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Northwest Heat Pump Water Heater Initiative Market Progress Evaluation Report #2

Prepared by:
Evergreen Economics
333 SW Taylor St #200
Portland, OR 97204
503-894-8676

Northwest Energy Efficiency Alliance
PHONE
503-688-5400
FAX
503-688-5447
EMAIL
info@neea.org

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Glossary

ACS	American Community Survey (US Census Bureau)
BPA	Bonneville Power Administration
DHP	Ductless heat pump
DIY	Do-it-yourself
DOE	United States Department of Energy
ENERGY STAR®	US DOE program helping businesses and individuals protect the environment through superior energy efficiency (energystar.gov)
ERWH	Electric resistance water heater
GE	General Electric Corporation
HPWH	Heat pump water heater
HVAC	Heating, ventilation, and air conditioning
HZ	Heating zone
MPER	Market Progress Evaluation Report
MPI	Market progress indicator – a metric tracked by NEEA to measure successes of a market transformation Initiative
MRE	Market research and evaluation
NAECA	National Appliance Energy Conservation Act
NEEA	The Northwest Energy Efficiency Alliance (neea.org)
NCS	Northern Climate Specification (http://neea.org/northernclimatespec)
POS	Point-of-sale
PUD	Public utilities district
RUCC	Rural-Urban Continuum Codes, produced by the US Department of Agriculture (see Appendix J – Urban / Rural Markets Definitions)
SIC code	U.S. Department of Labor Occupational Safety & Health Administration Standard Industrial Classification code

Executive Summary

The Northwest Energy Efficiency Alliance (NEEA) engaged Evergreen Economics in August 2015 to conduct the second Market Progress Evaluation for NEEA's Heat Pump Water Heater (HPWH) Initiative, also known as the Hot Water Solutions Program.

Methods

This report presents evaluation findings based on the following research tasks:

- Market Characterization and Progress Assessment
- Alliance Cost Effectiveness (ACE) Model Review
- Telephone Surveys with Homeowners
- Telephone Surveys with Installers
- In-depth Interviews with Utilities and Market Actors

The findings and recommendations in this report that are associated with distributors and large retailers are not based on a representative sample of the four state region – Idaho, Montana, Oregon and Washington. NEEA and its contractor did not conduct interviews in Idaho with these supply chain market actors for this report at the request of Idaho Power Company.

Findings

1. **In 2015, there were 4,392 manufacturer markdowns for Tier 2/Tier 3 HPWHs, and utilities provided incentives for 985 Tier 2/Tier 3 HPWHs** (it is unknown what percentage of these are for the same HPWHs). This is a significant increase in sales of HPWHs meeting the Tier 2 performance tier.
2. **In 2015, there were 328 manufacturer markdowns for Tier 1 HPWHs, and utilities provided incentives for at least 1,096 Tier 1 HPWHs** (it is unknown what percentage of these are for the same HPWHs).
3. **The exit of AirGenerate from the market was overcome by GE developing a product that meets Tier 2/Tier 3 specifications.** This has also led to a shift in sales from Tier 1 products to Tier 2/Tier 3. Furthermore, Brand familiarity may play a role in the recent success of Tier 2/Tier 3 HPWHs compared to 2014 sales of Tier 2 models.
4. **The impact of the NAECA standards underwhelmed the entire supply chain.** Consumers and installers are pursuing workaround solutions, and there was at least some overstocking of large ERWHs prior to the April 2015 update.
5. **Forty percent of HPWH purchasers have DHPs installed in their homes (as a primary source of heat)**. Experience and familiarity with heat pump technology

and/or previous participation in a NEEA Initiative (the NW Ductless Heat Pump Initiative) may increase the likelihood of a HPWH purchase.

6. **As found in MPER1, HPWH purchasers are comprised of households with higher incomes and education levels than the general population.** However, when compared to purchasers from 2014 (MPER1), purchasers in 2015 were more similar to the general population in terms of both income and level education. This may be indicative of a slight shift down the product adoption curve towards more widespread adoption.
7. **Certain manufacturers are very engaged and positive about the Initiative.** However, it is possible that the Initiative's support may be perceived as favoritism.
8. **As with MPER1, HPWHs have met the expectations of the vast majority of purchasers (95% for MPER2).** As a result, most said they have or would recommend a HPWH to someone they know. Most purchasers would recommend HPWHs because of the resulting lower energy bills—purchasers are realizing savings.
9. **Planned purchases still dominate the HPWH market, however most purchasers note that the motivation to replace their existing water heater was because it was getting old.** Very few HPWH purchasers reported that they purchased a HPWH as part of an emergency replacement situation.
10. **The Initiative website (Hot Water Solutions, formerly Smart Water Heat) is not driving awareness among Northwest HPWH purchasers.** Neither website was mentioned as an initial source of awareness among purchasers, nor was either mentioned as a source of additional information.
11. **Market actors and Northwest utilities are directly targeting the new construction market.**
    - Utilities have expanded eligibility to include new construction (8 of 10 utilities interviewed).
    - Manufacturers target homebuilders and contractors directly, and leverage home performance program points to help sales into new construction projects. Two distributors said that new construction situations are particularly receptive to HPWHs compared to retrofit/replacement situations.
12. **Market actors are concerned about appropriate HPWH sizing to meet household hot water needs.** Consumers may purchase a HPWH of the same volume as their existing ERWH, only to be disappointed in the hot water supply (in particular the recovery rate), especially when the HPWH is set to rely solely on the heat pump (Heat Pump Only mode). Market actors are concerned that negative perceptions of HPWHs at this early stage in market transformation may have a lasting impact on HPWH consumer demand. This is especially important for DIY installations, as the purchaser does not receive the same educated guidance as when a professional installer is involved.

13. **Roughly one-third of purchasers replaced their existing water heater explicitly for efficiency purposes**, with another 10 percent noting that they did so because their existing water heater was expensive to operate.
14. **DIY installations make up approximately half of the market.**
15. **Installers do not stock HPWHs, but most do not stock any water heaters.** Most installers now say that it takes the same amount of time to obtain and install a HPWH as it takes to obtain and install an ERWH.
16. **The list of installers maintained on the Hot Water Solutions website likely contains firms that no longer install HPWHs (and may contain companies that no longer exist).**
17. **Credit cards were used by two-thirds of HPWH purchasers, but tax credits were more important to purchasers.**
18. **Utilities serving Oregon and Washington (especially urban areas) are engaged with an active installer base.** However, utilities serving Idaho and Montana (and rural areas across the Northwest) have more difficulty engaging with installers and creating enthusiasm for HPWHs in the supply chain.
19. **The manufacturer markdown approach changes Initiative evaluability.** The total sales volume of HPWHs supported by the Initiative (via manufacturer markdowns and/or utility incentives) are unknown because it is impossible to determine whether households that purchased a HPWH with a markdown apply for and receive a utility incentive.

Recommendations

1. **Continue to address low awareness through broad based marketing and through cooperative marketing with supply chain partners.** Development of an infographic for HPWHs should be considered and added to NEEA's website as well as the Hot Water Solutions website, and could address a number of key issues such as appropriate sizing, cross-promotion with the Northwest Ductless Heat Pump Project (see recommendation below), and consumer barriers.
2. **Monitor traffic to the Hot Water Solutions website, as consumers do not mention it as a source of information regarding HPWHs.** NEEA should investigate ways to optimize consumer search results such as investing in "pay-per-click" (PPC) advertising.
3. **Develop a cross-promotional strategy with the Northwest Ductless Heat Pump Project and the Hot Water Solutions Program.**
4. **The Initiative should consider directly addressing the issue of appropriate HPWH sizing.** Consumer acceptance of HPWHs is a critical component of early market transformation, and any potential for negative perceptions among consumers should be met with education and outreach.

5. **Continue to track the rate of emergency replacements through consumer and supplier market research and evaluation.** The market moving from a high proportion of planned purchases to higher proportions of emergency replacements may indicate progress towards market transformation, as planned replacements are atypical in the general water heater market in the Northwest (Verinnovation 2012), and likely indicate high rates of early adopter purchases.
6. **Encourage utilities to continue incentives for large volume HPWHs. Ensure that manufacturer markdowns for large volume HPWHs continue.** The NAECA standard update is not the panacea NEEA anticipated, and HPWHs are not the default product for large volume residential electric water heating.
7. **Track HPWH installations to new construction, as this is an important submarket.**
8. **Consider a thorough review of the installer list on the Hot Water Solutions website to ensure that it is up to date.** The list should contain installers that are still in business and, ideally, only those that would respond positively to a customer inquiry about a HPWH purchase and installation.

1 Introduction

The Northwest Energy Efficiency Alliance (NEEA) engaged Evergreen Economics in August 2015 to conduct the second Market Progress Evaluation for NEEA's Heat Pump Water Heater (HPWH) Initiative. NEEA is an alliance of more than 140 utilities and energy efficiency organizations working on behalf of more than 13 million energy consumers. NEEA is dedicated to accelerating both electric and gas energy efficiency, leveraging its regional partnerships to advance the adoption of energy-efficient products, services and practices.

In June 2013 NEEA launched Smart Water Heat Initiative. The Initiative was rebranded in August 2015 to Hot Water Solutions, along with a new website and updated marketing collateral. The Initiative currently provides upstream incentives to manufacturers (known as manufacturer markdowns) that are passed down to the consumer via the retail or wholesale channels, in parallel with Northwest utility mail-in rebates.

1.1 Market Progress Evaluation Overview

The methodology and goals for this Market Progress Evaluation remain similar to the first evaluation so that market conditions and Initiative successes may be tracked over time. At a high level, the objectives of this Market Progress Evaluation Report (MPER) include:

1. Measure and track progress toward market transformation;
2. Assess the Initiative's impact on urban and rural areas of the Northwest; and
3. Document the Initiative's progress toward agreed-upon Initiative goals.

This study documents and assesses the market progress of NEEA's HPWH Initiative. The study findings are intended to inform the future implementation of the Initiative, and therefore, Evergreen provides substantive and actionable recommendations.

1.2 Initiative Goals

Key objectives of NEEA's HPWH Initiative include:

1. Increasing the number of Northern Climate Specification (NCS)[1]-qualified HPWHs;
2. Increasing the availability of NCS-qualified products;
3. Reducing market barriers (upfront cost, low awareness and knowledge of HPWHs);
4. Increasing adoption of HPWHs in the Northwest; and,

[1] The "Northern Climate Specification" will become the "Advanced Water Heater Specification."

5. Updating the National Appliance Energy Conservation Act (NAECA) to include federally mandated manufacturing standards for electric water heaters. The NAECA standard was updated in April 2015 for electric storage water heaters larger than 55 gallons in volume, and NEEA is currently focused on a second update for electric water heaters with tanks larger than 45 gallons (by 2025).

Ultimately, the objective of the Initiative is to assist in making HPWHs the default for electric water heating, thereby reducing energy consumption in the Northwest.

1.3 Evaluation Methodology

This section provides an overview of the methodologies used by Evergreen for MPER2. .

1.3.1 ACE Model Review

Evergreen conducted a review of NEEA's Hot Water Solutions Program ACE Model. The purpose of this review was to assess the underlying assumptions used by NEEA to estimate the benefits of the program. Evergreen summarized its review in a memo to NEEA and provided suggestions for modifying the cost-effectiveness calculations as part of an iterative process with key NEEA staff members. A memorandum with findings from this review is presented in Appendix A – ACE Model Review Memorandum.

1.3.2 Market Characterization and Initiative Progress

Evergreen completed a characterization of the HPWH market in the Northwest. The characterization includes the numbers of distributors and manufacturers serving the Northwest and the number of incentives provided for HPWHs, by performance tier and incentive source. Findings are presented in Section 2.

