations across two different programs. Up to 15% of HEAR funding can be used for administration costs including outreach & education. Each jurisdiction's total HEAR allocation and the expected amount to be used for E3 Campaign Incentives are listed in the table below.

Jurisdiction	Total HEAR Funding	Estimated Amount for 2025 Residential E3 Incentives
Thurston County	$472,263	$401,424
Olympia	$481,483	$409,261
Lacey	$477,555	$405,922
Tumwater	$477,540	$405,909
Tenino	$95,009	$80,758

Federal Energy Efficiency and Conservation Block Grant (EECBG)

Thurston County, Lacey, and Olympia will receive formula grant allocations through the U.S. Department of Energy's EECBG program, which may be used to fund weatherization upgrades and subsidized heat pump water heater (HPWH) installations for LMI households (<120% AMI). Expected numbers of home energy audits and HPWH installations per jurisdiction are listed below. The City of Tumwater does not meet the population threshold to qualify for this EECBG formula funding.

Jurisdiction	EECBG Formula Grant Amount	Estimated # Home Energy Audits	Estimated # HPWH Installations
Thurston County	$81,040	81	9
Olympia	$122,030	122	13
Lacey			

In addition to the block grants, Thurston County is participating in the EECBG Community Energy Fellowship program from August 2024 to December 2025. This federally funded Fellow will augment staff capacity to help Thurston County and partner cities develop, administer, and ensure sustainability of the E3 Campaign.

Local Government Funding Sources

To fund the Energize Olympia campaign in 2023 and 2024, the City of Olympia has provided funding from the City's Climate Program, the City's Community Development Block Grant (CDBG), and grant funding from the Washington State University Community Energy Efficiency Program. Olympia may also allocate some City funding in 2025 for E3 Campaign market rate incentives for households >120% AMI

(amount TBD). CDBG may be a potential supplemental funding source for the City of Lacey... Thurston County distributes its CDBG allocation on a rotating annual between Tumwater and unincorporated/South County cities. The potential use of County CDBG funds for E3 Campaign incentives in unincorporated/South County can be considered in the next round of CDBG fund distribution in 2025.

The City of Lacey uses City funding, as well as some of its HEAR allocation, for its Energy Efficiency Rebate Matching Program, which doubles the amount of Puget Sound Energy (PSE) rebates for qualifying appliances to City residents.

In addition to local government funding, the E3 Campaign may be able to leverage supplemental grant funding from non-profit partners, as Habitat for Humanity has provided for the Energize Olympia Campaign.

Advisory Support Service

When the E3 Campaign Phase I Project Plan was developed in December 2023, the TCMC was aiming to launch an advisory support service in Spring 2024. The planned advisory support service was to be integrated into the Switch Is On (SIO) web platform, and would include "low-touch" support via email plus "high-touch" support via phone and video calls. However, the vendor that had proposed these services to the TCMC was since purchased by another company that has no plans to continue the advisory support services.

The TCMC's 2024 Regional Initiatives Budget includes $19,500 for the Advisory Support Service. The TCMC will need to identify and procure a technical support provider to add this component into the E3 Campaign when it launches in 2025.

Outreach and Marketing Campaign

The SIO website rollout is accompanied by a regional (tri-county) outreach campaign that aims to raise community awareness about the benefits of home electrification and steer users to the central information hub. The SIO outreach campaign began in February 2024 with a kickoff event in Olympia, and will continue through June 2025 via partner communications, paid ads, a "chefluencer" program that trains local chefs as electrification ambassadors, and two-three community events at locations in the tri-county region.

A local Thurston County outreach and marketing campaign will accompany the launch of the E3 Campaign in 2025. This countywide campaign will build on the model of Energize Olympia with the primary goal of enrolling eligible participants in the E3 Campaign incentive program. The secondary goal is to raise awareness of electrification benefits and resources among the broader community by steering users to The Switch Is On web platform.

Summary of Campaign Development Status

As of July 2024, the following elements of the Thurston E3 Campaign are established:

- The Switch Is On website serves as the central information hub for the E3 Campaign. It educates residents about home electrification benefits and technologies, and provides tools to find vetted contractors and available incentives.
- The Switch Is On campaign includes general regional outreach about home electrification, but more targeted local outreach and marketing will be needed.

- Due to requirements of the available state and federal funding, E3 Campaign incentives will only be available to low- and moderate-income (LMI) households (up to 150% AMI), with some specifically committed to lower income levels (<120% or <80% AMI).
- Jurisdictions that have access to other funding sources (currently only Olympia and Lacey) may be able to also provide incentives for higher-income households.
- The E3 Campaign will follow the general Energize Olympia model of providing subsidized installations of eligible equipment for LMI households. However, the precise way that participants select installers is to be determined.
- Equipment to be covered will be from the list of HEAR eligible equipment (as well as the energy audits and HPWH installations with EECBG funding), but which specific equipment and how many installations per jurisdiction are to be determined.

Research Questions

We have identified six main categories of Research Questions about the E3 Campaign remain to be answered: Types of Equipment, Participant Pathways, Contractors and Installation Partners, Advisory Support Service, Outreach and Marketing, and Program Structure and Administration. Specific Questions in each category are listed below.

Types of Equipment

1. Which specific equipment (from the HEAR list of eligible equipment) will be incentivized?
2. What will be the incentive amounts and how many installations of each type can be completed with the available funding?

Participant Pathways

3. For the LMI Pathway that covers subsidized installations, will the household income threshold be <80%, <120%, and/or <150%?
4. What incentives will be included in the Market Rate Pathway?
5. Which jurisdictions will be able to fund additional incentives (e.g., rebates) for market-rate participants, and what will these be?

Contractors and Installation Partners

6. How many and what type(s) of installers/providers will we work with? (heat pump installers, home energy audit providers, etc.)
7. Which model for selecting installers will we use? (see Appendix A)
    a. Installer Model: Group purchase negotiated directly w/installer for both pathways as a time of sale discount for specific equipment.
    b. Distributor Model: Discount negotiated with an equipment distributor (usually less than installer discount, but can use any equipment meeting program efficiency requirements).
8. What types of implementation partners are needed?
    a. Will SPFHFH or another program partner support program administration of the LMI pathway with income verification and outreach?
    b. Will SPSHFH or another program partner be able to provide weatherization services and critical home repairs (as in Energize Olympia)?
    c. Are there opportunities to leverage other funding sources via partnerships?
9. What types of agreements or contracts are needed to involve program partners?

Advisory Support Service

10. What type of Advisory Support Service is needed?
11. How will the Advisory Support Service be procured/provided?

Outreach and Marketing[1]

12. What types of outreach messages are most effective?
13. How can we reach and engage the target populations that are eligible for incentives?
    a. What are residents' preferred engagement/outreach methods?
    b. What types of outreach partners are needed and what is their role?

Program Structure and Administration

14. What best practices for program structure and administration do we want to incorporate into the E3 Campaign?
15. How can we administer a multi-jurisdictional program as efficiently as possible and in a way that minimizes confusion for Thurston residents?
    a. What are the staff capacity needs and who will be the single point of contact?
    b. What systems need to be put in place for regional program administration?
    c. Can jurisdictions align their incentives as much as possible to avoid confusion?
16. How will jurisdictions utilize the budget for program administration, outreach & education (15% of HEAR funding)?

- How will costs for residents of urban growth areas be distributed?

17. What is our approach to customer support and management?
18. Will there be a role for volunteers (e.g., Energize Ambassadors)? If so:
    a. What is their role?
    b. Will they receive stipends and if so, how will this be funded?

Organization of this Report

This Report serves as a deliverable for the completion of two tasks under Step 2 of the E3 Campaign Phase I Project Plan:

- **Market Assessment**: Examine local energy metrics, including USDOE and NREL data analysis tools as needed, to inform campaign development.
- **Program and Incentive Research**: Research current and past incentive programs for home energy efficiency and electrification.

Market Research is covered in Section 2 of this Report, and Program and Incentive Research is covered in Section 3. Each of these tasks will address a subset of the E3 Research Questions listed above.

The Conclusion of each section includes staff recommendations based on the research, organized according to the six categories of Research Questions:

- Types of Incentives
- Participant Pathways
- Contractors and Installation Partners
- Advisory Support Service

[1] Development of a communications plan and materials is beyond the scope of this Report. These research questions are intended to serve as a starting point for developing that plan.

- Outreach and Marketing
- Program Structure and Administration

Next Step – Stakeholder Engagement

The E3 Campaign Phase I Project Plan includes two additional tasks under Step 2: *Partner Identification and Engagement* and *Resident Engagement.* These tasks are being completed via a professional services contract for stakeholder engagement between the City of Olympia (on behalf of the TCMC) and Confluence Communications. Confluence Communication's scope of work includes Partner Engagement and Resident Engagement, and may also augment the Program and Incentive Research task.

Results of Confluence Communications' stakeholder engagement will be reported in a follow-up Report in Fall 2024. Following the completion of the stakeholder engagement tasks, the Staff Team will finalize responses to the E3 Research Questions. Responses to these questions will be used to develop the E3 Campaign Launch & Implementation Plan.

2. MARKET ASSESSMENT

The initial step of background research for the E3 Campaign consisted of a Market Assessment to identify needs and opportunities for home electrification in Thurston County. The assessment utilizes federal data analysis tools provided by the United States Department of Energy ("USDOE") and National Renewable Energy Laboratory ("NREL"), as well as local research compiled by Thurston Regional Planning Council (TRPC) and City of Olympia, to examine local housing stock, household energy burdens, local and state energy consumption patterns, and priority energy efficiency upgrades to maximize utility bill savings. Finally, this section includes a summary of the pre-wave survey that was conducted prior to the launch of the Switch Is On pilot campaign in Washington. The survey examined perceptions of regional residents to electric-powered homes and the barriers to switching.

Results of the market assessment are used to inform the design of financial incentives, outreach and marketing for the E3 Campaign. Specifically, this section will help answer research questions about types of equipment to incentivize, housing types and characteristics to target, income eligibility criteria, outreach messages, and methods to engage target populations.

Thurston County Housing and Energy Use Data

In January 2024, the Thurston Regional Planning Council (TRPC) completed a white paper for the TCMC titled *Advancing Energy Efficiency in Residential Buildings (aka* "Energy Efficiency White Paper"). The TCMC also included housing market data in the May 2024 *Home Energy Score (HES) Model ordinance Policy Review Memo*. Findings from these analyses included the following:

- There were a total of 124,400 dwelling units in Thurston County in 2022. Forty-nine percent of the housing units were within the cities of Lacey, Olympia, and Tumwater, with another 16% in their urban growth areas (UGAs). Countywide 65% of units were single-family homes, 24% multifamily (mostly in incorporated cities), and 11% manufactured homes (mostly in rural County and UGAs).
- Sixty-six percent of housing units were owner-occupied in 2020, and 34% were rented. Nearly half of Lacey, Olympia, and Tumwater households rent, while only a fifth of rural residents do. Single family dwellings, townhouses, and manufactured and mobile homes are predominantly owner-occupied while buildings with two or more units are almost exclusively rented.

Households headed by a person of color are more likely to rent and have lower incomes than white households.

- 33% of Thurston County housing units were built before 1980, and 65% before 2000. The large proportion of older homes in the region suggests that many would benefit from energy- and cost-saving retrofits. According to the Northwest Energy Efficiency Alliance's Residential Building Stock Assessment, older homes in Washington State (built pre-1980) have less insulation, allow more air leakage, and have higher heat-loss rates than homes constructed in more recent decades.
- Based on 2022 U.S. Census data, 62% of Thurston County housing units used electricity as their energy source for home heating, and 30% used utility-provided natural gas (the remainder used bottled tank or LP gas, fuel oil/keronsene, or other fuels). Across TCMP jurisdictions, natural gas use is most common in Lacey homes (44 percent of homes), although the greatest number of households that heat with gas are in unincorporated Thurston County (around 12,500 homes)

The TRPC's Energy Efficiency White Paper (TRPC 2024) used data from the U.S. Department of Energy and local data to describe energy burden in Thurston County. Countywide, the average household spends $1,712 on home energy costs per year, which is an average of 2% of household annual income. This rate is slightly lower than the national average of 3%. Thirteen percent of Thurston County households have a high energy burden (defined as spending > 6% percent of income on energy costs) and 7% have a severe energy burden (spending >10% of income on energy costs).

In Thurston County, income is the greatest predictor of a household's energy burden (Figure 2). Households that make less than 30% of the Area Median Income (AMI) spend an average of 13% of that income on energy costs, compared to households at or above the AMI, which spend less than 2% of their annual income on energy. Renters have a slightly higher energy burden than homeowners. Residents of manufactured homes and older buildings carry larger energy burdens than those in homes built since 2010.

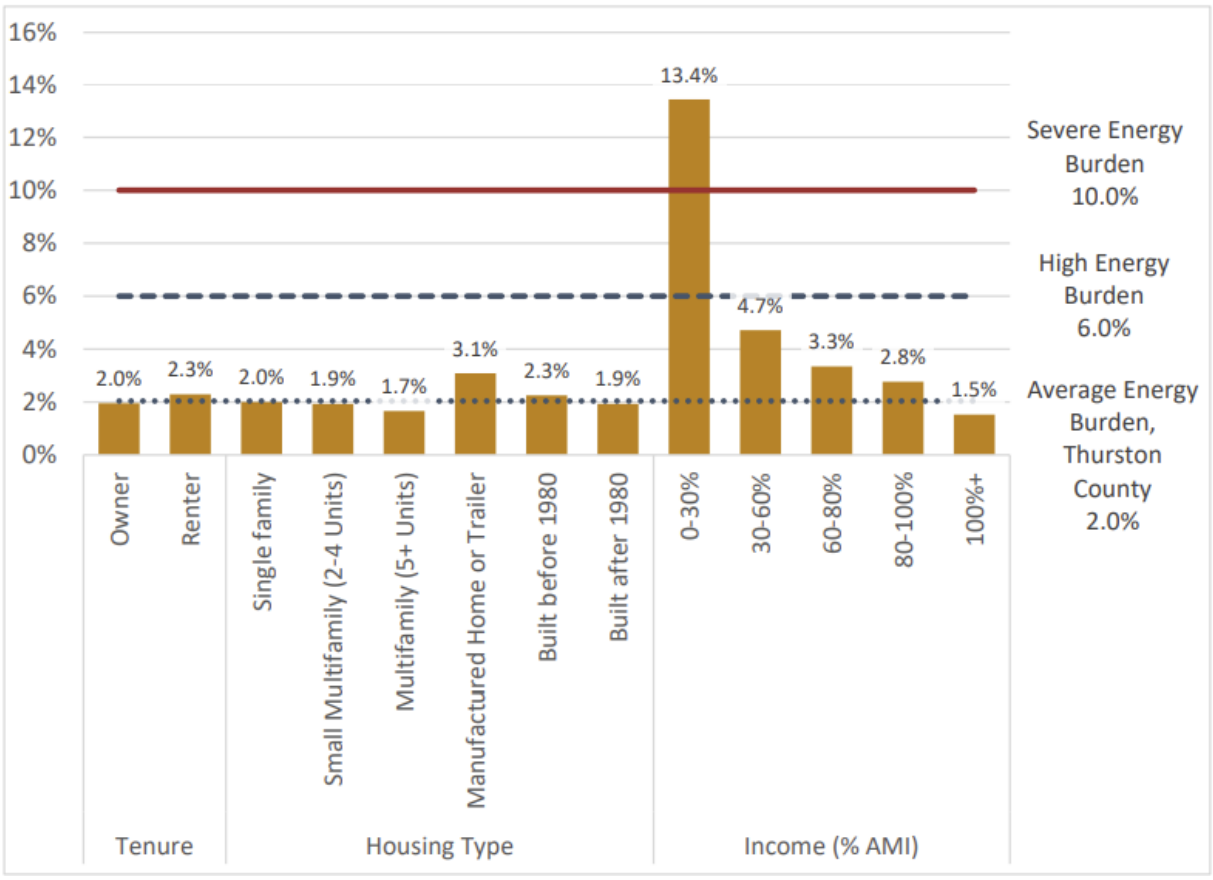

Figure 2: Average energy burden for various subgroups in Thurston County. Sources: TRPC (2022), US Dept of Energy (2020).

Geographically, residents of South County cities and unincorporated Thurston County experience greater energy burdens, with Bucoda and Tenino having the highest average burden (>3%). Residents of Olympia, Tumwater, and Lacey have lower energy burdens, ranging from 1.8-1.9%. This variation is likely caused by differences in building supply and fuel type between the county's urban and rural areas. Households that use fuel oil, propane gas, and wood as their primary fuel type have higher energy burdens than those that use electricity or natural gas.

Statewide Energy Consumption Survey Data

The U.S Energy Information Administration (EIA) administers a Residential Energy Consumption Survey (RECS) every five years to a nationally representative sample of homes. The survey provides detailed information on U.S. household energy usage split into U.S. Census Bureau regions and divisions. The four regions included are the Northeast, Midwest, South, and West, with the latter being divided into the Pacific and Mountain divisions. The Pacific division covers the states of California, Oregon, and Washington. Some survey data is also provided at the state level. The following three charts present data at for Washington state from the most recent 2020 RECS.

Figure 3 shows annual household energy end use consumption in Washington State households. This chart combines energy use from all major fuel sources: electricity, natural gas, propane, and fuel oil/

kerosene. Space heating is the largest overall consumer of energy in Washington State households (43%), and water heating is the second largest single category (24%).

Figure 4 repeats this breakdown of annual household energy consumption, but for *natural gas* alone. Compared to overall energy use in Figure 3, a much higher proportion of natural gas use goes towards both space heating (66%) and water heating (30%). Figure 5 shows the same breakdown for *electricity* alone. End use consumption of electricity shows a much lower percentage used for space heating (26%) and water heating (19%). Household electricity consumption in Washington state services 'other' equipment such as clothes dryers, cooking equipment, pool heaters, hot tub heaters, and lighting combined for 44%.

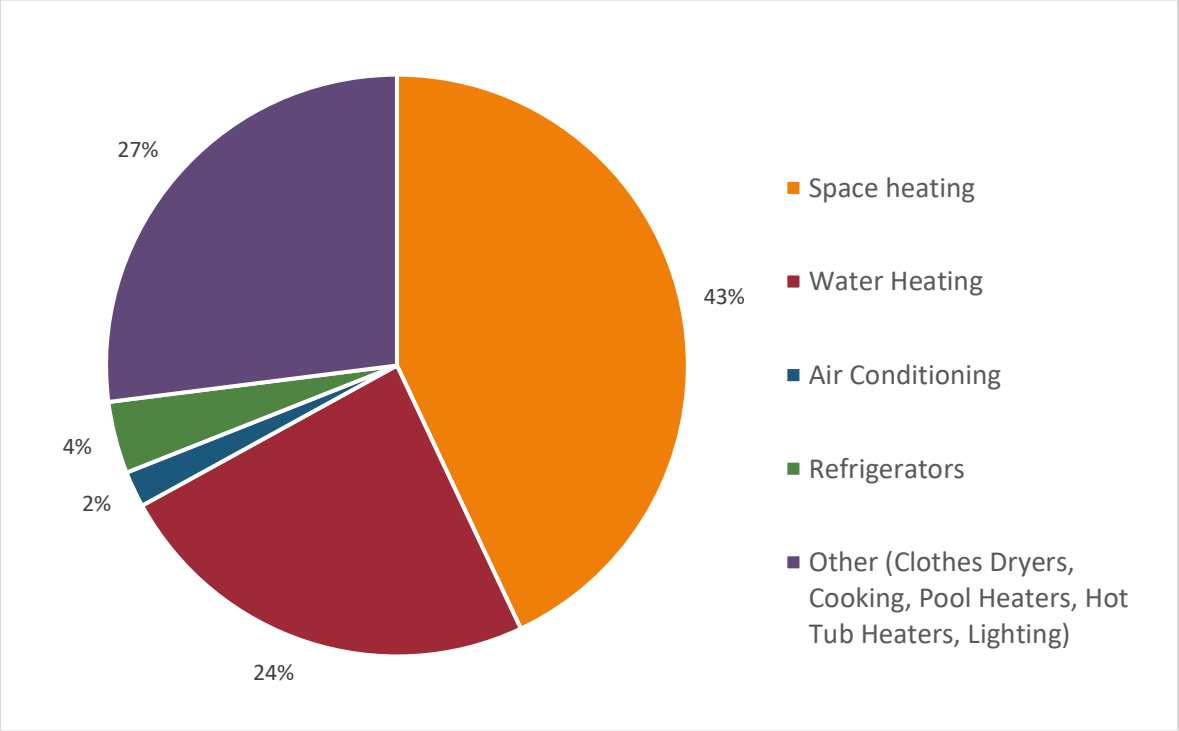

Figure 3: Annual household Energy End-Use Consumption in Washington State (2020 RECS).

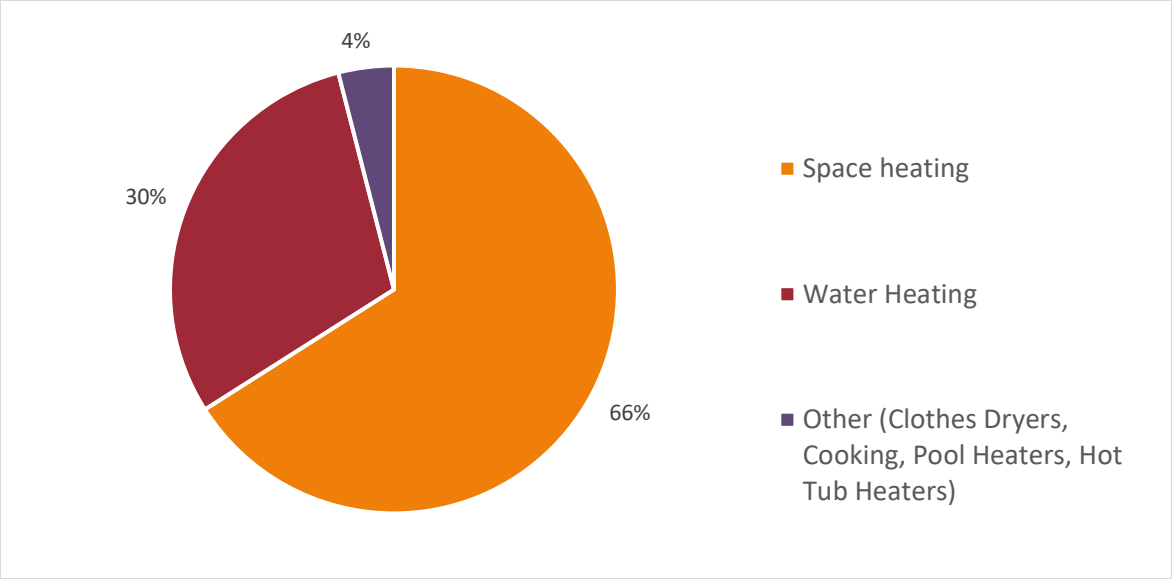

Figure 4: Annual Household Site End-Use Consumption of Natural Gas in Washington State (2020 RECS).

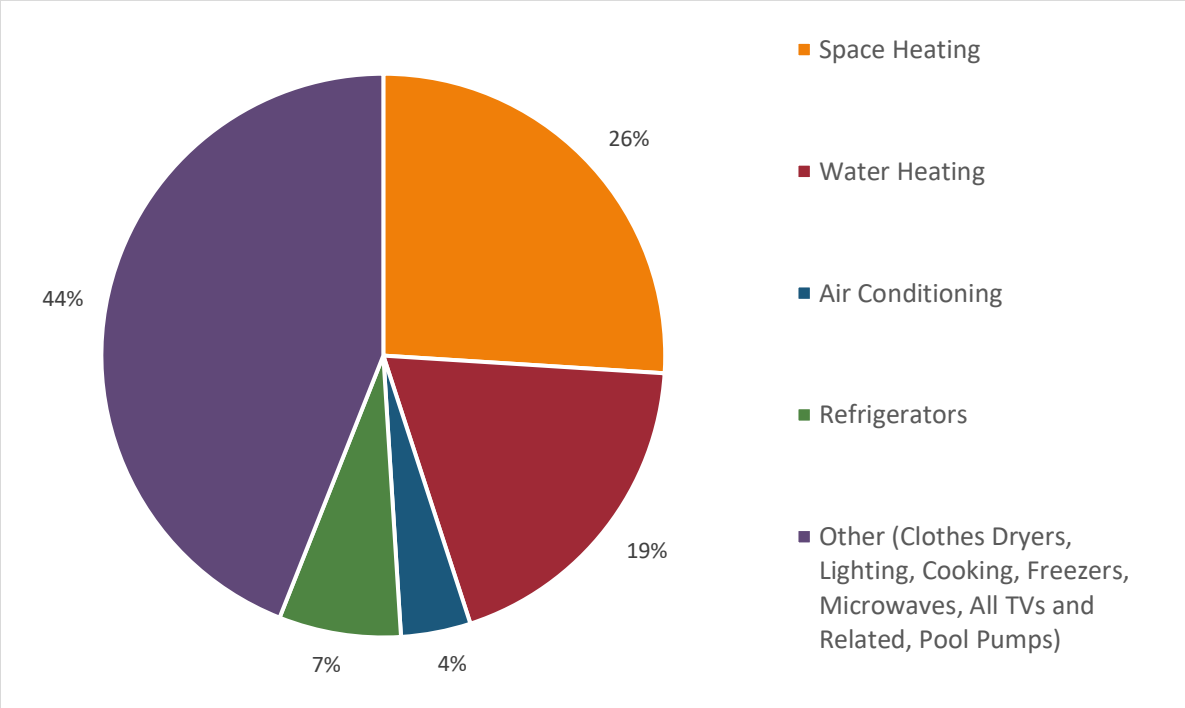

Figure 5: Annual Household Site End-Use Consumption of Electricity in Washington State (2020 RECS).

RECS data at the regional level provide additional detail about space heating fuel use and equipment. Data from the RECS Pacific Division for households with space heating equipment indicate that 63% use natural gas as their main space heating fuel source, 31% use electricity, 3% use wood, 2% use propane, and 1% use fuel oil or kerosene. The regional dataset also details the type of equipment used by households for space heating: 64.4% use central warm air furnaces, 10.3% use built-in electric units, 7.2% use built-in oil or gas room heaters, 6.0% use portable electric heaters, 5.4% use heat pumps, 2.6% use a wood stove, 1.8% use a steam or hot water system, and 1.8% use ductless heat pumps (mini split).

The combined total of only 7.2% heat pump use underscores the need for education and incentives to promote heat pump space heaters throughout the region.

Olympia Building Stock Analysis

Methodology

The City of Olympia received a residential building stock analysis from NORESCO as part of the development of the SHARE Accelerator rental housing retrofit program. The analysis uses NREL's ResStock data set that provides information on the vintage, square footage, building envelope, and systems to provide a baseline characterization of Olympia's housing stock. In the ResStock database, there are a total of 1,845 residential buildings in Olympia, WA, and the NORESCO analysis focused on a subset of 720 buildings (Study Set).

Although the exact distribution of buildings typologies may vary throughout the Thurston region, this building stock analysis can help inform how much energy can be saved through different energy efficiency home improvements, and which categories of upgrades are generally most cost effective throughout the entire County.

Existing Building Baseline Data

The Study Set was grouped into single-family, multifamily low-rise, and multifamily mid high-rise buildings. Figure 1[2] shows the Study Set Distribution by Building Type grouped into:

- Single-family (single-family detached, attached, and mobile homes, 383 buildings)
- Multifamily low-rise (<4 stories, 275 buildings)
- Multifamily mid high-rise (>=4 stories, 62 buildings)

Table 1[3] shows the summary and distribution plots of the baseline building characteristics of the three groups. Figure 2 to Figure 4[3] show a breakdown of baseline site energy consumption of electric, natural gas and propane fuel types by end use category.

- Single-family units have the largest site energy use across all fuel types on a per unit level, multifamily low-rise units have the second largest, and multifamily mid high-rise units have the smallest site energy use.
- Space heating, plug loads, and domestic water heating are the top three end users across the three building types, followed by lighting, refrigerator, and space cooling.
- Single-family units have more diversity on fuel types and use significantly more natural gas for space heating and domestic water heating, multifamily units largely use electricity for space heating and domestic water heating.
- Propane usage overall is a very small portion of total site energy use across the three building types

Each building group exhibits similar opportunities for weatherization, envelope upgrades, and electrification.

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[2] See Appendix B: Olympia Building Stock Analysis Data and Methodology

[3] See Appendix B: Olympia Building Stock Analysis Data and Methodology

Upgrade Analysis

The ResStock database hosts 15 building "upgrade groups" each representing an energy efficiency upgrade, which reports simulated energy performance results. With multiple measures in each group, there are a total of 260 upgrade measures with various combinations of upgrade groups. Detailed documentation on each measure and group can be found at https://www.nrel.gov/docs/fy24osti/88109.pdf. The 15 upgrade groups are listed below:

1. Replacement Heating, Cooling and Water Heating Systems
2. Envelopes
3. Appliances, Pools and Spas, and Lighting
4. Universal Cooling, Water Heaters, and Gasification
5. Heat pumps With Electric Backup
6. Heat Pumps with Existing System as Backup
7. Heat Pumps with Electric Backup and Light Touch Envelope
8. Heat Pumps with Electric Backup and Intermediate Envelope
9. Heat Pumps with Electric Backup and Advanced Envelope
10. Heat Pumps with Existing Backup and Light Touch Envelope
11. Heat Pumps with Existing Backup and Intermediate Envelope
12. Heat Pumps with Electric Backup and Advanced Envelope
13. HPWH (Heat Pump Water Heater) + Measure Packages
14. Furnace or Boiler w/ Envelope Packages
15. Home Upgrade

Due to the variety of configurations of the existing space heating systems, the heat pump measures in ResStock vary by existing heating or back-up heating fuel type, ducted vs. non-ducted and central vs. terminal, etc. A heat pump measure may only cover a small subset of baseline units with a specific space heating configuration. For example, a ducted air source heat pump (ASHP) measure that replaces the existing natural gas furnace does not combine with a ductless mini-split heat pump (MSHP) measure that replaces the existing electric furnace.

Table 2 through Table 4[4] show the top 3 performing measure packages, i.e., those that generate the largest amount of savings on utility bills from an average baseline unit. Note that on the single-family units, the measures that generate the largest utility bill savings are different from the measures that generate the largest site energy savings. ASHP measures reduce site energy but can result in large utility bill increase when compared to gas furnaces.