1.3.3 Telephone Surveys with HPWH Purchasers

The Evergreen team completed 134 telephone surveys with homeowners who purchased a HPWH and received a utility rebate for either a Tier 1 or Tier 2/Tier 3 HPWH. The team completed 46 surveys with Tier 1 purchasers and 88 surveys with Tier 2/Tier 3 purchasers in the Northwest. Survey participants reside in either Oregon or Washington. There were no surveys conducted with households that purchased a HPWH from either Idaho or Montana as purchaser contact data was not available to evaluators. Details regarding the sampling for this survey effort are presented in Appendix B – HPWH Purchaser Sampling Memo.

1.3.4 Telephone Surveys with Northwest General Population Households

Evergreen also completed 153 telephone surveys with general population households in the Northwest with electric water heating. Findings from surveys with Northwest homeowners are presented throughout Section 3 of this report. Details regarding the sampling for this survey effort are presented in Appendix C – General Population Sampling Memo.

1.3.5 In-depth Interviews with Market Actors and Installers

Evergreen conducted in-depth interviews with market actors and installers. The interview completes by market actor type are shown in Table 1.

Table 1: In-Depth Interview Completes by Market Actor Type

Market Actor Type	Completed Interviews
Northwest Utilities	10
Manufacturers	3
Distributors	4
Retailers	6
Installers	16

The interviews with market actors focused on program design, business practices, experiences working in the HPWH market, customer barriers, the NAECA standard update, and suggestions for improving the Initiative. Findings from utility and market actor interviews are presented throughout Section 3 of this report.

The findings and recommendations in this report that are associated with distributors and large retailers are not based on a representative sample of the four state region – Idaho, Montana, Oregon and Washington. NEEA and its contractor did not conduct interviews in Idaho with these supply chain market actors for this report at the request of Idaho Power Company.

For additional information regarding the business scope and practices of the market actors see Appendix F – Market Actor Business Scope and Practices.

2 Market Characterization and Initiative Progress

This section provides an overview of the Northwest HPWH market since January 2015.

2.1 Target Market

The target market for the Heat Pump Water Heater Initiative is single-family homes in the Northwest with electric resistance water heaters (ERWH). Table 2 shows the percentage of homes within each state that are in the target market (Ecotope 2011) as well as the estimated number of homes.

Table 2: Northwest Homes with Electric Water Heaters, by State

	Single-Family Homes with Electric Water Heaters	
State	**Percentage of Homes[2]**	**Number of Homes[3]**
Idaho	52%	266,749
Montana	38%	133,447
Oregon	55%	631,670
Washington	59%	1,156,133
Total	**55%**	**2,187,999**

Evidence presented in Section 3.3.3 suggests that the target market may need to be redefined based on an estimate of technical potential, as not all homes have suitable space for a HPWH without significant modification to the layout of the home (through a more costly major retrofit). This is most significant among multifamily and manufactured homes—which are already excluded from the target market definition for this Initiative—but also impacts some proportion of single-family homes in the Northwest. It is currently unknown what proportion of single-family homes would require a major retrofit to accommodate a HPWH.

2.2 Initiative Achievements (2015)

As with MPER1, it is unknown how many purchasers that received a utility incentive also received a manufacturer markdown at the time of purchase. Due to this, it is impossible to know exactly how many HPWHs are represented by manufacturer markdown and utility incentive data, respectively. This is further complicated by incomplete utility incentive data

[2] This includes tankless water heaters, which account for 3 percent of all water heaters in the Northwest.
[3] Estimate based on US Census Bureau, 2010-2014 American Community Survey five-year estimates (US Census Bureau 2014), multiplied by the percentage of homes with electric water heaters.

coverage—not all utilities were willing to share their incentive tracking data with Evergreen evaluators.

Table 3 shows that there were 328 Tier 1 and 4,392 Tier 2/Tier 3 point-of-purchase manufacturer markdowns for HPWHs in the Northwest since January 2015. It is very highly likely that at least some of the homeowners that purchased HPWHs with a manufacturer markdown also received a utility incentive for the same HPWH, but this overlap remains unknown as manufacturer markdown incentives are tracked to the purchase location and not the installation location (i.e., the end user).

Table 3: HPWH Manufacturer Markdowns in 2015, by State, Volume and Tier

	Tier 1		Tier 2/3		
State	**≤55 gallon**	**>55 gallon**	**≤55 gallon [4]**	**>55 gallon**	**Total**
Idaho	13	0	60	22	**95**
Montana	5	0	37	9	**51**
Oregon	85	0	1,168	393	**1,646**
Washington	225	0	2,196	507	**2,928**
Total	**328**	**0**	**3,461**	**931**	**4,720**

Table 4 shows that there were approximately 2,081 HPWHs incentivized by utilities and/or Energy Trust of Oregon in the Northwest since January 2015.[5] These utility incentives ranged from $150 to $1,398 per HPWH.

Table 4: Known Utility HPWH Incentives in 2015, by State, Volume and Tier[6]

	Tier 1		Tier 2/3		
State	**≤55 gallon**	**>55 gallon**	**≤55 gallon**	**>55 gallon**	**Total**
Idaho	23	4	5	0	**32**
Montana	0	0	1	0	**1**
Oregon	360	56	304	128	**848**
Washington	605	48	464	83	**1,200**
Total	**988**	**108**	**774**	**211**	**2,081**

[4] Evergreen excluded two 50-gallon Tier 3 HPWHs that did not have a state listed.
[5] Source: NEEA's "HPWH Local Program Survey" results.
[6] Approximately 48 of these HPWHs were installed through NEEA's Northwest Energy Star Homes Initiative.

It is unknown how many purchasers who received a utility incentive (Table 4) also received a manufacturer markdown at the time of purchase (Table 3), and therefore, it is impossible to know exactly how many HPWHs are represented by both manufacturer markdowns and utility incentives. The range of HPWHs incentivized during 2015 is 5,493 to 6,801 HPWHs. The minimum is calculated by assuming 100% overlap in incentives where manufacturer and tank volume match, while the maximum is calculated by assuming zero overlap.

2.3 Supply Side Characteristics

The Hot Water Solutions Program established relationships with a number of water heater distributors through other initiatives and supply chain research. Table 5 presents the number of overall water heater distributor companies, branches and contacts by state.

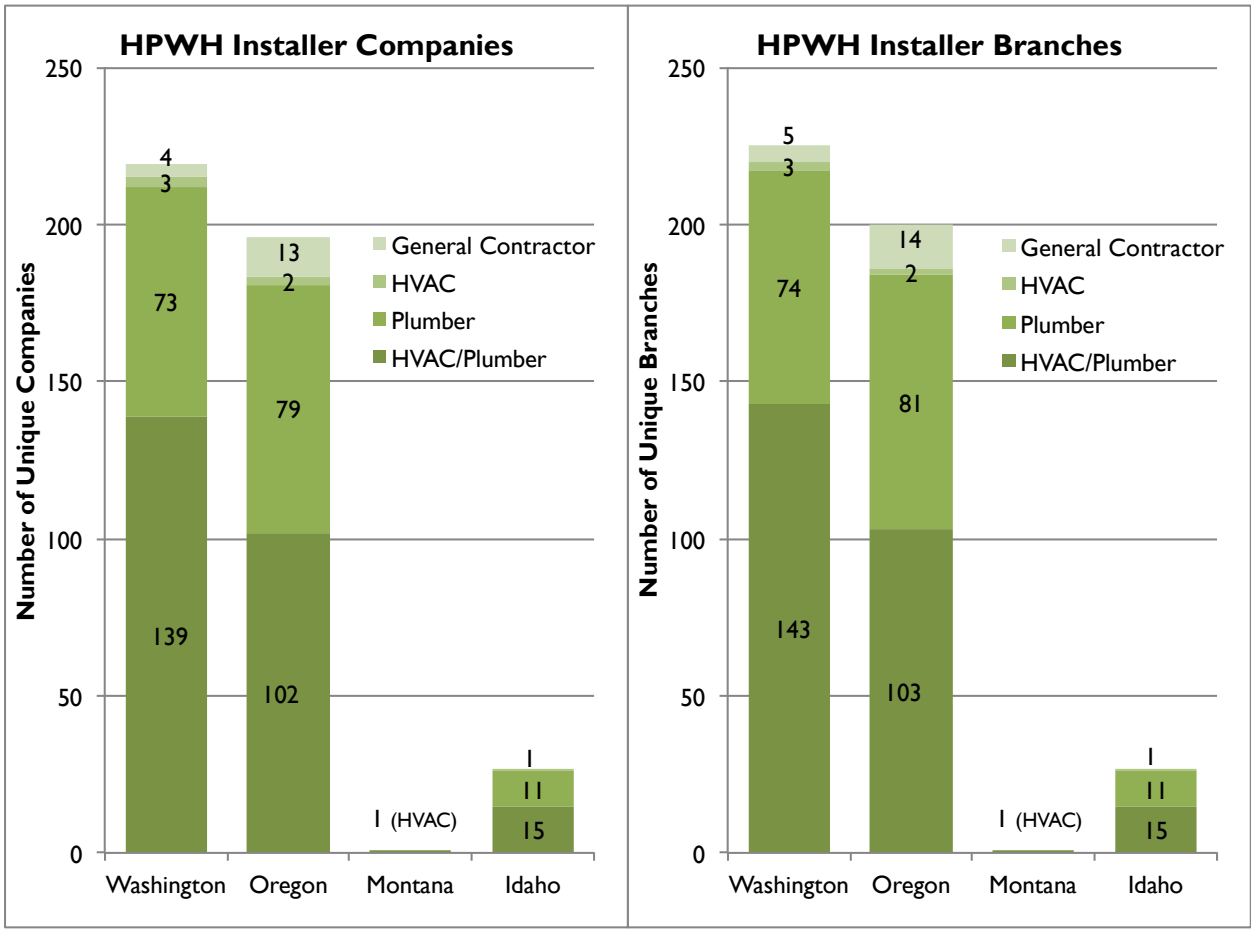
Table 5: HPWH Distributor Companies and Contacts, by State[7]

State	Companies[8]	Branches	Contacts[9]
Idaho	20	48	35
Montana	11	28	23
Oregon	29	74	47
Washington	33	133	98
Total	**93**	**283**	**204**

The Initiative established strategic relationships with 443 installation companies consisting primarily of plumbers and heating, ventilation, and air conditioning (HVAC)/plumber installers. Figure 1 provides a detailed breakdown of the number of companies and Initiative trained installers by both state and role within the industry.[10]

[7] Evergreen excluded one distributor from Nevada and one from Ohio from this table because NEEA does not serve these states. Evergreen also excluded three distributors because they did not have a state or address listed and evaluators were unable to determine the location with an Internet search.
[8] Some companies had branches in multiple states, so Evergreen counted one company location per state.
[9] The number of contacts is lower than the number of branches; some did not list any contact information or listed the same contact for multiple branches, which were removed during contact de-duplication process.
[10] The Initiative's trained installers list was found to have Standard Industrial Classification (SIC) codes that were inconsistent with their self-reported business type in the Hot Water Solutions trained installer database. For additional information, see Appendix E of the HPWH MPER1.

Figure 1: Hot Water Solutions Trained Installers Companies and Branches, by Role and State



3 Evaluation Findings

Section 3 presents the findings from primary research with Northwest HPWH purchasers, general population households, utilities, and supply-side market actors and installers.

The findings and recommendations in this report that are associated with distributors and large retailers are not based on a representative sample of the four state region – Idaho, Montana, Oregon and Washington. NEEA and its contractor did not conduct interviews in Idaho with these supply chain market actors for this report at the request of Idaho Power Company.

3.1 HPWH Purchasers are Early Adopters

HPWH purchaser characteristics, as well as the situations in which HPWHs are currently purchased, are indicative of the early stages of the diffusion of innovation adoption curve.

To demonstrate this, evaluators compared the demographics of purchasers with the general population, examined the situations in which purchases are currently made, and asked suppliers and installers to consider their customer base.

3.1.1 Demographically Dissimilar from General Population

While the demographics of purchasers between 2014 (MPER1) and 2015 (MPER2) were similar, there are important differences between 2015 purchasers and the general population of the Northwest.

The Initiative's target market is defined as single-family homeowners, and almost all HPWH purchasers in 2015 owned their home (99%), 96 percent of which were single-family detached homes. While this is significantly different from the general population of Oregon and Washington—where 62 percent of homes are owner-occupied and 64 percent are single-family detached homes (US Census Bureau 2014)—it is not surprising nor indicative of early adopters, but rather due to the fact that the Initiative explicitly targets single family homes.

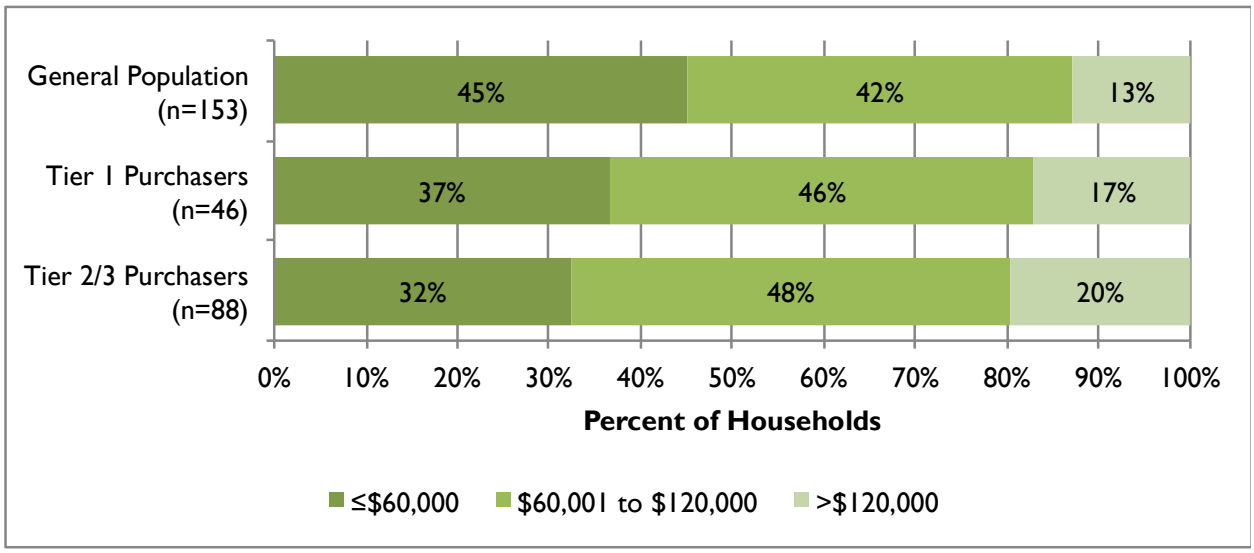
Additionally, more than half of the HPWHs were installed by the purchaser as part of a do-it-yourself (DIY) installation, limiting the potential for installer influence and further indicating that current HPWH purchasers may not be representative of the population of the Northwest (approximately 29% of homeowners in the general population of the Northwest are estimated to install their own water heaters as part of a DIY installation; Verinnovation, 2011).

Two Key Differences: Income and Education

Figure 2 shows that there is an apparent relationship between household income and purchase of HPWHs. While approximately 45 percent of the general population of the Northwest report household incomes below $60,000 per year, smaller proportions of Tier 1 and Tier 2/Tier 3 purchasers fall into this category (37% and 32%, respectively).

Importantly, among the general population, households with incomes over $60,000 were significantly more likely to be aware of HPWHs than those with lower household incomes.

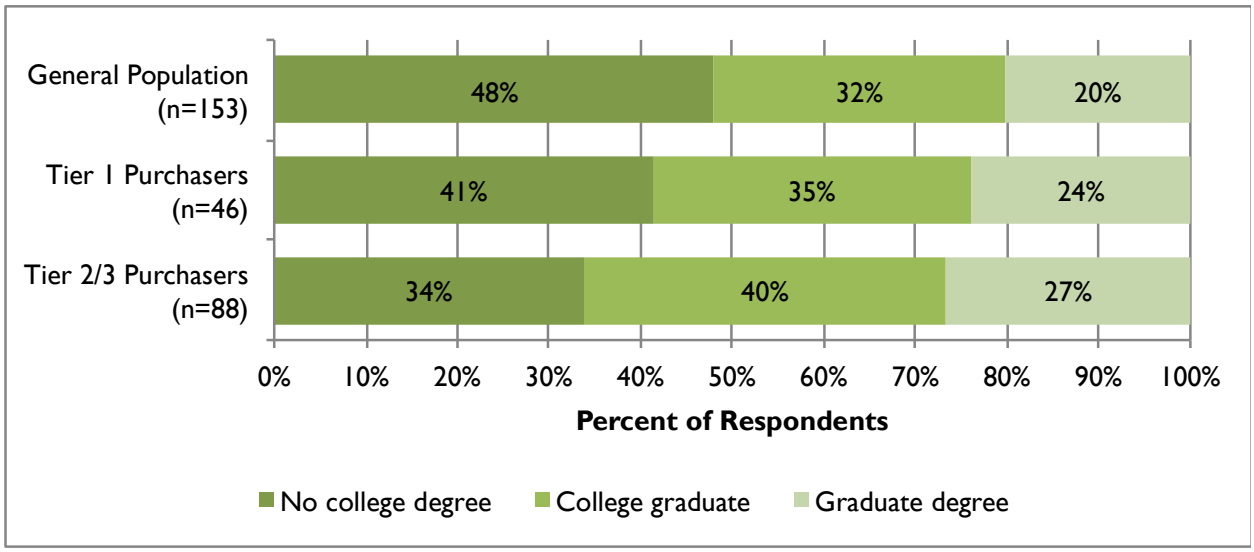
Figure 2: Comparison of Household Income – General Population, HPWH Purchasers



Q 45. Which of the following categories includes your approximate annual household income in 2015?

Figure 3 compares the household education of the Northwest general population with HPWH purchasers. Nearly half of the general population has not received a college degree (48%), compared to one-third of Tier 2/Tier 3 purchasers; this difference is statistically significant. General population households with only a high school education or GED were significantly less likely to have heard the term "heat pump" (63%) than those with more education (87%).

Figure 3: Comparison of Education – General Population, HPWH Purchasers



Q 44. Which of the following includes the highest level of education you have completed?

Taken together, the evidence reported in Figure 2 and Figure 3 shows that HPWH purchasers comprise households with higher incomes and education levels than the general population.

3.1.2 Familiarity with Heat Pump Technology

As was the case in MPER1, a significantly larger proportion of HPWH purchasers (40%) relied on ductless heat pumps (DHPs) as their primary household heat source compared to all Northwest homes (1.4%) (Ecotope 2012). This reinforces the finding from MPER1 that experience and familiarity with heat pump technology and/or previous participation in a NEEA Initiative (i.e., the Northwest Heat Pump Project) may increase the likelihood of a HPWH purchase.

Many HPWH purchasers are particularly familiar with heat pump technology—40% have ductless heat pumps installed in their home.

3.1.3 Planned Replacements, Not Emergency Replacements

Water heater purchases are frequently the result of a failure of the existing water heater at a home. However, MPER1 found high rates of planned replacements among HPWH purchasers in 2014, and in the report Evergreen noted "the [HPWH] market moving from a high proportion of planned purchases to higher proportions of emergency replacements may indicate progress towards market transformation" (Evergreen Economics, 2015). This statement is aligned with NEEA's Initiative logic model, as the Initiative intends to impact the traditional water heater supply chain through product support, recruiting and supporting market actors, and market actor training.

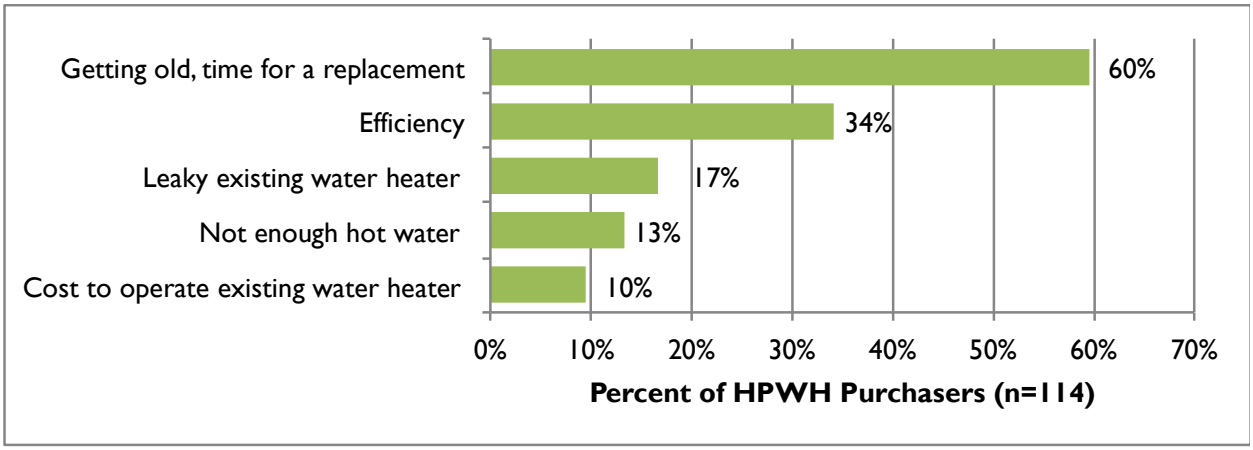
What Led to HPWH Purchases in 2015?

In 2015, most HPWH purchasers replaced their previous water heater as part of a planned replacement (88%) as opposed to an emergency situation (12%).[11] This is very similar to the findings from MPER1, where 86 percent of respondents installed the HPWH as part of a planned replacement.

Even though their existing water heater was functional, Figure 4 shows that over half of 2015 HPWH purchasers who replaced an existing water heater did so because it was getting old and was reaching the end of its useful life (similar to the MPER1 findings for 2014 purchasers). However, more than one-third purchased a HPWH explicitly as an upgrade to a more efficient water heater solution.

[11] This represents a much higher rate of planned replacement than in the overall Northwest market (57%; Verrinovation 2012).

Figure 4: Primary Reasons for Replacing Water Heater



Q 13. What was the reason you decided it was time to replace your previous water heater?

The majority of HPWH purchasers (72%) considered at least one alternative to a HPWH when making their purchase decision. The ability to compare across multiple product types is a luxury associated with planned replacements, as opposed to emergency replacements where consumers are driven to purchase a water heater in a timely manner to ensure continued hot water.