The top 3 performing packages are a combination of envelope measures and/or HPWH. The following is a summary of the proposed measure package:

<u>HPWH</u>

Replace existing non-electric water heater or existing less-efficient electric water heater with a HPWH UEF 3.35-3.45.

<u>Building Envelope</u>

The individual envelope measures included in the advanced and intermediate envelope package are

[4] See Appendix B: Olympia Building Stock Analysis Data and Methodology

listed below[5]. The Advanced Envelope package includes measures that are of higher performance but also more costly and disruptive.

Light Touch Envelope	Intermediate Envelope	Advanced Envelope
• General Air Sealing • Attic Floor Insulation	• Attic Floor Insulation • General Air Sealing • Duct Sealing • Drill-and-Fill Wall Insulation • Foundation Wall and Rim Joist Insulation, With Sealing of Crawlspace Vents	• Attic Floor Insulation • Duct Sealing • Drill-and-Fill Wall Insulation • Foundation Wall and Rim Joist Insulation, With Sealing of Crawlspace Vents • ENERGY STAR Windows • Exterior Continuous Wall Insulation • IECC 2021 Air Sealing • Improved Ventilation

Table 2: Top 3 (Performing) and Baseline Total Site Energy and Utility Bills Single Family Units

Description	Average Home Site Energy (kWh/yr.)	Average Home Utility Bills ($/yr.)	Average Home Utility Bills Savings ($/yr.)
13.17 HPWH + Advanced Envelope	12,151	$1,182	$417
2.05 Envelope, Advanced	14,132	$1,294	$305
13.16 HPWH + Intermediate Envelope	14,370	$1,302	$297
Baseline	19,685	$1,599	$0

Table 3: Top 3 (Performing) and Baseline Total Site Energy and Utility Bills Multifamily Low-Rise Units

Description	Average Home Site Energy (kWh/yr.)	Average Home Utility Bills ($/yr.)	Average Home Utility Bills Savings ($/yr.)
13.17 HPWH + Advanced Envelope	6,811	$815	$343
2.05 Envelope, Advanced	7,972	$917	$241
13.16 HPWH + Intermediate Envelope	8,474	$962	$196
Baseline	10,700	$1,158	$0

[5] See Appendix B: Olympia Building Stock Analysis Data and Methodology for detailed descriptions of each envelope measure

The Switch Is On Pre-Wave Campaign Research

In early 2024, the Building Decarbonization Coalition and KWL Insights partnered to conduct a survey prior to the launch of the Washington State SIO campaign. The survey assessed perceptions and concerns of residents of King, Pierce, and Thurston County[6] about switching to electric appliances. A post-wave survey will be conducted in early 2025 to compare perceptions before and after campaign implementation.

The survey found that about 40% of homes are fully electric already, and that about 40% of non-electric homeowners expressed a likelihood to switch to electric. HVAC equipment was the most common appliance fueled by gas/oil (39%), followed by water heaters (36%), and stoves/ovens (30%). 90% of clothes dryers were reportedly already electric.

Most homeowners reported having basic (27%) or moderate (46%) knowledge about the advantages and disadvantages of electric homes. Seventy percent of homeowners have very favorable (44%) or somewhat favorable (26%) views of electric appliances, with environmental impacts and safety/air quality as the most cited reasons. Concerns about cost and performance were cited as less favorable reasons to switch to electric appliances.

The survey explored respondents' perceptions of barriers to electrifying their home. The factors most mentioned included changes to the home required of the installation process, increased electricity bills, and the upfront cost of new appliances. 86% of survey respondents said incentives are either extremely (22%), very (33%), or moderately (31%) important to motivate them to buy and install new electric appliances. Other barriers that were named were a lack of trustworthy information and a lack of information about the installation process.

Finally, the pre-wave survey applied the results to identify three homeowner segments:

- “Electric ambassadors” (16% of homeowners) tend to be younger homeowners and those raising kids, have high electric knowledge and favorability, and are highly motivated by environmental factors.
- “Potentials” (54%) have medium-low knowledge and high favorability of electric, and often consider environmental impacts when purchasing appliances.
- “Detractors” (31%) tend to be older and retired homeowners, have neutral/unfavorable views of electric, are generally unconcerned with environmental factors, and are highly concerned with costs and performance of electric appliances.

Recommendations from Market Research

Based on the market research described in this section, the TCMC Staff Team offers the following recommendations for the E3 Campaign.

[6] Due to population size differences among the three counties, the sample is heavily focused on King and Pierce Counties. Further survey results for Thurston County are forthcoming via the stakeholder engagement contract with Confluence Communications.

Types of Equipment

- **Prioritize Heat Pump Space Conditioning Retrofits:** Heat pump space conditioning upgrades are recommended due to space heating typically being the largest end use across all building and fuel types. Although there is limited utility bill savings from a natural gas furnace to ASHP retrofits due to local utility rates, ASHP retrofits offer significant savings to households with electric resistance heating and reduce overall site energy use compared to most existing space heating systems. Additionally, ASHP retrofits electrify one of the largest natural gas end uses for single family residential buildings.
- **Prioritize Heat Pump Water Heater Retrofits**: HPWH is recommended to replace the existing electric water heaters and the more occupants with hot water use in a household, the quicker the payback. Climate zone 4C has mild ambient conditions suitable for HPWH operation when the units are in a garage in single-family units. Electrification retrofits may also be prioritized, as water heating is the second largest natural gas end use (based on statewide data). However, in homes with natural gas or propane water heaters, field assessment will be needed to ensure the existing home electric service can accommodate the additional electric demand with HWPH replacement. The measure can become cost prohibitive and disruptive if a new utility service line is required. With the large percentage of electric water heaters serving existing units, particularly multifamily units (79% in multifamily low-rise, 82% in multifamily mid high-rise), HPWH replacement is a good retrofit solution without concerns of upsizing the existing electrical service.
- **Consider incentives for Intermediate Envelope upgrades**: Intermediate Envelope is less disruptive for occupied homes and is significantly more cost friendly than Advanced Envelope upgrades.
- Duct Sealing
- Attic Floor Insulation
- Foundation wall and rim joist insulation
- General Air sealing (attached garage to house, windows and doors, holes/cracks)
- **Consider upgrades for LED Lighting**: Although lighting efficiency measures are not specifically addressed in the recommended package, LED light bulbs are heavily incentivized by local utility companies and may provide rapid payback, and thus are also recommended for consideration.

Participant Pathways

- **Prioritize Low-Income Households <100% AMI:** In Thurston County, the average household spends about 2% of its annual income on energy costs. Energy burden is much higher among low-income households that make less than 80% of the Area Median Income (AMI) (see Figure 2). Households at 80-100% AMI have a higher-than-average energy burden (2.8% of annual income), while for households at 100%+ AMI it drops to 1.5%, which is a lower energy burden than the countywide average.
- **Consider incentivizing upgrades for older homes and manufactured homes:** Residents of manufactured homes and older buildings carry larger energy burdens than those in homes built since 2010. Older homes (pre-1980) have less insulation, allow more air leakage, and have higher heat-loss rates than newer homes. Weatherization upgrades should be considered for older homes.
- **Consider incentives for renters in future campaign phases.** Renters have a slightly higher average energy burden than homeowners in Thurston County. Renter incentives would extend program benefits to more BIPOC residents and members of overburdened communities. However, current funding for the E3 Campaign is mostly restricted to equipment upgrades that

only homeowners can make (e.g., installing a new heat pump), so renter incentives can be considered in a future phase of the campaign.

Outreach and Marketing

- **Develop outreach partnerships with community-based organizations:** To ensure that campaign benefits reach low-income communities, the TCMC should partner with CBOs to help promote the program within their target communities.
- **Ensure that the campaign reaches residents in rural as well as urban areas:** The greatest number of households that heat with gas are in unincorporated Thurston County. Residents of South County cities and unincorporated Thurston County experience greater energy burdens than urban residents.
- **Consider messaging to target homes that use other fuels other than natural gas:** Households that use fuel oil, propane gas, and wood as their primary fuel type have higher energy burdens than those that use electricity or natural gas. These homes are more common in rural areas of the county.
- **Emphasize environmental and safety benefits in campaign messaging:** Environmental considerations can play a considerable role in homeowner appliance selection. Switching to electric appliances also improves safety in the home. Fewer dangers such as leaking gas or carbon monoxide poisoning are present with electric appliances.
- **Provide education and assistance to make electrification easier and more convenient:** The SIO pre-wave survey identified 54% of regional homeowners as "potentials" with favorable views of electric appliances but low to moderate knowledge. This audience segment would be more likely to take action if given practical information and tools to make electrification upgrades easier (e.g., information about technologies, incentives, how to find trusted contractors, and steps in the installation process).
- **Address concerns about electric appliance cost and performance:** The SIO survey identified 31% of regional homeowners as "detractors" who have negative or neutral views of electric appliances. This group will need information on the financial values of electric appliances including incentives and increased energy efficiency, as well as the reliability of service in the summer and winter.

3. INCENTIVE PROGRAM RESEARCH

The second step in background research for the E3 Campaign was to research current and past incentive programs for home energy efficiency and electrification. We begin with a thorough review of the existing Energize Olympia Ductless Heat Pump Program, followed by a summary of other regional group purchase programs, Puget Sound Energy rebates and technical assistance programs, the prior "Thurston Energy" program, and existing federal and state financial incentives.

Results of the incentive program research provide valuable insights to inform all six categories of Research Questions, with a particular focus on the categories not answered by the Market Assessment: Contractors and Installation Partners, Advisory Support Service, and Program Structure & Administration.

Energize Olympia Ductless Heat Pump Program

Summary

Energize Olympia is a City of Olympia program supported by a partnership with South Puget Sound Habitat for Humanity incentivizing ductless heat pump (DHP) retrofits by packaging community outreach, education, connection to rebates and incentives, a group purchase discount, and vetted installer partners to offer reduced-cost and no-cost DHP installations to Olympia residents. The program emphasized engagement with—and installations in—historically marginalized communities, particularly low- to moderate-income households.

Energize Olympia is based on an "Installer Model" (rather than a "Distributor Model") in which a group purchase is negotiated directly with an installer as a time of sale discount for specific equipment (see Appendix A). At its core, the program consists of five primary activities[7]:

1. Recruiting, vetting, and selecting a qualified installer partner.
2. Negotiating a "group purchase" discount for equipment and installations with a program installer.
3. Conducting community outreach and hosting educational workshops.
4. Providing customer support and guidance.
5. Installing DHPs and, for qualified low-income homes, providing weatherization as needed.

Energize Olympia 2023 Pilot Program

The Energize Olympia pilot program offered two pathways. The first pathway ("market rate") was available to any City of Olympia resident and offered: a $600-$1000 group purchase discount, an additional $800 savings for the first 40 participants, a free site assessment, streamlined installation and customer support, and guidance on relevant incentives and financing.

The second pathway was limited to qualified low- to moderate-income (LMI) residents earning at or below 120% of the area median income (AMI). This pathway offered fully subsidized DHP equipment and installations as well as limited weatherization services through Habitat for Humanity. Participants progressed through the program via the following steps:

- Sign up for and attend an educational workshop.
- Submit a general program application.
- If eligible for the LMI pathway, submit a second application with Habitat for Humanity.

1. Schedule and receive a free site assessment.
    a. Market rate participants then receive a bid from the installer.
2. Schedule and receive a DHP installation.

Highlights of the 2023 Energize Olympia Pilot Program included:

[7] See Appendix C: Energize Olympia Program Logic Model.

- 231 contacts with Olympia residents during outreach events, and thousands reached through advertisements and the program's webpage.
- 253 individuals educated through the program's educational workshop series.
- 67 total heat pump installations.
- 22 fully subsidized (zero cost) heat pump installations for low- to moderate-income households, 100% of which did not have access to cooling prior to the program.
- At least 42 households converted to electric as their energy source for heating.
- A total of $69,150 in savings on ductless heat pump purchases and installations (in addition to the $600-$1000 per installation group purchase discount) for participants who were *not* eligible for the low- to moderate-income household pathway.

Energize Olympia 2024

The Energize Olympia 2024 program will run from August 2024 through November 2024. The 2024 program follows a similar structure to the 2023 pilot with market rate and fully subsidized program pathways. The market rate pathway offers a group purchase of discount of 10% off qualified DHP equipment up to a maximum of $1,200, an additional $800 Energize Olympia rebate available to the first 50 participants to contract with an installer through the program. Goals for Energize Olympia 2024 program include:

- 6,500 visits to the Energize Olympia webpage
- 500 individuals attending the educational workshop series
- 150 total heat pump installations, including at least 75 fully subsidized installations for low- and moderate-income households.

Program Partners

City of Olympia: The City has primary ownership of the program's execution and administration with support from South Puget Sound Habitat for Humanity, and Spark Northwest (during the 2023 pilot). The City secured funding and dedicated staff resources for the program including the Director of Climate Programs and a CivicSpark Fellow during the 2023 pilot program, as well as the Building Decarbonization Program Manager and Climate Program Specialist for the 2024 program.

Habitat for Humanity: South Puget Sound Habitat for Humanity provides integrated critical home repair and weatherization services in coordination with DHP installations for LMI participants, including site assessments and management of subcontracts. Additionally, Habitat for Humanity supported program promotion, grant funding for LMI installations, participant recruitment, marketing and outreach efforts.

Spark Northwest: During the 2023 pilot program, Spark Northwest served as a partner for various program elements, including planning and design, installer selection, outreach and education, customer support and program evaluation.

Installation Partners: Installation Partner staff provide information at the educational workshops, conduct free site assessments, offer streamlined access to incentives and rebates and execute installations for the program. Chehalis Sheet Metal Heating, Cooling & Roofing were the sole program installer for the 2023 Energize Olympia Pilot, and a program installer for Energize Olympia 2024. Sunset Air is the second program installer for Energize Olympia 2024. Program installers were selected through

a competitive Request for Proposals process evaluating qualifications, experience, pricing, alignment with program goals and commitment to customer support[8]

Puget Sound Energy (PSE): PSE is the local electric and natural gas utility and provides rebates for energy efficiency retrofits including DHP installations. This includes increased rebates amounts for households up to 90% AMI through the Efficiency Boost Rebate Program (EBR). During Energize Olympia 2024, PSE provided an exception to the 90% AMI income limits for the EBR for Energize Olympia Participants to align with the 120% AMI income-qualification limits of the Energize Olympia Program. This incentive helps reduce the cost of installations and allows Energize Olympia staff to provide fully subsidized installations to a greater quantity of households.