3.1.4 HPWH Purchase Decision and Triggers

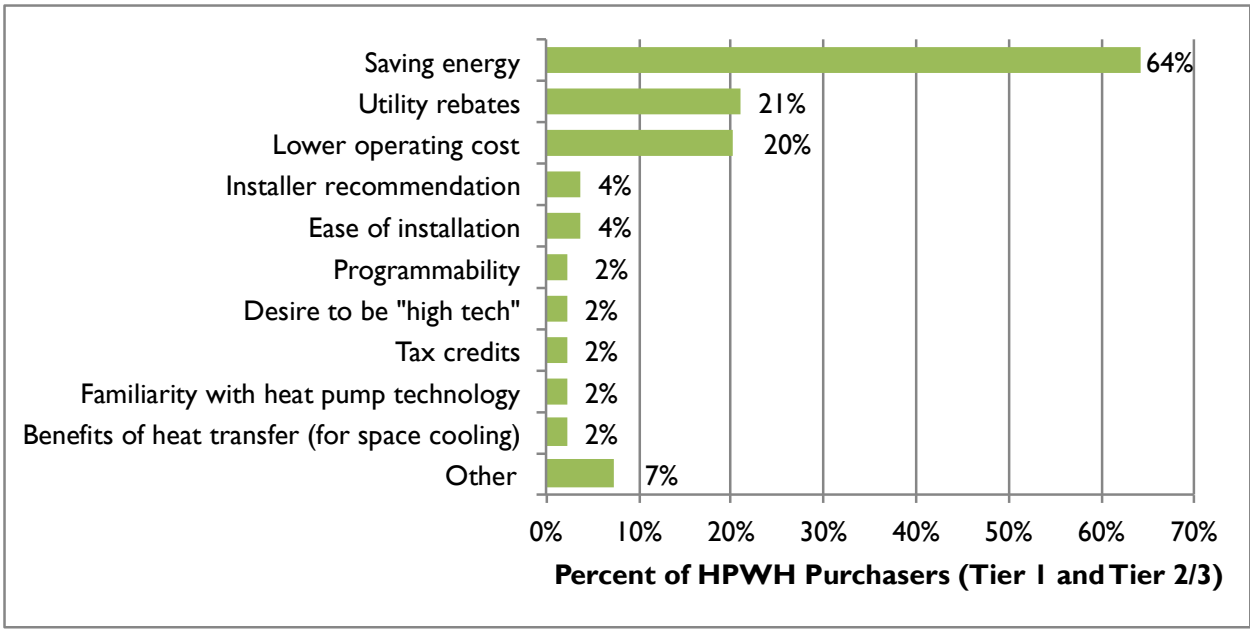
The reasons why HPWH purchasers decided to replace their existing water heater are explored in Section 3.1.3. To better understand their decision Evergreen discussed the reasons why purchasers' selected a HPWH and also what would constitute a purchase trigger[12] among the general population.

Why did Purchasers Choose a HPWH?

The most frequently cited reasons for purchasers' interest in HPWHs include saving energy (64%), utility rebates (21%), and lower operating cost (20%) (see Figure 5). The vast majority of both Tier 1 and Tier 2/Tier 3 purchasers (83%) claimed that the idea to purchase a HPWH was their own idea and not a suggestion from a contractor or installer.

[12] For the purpose of this discussion, a purchase trigger is something that would positively impact a customer's decision towards purchasing a HPWH as opposed to another water heater solution

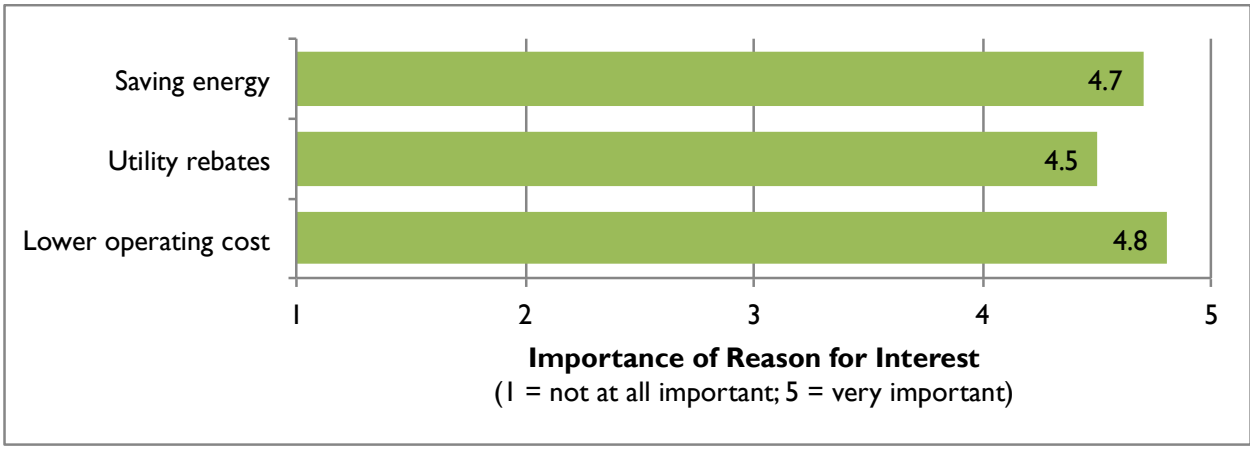
Figure 5: HPWH Purchasers' Reasons for Interest in HPWHs



Q 22. What initially interested you in a heat pump water heater, as opposed to other types of water heaters? "Other" responses (less than 2% each) include: payback period, only available 80-gallon electric water heater, recommendations (not from installer), carbon footprint, ease of maintenance, and resale value.

Respondents were asked to rate the importance of their reasons for interest—or purchase trigger—in HPWHs on a 5-point scale, where 1 is not at all important and 5 is very important. The findings are shown in Figure 6, and show that saving energy, utility rebates, and lower operating cost are all important in purchasers' decisions to select a HPWH as opposed to another water heater type.

Figure 6: HPWH Purchasers' Importance of Reason for Interest in HPWHs



General Population HPWH Purchase Triggers: What Would it Take?

Evergreen asked general population survey respondents what events would cause them to purchase a new water heater of any type. Northwest household would purchase a new water if:

- Their existing water heater fails, breaks or starts to leak (87%)
- They wanted increased water capacity/faster heating (8%)
- They desired higher efficiency/lower operational cost (7%)[13]
- When their existing equipment starts getting old (2%)
- During a major home remodel (1%)

Evergreen asked respondents who were aware of HPWHs prior to the survey about purchase triggers—future conditions that could have a significant impact on their decision to buy a new HPWH versus a different type of water heater. These households report the following triggers to purchase a HPWH:

- Decline in the cost of HPWHs (78%)
- Failure of their current water heater (71%)
- An increase in the utility rebate (64%)

In summary, the majority of Northwest households are reluctant to purchase a new water heater if their existing water heater is functional. When it becomes nonfunctional—an emergency replacement situation—those who are aware of HPWHs would consider a HPWH if the first cost were lower.

3.1.5 Market Actor Perspectives: Emergency Versus Planned Replacements

Manufacturers, distributors, and installers were asked to provide their perspectives on the rates of emergency replacements, as well as barriers to increasing the prevalence of HPWHs in emergency replacement situations.

As noted by one manufacturer, "while the water heater market is 90 percent emergency replacement, HPWHs are 85 percent planned replacements." This manufacturer also mentioned that advertising tends to generate planned replacements whereas manufacturer markdowns tend to help

"While the water heater market is 90 percent emergency replacements, HPWHs are 85 percent planned replacements"

[13] It is unclear why these households have not acted on their intentions, as they all report having standard ERWH installed in their homes (and not HPWHs).

with installations in emergency replacement situations, as the incentive works to alleviate the emergency replacement challenges, primarily justifying the upfront cost when there are capital constraints. Manufacturers also noted that lack of HPWH awareness and lack of sufficient time for the more complicated installation may be barriers specific to customers selecting HPWHs in emergency replacement situations.

One of the interviewed distributors said HPWHs are not ideal for an emergency replacement situation because there is too much required planning to accommodate a HPWHs size, ventilation, and condensation needs. A different distributor believed the tendency to select traditional water heaters for emergency replacements is caused by a lack of time for the end-user to research their options and find incentives.

Nearly all installers (13 out of 14) that installed HPWHs in 2015 said that none of their 2015 HPWH installations were done in emergency replacement situations. Nevertheless, in the event of an emergency replacement HPWH request, participating installers said that there would be no difference in the time it takes to have a HPWH ordered and installed for their customers (compared to a standard ERWH). This is primarily true because the major distributors generally have HPWHs available either day-of or within 48 to 72 hours of the order. Retailers noted similar barriers to HPWHs in emergency replacement situations as other market actor groups, including high purchasing cost and lack of customer awareness, as well as contending with space and ducting complexities.

3.2 Sources of Awareness and HPWH Marketing

The Northwest utilities and market actors use a range of methods and messages to promote HPWHs to their customers in the Northwest. Below we present the marketing activities implemented by Northwest utilities, and then examine how each market actor group is approaching HPWH marketing to their respective customers and target markets.

3.2.1 Northwest Utilities Marketing Activities

Northwest utility representatives report that their direct marketing related to promoting HPWHs consists of the following:

- Including HPWH messaging on utility websites
- Regular mailings to utility customers (e.g., bill stuffers)
- Email blasts
- Informational brochures with home energy audits
- Monthly newsletter articles
- Informational brochures in utility offices
- Newspaper articles (less frequently)
- Home improvement (less frequently)

Despite their marketing efforts, utility representatives identified local retailer promotions and discounts (in partnership with NEEA and manufacturers) as the largest driver of HPWH sales.[14] Typically, the utilities provide customer mailing lists or selected zip codes and utility branding to a manufacturer or NEEA's Program Management Contractor (PMC) to support a mail campaign, and then advertise the promotion via social media and direct mailers to customers (often with assistance from NEEA and the manufacturer). According to utilities, sometimes the retailers also conduct their own newspaper or radio advertising.

Overall, the utility representatives reported that local retailer promotions have been very effective in driving HPWH installations, and in some cases non-participating retailers will match the prices of participating retailers. Utility perceptions of the long-term effectiveness of retailer participation are mixed, however. In some markets the retailers remain well stocked with HPWHs throughout the year, even when they are not running promotions, while in other markets the stock of HPWHs drops to zero. Moreover, for many rural customers, the nearest big box retailer may be 50 miles away, and their local store will not carry HPWHs.