Program Funding

Energize Olympia 2023

Funding Source	Funding Amount	Income/Qualifiers
City of Olympia Community Development Block Grant	$113,500	Household income below 80% AMI
SPSHFH Washington State University Community Energy Efficiency Program	$60,000	Household income below 120% AMI
City of Olympia Climate Program	$32,000	Household income above 120% AMI

Energize Olympia 2024

Funding Source	Funding Amount	Income/Qualifiers
City of Olympia Washington State Home Electrification and Appliance Rebate (HEAR) Program	$481,483	Household income below 120% AMI
SPSHFH HEAR Program	TBD	Household income below 120% AMI
City of Olympia Community Development Block Grant	$46,273	Household income below 80% AMI
SPSHFH Washington State University Community Energy Efficiency Program	$350,000	Household income below 120% AMI
City of Olympia Climate Program	$100,000	Household income below 120% AMI
City of Olympia Climate Program	$40,000	Household income above 120% AMI

Communication and Outreach

The Energize Olympia has an emphasis on targeted outreach to support low-income households, vulnerable populations, and overburdened communities. The outreach strategy includes the following components:

[8] See Appendix D: Energize Olympia 2024 Heat Pump Installation Services Request for Proposals

- **Educational Workshop Series:** City of Olympia staff, South Puget Sound Habitat for Humanity (SPSHFH) and Program Installers educate residents of Olympia on the benefits of DHP technology through its free series of educational workshops. The workshops provide information on the benefits of heat pump technology, residential energy efficiency, an overview of the program pathways and installation process, as well as information on the many available financial incentives including federal tax credits, the Energize Olympia discounts, and local utility incentives from Puget Sound Energy. The city intends to host an on-demand workshop available online as well as two in-person workshops at various locations throughout Olympia. The project team has committed to providing additional outreach to Spanish-speaking residents, which is the second-most common language spoken in the Olympia area. The on-demand workshop will be provided with Spanish translations, and there is marketing budget set aside for providing interpretation services as required throughout the duration of the program.

- **Outreach at Community Events:** City of Olympia and SPSHFH staff provide targeted outreach at community events throughout the duration of the program. This includes informational presentations for cultural organizations, faith-based organizations, and neighborhood associations, as well as tabling at local businesses, trade shows or community events such as Earth Day.

- **Radio and Streaming Advertising:** The Energize Olympia program is placing radio and streaming advertisements to promote the launch of the Energize Olympia 2024 program. This will consist of two weeks of radio ad placement, and two weeks of Spotify advertisement.

- **Distribution of Marketing Materials:** Energize Olympia staff distribute physical marketing materials including post cards, flyers and a street banner at various businesses and hubs throughout the City of Olympia, as well as provide yard signs for participants who receive an installation. Additionally, program staff will regularly post online updates on the status of the program through the City of Olympia's Climate Actions e-newsletter and promote the program the program through social media posts on Facebook, Instagram, Threads, and X.

- **Customer support:** Throughout the duration of the program, Energize Olympia staff will be providing ongoing customer support, and case management regarding the installation of their HEAR-eligible appliances.

- **Post-Installation Education:** After receiving a HEAR-eligible equipment installation, Energize Olympia participants receive an educational packet providing information on how to use and maintain their newly installed equipment as well as a reference to the sources of funding that helped subsidize their installation.

Other Local Group Purchase Programs in WA

Group Purchase Programs

Group Purchase programs come in many forms, and can utilize many names (Energize, Energy Smart, Clean Heat, or Solarize). In general, programs are focused on collaboration among local governments, nonprofit partners and community organizations to enable streamlined access to technologies such as heat pump space conditioning, solar panels, or home electrification. These programs typically focus on the following elements:

- **Community Outreach and Education**: Leverage trusted networks such as local government and community-based organizations to provide information on energy efficient technologies, and help residents make informed decisions when retrofitting their homes.
- **Engaging Equipment Manufacturers and Distributors**: Group purchase programs procure qualified equipment installers and negotiate a "bulk" discount through contractor networks, or a request for proposals process. Some programs implement community-led installer selection to bolster engagement and community buy-in for the program.
- **Reducing Upfront Costs**: Group purchase programs reduce barriers to accessing energy efficient technologies by helping residents leverage the negotiated group purchase discount as well as local utility incentives, federal incentives and financing.

Comparison of Local Programs

In addition to Energize Olympia, there are several other heat pump space conditioning group purchase programs throughout Washington State, including Energy Smart Eastside, Energize King County, Energize Shoreline, and the Kicking Gas program. There are also solar group purchase programs including Solarize Thurston, Solarize Whatcom and Solarize Island County. In Table 4, these programs have been compared according to the following parameters:

- **Technologies/Qualifiers**: What energy efficient or electric appliances are incentivized through the group purchase program. Are there any requirements for the pre-existing conditions such as fuel type?
- **Low- and Moderate-Income Incentives**: What incentives are offered to income qualified households, and what are the income qualification limits?
- **Market-Rate Incentives**: What incentives, if any, are offered to all participants regardless of household income?
- **Installer/Distributor Model**: Is the group purchase discount negotiated with individual program-vetted installers for specific equipment, or is the discount negotiated with an equipment distributor with a network of qualified contractors for a wider variety of energy efficient technology?
- **Program/Campaign**: Is the program continuously offering incentives year-round, or does the program follow a campaign model with limited access to incentives over a period of time, or first-come-first serve access to incentives?

Information on the specific details and structure of local group purchase programs will be addressed through continued partner engagement by TCMC staff, and stakeholder interviews by Confluence Communications.

Table 4: Comparison of Local Group Purchase Programs in Washington State

Program	Location	Technologies/ Qualifiers	Low- and Moderate-Income Incentives	Market-Rate Incentives	Installer/Distributor Model[9]	Program/ Campaign
Energize Olympia	City of Olympia	Ductless Heat pump space conditioning	100% cost coverage heat pump installation for households below 120% AMI	Group purchase discount of 10% up to $1,200 off qualified equipment Stackable $800 rebate for first self-funded 50 participants	Installer Model	Campaign
Energy Smart Eastside	City of Redmond, City of Issaquah, City of Mercer Island, City of Kirkland, City of Bellevue, City of Sammamish	Heat pump space conditioning	100% cost coverage heat pump installation for households below 80% AMI with an existing gas or oil furnace. $6,000 Fuel Switch Rebate for heat pump installation for households with existing fossil fuel heating equipment below 150% AMI. This does not stack with the $500 Mitsubishi Rebate	$500 Mitsubishi Rebate	Distributor Model	Program
Energize King County	King County North Highline and Skyway-West Hill unincorporated areas	Heat pump space conditioning	100% cost coverage for income-qualified households up to 80% AMI 80% cost coverage for income-qualified households up to 120% AMI	N/A	Distributor Model	Campaign

[9] See Appendix A: Types of Group Purchase Models

Seattle Clean Heat	City of Seattle	Heat pump space conditioning for homes with heating oil.	100% cost coverage installations for income qualified households. The program has different income eligibility thresholds depending on the heat source (electric, gas or oil) and whether the household is renter- or owner-occupied.	$2,000 rebate for any household using heating oil converting to a heat pump.	Distributor Model	Program
Energize Shoreline	City of Shoreline	Heat pump space conditioning	N/A	$1,000 rebate available to the first 20 residents on a first-come first-served basis.	Distributor Model	Campaign
Kicking Gas	Whidbey Island, Snohomish County, Bainbridge Island	Heat pump space conditioning for households with natural gas, propane or heating oil Electric cooking measures for households with propane, natural gas or wood cooking systems.	Heat pump space conditioning: 50% cost coverage up to $7,500 for income-qualified households up to 120% AMI	Heat pump space conditioning: 20% cost coverage Cooking: $1,000 for induction stoves or $500 for electric stoves	Installer Model	Program
Solarize Thurston	Thurston County	Solar group purchase for residential buildings			Installer Model	Campaign
Solarize Whatcom	Whatcom County	Solar group purchase for			Installer Model	Campaign

		residential buildings				
Solarize Island	Island County	Solar group purchase for residential buildings			Installer Model	Campaign

Puget Sound Energy Incentive Programs

PSE Energy Efficiency and Electrification Rebates

Puget Sound Energy (PSE) provides energy efficiency rebates for all current single-family residential customers of electricity and natural gas services. These rebates provide savings on energy efficiency upgrades in the home, including heat pump space heating and water heating, washers and dryers, and weatherization and window upgrades, as well as the installation of smart thermostats. More information on PSE's 2024 Residential Rebates, Single Family HVAC, Water Heat & Windows Matrix, and PNW Midstream HVAC and WH Incentives can be found in Appendix E.

PSE provides additional incentives for income qualified customers through their Efficiency Boost Rebate (EBR) program. Households become eligible for this service with an income up to 90% AMI. As noted above, PSE temporarily extended this income limit to 120% AMI to align with Energize Olympia eligibility requirements during Energize Olympia 2024.

Energy efficiency rebates for HPWH are $500 for single-family customers and range from $700-$750 for efficiency boost eligible customers. PSE provides a $75 rebate for single family homes to install heat pump clothes dryers, efficiency boost customers earn $200. Incentives were offered for converting natural gas space heating to heat pumps at $3,000 for single-family customers and $4,000 for efficiencyr boost customers. This rebate was phased out on July 31st, 2024, but may be coming back at a future date. PSE also provides rebates for replacing an electric resistance heating system with a qualifying air-source heat pump ($1,500 standard rebate, $2,400 efficiency boost rebate), as well as a limited time offer for an additional $500 rebate available September 1, 2024, through October 15, 2024.

Customers can access these rebates by first ensuring their purchased equipment meets PSE qualifications, as found on their website. After installation of qualified equipment, customers may apply for the PSE rebate online or by submitting a rebate application form within 30 days of purchase. All customers have the option to consult with a PSE Energy Advisor for support with their energy efficiency upgrades and rebate application process. The Energy Advisors provide clarity on PSE's efficiency and clean energy programs, as well as recommendations to aid customers in their energy saving decisions.

The City of Lacey has allocated funds to 100% match PSE's residential energy efficiency rebates. This program is eligible to anyone within the Lacey city limits that has completed energy efficiency upgrades through PSE's program. As of August 2024, Lacey has matched rebates on 75 heat pump purchases and electrification projects. The matching rebate program is currently closed but Lacey intends to re-open the program later this year (2024) utilizing grant allocations through the state Home Electrification and Appliance Rebate (HEAR) program.

PSE Home Electrification Pilot Program

PSE's pilot electrification program aims to help up to 10,000 of its natural gas customers transition to more efficient and sustainable technologies for space conditioning and water heating. The pilot will help PSE design effective programs and incentives for customers to take advantage of new technologies, such as high-efficiency heat pumps, to lower their carbon footprint and contribute to Washington's clean energy transition. The program is funded through the end of 2024.

As part of the program, PSE natural gas customers receive a free in-person home electrification assessment (HEA) that will provide them with a comprehensive roadmap to electrifying their home.

Customers participating in the assessment will receive a report outlining a list of projects they can undertake to electrify certain facets of their home, including information on qualified installers and financial incentives from local, state or federal programs such as the Inflation Reduction Act. A HEA sample report can be found in Appendix F that outlines the opportunities and recommendations identified during the walkthrough. Opportunities can include switching your gas furnace to an electric air sourced heat pump, upgrading to an ENERGY STAR clothes washer, upgrading attic insulation, and more. Customers may also qualify for additional rebates from PSE to reduce the upfront costs associated with their electrification project and will receive a $50 gift card for their participation.

The home electrification assessments are administered through PSE's implementation partner, Franklin Energy. Franklin Energy offers comprehensive utility-focused services to implement and administer energy efficiency programs. Customers can connect with Franklin Energy Electrification coaches to receive a walkthrough and recommendations for pursuing electrification with additional questions directed to their Home Electrification Team's email.

Previous "Thurston Energy" Program

Thurston Economic Development Council (EDC) and Thurston Climate Action Team (TCAT) partnered on the implementation of a home energy assistance program from 2009 to 2015. The "Thurston Energy" program was initially funded through a federal grant through the American Recovery and Reinvestment Act (ARRA) and then by Washington State University (WSU) from 2014-2015. The program consisted of an outreach campaign for residential and commercial property owners, and subsidized energy audits with a focus on pre-1995 building stock. The residential campaign included single-family and multi-family households at all income levels. Participants were recruited via door-to-door canvassing. Through a partnership with a local credit union, participants had access to a revolving loan fund to finance their energy efficiency upgrades. In addition to its direct household benefits, the Thurston Energy program helped develop the local workforce by launching seven new energy efficiency companies.

Thurston EDC has expressed an interest in participating in the TCMC's 2025 E3 campaign by supporting workforce development, technical assistance, and/or other capacities as needed. As part of the stakeholder engagement contract in September 2024, Confluence Communications will interview EDC to explore potential partnership roles in the E3 Campaign.

Existing Federal and State Incentives

Federal Tax Credits

The 25c tax credit/residential clean energy property credit is a way for the federal government to encourage energy efficiency by reducing the amount of taxes homeowners/renters owe if they install qualifying upgrades to their home. The Inflation Reduction Act has been recently updated so that the residential clean energy property credit will continue through 2034 and has expanded percentages and rates. The credit applies for property placed in service after December 31, 2024, and before January 1, 2033. For Heating, Cooling, and Water Heating, the updated tax credit can cover up to 30% of the cost to transition, with caps per year depending on the equipment type. Additionally, households may claim up to $1,200 total annually for energy efficiency improvements including doors, windows and qualifying home energy audits.

Homeowners, including renters for certain expenditures, who purchase energy and other efficient appliances and products are eligible for these tax credits. Electric or natural gas heat pumps; electric or natural gas heat pump water heaters; central air conditioners; natural gas or propane or oil water heaters; natural gas or propane or oil furnaces or hot water boilers all meet the specific efficiency tiers and are eligible for these tax credits.

Future State Incentives

The Washington State Department of Commerce has applied for US Department of Energy (DOE) Whole Home Efficiency Rebates Program authorized by the 2022 Inflation Reduction Act. The DOE expects to release funds to Washington State later this year, no sooner than early 2025. Commerce has not yet established specific guidance on how their programs will operate, but half the rebate funds will go to LMI households, and the other half will be allocated towards moderate income households up to 150% AMI. This means residents in E3 jurisdictions between 120% to 150% AMI may be able to leverage additional incentives.

Upgrades and building materials incentivized by the State program could include:

- Electric wiring
- Electric panel upgrades
- Insulation
- Air sealing
- Ventilation
- Appliances
- Heat pumps
- General Weatherization measures

Recommendations from Incentive Program Research

Based on the above-described background research into similar energy incentive programs, the TCMC Staff Team offers the following recommendations for the E3 Campaign.

General Recommendation

Staff recommends that the E3 Campaign generally follow the tested local model of Energize Olympia, with potential modifications and refinements as detailed below.

Types of Equipment

- **Additional incentives are needed to reduce financial barriers to electric appliances.** Available PSE incentives are $3,000-$4,000 for natural gas to heat pump conversion, $1,500-$2,400 for electric furnace to heat pump conversion, $500-$750 for HPWH, and $75-$200 for heat pump clothes dryers. Based on Energize Olympia and SPSHFH experience, total installation costs may be upwards of $4,500 for HPWH, $8,000 for ductless heat pumps, and $12,000 for ducted heat pumps. Even with a potential maximum $2,000 federal tax credit, the upfront costs of electric equipment may be out of reach for many households. Although tax credits are helpful, the incentive is only available to US taxpayers when filing their annual taxes, does not reduce upfront costs, and may be burdensome compared to a time-of-sale rebate.
- **Consider incentives for ducted as well as ductless heat pumps:** Energize Olympia has so far only included incentives for ductless heat pump (DHP) installations, but has received queries from residents interest in ducted systems. Incentivizing ducted systems may alleviate concerns about DHP systems not providing adequate backup heat and would allow the countywide campaign to reach a broader population of homeowners.
- **Provide incentives to switch from all fuel sources:** Some of the local group purchase programs in WA focus on homes that use a specific type of non-electric heating (e.g., Seattle Clean Heat) while others apply to multiple sources (e.g., Kicking Gas). Although electric and natural gas fuel are most prevalent, other sources (wood, propane, heating oil) are also common in rural areas of Thurston County. It is recommended that Thurston County take an inclusive approach to electrification that incentivizes the switch from natural gas, propane, heating oil, wood, or electric resistance heating and water heating systems.