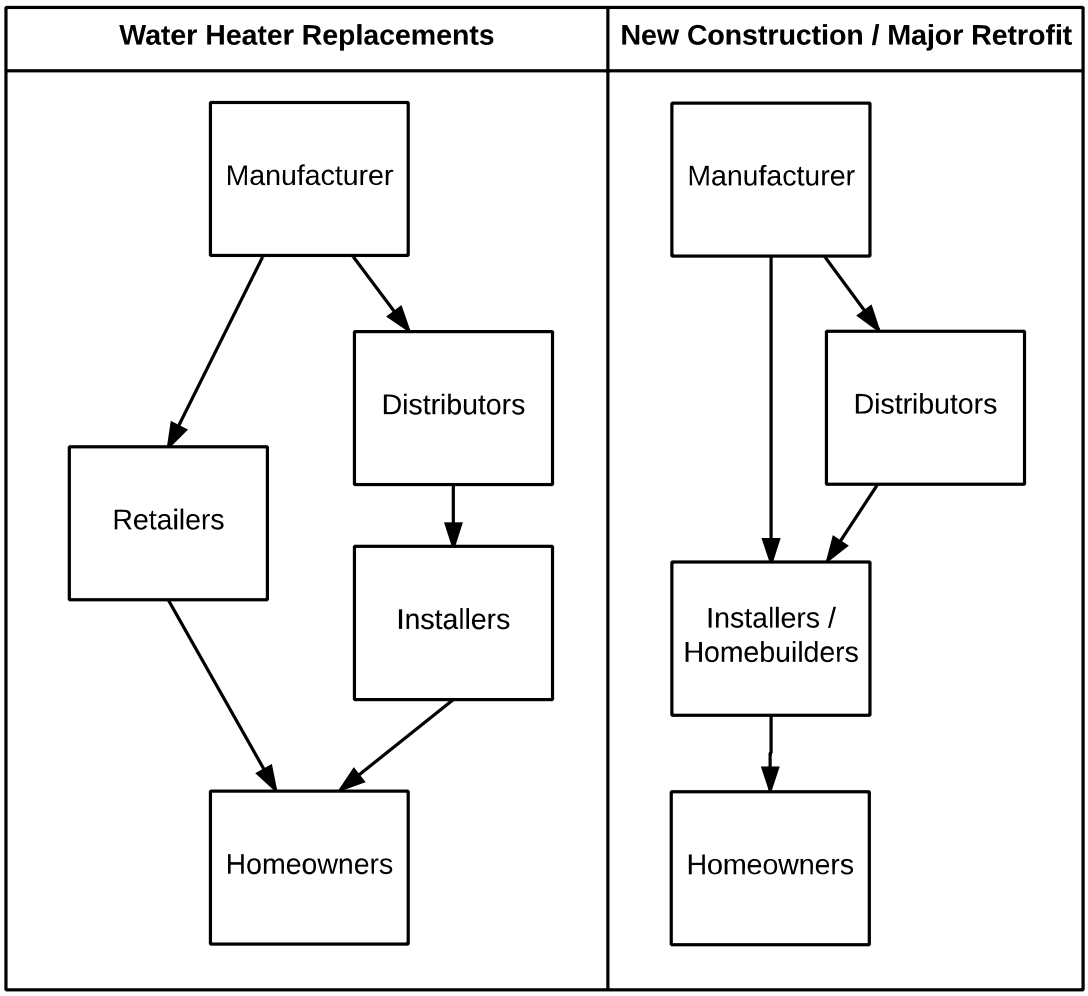
3.2.2 Two Sales Channels: Replacements Versus New Construction / Major Retrofits

Manufacturers supply two distinct sales channels, shown in Figure 7. For water heater replacement situations—not in new construction or major home retrofits—manufacturers reported that they typically target the homeowner via their retailer partners (one also mentioned that they target contractors through their retail partner). For new construction and major retrofits, they target homebuilders and contractors directly and through distributors, with one manufacturer and a distributor noting that they leverage the points a builder can gain from installing a HPWH (as part of a home performance program such as HERs or RESNET).

Evidence from the distributor interviews generally aligned with the way manufacturers understand the market's two supply channels: none of the interviewed distributors market HPWHs to residential customers, explaining that their target market is installers (mostly plumbers) rather than end-users, but the distributors did not differentiate between replacement situations and major retrofits or new construction. Evidence from installer interviews suggests that the installers primarily source HPWHs and other water heaters from distributors, even in the event of a typical water heater replacement. Furthermore, evidence from retailer interviews also confirmed that they primarily sell directly to homeowners and less to installers (including plumbers, contractors, and homebuilders).

[14] General Electric (GE) has been the most active manufacturer in the region.

Figure 7: Structure of Two Key Sales Channels (According to Manufacturers)



3.2.3 How Market Actors are Increasing Awareness

This section presents the techniques and messages used by each market actor group in their efforts to increase HPWH awareness and knowledge in the Northwest. Increasing awareness among consumers and other market actors in the supply chain is critical to overcoming key market barriers, discussed subsequently in Section 3.3.

Manufacturers Marketing Techniques and Messages

Manufacturers noted that they are using a wide range of marketing approaches, including information on their websites, social media advertisements, direct mail, email blasts, trade shows and print ads. As one manufacturer said, "you name it, we do it." One mentioned that they leverage their retailer partners for additional advertising (typically radio, emails and in-store materials), and another mentioned that NEEA and CLEAResult drive a lot of their digital messaging.

Manufacturers use a range of messages to promote HPWHs in the Northwest, including:

- Available incentives (n=3)
- Tax credits (n=3)
- Energy savings (n=2)
- ENERGY STAR (n=2)
- Energy factor (n=1)
- Comfort (n=1)

> *"We use energy factor instead of energy savings because we make all different types of water heaters and don't like to say that one is better than another"*

Interestingly, one manufacturer that produces traditional water heaters and HPWHs said that they usually use the *energy factor* instead of *energy savings* over an ERWH because they also sell ERWHs and do not want to hurt those sales by saying that they are inferior. Another mentioned using ENERGY STAR savings estimates despite the fact that they "are lower than what we can claim" because of the trustworthiness associated with the ENERGY STAR label.

Furthermore, one noted that the "$300 federal tax credit has changed the messaging [for 2015]. Usually we don't know if there will be a credit [until the end of the year, retroactive], but this year we knew early on and therefore we can and have used it as a promotion."

Distributor Marketing: Targeted at Installer Community

As discussed subsequently (see Section 3.2.2), distributors do not market HPWHs to residential customers, but rather to the installation community. Three of the distributors actively market to these installers, including one who tries to discuss HPWHs with every installer who comes in to place an order. The fourth said their company philosophy is to wait for their customers to reach out with questions rather than marketing their products.

All three of the distributors who market to installers do so primarily through sales representatives, but one of them also sends out flyers. None mentioned using trade shows, social media, newspaper/ratio/TV advertising, or building trade publications. One of these distributors said their HPWH marketing has increased somewhat over the last year to help them stay competitive in the market; these changes were intended to increase the emphasis of HPWHs over other types of water heaters, particularly with their pricing and information about how the technology works.

The key marketing messages distributors use to promote HPWHs to installers include:

- Energy savings (n=1)
- Cost savings (n=1)
- Payback period (n=1)
- Available rebates (n=1)

When speaking with installers about HPWHs, one distributor's strategy is to emphasize how the current rebates make it so that HPWHs cost the same or less than a traditional water heater, thus making them easier to sell. A different distributor said that they felt responsible for educating the installers about the NAECA regulations and which water heater models will be impacted (i.e., no longer available).

Retailer Marketing: Mass Marketing Handled at Corporate Level

Retailers confirmed their target market identified by manufacturers in Section 3.2.2—they primarily promote and sell directly to homeowners and not contractors, plumbers, or new homebuilders. All retailers stocking HPWHs noted that the vast majority (90 percent or more) of purchased units are installed in existing homes as a part of a planned retrofit.

Only one interviewee provided insight into their company's marketing methods, which include a mix of print ads and store signage (the other interviewees mentioned that marketing was handled at a corporate level and they were unsure of the various methods employed, if any). However, four retailers reported a variety of messages that they deliver to their customers in-store, including:

- Energy savings (n=4)
- Cost savings (n=2)
- Code compliance (n=1)

None of the retailers indicated marketing differently in the Northwest than the rest of the country. Furthermore, none of the interviewees indicated changing their marketing messages in the past year, and no retailer noted NEEA or Northwest utility messaging or marketing efforts have conflicted with their activities.

Installer Marketing: Most Don't Market HPWHs

Overall, 12 out of 16 participating installers are not actively marketing HPWHs. One of the primary reasons installers said they have limited marketing devoted to HPWHs is because they are not interested in devoting resources to HPWHs—the majority of their customers are not interested in or are unaware of HPWHs when they approach the installer.

Four of the installers—all focused on energy efficiency, two of which actively market HPWHs—said that 50 percent or more of their clientele approach them specifically for HPWHs versus traditional water heaters.

The key messages installers use when discussing HPWHs with their customers include:

- Energy savings (n=8)
- Larger hot water capacity (n=1)
- Ease of use, controllability (n=1)

Engaging the installer community to more actively promote HPWHs may impact the prevalence of customers selecting HPWHs in emergency replacement situations (especially for those customers replacing smaller volume ERWH, as they can likely replace their existing ERWH with a very similar product instead of a HPWH).

3.2.4 Where Do Purchasers Learn about HPWHs?

Shown in Table 6, initial awareness of HPWHs most often came from the Internet, utility print advertising, and retail store mailers (12% of purchasers each). However, similar to MPER1, while only 12 percent of purchasers said the Internet was an initial source of awareness, 41 percent of all purchasers said they learned subsequently about HPWHs from Internet research. Similarly, while only 9 percent of purchasers initially heard about HPWHs through a retail display, 20 percent indicated they subsequently learned more about HPWHs from seeing them in a retail store.

While not shown in Table 6, in general Tier 1 purchasers initially learned about HPWHs from similar sources as Tier 2/Tier 3 purchasers. However, only Tier 2/Tier 3 purchasers (19%) learned about HPWHs through a utility print advertisement.

Table 6: Purchaser Source of Awareness and Information Regarding HPWHs

Source of Awareness	First Mention (n=184)	All Mentions (n=186)
Internet research	12%	41%
Utility print ad, bill stuffer	12%	14%
Retail store mailer	12%	13%
Friend or acquaintance	10%	14%
Retail display/saw it in store	9%	20%
Contractor/installer	9%	14%
Newspaper ad	7%	10%
Energy Trust	6%	8%
Retail store salesperson	5%	13%
Other	19%	26%

Q 1. First, how did you first hear about heat pump water heaters?
Q 2. Did you hear about them anywhere else or learn more about them from any other sources?
"Other" sources of awareness include: magazines, plumbing showrooms, utility newsletters, utility websites, newspaper stories, conferences, tradeshows, door-to-door salespeople, energy audits, previous HPWH ownership and experience, and television advertisements.

In some cases, the absence of responses may be equally important to consider. In this case, neither the Smart Water Heat nor Hot Water Solutions websites were the initial source of

awareness among purchasers, nor was either mentioned as a source of additional information. This presents a significant opportunity to the Initiative as NEEA begins to market the website to consumers in mid-2016.

3.3 Barriers to HPWH Purchases

Table 7 shows barriers for HPWH purchases in the Northwest mentioned by market actors, with darker orange indicating higher levels of consensus within a market actor group. Barriers are shown in order of the level of consensus within and across market actor groups.

Table 7: HPWH Purchase Barriers Mentioned by Market Actors

	Market Actor Group			
Barriers	**Manufacturers (n=3)**	**Distributors (n=4)**	**Retailers (n=6)**	**Installers (n=16)**
First cost/lack of capital	100%	50%	83%	50%
Space requirements	33%	50%	33%	13%
Low awareness/ familiarity	33%	50%	0%	25%
Installation time	33%	0%	17%	0%
Noise	33%	0%	0%	13%
Ducting/ventilation requirements	0%	25%	0%	19%
Condensate drainage requirements	0%	25%	17%	0%
Hot water output	33%	0%	0%	6%
Split incentive (landlord/renter)	33%	0%	0%	0%
Market actor recommendation*	33%	0%	0%	0%
Cold climate performance	0%	0%	17%	0%
Earthquake strapping (code)	0%	0%	17%	0%

** Promoting other technologies / solutions instead of HPWHs.*

3.3.1 Key Barrier: Initial Cost

According to market actors, initial cost is still the primary barrier. All three manufacturers, the majority of retailers, and half of distributors and installers mentioned first cost or lack of capital among Northwest households. High first cost is particularly important with respect to emergency replacement situations—where consumers have a small window of opportunity to consider the balance between upfront cost, the payback period length, and the overall return on investment—and for customers with limited capital (particularly among lower income residents and those living on fixed incomes).

The high relative first cost of HPWHs is still the primary barrier to more widespread adoption in the Northwest

Evergreen asked Northwest general population households who said they were not interested in HPWHs (by rating their interest as a 3 out of 5 or below) to explain why. Overall, the most common reason was the upfront cost (48%), followed by needing more information about the technology (25%). The importance of this barrier is also apparent when considering key purchase triggers, which were discussed in Section 3.1.4. More than three-quarters of general population households would consider a HPWH if the cost were lower.

3.3.2 Key Barrier: Functioning Existing Water Heater

Among general population survey respondents who have a high interest in energy efficiency but had never considered a HPWH, only 6 percent would consider replacing their water heater for improved energy efficiency while 93 percent would consider replacement if it breaks, leaks or fails. Hence, this subset of the general population believes efficiency is very important when making a purchase decision, but not important enough to justify early replacement. So unless their current water heater breaks or fails, these people are not likely to consider a HPWH despite its high efficiency (this is also discussed in Section 3.1.4, as 87 percent of general population households would not purchase a new water heater of any type unless their existing water heater failed).

3.3.3 Barrier to 100% Saturation: Technical Potential Limitations

Market actors were able to provide key additional insight into the technical potential for HPWHs. In certain instances, it is not a question of needing higher incentives to pay for complicated retrofits. In some homes—particularly true among mobile homes, apartments, and condos—there is simply not enough space to install a HPWH where their old water heater was located (and in many cases the home does not have a garage or other protected space). In these cases, the households are left without any options other than downsizing and not having enough hot water. This may be an important issue for manufactured and mobile homes because the building is designed to accommodate the original equipment with no wasted space.

For Initiative planning it should be noted that it is highly unlikely to achieve 100 percent saturation of HPWHs among homes with electric water heating because the technical potential of the current product offering is less than 100 percent; put simply, currently available HPWHs do not fit in all homes.

3.3.4 Not a Barrier: Installer Stocking

The vast majority of participating installers did not maintain a stock of *any* water heaters because it was relatively easy for them to order from a distributor on a per-order basis. Despite the fact that a vast majority of interviewed installers did not stock water heaters, all but one noted that they could offer their customers water heaters or HPWHs within one to two days.

Most water heater installers do not maintain their own stock of water heaters.

3.4 Importance of Incentives, Financing, and Tax Credits

The primary objective of incentives and financing options are to reduce the primary barrier faced by Northwest consumers: first cost and lack of capital (see Section 3.3 for further information on relevant barriers to increasing HPWH adoption in the Northwest).

3.4.1 Installers Bolstered by Incentives

Installers report that all of their installations received incentives from a Northwest utility, and 11 out of 16 installers said that utility rebates are either very or extremely important.

It is somewhat atypical—even in the earlier stages of market adoption—for all sales to receive incentives (even all sales through a particular channel). This demonstrates the importance incentives play in the current HPWH market in the Northwest, helping to reduce the first cost barrier and leading to increases in HPWH sales year to year.

"I think the rebates are everything, that's the only reason that I can see a customer being interested… a lot of the customers are saying 'well hey if I can get this tank for free its going to be the option.'"

3.4.2 Incentive Importance Confirmed by Purchasers

The importance of incentives is discussed in detail in Section 3.1.4 (see Figure 5 and Figure 6). In summary, 21 percent of HPWH purchasers noted the utility incentives as a motivating factor in their decision to purchase a HPWH. Among all HPWH purchasers, the importance of incentives was rated 4.5 out of 5 (on a 5-point scale, where 1 is not at all important and 5 is very important).

3.4.3 Credit Cards Less Important

Evergreen asked HPWH purchasers about various types of financial assistance they may have received to assist with their HPWH purchase, including traditional loans, credit cards, federal tax credits and state tax credits. The most common financing source were credit

cards, which were used by approximately 66 percent of purchasers. Purchasers who used a credit card to finance their HPWH rated the importance of this type of financing on a scale from 1 (not at all important) to 5 (very important). The average importance ratings for Tier 1 and Tier 2/Tier 3 purchasers were 2.3 and 2.5, respectively.

3.4.4 Traditional Loans Infrequently Used

Overall, traditional loans were used by only 5 percent of purchasers. For purchasers who did receive a loan, the most common sources included local banks or credit unions (50%) and retailer credit options (33%).

3.4.5 Oregon State Tax Credit Nearly as Important as Incentives

State tax credits were available to Oregon residents for the purchase of a HPWH.[15] The majority of purchasers in Oregon—82 percent—reported receiving the credit. The purchasers who have received these state tax credits rated their importance as 4.4 out of 5 (very important).

3.4.6 Federal Tax Credit Somewhat Important

Almost half (46%) of HPWH purchasers have received or will receive federal tax credits. However, these credits appear to be less important than the state tax credits, with an average importance rating of 3.4 out of 5.

Oregon state tax credits were rated nearly as important as utility incentives and more important than federal tax credits.

3.5 Consumer Satisfaction with HPWHs

Overall, HPWHs have met the expectations of the vast majority of purchasers (95%), giving an average satisfaction rating of 4.6 out of 5 (with 5 being "very satisfied"). Specifically, purchasers were highly satisfied with the following attributes, measured on the same satisfaction scale:

- The change in electricity bill (4.2)
- The hot water supply (4.4)
- The maintenance requirements associated with their HPWH (4.6)

Purchasers expressed lower satisfaction with:

- The sound level of the HPWHs (3.8)

[15] There was no state tax credit available to residents of Washington.

These average satisfaction ratings are all very similar to MPER1 with the only exception being that satisfaction with the sound level of the HPWH fell from 4.2 (out of 5) in MPER1 to 3.8 in MPER2.

As a result of their high levels of satisfaction, 93 percent of purchasers said they have or would recommend a HPWH to someone they know, for the following reasons:

- Lower energy bills (85%)
- The reasonable equipment cost (17%)
- Improved/increased hot water supply (9%)

As shown in Table 6 in Section 3.2.4, 10 percent of HPWH purchasers first hear about HPWHs from a friend or acquaintance, so high levels of satisfaction among HPWH purchasers is important for ensuring positive word of mouth marketing amongst Northwest households.

Beyond ensuring positive word of mouth marketing, it is encouraging to know that the majority of HPWH purchasers perceive a change in their electricity bill—and that it is significant enough to use as the basis for a recommendation to a peer.

3.6 Underwhelming Effects of NAECA Standard Update

In general, market actors across the board were underwhelmed by the impact of the NAECA Standard update (effective April 2015).

3.6.1 Utility Perspectives on NAECA Standard Update

None of the utilities directly linked changes in program activity to the federal code changes for large ERWH that took effect in April of 2015, although two interviewees noted that some larger households could be inclined to install two smaller ERWH in lieu of larger HPHWs.

When Evergreen asked the utility representatives if they were anticipating future federal code changes affecting ERWH of 55 gallons or smaller, eight interviewees said they had not heard anything about new code changes, one respondent had heard of intentions to change the code for smaller tanks by 2017 (but could not remember the source) and another respondent had heard rumors about potential new regulations by 2020 at a Regional Technical Forum (RTF) meeting. Four respondents offered the following observations about potential future code changes:

- “Most homes (in our territory) have 40 to 52 gallon tanks in small spaces so this would be a big, intrusive change.”

- "This would be a hardship for many people with smaller heaters or in mobile homes. They would have to go to small, ducted Tier 3 units in conditioned space, like coat closets. Or they would have to move their tank to a larger space and add plumbing."
- "Changing code would make sense to prevent double 50s[16] going in."
- "Our local building stock has larger homes, probably few small tanks. Most smaller homes would probably go tankless."

3.6.2 Manufacturer Perspectives on NAECA Standard Update

All of the manufacturers report underwhelming demand for HPWHs relative to their expectations from the NAECA standard update. Two reported minor increases in demand, but also noted that installers are finding workarounds (see Section 3.6.6 for information regarding workarounds).

Evergreen asked manufacturers if they saw an increase in orders for large volume ERWHs prior to the April 2015 standard update. Both manufacturers that make ERWHs reported that there were increases in orders. One noted an increase of approximately 150 percent of normal from October 2014 to December 2014, followed by a decision to cap the quantity a customer (for example, a distributor or retailer) could purchase based on historical demand from the customer. They permitted their customers to shift the disposition of their order (that is, to buy more or less large volume models than they typically purchase, so long as the overall quantity remained the same), but they did not notice many customers changing their orders. Reportedly, the market for large volume water heaters is low generally, so shifting supply to large volume models at the expense of smaller volume models would have presented a problem for the purchasing distributor or retailer.

Despite reporting underwhelming demand for HPWHs, manufacturers did note that the stock of large volume ERWHs is almost certainly exhausted.

3.6.3 Distributor Perspectives on NAECA Standard Update

When the NAECA update took effect in April 2015, all four of the distributors made some type of change in their stocking practices. Prior to April 2015, they all increased their supply of ERWH 55 gallons and above, but none indicated they increased the sale price for these units. The distributors sold the last of these large water heaters around July-September 2015. The NAECA update also motivated three of the four distributors to increase their stock of HPWHs; one of these decisions was also influenced by the additional incentives that came onto the market for GE HPWHs.

[16] "Double 50s" is a term that one utility is using to describe the practice of installing two small (typically 50 gallon) ERWH instead of a large volume HPWH.

Two of the distributors indicated that the 80-gallon HPWHs are selling faster than the 50-gallon models. One attributed this trend to NAECA's requirements for large water heaters while the other explained that HPWHs are slower to recover than the old ERWH, so customers are replacing their 50-gallon water heaters with 80-gallon HPWHs to ensure that their hot water supply will not decrease. However, this trend may be limited to the experience of a few distributors because the sales records for point-of-purchase manufacturer markdowns demonstrate that 50-gallon HPWHs are selling much faster than the 80-gallon models (see Section 2.2 for additional information).

All four of the distributors Evergreen interviewed said that the new federal standards have increased their sales of large HPWHs, but also the sales of workaround alternatives (see Section 3.6.6 for information regarding workarounds).

Thinking about the future, two of the distributors believe that most households requiring at least 55-gallons of hot water capacity will generally opt for a HPWH, whereas the other two believe households will purchase two 50-gallon water heaters or another alternative until they are no longer cheaper than large HPWHs.

It is important to note that the two distributors who believe customers will select HPWHs both offer GE models and are currently receiving manufacturer markdowns. NEEA's Initiative is currently working to promote HPWHs by funding these point-of-purchase manufacturer markdowns. The fact that the two distributors who are offering HPWH models that are eligible for the markdowns have a more favorable view on the future of the HPWH market than the other two distributors suggests that the Initiative's influence is affecting their perception of the market as the markdowns continue to drive sales.

3.6.4 Installer Perspectives on NAECA Standard Update

Of the 10 participating installers that commented on the 2015 NAECA update, eight said the update had a relatively minor effect on the HPWH market thus far, primarily because the Northwest HPWH market does not include many customers that require a large capacity tank above 50 gallons.

However, four of the 10 installers mentioned that the updates do affect customers needing large capacity tanks fairly significantly. To accommodate those customers, these installers have recommended workaround solutions (see Section 3.6.6 for information regarding workarounds).

Two other Oregon installers also mentioned that the tank size could be an issue for large capacity customers, although both (along with an additional two installers) said the new GE HPWHs have begun to accommodate more installation locations and have become their primary recommendations for customers that inquire about a large volume of electrically heated water.

3.6.5 Retailer Perspectives on NAECA Standard Update

Three retailers noted no change in the stocking of HPWHs since the 2015 NAECA Update went into effect in April 2015. Of the two retailers that did change their stock of HPWHs, one retailer decreased stock to roughly half of previous stock numbers, and one increased stock. No retailer reported increasing their supply of large volume ERWH prior to April 2015.

Although the majority of retailers interviewed were aware of the updated NAECA standards (only two retailers were unaware), the consensus was that homeowners are unaware of the updated standard. Two retailers reported that the inability for the customer to replace an existing high-capacity ERWH with another comparable unit irritates customers. Retailers anticipate that some customers may pursue workaround solutions (see Section 3.6.6 for information regarding workarounds).