Participant Pathways

- **Continue to use 120% AMI as the maximum for LMI Pathway eligibility:** 120% AMI has worked well in the Energize Olympia program by enabling participation of a broad section of the community. PSE also helped maximize program benefits by extending their Efficiency Boost Rebate Program to the 120% AMI threshold for the duration of the campaign. In 2024, 120% AMI is $108,200 for a 2-person household and $135,250 for a 4-person family (compared to $72,150 for 2-person and $90,150 for 4-person at the 80% AMI level). Extending eligibility to 150% AMI (as allowed by the HEAR funding) may spread the funding too thin and reduce program benefits to the households that need them the most. Households between 120% - 150% AMI may be able to leverage future state incentives provided by the Department of Commerce Whole Home Efficiency Rebates Program.
- **Continue to partner with SPSHFH for LMI Pathway:** South Puget Sound Habitat for Humanity (SPSHFH) has expressed interest in partnering with the E3 Campaign to expand the Energize Olympia model countywide. SPSHFH has administered the LMI Pathway under the Energize Olympia umbrella in 2023-2024. SPSHFH contracts directly with the installer(s) and subcontractors to coordinate subsidized DHP installations for LMI participants along with site assessments, integrated critical home repair and weatherization services. They also have supported program promotion, grant funding for LMI installations, participant recruitment, marketing and outreach efforts.
- **Provide a "Market Rate" Pathway including a group purchase discount and potential additional incentives:** The 2024 Energize Olympia campaign offers a market rate pathway that is available to any city resident regardless of income. This includes a group purchase of discount of 10% off qualified DHP equipment up to a maximum of $1,200, and $800 rebate available to the first 50 participants to contract with a program installer. If the E3 Campaign can negotiate a similar discount, this will provide a substantial incentive unto itself for "market rate" households in Thurston County. Additional incentives that can be included (at no or low cost to the E3 Campaign partners) include free educational workshops, guidance on relevant incentives and financing, streamlined installation, and customer support. If supplemental funding is available, partners may consider additional rebates (e.g., to the first 50 participants who contract with an installer).

Contractors and Installation Partners

- **Consider utilizing a Distributor Model or Installer Model of Group Purchase.**
    - Using a Distributor Model to negotiate the group purchase discount may reduce the administrative burden required to run the E3 campaign compared to the Installer Model used in Energize Olympia. The E3 campaign intends to incentivize building upgrades that haven't been used in Energize Olympia including ducted heat pumps, and heat pump water heaters, and it may be easier to negotiate a discount for multiple technologies with a single equipment manufacturer. Additionally, some participants prefer to seek multiple bids and select contractors from a network rather than being assigned one option.
    - Using an Installer Model to negotiate a group purchase discount will likely result in a greater discount for Market-Rate E3 participants. This is important to consider for the E3 campaign, since some jurisdictions may not have the budget for additional market-rate incentives. The Energize Olympia 2024 Installer group purchase discount of 10% up to $1,200 off qualifying equipment is a higher incentive than the $500 manufacturer group purchase discount typical in other local group purchase programs. This model would require more up-front work from staff during contractor procurement, however

many participants in Energize Olympia and similar Installer Model programs appreciate having pre-vetted contractors and streamlined access to site assessments and bids from program installers.

- **Determine the Installer Procurement Strategy**. Regardless of the decision to move forward with a Distributor Model, or Installer Model group purchase program, the E3 project team will need to procure one or multiple contractors for the LMI program pathway via a competitive RFP. With the addition of heat pump water heater technology in addition to heat pump space conditioning retrofits, plumbing installation services will be required. The RFP could be open only to installers who are able to complete all aspects heat pump space conditioning and HPWH upgrades, or a roster of installers who are qualified for specific installations based on each company's construction discipline (HVAC, plumbing, and electrical upgrades).

Advisory Support Service

- **Focus on providing a robust "customer support" service to guide residents through E3 Campaign participation.** Staff do not currently recommend launching a high-touch technical advisory support service as envisioned in the Phase I Project Plan. Home electrification planning assistance is already available to Thurston residents via PSE's Energy Advisors, PSE's home electrification assessments (at least through 2024), and The Switch Is On web platform. It is likely that additional statewide electrification planning and assistance tools may become available in 2025. Adding another third-party service to the E3 Campaign would stretch limited budget and staff resources, and could further complicate program messaging and confuse participants. Rather, staff recommends that the E3 Campaign provide a single point of contact for customer support and case management (see "Program Structure and Administration" below). Effort should be placed on campaign design and capacity building to ensure a positive customer experience and effective distribution of campaign incentives.

Outreach and Marketing

- **Continue to provide a free educational workshop series:** The on-demand and in-person Energize Olympia workshops were both well attended and provide a valuable supplemental incentive to all program participants in both pathways. Having a workshop available on demand, as well as frequently asked questions available online can reduce administrative burden of answering common participant questions.
- **Partner with community-based organizations for outreach:** Energize Olympia and other local group purchase programs have leveraged trusted community partners to engage members of target communities. The E3 Campaign Launch and Implementation Plan should include a comprehensive list of community outreach partners that will be engaged.
    - **Recruit community volunteers for distribution of marketing materials.** Energize Olympia 2023 utilized volunteers from community-based organizations as "Energize Ambassadors." Energize Ambassadors were successful in distribution of marketing materials including post cards, stickers and fliers throughout Olympia. Early recruitment of "E3 Ambassadors" can build greater awareness for the program, natural engagement of community partners, and opportunities for press coverage.
- **Set aside budget for outreach and marketing:** Energize Olympia budgeted approximately $10,000 for radio and streaming advertising, and design/printing of marketing materials. The E3 outreach budget should consider the larger, multijurisdictional scope of the campaign, as well as the ability to build on existing Energize campaign materials. The E3 Campaign can also leverage

cross-jurisdictional and cross-departmental staff resources to conduct outreach at diverse community events.

- **Budget for translation and interpretation services:** Translate outreach materials and the on-demand workshop into Spanish. Set aside marketing budget for providing interpretation services as needed throughout the program.
- **Build on the existing Energize Olympia brand:** To save costs, the E3 Campaign can modify and expand existing Energize Olympia marketing materials. The final E3 Launch and Implementation Plan will include the final decision on campaign name and brand.
- **Consider how to incorporate Switch Is On resources into E3 Campaign outreach:** The Switch Is On (SIO) website is intended to serve as a one-stop shop for information on electrification technologies and benefits, as well as tools to find incentives and vetted contractors. The new E3 Campaign incentives will be included in SIO's incentive finder. The TCMC Staff Team need to discuss and decide whether and how SIO's brand and materials will be used for E3 outreach.

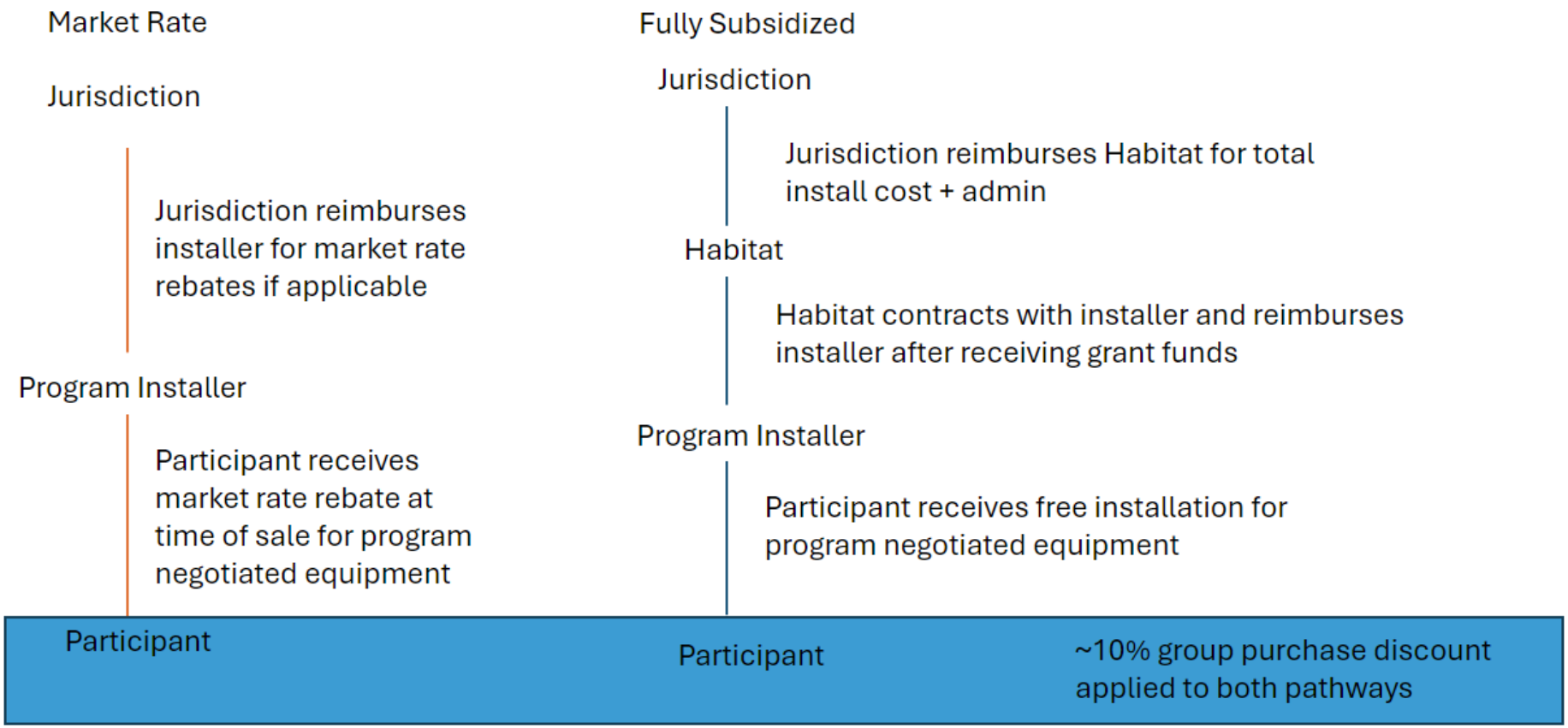
Program Structure and Administration

- **Utilize a single point of contact for customer support and case management.** Due to the complexity of a multi-jurisdictional, and multiple technologies, the E3 Campaign should have a single point of contact for application, and eligibility questions. This strategy was recommended during preliminary stakeholder engagement with Spark Northwest and has been successful in other multi-jurisdictional group purchase programs such as Energy Smart Eastside. The USDOE Community Energy Fellow, hosted by Thurston County, can serve as this point of contact; however, it is uncertain if additional staff capacity will be needed to manage the campaign (see below).
- **Assess whether additional staff capacity is needed.** The Staff Team needs to fully assess whether existing staff capacity, including the Community Energy Fellow, will be sufficient to administer the multi-jurisdictional campaign and provide needed customer support. Additional information from partner interviews (TBD from Confluence Communications) may help with this assessment. It may be possible, budget permitting, to contract with a partner organization for additional capacity if deemed necessary.
- **Create a primary webpage for information on the E3 Campaign.** Although specific incentives may vary between TCMC jurisdictions participating in the E3 campaign, it is important to have a clear, singular source of information for participants to learn about what incentives are being offered, who to contact for customer support, and how to participate in the program. This could be hosted on the TCMC's website, and follow a similar structure to the Energy Smart Eastside website, which acts as a central hub that links to each jurisdiction's webpage.
- **Include interactive mapping tool on campaign webpage.** Staff recommends creating an interactive web tool (to the extent possible with existing resources) that prompts residents to enter their home address when they first visit the site. They will then be directed to specific incentives available in their home jurisdiction.
- **Determine strategy for management of information, files and systems**. The Energize Olympia 2024 Program uses Monday.com software to streamline the process of tracking participants, managing program applications, and assigning program partner tasks. The E3 campaign will need to identify a strategy for application intake and management, as well as a software solution that meets each jurisdiction's IT and security standards.

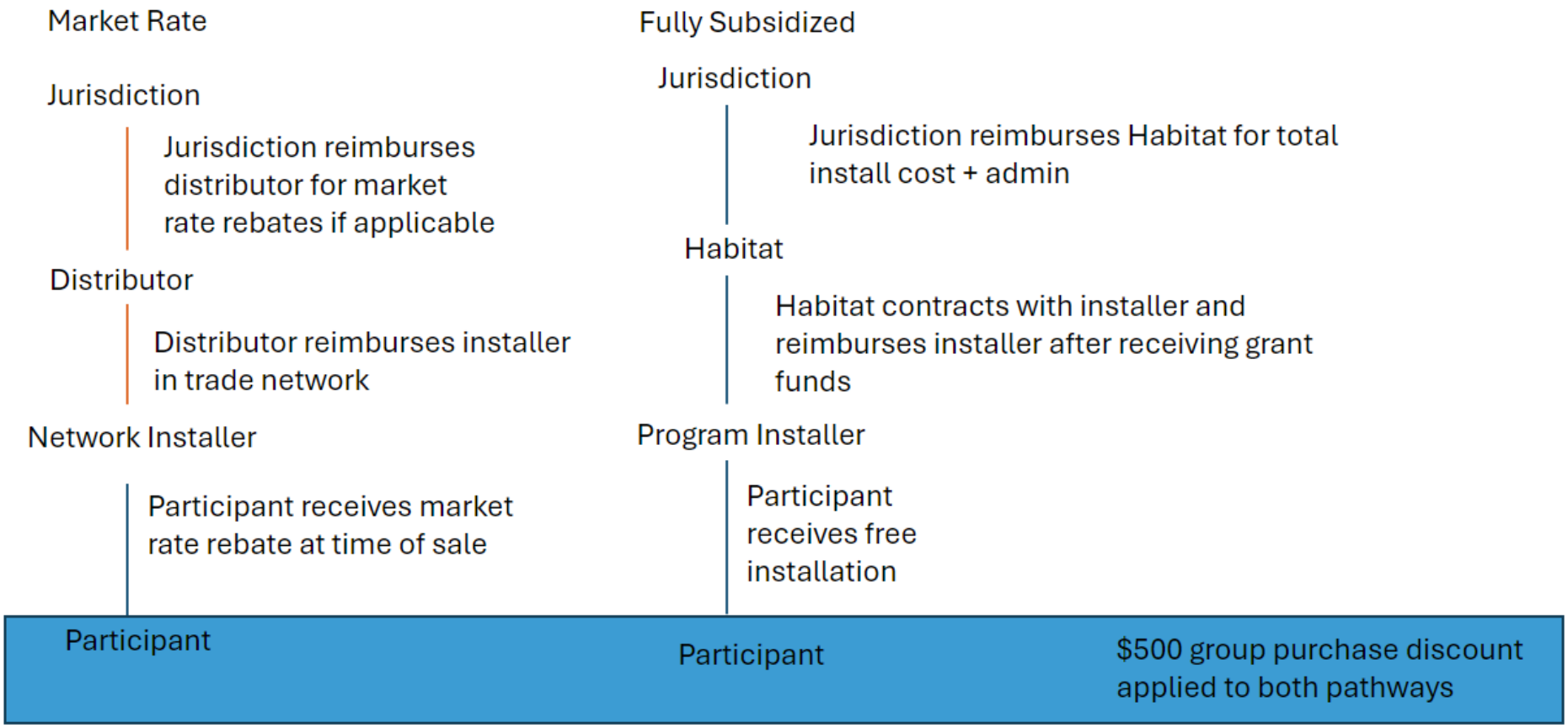
APPENDIX A

Types of Group Purchase Models

Installer Model: Group purchase negotiated directly w/installer for both pathways as a time of sale discount for specific equipment. (More contracting & only pre-negotiated equipment)



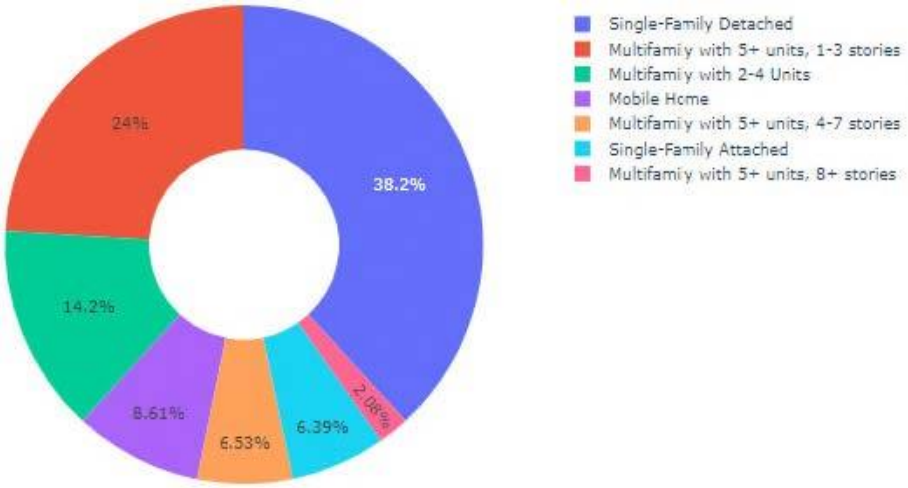
Distributor Model: Discount negotiated with an equipment distributor (usually less than installer discount, but can use any equipment meeting program efficiency requirements). Still need to negotiate with subsidized program installer for quality control



APPENDIX B

Olympia Building Stock Analysis Data and Methodology

Figure 1: Study Set Distribution by Building Type



Description of Envelope Measures:

- **Attic Floor Insulation**: Attic floor insulation increased to IECC-Residential 2021 levels for dwelling units with vented attics and any lower level of insulation.
- **General Air Sealing**: A 30% whole-home reduction in infiltration (ACH50) for dwelling units with greater than 10ACH50 in the baseline.
- **Duct Sealing**: Duct sealing to 10% leakage and R-8 duct insulation for any leakier or less-insulated ducts.
- **Drill-and-Fill Wall Insulation**: Drill-and-fill wall insulation (R-13) for dwelling units with no wall insulation and wood stud walls.
- **Foundation Wall and Rim Joist Insulation, With Sealing of Crawlspace Vents**: Add R-10 interior insulation to foundation walls and rim joists in conditioned basements and crawlspaces, seal crawlspace vents.
- **Energy Star Windows**: Replace any less-efficient existing windows with windows that meet ENERGY STAR (v7)12 criteria. This measure includes a 30% infiltration reduction for dwelling units with existing single-pane windows and 15% infiltration reduction for dwelling units with existing double-pane windows. Anniston, AL resides in South-Central Energy Star climate zone, and the corresponding window specification is following:

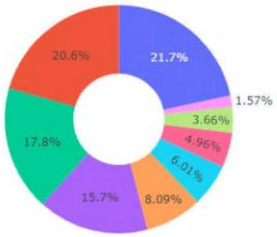
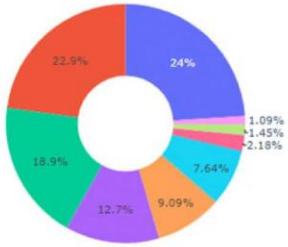
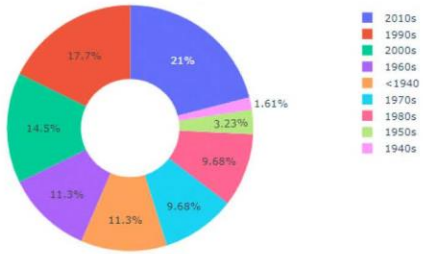
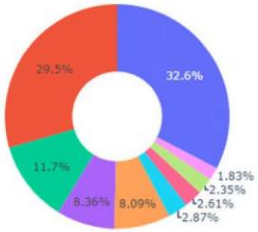
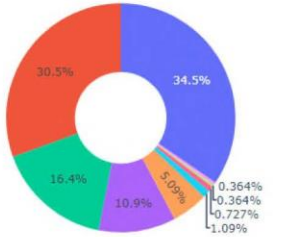
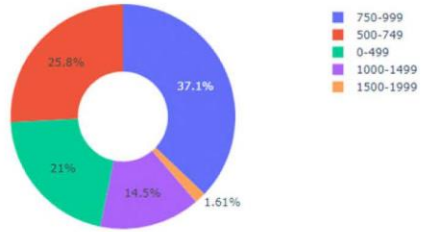
  South-Central: U-factor: 0.28 SHGC: 0.23
- **Exterior Continuous Wall Insulation**: 1" exterior insulation extruded polystyrene (XPS) (R-5/in.) for wood or concrete masonry unit (CMU) walls with existing total insulation of less than R-19.
- **IECC 2021 Air Sealing**: Improve dwelling unit's infiltration to IECC 2021 air sealing requirements 3 ACH50 for climate zone 4C.
- **Improved Ventilation**: Exhaust-only ventilation is for climate zones 3A for dwelling units with greater than 3 ACH50.

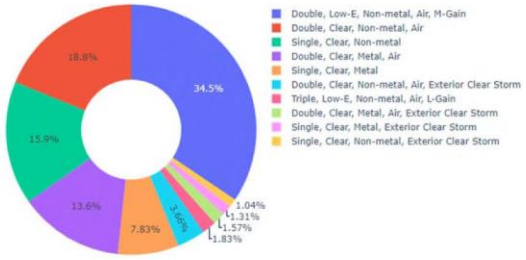
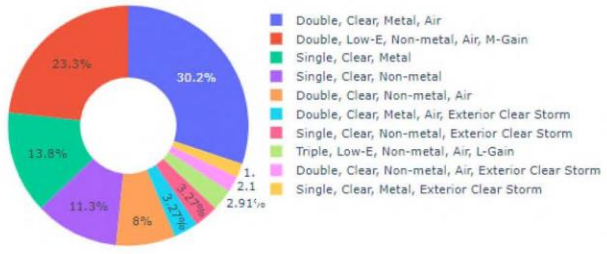
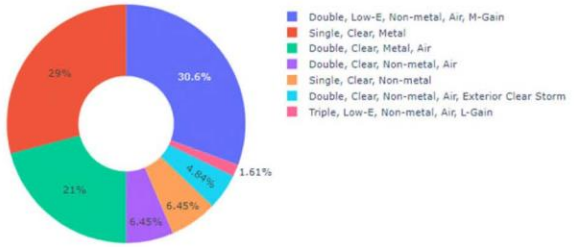
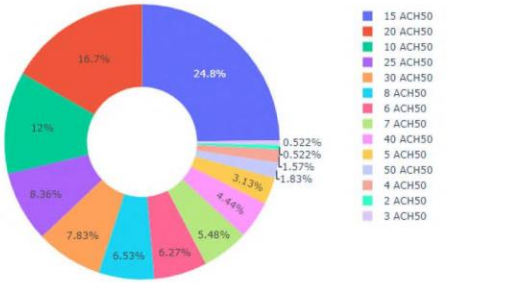
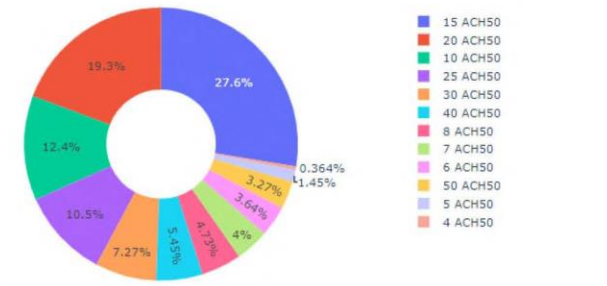
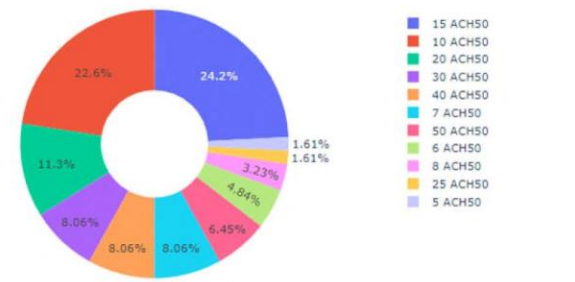
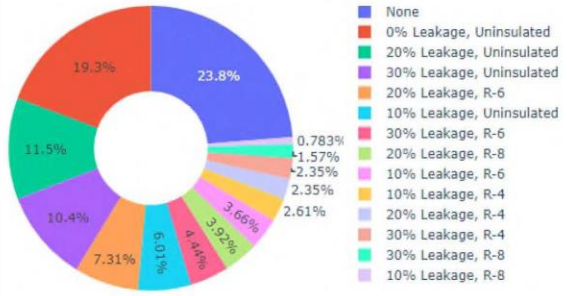
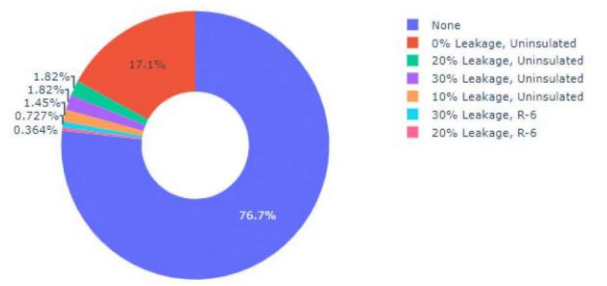
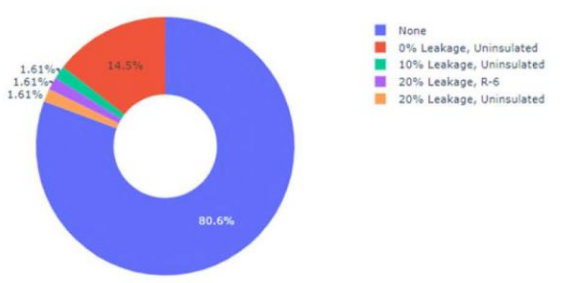
Table 1 and Figures 2-4

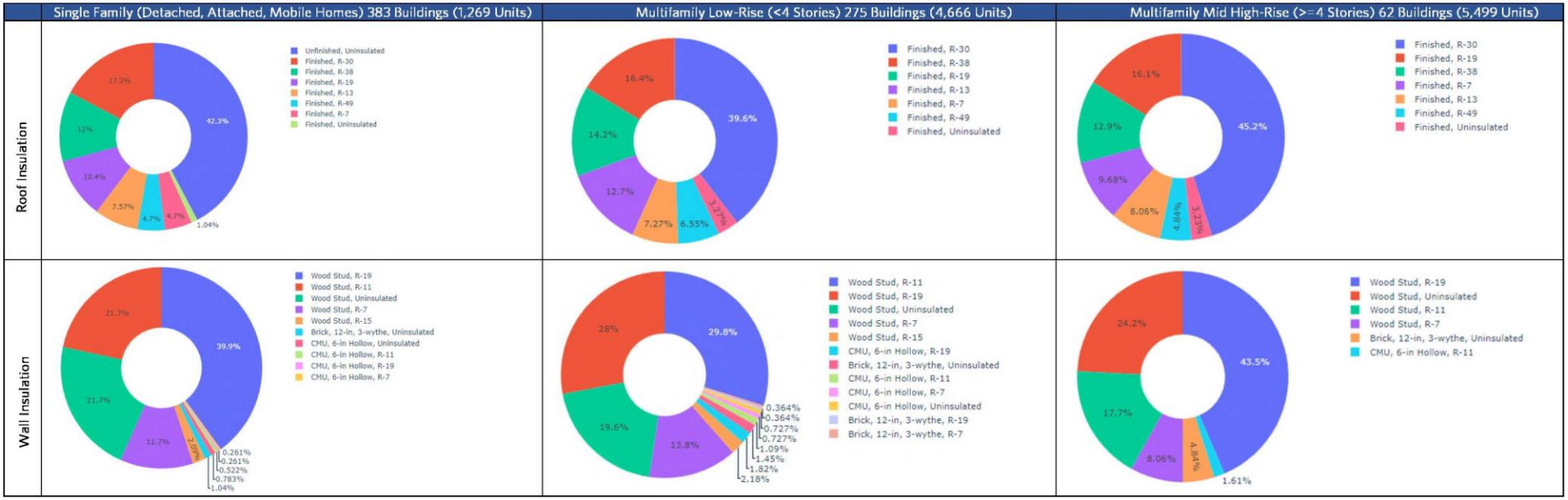
Improved Ventilation: Exhaust-only ventilation is for climate zones 3A for dwelling units with greater than 3 ACH50.

Table 1 shows the summary and distribution plots of the baseline building characteristics of the three groups. Figure 2 to Figure 4 show the baseline site energy end use disaggregation (electricity, natural gas, and propane) of the three groups. For each site, gross electricity consumption--rather than net consumption--is plotted, for better understanding of the baseline buildings; only one detached single-family unit in the Study Set has PV (Photovoltaic) on site.