Considering the effects of the updated NAECA standard on the smaller volume electric water heater market, two retailers believe that there will be an increase in sales over time, while two retailers anticipate no change in sales for smaller HPWHs.

3.6.6 NAECA Standard Update Workarounds—An Unfortunate Reality

Utility and market actors were asked if customers were or were likely to circumvent the intention of the NAECA standard update by replacing large ERWH (over 55 gallons) with something other than a HPWH. It should be noted that water heater customers are often influenced by the salesperson or installer in terms of what water heater type they select.

While most utilities and market actors believe the workarounds are happening, most also report that they are infrequent situations and by no means typical. In many cases, customers replacing larger volume ERWH are either installing HPWHs or simply downsizing to a 50 gallon ERWH. Table 8 shows that the most frequently mentioned workaround is installing two small ERWH instead of a large HPWH. It is unclear how frequent this or other workarounds are occurring in the market—further research is needed to better understand the prevalence of workarounds in the Northwest market.

Table 8: NAECA Standard Workarounds Mentioned by Market Actors

HPWH Workaround	Market Actor Group			
	Manufacturers (n=3)	Distributors (n=4)	Retailers (n=6)	Installers (n=4*)
Two small ERWH (typically 50 gallon)	2	2	4	4
One small ERWH with mixing valve	1	1		
On-demand water heater		1	3	
Commercial grade ERWH	1	1	1	1

** Only four of 16 installers provided responses.*

3.7 Where is the HPWH Market Heading?

Market actor opinions about the future of the HPWH market were varied, though generally market actors predict the same levels or modest increases in HPWH sales in the Northwest.

3.7.1 HPWH Sales

Two of the manufacturers predict low sales (less than 5% market share for HPWHs) in 2016, and small increases in sales over the next three years (dependent on the availability of incentives). The third—the manufacturer that is actively engaged with the Initiative—said that they expect continued decent sales volumes, and that this is dependent on continued incentives for larger volume HPWHs.

Three of the four distributors believe that their company's HPWH sales will stay the same or increase by a small amount over the next three years, while the fourth was confident that both their sales and market share would increase. Two said that any increase in HPWH sales would be dependent on the availability of utility incentives, whereas the other two believed local income and building codes were more influential on HPWH sales than incentives.

Two retailers predicted that sales would increase over the next three years, and two respondents predicted that sales would remain about the same (the remaining two were unable to answer). Two interviewees believe that future sales are "very dependent" on available utility incentives. Four respondents believe that the fastest growing market for HPWHs is in existing homes (either remodels or replacements), while the other two retailers were unsure.

Looking ahead, five of the 16 installers said they anticipate HPWH installations to increase throughout the Northwest over the next two years. Five of the participating installers said

they anticipated their HPWH installations to remain about the same as they were in 2015 over the next two years, primarily because they were not focused on HPWHs as a key component of their company and because they believe the market potential in the Northwest climate is relatively limited. One installer anticipated their HPWH installations to decrease as they transition to more central heating system installations in multifamily new construction projects, and two installers said they were unsure of their future expectations for HPWH installations. For the installers that anticipated increases in their HPWH installations, the primary reasons included better technology (especially within the GE products), increased customer awareness, and additional available incentives from utilities.

3.7.2 HPWH Price

Two manufacturers estimated that the price of HPWHs is likely to increase over the next two to five years, with one noting that some manufacturers are likely to leave the HPWH market over the next five years. While the third manufacturer was unable to directly comment, they did note that sales volume will impact HPWH cost, and that sales have not increased as rapidly as they had anticipated.

Two distributors expect HPWH prices to increase as incentives decrease, cost of materials to build HPWHs increase, and/or the code requirements become more demanding. A third distributor expects prices will stay about the same, believing new players will enter the HPWH market and offset any price increases from rising supply chain or manufacturing costs.

Retailer predictions for HPWH pricing were very mixed, with some predicting a price increase and some predicting a price decrease.

3.7.3 HPWH Technology Trends

Manufacturers noted a number of technological trends with HPWHs. Two mentioned controllability via Internet connectivity, although with different purposes in mind. The first described using connected HPWHs for peak load shaving or shifting (demand response), describing water heaters as comparable to storage batteries. The other mentioned using their connectivity to manage the energy use of one's home (or larger building).

The other manufacturer noted that there is a relationship between higher energy factor and slower hot water recovery, so that as more efficient HPWHs enter the market, consumers should continue to size up in order to ensure sufficient hot water supply.

3.7.4 What Support is Needed?

Market actors and utilities provided limited input regarding what support they lack or need to help NEEA’s market transformation efforts.

Utilities in Idaho and Montana (and Rural Northwest) Lack Installers

While some utilities have several very engaged and active installers in their service territories, utilities in Idaho, Montana and rural areas in general have more difficulty getting plumbers enthusiastic about HPWHs.

HPWH Sizing is Critical, Needs to be Addressed by Initiative

One manufacturer mentioned that more information and training is needed about the performance of HPWHs in terms of meeting hot water needs, as they are concerned that there are unrealistic expectations related to hot water output of smaller HPWHs when compared to equally sized ERWHs. This manufacturer reported that their customers' experiences suggest sizing up a HPWH compared to an ERWH (buying a model with larger capacity), but that when consumers go to purchase a HPWH, many utilities have removed incentives for larger models. Distributors also mentioned that some end-users reported being frustrated with the slow recovery time of their HPWH.

Distributor Support is Sufficient

When asked about what type of support they would like from NEEA going forward, the distributors indicated that they do not want NEEA to make any major changes. One of these distributors said that NEEA's support is "good as is, any more support would just be getting in the way".

Installers Request Broad Marketing to Increase HPWH Awareness

Installers mentioned that HPWH installations will remain uncommon in the northwest as long as customers are not familiar with the technology and potential savings. Five of the participating installers noted that NEEA has done an adequate job in promoting HPWHs in the northwest market but could help increase HPWH installations by increasing their advertising efforts in print media and television, focusing specifically on HPWHs.

4 Key Findings and Recommendations

Below, we present the key findings from this Market Progress Evaluation and recommendations for Initiative improvements and refinements.

The findings and recommendations in this report that are associated with distributors and large retailers are not based on a representative sample of the four state region – Idaho, Montana, Oregon and Washington. NEEA and its contractor did not conduct interviews in Idaho with these supply chain market actors for this report at the request of Idaho Power Company.

4.1 Key Findings

1. **In 2015, there were 4,392 manufacturer markdowns for Tier 2/Tier 3 HPWHs, and utilities provided incentives for 985 Tier 2/Tier 3 HPWHs** (it is unknown what percentage of these are for the same HPWHs). This is a significant increase in sales of HPWHs meeting the Tier 2 performance tier. From July 2013 through the end of 2014, there were between 430 and 593 Tier 2 HPWHs installed in the Northwest with Smart Water Heat (the name of the Initiative at the time) or utility incentives. Key Finding #3, below, provides additional context regarding this jump in Tier 2/Tier 3 HPWH sales.
2. **In 2015, there were 328 manufacturer markdowns for Tier 1 HPWHs, and utilities provided incentives for at least 1,096 Tier 1 HPWHs** (it is unknown what percentage of these are for the same HPWHs). From July 2013 through the end of 2014 between 4,053 and 4,593 Tier 1 HPWHs were installed with Northwest utility incentives and/or manufacturer markdowns. This shift from Tier 1 to Tier 2 sales is the result of Key Finding #3, below.
3. **The exit of AirGenerate from the market was overcome by GE developing a product that meets Tier 2/Tier 3 specifications.** This has also led to a shift in sales from Tier 1 products to Tier 2/Tier 3. Furthermore, Brand familiarity may play a role in the recent success of Tier 2/Tier 3 HPWHs compared to 2014 sales of Tier 2 models. Only one market actor brought up brand familiarity during MPER2 research, potentially suggesting that this issue no longer persists in the market to the same degree as previously. Lastly, Tier 2/Tier 3 installations in 2015 reportedly took less time than Tier 1 installations, and purchasers of Tier 2/Tier 3 HPWHs were more satisfied with the installation times (this was not the case in 2014 with the more complicated AirGenerate installation).
4. **The impact of the NAECA standards underwhelmed the entire supply chain.** Consumers and installers are pursuing workaround solutions, and there was at least some overstocking of large ERWHs prior to the April 2015 update. Most consumers are unaware of the standard (but low awareness of appliance standards is typical among the general population).

5. **Forty percent of HPWH purchasers have DHPs installed in their homes (as a primary source of heat)**. Experience and familiarity with heat pump technology and/or previous participation in a NEEA Initiative (the NW Ductless Heat Pump Initiative) may increase the likelihood of a HPWH purchase.
6. **As found in MPER1, HPWH purchasers are comprised of households with higher incomes and education levels than the general population.** However, when compared to purchasers from 2014 (MPER1), purchasers in 2015 were more similar to the general population in terms of both income and level education. This may be indicative of a slight shift down the product adoption curve towards more widespread adoption.
7. **Certain manufacturers are very engaged and positive about the Initiative.** However, it is possible that the Initiative's support may be perceived as favoritism, and it is important for NEEA to maintain some degree of brand neutrality to encourage less engaged manufacturers to continue to support the Initiative and to continue to develop higher tier HPWHs.
8. **As with MPER1, HPWHs have met the expectations of the vast majority of purchasers (95% for MPER2).** As a result, most said they have or would recommend a HPWH to someone they know. Most purchasers would recommend HPWHs because of the resulting lower energy bills—purchasers are realizing savings. However, satisfaction with the level of sound is down from 4.2 out of 5 to 3.8 out of 5.
9. **Planned purchases still dominate the HPWH market, however most purchasers note that the motivation to replace their existing water heater was because it was getting old.** Very few HPWH purchasers reported that they purchased a HPWH as part of an emergency replacement situation.
10. **The Initiative website (Hot Water Solutions, formerly Smart Water Heat) is not driving awareness among Northwest HPWH purchasers.** Neither website was mentioned as an initial source of awareness among purchasers, nor was either mentioned as a source of additional information.
11. **Market actors and Northwest utilities are directly targeting the new construction market.**
    - Utilities have expanded eligibility to include new construction (8 of 10 utilities interviewed).
    - Manufacturers target homebuilders and contractors directly, and leverage home performance program points to help sales into new construction projects. Two distributors said that new construction situations are particularly receptive to HPWHs compared to retrofit/replacement situations.
12. **Market actors are concerned about appropriate HPWH sizing to meet household hot water needs.** Consumers may purchase a HPWH of the same volume as their existing ERWH, only to be disappointed in the hot water supply (in

particular the recovery rate), especially when the HPWH is set to rely solely on the heat pump (Heat Pump Only mode). Market actors are concerned that negative perceptions of HPWHs at this early stage in market transformation may have a lasting impact on HPWH consumer demand. This is especially important for DIY installations, as the purchaser does not receive the same educated guidance as when a professional installer is involved.