Table 1: Baseline Study Set Characteristics Summary with Charts

	Single Family (Detached, Attached, Mobile Homes) 383 Buildings (1,269 Units)	Multifamily Low-Rise (<4 Stories) 275 Buildings (4,666 Units)	Multifamily Mid High-Rise (>=4 Stories) 62 Buildings (5,499 Units)
Summary	• 34% of the homes were built prior to 1980, 7% were built in the 1940s or prior to 1940s • 22% of the homes are <1,000SF, 62% of the homes are >=1,000SF and <2,000SF, 16% are >=2,000SF • 39% of the homes' envelopes are characterized as "very leaky" with ACH50 (Air Change Rate at 50Pa) values ranging from 20-50 which call for weatherization opportunities • 44% of the homes have "leaky" ductwork (20% to 30% leakage) with varying insulation levels, 26% of the homes have terminal units without distribution ductwork • 26% of the homes have extremely low-insulating single pane windows • 45% of the homes have 100% LED (Light-emitting Diode), and 24% homes still have incandescent lights • 19% of the homes have heat pumps for space heating, 31% have electric heaters, and 50% have either natural gas or propane furnaces or boilers • 2% of the homes have heat pump water heaters (HPWH), 56% of homes have electric water heaters, 42% of homes have gas or propane water heaters • 66% of the homes have inadequate roof or attic insulation • 97% of the homes have wood stud wall construction, 33% of the homes have poor insulation (uninsulated or R-7) in the stud cavity	• 36% of the buildings were built prior to 1980, 3% of which were built in the 1940s or prior to 1940s • 76% of the units are <1,000SF, 21% of the units are >=1,000SF and <2,000SF, 3% are >=2,000SF • Units in 46% of the buildings' have envelopes characterized as "very leaky" with ACH50 (Air Change Rate at 50Pa) values ranging from 20-50 which call for weatherization opportunities • Units in 5% of the buildings have "leaky" ductwork (20% to 30% leakage) with varying insulation levels, units in 77% of the buildings have terminal units without distribution ductwork • Units in 30% of the buildings have extremely low-insulating single pane windows • 23% of the homes have 100% LED (Light-emitting Diode), and 34% homes still have incandescent lights • Units in 15% of the buildings have heat pumps for space heating, 79% have electric heaters (93% of the shared heating have central electric heating), and 6% have either natural gas or propane furnaces or boilers • Units in 2% of the buildings have heat pump water heaters (HPWH), 87% of buildings have electric water heaters, 11% of buildings have gas or propane water heaters • 37% of the buildings have inadequate roof insulation • A mix of steel/wood framed (indicated as wood-stud to match software input), brick and CMU mass wall construction types, 35% of the buildings have poor insulation (uninsulated or R-7)	• 37% of the buildings were built prior to 1980, 13% were built in the 1940s or prior to 1940s • 84% of the units are <1,000SF, 16% of the units are >=1,000SF and <2,000SF • Units in 35% of the buildings' have envelopes characterized as "very leaky" with ACH50 (Air Change Rate at 50Pa) values ranging from 20-50 which call for weatherization opportunities • Units in 3% of the buildings have "leaky" ductwork (20% leakage) with varying insulation levels, units in 81% of the buildings have terminal units without distribution ductwork • Units in 35% of the buildings have extremely low-insulating single pane windows • 32% of the homes have 100% LED (Light-emitting Diode), and 40% homes still have incandescent lights • Units in 10% of the buildings have heat pumps for space heating, 82% have electric heaters (95% of the shared heating have central electric heating), and 8% have either natural gas or propane furnaces or boilers • Units in 5% of the buildings have heat pump water heaters (HPWH), 77% of buildings have electric water heaters, 18% of buildings have gas or propane water heaters • 37% of the buildings have inadequate roof insulation • A mix of steel/wood framed (indicated as wood-stud to match software input), brick and CMU mass wall construction types, 37% of the buildings have poor insulation (uninsulated or R-7)
Vintage			
Unit Floor Area			

	Single Family (Detached, Attached, Mobile Homes) 383 Buildings (1,269 Units)	Multifamily Low-Rise (<4 Stories) 275 Buildings (4,666 Units)	Multifamily Mid High-Rise (>=4 Stories) 62 Buildings (5,499 Units)
Window			
Infiltration			
Duct Leakage and Insulation			



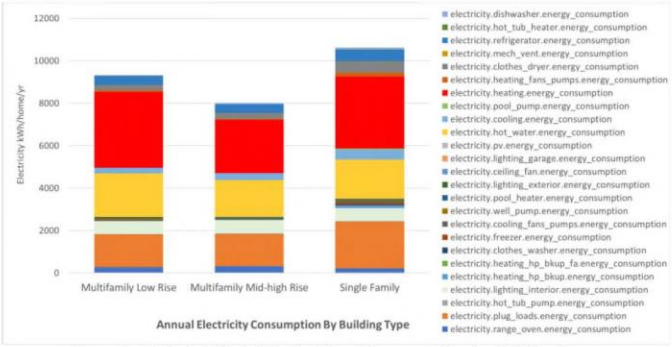


Figure 2: Study Set Electricity End Use Disaggregation by Building Types

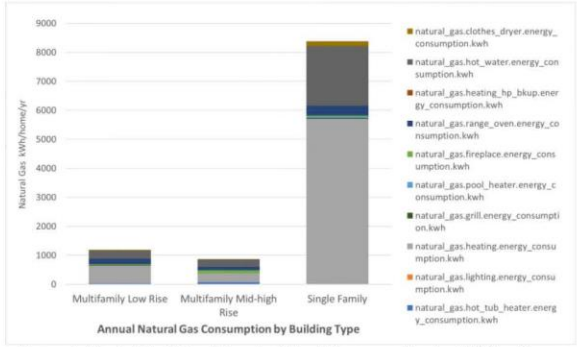


Figure 3: Study Set Natural Gas End Use Disaggregation by Building Types

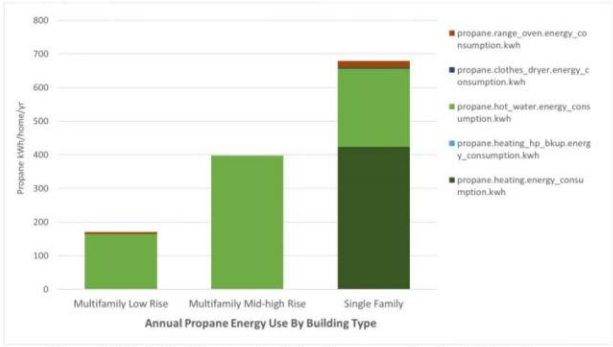
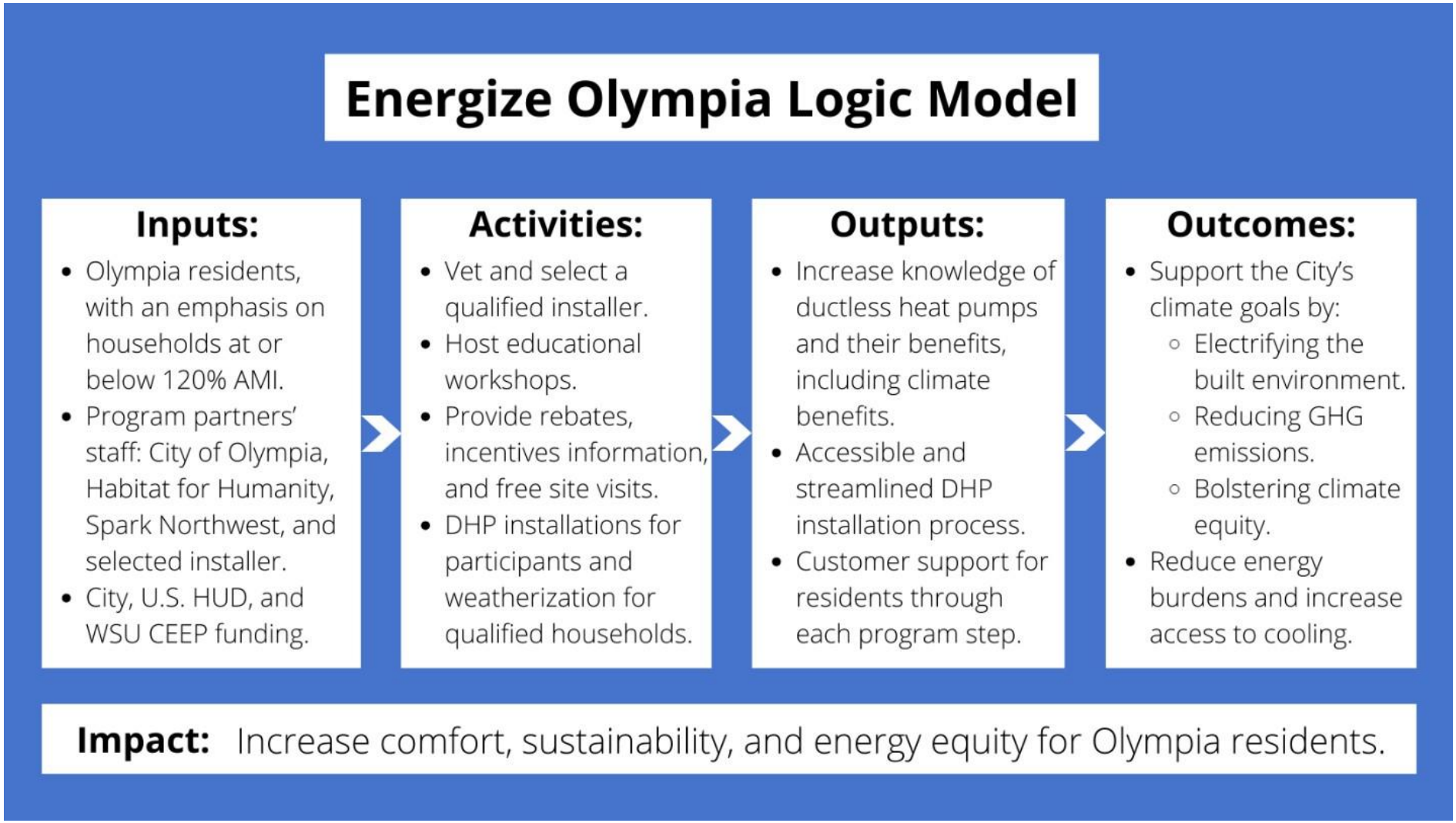


Figure 4: Study Set Propane End Use Disaggregation by Building Types

APPENDIX C

Energize Olympia Program Logic Model



APPENDIX D

Energize Olympia 2024 Heat Pump Installation Services Request For Proposals

APPENDIX E

Puget Sound Energy Rebates

Save money with PSE's energy efficiency rebates

Which PSE services do you use? (Indicates which rebates you qualify for below) ● Electric ● Natural Gas ● Electric and Natural Gas

Rebate	Single family	Efficiency Boost*
Appliances		
ENERGY STAR® frontload clothes washer ●	$75	$125
ENERGY STAR clothes dryer ●	$50	$100
Heat pump clothes dryer ●	$75	$200
Energy management		
ENERGY STAR smart thermostat (limit 1 per household) ● ●	$75	$175
Line voltage connected thermostat (PSE approved models, maximum of 5 per household) ● ●	$75	$130
Home heating systems		
Gas furnace to AHRI Certified ducted heat pump ●	$3,000	$4,000
Gas heating (furnace or boilers) to AHRI Certified ductless heat pump ●	$3,000	$4,000
Electric resistance to air-source heat pump conversion ●	$1,500	$2,400
ENERGY STAR or AHRI Certified natural gas forced-air furnace ●	$250	$750
Water heating systems		
Heat pump water heater Tier 3 ●	$500	$700
Heat pump water heater Tier 4 ●	$500	$750
ENERGY STAR tankless water heater ●	$250	$600
Weatherization **		
Attic insulation (R11 or less to R49) ● ●	$1.75 per sq ft	
Wall insulation (R0 to R13) ● ●	$2.50 per sq ft	
Floor insulation (R11 or less to R30) ● ●	$2.50 per sq ft	
Prescriptive air sealing (attic and/or floor) ● ●	$0.20 per sq ft	
Prescriptive duct sealing and insulation (R0 to R11) ● ●	Up to $1,000	
Advanced duct sealing ● ●	Up to $1,250	
Standard duct sealing only ● ●	Up to $550	
ENERGY STAR whole house ventilation ● ●	$50 per home	
Windows		
Windows (single-pane to U30 replacement) ● ●	$50 per window, up to $750	$200 per window, up to $2,000
Windows (single- or double-pane to U22 replacement) ● ●	$100 per window, up to $1,500	$200 per window, up to $2,000

You must be a current PSE single family residential customer and can only apply for rebates for the PSE services you use (electric and/or natural gas). Single-family new construction, multifamily (5 or more attached units) and commercial accounts are not eligible. Qualifying products must be installed in PSE's service area. Weatherization work must be completed by a pre-authorized PSE Trade Ally. All are tariffed services and subject to change or termination without prior notice. Additional qualifications apply. For a complete list of qualifications, visit pse.com/rebates or call a PSE Energy Advisor at 1-800-562-1482, Monday through Friday, 8 a.m. to 5 p.m. or email at energy.advisor@pse.com. Check out the PSE Marketplace at pse.com/marketplace to learn more about instant rebates on select energy-efficient products for qualified customers.

* Income-qualified customers may be eligible for increased Efficiency Boost rebates. Contact a PSE Energy Advisor at 1-800-562-1482 or energy.advisor@pse.com, or visit pse.com/boost, to learn more.

** In addition to the standard rebate amount, bundle 3 rebates in one project for up to $350. Bundle 4 rebates in one project for up to $500

pse.com/rebates

PSE PUGET SOUND ENERGY

PUGET SOUND ENERGY

2024 PSE Trade Ally Network residential rebate matrix

Minimum requirements for space heat, water heat, windows and weatherization

General qualifications for PSE single family existing customers (including manufactured homes and Efficiency Boost, excluding midstream rebates)

- Must be a current PSE single family residential customer. Single family new construction, multi-family (5 or more attached units), and commercial accounts are not eligible.
- Rebate application must be submitted within 30 days of installation.
- Qualifying equipment must be installed in PSE's electric or natural gas service territory.
- Rebates only available on new, qualifying equipment.
- Must install to comply with federal, state and local code requirements.
- Cannot be combined with other rebates including PSE's Low Income Weatherization program.
- Equipment that is replaced under warranty is not eligible for a rebate.
- One home heating rebate and one water heating rebate per qualified single-family residence.
- Rebate cannot exceed the pre-tax purchase price of any rebate product.

Manufactured home and mobile home: factory built dwelling that includes: (a) plumbing, heating, air conditioning, and electrical systems, normally contained within the belly of the structure and within a rodent barrier; (b) is built on a permanent chassis; (c) can be transported in one or more sections; (d) may, or may not be permanently affixed to a concrete foundation.

Questions?

Email tradeallysupport@pse.com or call an Energy Advisor at 1-800-562-1482, Monday through Friday, 8 a.m. to 5 p.m.

Electric space heat rebates			
Measure	Incentive amount	Pre-existing condition	Equipment qualifications
Electric resistance to ductless heat pump conversion	$1,500	• Existing PSE electric, single family existing (SFE) site-built home • Electric resistance must be primary heating[1] • Must not have an existing heat pump	• AHRI Certified® as variable speed mini-split/multi-split heat pump • Must have an HSPF of at least 9.0, or HSPF2 of at least 8.1. For units that have both HSPF and HSPF2, the HSPF rating will be used to determine eligibility • Must use inverter technology, and be a minimum of 3/4 ton in heating mode • One indoor head must be installed in main (high-flow) living area • ADU's (accessory dwelling unit) must be occupied full time and meet ADU code requirements[2]
Electric forced-air furnace (EFAF) to ductless heat pump conversion	$1,500	• Existing PSE electric, SFE site-built home • Home must be heated by EFAF • Must not have an existing heat pump	• AHRI Certified as variable speed mini-split/multi-split heat pump • Must have an HSPF of at least 9.0, or HSPF2 of at least 8.1. For units that have both HSPF and HSPF2, the HSPF rating will be used to determine eligibility • Must use inverter technology, and be a minimum of 3/4 ton in heating mode • One indoor head must be installed in main (high-flow) living area
EFAF to air source heat pump conversion	$1,500	• Existing PSE electric, SFE site-built home • Home must be heated by EFAF • Must not have an existing heat pump • Customers with existing gas furnaces are not eligible	• AHRI Certified heat pump • Must have an HSPF of at least 8.5, or HSPF2 of at least 7.2. For units that have both HSPF and HSPF2, the HSPF rating will be used to determine eligibility
Manufactured home and Efficiency Boost—electric resistance (zonal or EFAF) to ductless heat pump conversion	$2,400	• Existing PSE electric, manufactured home and Efficiency Boost (Income qualified customers) • Electric resistance must be primary heating • Must not have an existing heat pump	• AHRI Certified as variable speed mini-split/multi-split heat pump • Must have an HSPF of at least 9.0, or an HSPF2 of at least 8.1. For units that have both HSPF and HSPF2, the HSPF rating will be used to determine eligibility • Must use inverter technology, and be a minimum of 3/4 ton in heating mode • One indoor head must be installed in main (high flow) living area • ADU's must be occupied full time and meet ADU code requirements[2]
Manufactured home and Efficiency Boost—electric forced-air furnace to air source heat pump conversion	$2,400	• Existing PSE electric, manufactured home and Efficiency Boost (Income qualified customers) • Home must be heated by EFAF • Customer with existing gas furnace are not eligible • Must not have an existing heat pump	• AHRI Certified heat pump • Must have an HSPF of at least 8.5, or HSPF2 of at least 7.2. For units that have both HSPF and HSPF2, the HSPF rating will be used to determine eligibility
Natural gas furnace to hybrid heat pump conversion (ONLY can be offered by trained REP)	$1,700	• Existing PSE dual-fuel (both gas and electric), single family existing (SFE) site-built, or manufactured home (ADUs are not eligible) • Home must be heated by natural gas furnace • Must not have an existing heat pump	• AHRI Certified heat pump • Must have an HSPF of at least 8.5, or HSPF2 of at least 7.2. For units that have both HSPF and HSPF2, the HSPF rating will be used to determine eligibility
Natural gas furnace to hybrid heat pump conversion + 95%+ furnace (ONLY can be offered by trained REP)	$1,950	• Existing PSE dual-fuel (both gas and electric), single family existing (SFE) site-built, or manufactured home (ADUs are not eligible) • Home must be heated by natural gas furnace • Must not have an existing heat pump	• AHRI Certified heat pump • Must have an HSPF of at least 8.5, or HSPF2 of at least 7.2. For units that have both HSPF and HSPF2, the HSPF rating will be used to determine eligibility • AHRI or ENERGY STAR® certified • Minimum 95% AFUE

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Electric space heat rebates			
Measure	Incentive amount	Pre-existing condition	Equipment qualifications
Midstream air source heat pumps (distributor pass-through)	$300 to $600	• Retrofit and new construction • Any pre-existing heat source	• AHRI Certified as variable speed mini-split/multi-split heat pump • <65 kBtuh (<5.4 tons) • See PACIFIC NORTHWEST MIDSTREAM HVAC AND WATER HEATING PROGRAM tables in separate attachment.
Advanced duct sealing	Up to $1,250 per home	• The pre-leakage of the ductwork must be ≥200 CFM at 50 pascals or the equivalent • Contractor must identify an issue with the existing ductwork: o Majority Metal Duct or Metal Plenum with Flex Branch Runs: ▪ At least 25% of accessible and previously unsealed plenum/duct directly connected/ adjacent to the air handler is in unconditioned space OR; At least 50% of ducts are accessible, previously unsealed, and in unconditioned space OR; At least one visually ascertainable supply duct issue exists in unconditioned space. This includes any or all the following: duct disconnects, breaks, or crushed ductwork OR; The flex ducts are connected to the metal duct using duct tape with no panduit straps or zip ties. ▪ 100% Flex Duct: ▪ At least one visually ascertainable supply duct issue exists in unconditioned space. This includes any or all the following: duct disconnects, breaks, or gaps OR; The flex ducts are connected using duct tape with no panduit straps or zip ties.	• Contractor must be Aeroseal-certified in order to complete installation

Electric water heat rebates			
Measure	Incentive amount	Pre-existing condition	Equipment qualifications
Heat pump water heater (HPWH)	$500	• Existing PSE electric, SFE site-built home • New construction is not eligible	• NEEA Tier 3 or Tier 4 Northern Climate Specification approved • ≤120 gallons to align with the Advanced Water Heating Specification 8.0 from NEEA
Manufactured home and Efficiency Boost—heat pump water heater	$200 rebate for Tier 3 and $250 rebate for Tier 4	• Existing PSE electric, manufactured home and Efficiency Boost (Income qualified customers) • New construction is not eligible	• NEEA Tier 3 or Tier 4 Northern Climate Specification approved • ≤120 gallons to align with the Advanced Water Heating Specification 8.0 from NEEA • Not available in combination with geothermal heat pumps
Small commercial HPWHs	Tier 3 $600, Tier 4 $650	• Existing PSE electric customer, replacing electric HW	• This incentive is additional to the midstream or retail instant incentive • NEEA Tier 3 or Tier 4 Northern Climate Specification approved • ≤120 gallons to align with the Advanced Water Heating Specification 8.0 from NEEA • Not available in combination with geothermal heat pumps • New construction and Multifamily not eligible

PSE PUGET SOUND ENERGY

PACIFIC NORTHWEST MIDSTREAM HVAC AND WATER HEATING PROGRAM

2023 Heat pump incentives

SEER/HSPF rated equipment[1]

Residential and small commercial <5.4 ton air-cooled heat pumps[2]

Unit type	Size category	Project type	Tier	SEER (minimum)	HSPF (Minimum)	Pass-through rebate[3] ($/outdoor system)
Mini or multi-split heat pump[4]	<65 kBtuh (<5.4 Tons)	Retrofit or new construction	1	16.0	9.5	$400
			2	16.0	11.0	$600
Traditional heat pump	<65 kBtuh (<5.4 Tons)	Retrofit	1	15.0	9.0	$300
		Retrofit or new construction	2	15.0	10.0	$500

1. Table is effective for equipment that only has SEER/HSPF ratings in the AHRI Directory with invoice dates between January 1, 2023-December 31, 2023 and for equipment that has both SEER/HSPF and SEER2/HSPF2 ratings in the AHRI Directory with invoice dates between January 1, 2023-June 30, 2023.
2. Values are AHRI rated efficiencies
3. The contractor is highly encouraged to pass the equipment rebate through to the customer.
4. To qualify as a mini- or multi-split heat pump, products must be listed in the AHRI database as Variable Speed Mini-Split and Multi-Split Heat Pumps. These products may be referred to as Ductless Heat Pumps in the marketplace.

SEER2/HSPF2 rated equipment[1]

Residential and small commercial <5.4 ton air-cooled heat pumps[2]

Unit type	Size category	Project type	Tier	SEER2	HSPF2	Pass-through rebate[3] ($/outdoor system)
Air source heat pump	<65 kBtuh (<5.4 Tons)	Retrofit or new construction	1	15.2	8.1	$300
			2	15.2	8.5	$400
			3	16.0	9.5	$600

1. Table is effective for equipment that only has SEER2/HSPF2 ratings in the AHRI Directory with invoice dates between January 1, 2023-December 31, 2023 and for equipment that has both SEER/HSPF and SEER2/HSPF2 ratings in the AHRI Directory with invoice dates between July 1, 2023-December 31, 2023.
2. Values are AHRI rated efficiencies
3. The contractor is highly encouraged to pass the equipment rebate through to the customer.

Why heat pump technology?

- Provide customers with reliable HVAC systems and more savings, upfront and long-term
- Achieve higher profit margins
- Get credits toward Washington State Energy Code requirements in a new home build

Provided by

PUGET SOUND ENERGY Seattle City Light Snohomish County PUD

PACIFIC NORTHWEST MIDSTREAM HVAC AND WATER HEATING PROGRAM

2023 Hybrid heat pump water heater incentives

Hybrid heat pump water heaters[1]					
Building type	**Size category**	**Project type**	**Qualifying models[2]**	**Customer pass-through rebate[3] ($/unit)**	**Contractor spiff[4] ($/unit)**
Commercial	<120 gallons[5]	Retrofit or new construction	Any NEEA Tier	$600	$100
Residential	<120 gallons	Retrofit	NEEA Tier 3 or 4	$500	$100
	<120 gallons	New construction	NEEA Tier 4	$150	N/A

1. May be referred to as electric hybrid water heaters in the marketplace.
2. The Northwest Energy Efficiency Alliance (NEEA) qualifying product list can be found online here: https://neea.org/resources/hpwh-qualified-products-list
3. The contractor is highly encouraged to pass the equipment rebate through to the customer.
4. Contractor spiff will be passed through by the distributor to the contractor as a line item on the invoice.
5. Equipment of 120 gallons or greater capacity and with 6 kW of input power or less may qualify for commercial installations. Please contact the program implementer for more information.

Why hybrid heat pump technology?

- Provide customers with reliable water heating systems and more savings, upfront and long-term
- Achieve higher profit margins
- Get credits toward Washington State Energy Code requirements in a new home build

Provided by

PUGET SOUND ENERGY Seattle City Light Snohomish County PUD

7655 12/22

APPENDIX F

Puget Sound Energy Home Electrification Assessment

Your PSE Home Electrification Assessment

Test Five
1315 20th Street, Anacortes, WA 98221

Prepared By:
Kyle Brighton
psehea@franklinenergy.com
866.574.3294
9/13/2023

PUGET SOUND ENERGY

Go electric, at home

Whether you're interested in saving more energy at home, making a positive environmental impact, preparing for future energy upgrades, or all of the above, here are some of the most effective ways you can start on your electrification journey.

Heat pumps

Electric heat pumps are up to four times more efficient than traditional HVAC sources, such as furnaces or central air conditioners. And because heat pumps heat and cool your home through a single system, making the switch can lead to lower energy costs all year-round.

Heat pump water heaters

Compared to a standard water heater, heat pump water heaters can be three times as efficient while still delivering the hot water your household needs. Considering that water heating is one of the highest contributors to the average energy bill, it's a smart choice.

Appliances

Upgrading to ENERGY STAR® certified electric kitchen and laundry appliances is a great way to lower your energy use, without sacrificing reliability or quality. These models also feature innovative technologies that can improve safety and your experience.

Cost Comparison: Heating Systems

Approximately 40% of the average home's energy use can be attributed to heating and cooling, which means it offers a significant opportunity for energy savings. See how different heating systems compare depending on your home's square footage.

Estimated annual heating for PSE gas and electric (dual fuel) customers

Square Footage	0-1,000	1,000 - 1,500	1,500 - 2,000	2,000 - 2,500	2,500 - 3,000	3,000 - 3,500	3,500 - 4,000	4,000 +
Gas Furnace (80% AFUE)	$601	$793	$965	$1,101	$1,376	$1,552	$1,884	$2,100
Gas Furnace (95% AFUE)	$506	$668	$812	$927	$1,158	$1,307	$1,587	$1,768
Electric Furnace	$1,178	$1,554	$1,891	$2,158	$2,697	$3,043	$3,694	$4,116
Baseboard/ Cadet Heaters	$883	$1,165	$1,418	$1,618	$2,022	$2,282	$2,770	$3,087
Ducted Heat Pump	$496	$655	$797	$909	$1,136	$1,282	$1,556	$1,734
Ductless Heat Pump	$317	$419	$509	$581	$726	$820	$995	$1,109

Estimated annual energy costs do not include added or reduced air-conditioning costs. Gas furnace or heat pump actual efficiency may be less than listed due to ductwork condition, installation practices or equipment wear and tear. Usage based on regional building stock estimates. Actual results may vary depending on home characteristics, occupancy, and customer behavior. Supplemental heat is often necessary for DHP/HP applications; load applies to all existing system calculations. Calculated using PSE gas and electricity rates effective July 2023.

PUGET SOUND ENERGY

Top upgrades for your home

Puget Sound Energy offers rebates and incentives for the following improvements identified during your home electrification assessment. Specific qualifications may apply.

Opportunity	Recommendation
Billing Assistance	You may be eligible for PSE Home Energy Lifeline Program which provides up to a $1,000 account credit! For more information visit: www.pse.com/en/account-and-billing/assistance-programs/HELP. You may also be eligible for state resources available under the Low-Income Home Energy Assistance Program (LIHEAP) where a grant is sent directly to the energy provider on behalf of the eligible household. In addition, LIHEAP may also help repair or replace heating and cooling systems. For more information visit: www.commerce.wa.gov/LIHEAP
Replace your electrical panel	One or more of your circuit breakers appears to be past its useful life. You may qualify for PSE rebates for electric panel upgrades! To receive more information please contact your Electrification Coach at psehea@franklinenergy.com
Switch your gas furnace to an electric air sourced heat pump	Consider switching to a efficient ducted electric heat pump that provides both heating and cooling comfort to your home. PSE now offers up to $3,000 in rebates and you may receive an additional $600 discount provided by your contractor! For more information visit: www.pse.com/ElectricHome and www.pse.com/midstream. You may also be eligible for IRA Tax Credit incentives for Heat Pumps, up to $2,000/ max of $3,200 per year. For more information visit: www.rewiringamerica.org/calculator
Switch your gas furnace to an electric ductless heat pump	Consider switching to an efficient ductless electric heat pump that provides both heating and cooling comfort to your home. PSE now offers rebates up to $3,000 and you may receive an additional $600 discount provided by your contractor! For more information visit: www.pse.com/ElectricHome and www.pse.com/midstream. You may be eligible for IRA Tax Credit incentives for Heat Pumps, up to $2,000/ $3,200 per year. For more information visit: www.rewiringamerica.org/calculator
Upgrade to an efficient ductless heat pump	For a typical household in our region, heating accounts for roughly 50% of a home's energy use and depending on the application, ductless heat pumps can operate up to three times more efficient. Visit www.pse.com/heating to see if you are eligible for a rebate to upgrade to a ductless heat pump and receive PSE rebates of up to $1,500 per home to change electric resistance heating to a Heat Pump! For more information visit: www.pse.com/ductlessheatpump www.pse.com/midstream. You may also be eligible for IRA Tax Credit incentives for Heat Pumps, up to $2,000/ max of $3,200 per year. For more information visit: www.rewiringamerica.org/calculator

PUGET SOUND ENERGY

Steps to get started

1) Review your report and start planning for your recommended upgrades!
2) Get a contractor referral for a safe, dependable, and efficient Recommended Energy Professional at www.pse.com/REP.
3) Review your project and eligible funding opportunities with your contractor to ensure your installation will qualify for applicable rebates and/or tax credits.

Inflation Reduction Act (IRA)

The 2022 Inflation Reduction Act (IRA) offers federal tax credits to people working to cut their home energy use and adopt renewable energy.

Many of these tax credits overlap with utility rebate programs, so you may be able to combine the tax credits with other incentives.

And, since the IRA tax credits will be in place until 2032, you have the time you need to plan your project. Learn more at www.pse.com/IRA.

PSE can help

If you're struggling to pay your energy bills, our bill assistance programs and home weatherization program can help. It's easy to learn if you're eligible for bill assistance or free home weatherization upgrades. Learn more at www.pse.com/assistance.

Contact information

- For questions about your home electrification report, please contact an Electrification Coach at pseHEA@franklinenergy.com or call 1-866-574-3294.
- For more information about other energy saving opportunities, please contact a PSE Energy Advisor at energy.advisor@pse.com or call 1-800-562-1482.

Health and safety conditions

Older homes may have some conditions that need to be addressed before implementing energy efficiency upgrades.

Knob and tube wiring: Typically found in homes built prior to 1960, older wiring shall be inspected by a licensed electrician and certified as a safe or upgraded to modem wiring.

- Moisture intrusion: Water entering your home via the attic, roof, walls, or crawlspace can cause serious damage to the structure as well as health related issues to occupants.
- Animal/insect pests: Often found in the attic or crawlspace, if evidence of pests exists, this should be dealt with by a trained and licensed exterminator.
- Ventilation: Some conditions may lead to the home being stuffy or having internal moisture problems. Operate controlled ventilation systems in your home with ENERGY STAR® rated fans.

Combustion appliances fueled by natural gas, propane, oil or wood:

- Carbon monoxide (CO): If you home has any kind of combustion appliance such as a furnace, water heater, fireplace or stove, make sure that you have a properly working CO monitor on each occupied floor. Test your monitor(s) annually.