13. **Roughly one-third of purchasers replaced their existing water heater explicitly for efficiency purposes**, with another 10 percent noting that they did so because their existing water heater was expensive to operate.
14. **DIY installations make up approximately half of the market.**
15. **Installers do not stock HPWHs, but most do not stock any water heaters.** This is the same as in MPER1. Most installers now say that it takes the same amount of time to obtain and install a HPWH as it takes to obtain and install an ERWH. This is a positive shift in the availability of HPWHs in the supply chain, as well as indicative of an installer base with more experience with HPWHs.
16. **The list of installers maintained on the Hot Water Solutions website likely contains firms that no longer install HPWHs (and may contain companies that no longer exist).**
17. **Credit cards were used by two-thirds of HPWH purchasers, but tax credits were more important to purchasers.** Many Oregon purchasers have or will receive a state tax credit (they are not available to Washington purchasers). Almost half of all purchasers have or will receive a federal tax credit.
18. **Utilities serving Oregon and Washington (especially urban areas) are engaged with an active installer base.** However, utilities serving Idaho and Montana (and rural areas across the Northwest) have more difficulty engaging with installers and creating enthusiasm for HPWHs in the supply chain.
19. **The manufacturer markdown approach changes Initiative evaluability.** The total sales volume of HPWHs supported by the Initiative (via manufacturer markdowns and/or utility incentives) are unknown because it is impossible to determine whether households that purchased a HPWH with a markdown apply for and receive a utility incentive. Furthermore, there are two risks related to the evaluability of the Initiative, which include:
    - Uncertainty regarding installation location: customers can install their HPWH outside of the Northwest unbeknownst to the Initiative; there is no indication that this is occurring frequently.
    - Customer research is much more difficult and costly: Evergreen attempted to conduct in store research but both the cost and complications with retailer approval were prohibitive.

4.2 Recommendations

1. **Continue to address low awareness through broad based marketing and through cooperative marketing with supply chain partners.** Development of an infographic for HPWHs should be considered and added to NEEA's website as well as the Hot Water Solutions website, and could address a number of key issues such as appropriate sizing, cross-promotion with the Northwest Ductless Heat Pump Project (see recommendation below), and consumer barriers.
2. **Monitor traffic to the Hot Water Solutions website, as consumers do not mention it as a source of information regarding HPWHs.** The Internet is an important resource among consumers looking to learn more about HPWHs, and yet none listed the Hot Water Solutions website as a source of information. NEEA should investigate ways to optimize consumer search results such as investing in "pay-per-click" (PPC) advertising.
3. **Develop a cross-promotional strategy with the Northwest Ductless Heat Pump Project and the Hot Water Solutions Program.** Work with utilities and retailers to promote DHPs to HPWH customers and HPWHs to DHP customers. Train installers to refer their customers to the other Initiative's website, or provide marketing collateral covering both Initiatives. While significant barriers for HPWHs persist, experience with DHPs—potentially in the sense of realized energy and utility bill savings—should be considered a key point of leverage for the Initiative.
4. **The Initiative should consider directly addressing the issue of appropriate HPWH sizing.** Consumer acceptance of HPWHs is a critical component of early market transformation, and any potential for negative perceptions among consumers should be met with education and outreach. Installers and retail sales staff members are a key point of leverage for educating consumers about appropriate sizing, as well as providing information (such as an infographic) on the Hot Water Solutions website.
5. **Continue to track the rate of emergency replacements through consumer and supplier market research and evaluation.** The market moving from a high proportion of planned purchases to higher proportions of emergency replacements may indicate progress towards market transformation, as planned replacements are atypical in the general water heater market in the Northwest (Verinnovation 2012), and likely indicate high rates of early adopter purchases. Evergreen found similar rates of planned replacements during 2015 as previously. One manufacturer believes that the key to increased typical water heater replacements—those occurring in emergency situations—are the instant point-of-purchase manufacturer markdown incentives.
6. **Encourage utilities to continue incentives for large volume HPWHs. Ensure that manufacturer markdowns for large volume HPWHs continue.** The NAECA standard update is not the panacea NEEA anticipated, and HPWHs are not the default product for large volume residential electric water heating. Workaround

solutions should be discouraged and incentives for large volume HPWHs should remain available in order to continue to transform the electric water heating market in the Northwest. Customers and market actors report that the incentives are key to HPWH purchases.

7. **Track HPWH installations to new construction, as this is an important submarket.**
8. **Consider a thorough review of the installer list on the Hot Water Solutions website to ensure that it is up to date.** The list should contain installers that are still in business and, ideally, only those that would respond positively to a customer inquiry about a HPWH purchase and installation.

Appendix A – ACE Model Review Memorandum

The ACE Model Review Memorandum begins on the next page.

1648 Martin Luther King Jr. Way
Berkeley, CA 94709

Office: 510.899.5555
www.evergreenecon.com

MEMORANDUM

February 16, 2016

To: Amy Webb-Cabrera and Ryan Brown, NEEA

Re: HPWH Initiative MPER2 ACE Model Review Findings

This memorandum presents the findings of Evergreen Economics' Alliance Cost Effectiveness (ACE) Model review. This research is part of the ongoing Market Progress Evaluation Report (MPER) #2 Market Research and Evaluation project of NEEA's Heat Pump Water Heater (HPWH) Initiative.

Note that this memorandum is not intended to address specific formulaic or other errors uncovered during our review; such occurrences were communicated directly to NEEA staff during the review.

Incorporation of Tier 3 into Savings Rate

Ryan Brown asked Evergreen if it was appropriate to incorporate Northern Climate Specification (NCS) Tier 3 unit energy savings (UES) into the savings rate in the HPWH ACE Model via estimating the proportion of Tier 2/3 HPWHs installed in Cold Climate Efficiency (CCE) mode. Given the currently available HPWH models, Tier 3 is only met when certain HPWHs are switched into CCE mode. Therefore, tracking of unit sales only will not provide enough information to estimate the number of HPWHs in use that meet Tier 3 installation criteria. The proportion of Tier 2/3 HPWHs installed in CCE mode is needed to support incorporating a weighted UES for Tier 2/3 HPWH sales.

The ACE Model currently assumes 70 percent of Tier 2/3 HPWHs are in use in Hybrid mode, and not CCE mode. The model estimates that 30 percent of Tier 2/3 HPWHs are in use in CCE mode. We do not have data to suggest otherwise.

Through MPER2 primary research, Evergreen aims to estimate the proportion of Tier 2/3 products installed as Tier 3 through installer interviews and HPWH purchaser surveys. This parameter should be incorporated into the next iteration of the ACE Model and should be updated regularly through future MPER research. Furthermore, as the rate of Tier 2/3 HPWHs meeting Tier 3 is likely to change over time, the "Tech Inputs" tab of the model should be slightly redesigned to allow for changes in the distribution of Tier 2/3 units as opposed to a single estimate for weighted UES that covers all time periods.

Near-term Adoption Forecast (Large HPWHs)

The ACE Model projects rapid growth for large volume HPWHs due to the recent update to the National Appliance Energy Conservation Act (NAECA) in April 2015. The updated standard prohibits the manufacture of residential electric storage water heaters above 55 gallons below a specified efficiency level, essentially mandating that all large volume electric storage water heaters produced for sale in the United States rely on heat pump technology.

In the months following April 2015 NEEA did not notice a significant increase in sales of large volume HPWH products, leading to concerns regarding the impact of the standards update and the reasonableness of existing sales forecasts. However, since the standard impacts the *manufacturing*, and not the *selling/purchasing*, the impacts of the standard will not be fully realized until the existing stock of electric resistance water heaters (ERWHs) are sold through.

Below is a direct quote from manufacturer in April 2015:

> "The last six months we had factories running at close to 100% capacity, producing old [electric resistance] models. That inventory will deplete in six months…"

This suggests that rapid growth within the large volume market is possible, as even at full capacity a large water heater manufacturer estimates that they only have six months stock as of April 2015. That stock is likely exhausted at this point.

Evergreen is finalizing parallel research with Geoff Wickes to address this issue in the near-term (and include questions to address this issue in our market actor and installer interview guides for the current MPER2). The research regarding replacements for large volume electric storage water heaters has indicated that market actors believe many consumers are finding alternate solutions (downsizing with or without mixing valves, on-demand hot water, etc.). While rapid growth in the large volume HPWH market is possible, consumer barriers – especially price – still exist and HPWHs have not necessarily become a default choice.

Forecasted Water Heater Standards Effective Dates

The standard for large volume is already effective. The standard for small volume is assumed to be 2025. We believe this is the consensus among most market actors, and we can confirm this during MPER2.

Standards Compliance – Impact of Standards

Regarding compliance, since the NAECA standards update impacts manufacturing it is fairly safe to say that once the existing stock of ERWHs is sold, the only large volume residential electric storage water heaters available will be HPWHs. We do not believe any of the manufacturers will risk noncompliance in terms of production, so sell-through rate (and end date) and prevalence of other options (e.g., two small tanks, on-demand water heating, etc.) are the only key factors.

With respect to the other options available on the market for large volume electric water heating – multiple small tanks, on-demand water heating, commercial water heaters, etc. – the only currently available information comes from market actor predictions. Through MPER2, Evergreen plans to revisit this issue with key market actors to better understand this issue. This is a critical issue as the impacts of the standards are a key tenant of NEEA's market transformation strategy and ACE Model forecasted impacts.

Incorporating Sales to New Construction

According to MPER1, approximately 18 percent of Initiative incentivized HPWHs are installed in newly constructed homes. The differences between a replacement water heater and a water heater going into new construction are slight, but important. The main differences in accounting energy savings are a different "base case" water heater; as opposed to measuring UES from the stock of existing ERWH (some average of typical replaced water heater efficiencies), you would be "replacing" currently available models only.

However, this is a UES issue only, so it is not something that the ACE model can handle directly. A review of the UES workbook from the Northwest Regional Technical Forum (RTF)[17] shows that the current UES calculations are for "New and Existing Construction," so the ACE model does not require any adjustments to handle the new construction installations.

The issue with including HPWHs installed in New Construction is that the current logic model does not indicate that NEEA's efforts have any impact on HPWHs installed in new homes. Furthermore, it is possible that these installations are being double counted, based on the following two sentences:

[17] Source: rtf.nwcouncil.org/measures/res/Res_HPWH_v3_1.xlsm

> "New construction savings are assumed to be tracked in the Efficient Homes ACE Model" (cell D24, Key Assumptions tab)
>
> "New construction savings are assumed to be tracked in the Manufactured Homes initiative" (cell D26, Key Assumptions tab)

In order to reflect the current Initiative logic and to ensure that installed HPWHs are not double-counted, NEEA should ensure that New Construction is included in the updated approved Initiative logic model and that HPWHs installed via other Initiatives are not also counted as part of this Initiative.[18]

Base-Case (ERWH) Effective Useful Life (EUL)

The RTF's EUL for HPWHs is 13 years[19] and the EUL for *efficient* ERWHs is 15 years (note that efficient ERWH measure is currently deactivated).[20] The EUL of 13 years for standard electric resistance water heaters currently included in the ACE Model is appropriate. Evergreen reviewed a number of sources to assess the reasonableness of this parameter. The table below provides a summary of our findings, which are the basis for the conclusion that 13 years is appropriate, and not the 15 year EUL for efficient ERWH.

[18] This will prove challenging as it is impossible to track manufacturer markdown HPWHs to the end-user, and thus it is unknown what proportion of these units are installed in New Construction, and it is impossible to track whether any single HPWH incentivized via a manufacturer markdown is installed in a new home or a manufactured home (which would be the method for ensuring that double-counting does not occur).

[19] Source: rtf.nwcouncil.org/measures/res/Res_HPWH_v3_1.xlsm

[20] Source: http://rtf.nwcouncil.org/measures/measure.asp?id=125&decisionid=488

Source	Link	EUL	Notes
Database for Energy Efficient Resources (DEER)	http://www.deeresources.com/files/DEER2013codeUpdate/download/DEER2014-EUL-table-update_2014-02-05.xlsx.	13 yrs	Basis for California EE savings, which serves as the basis for many TRMs across the U.S.
Keystone Energy Efficiency Alliance (KEEA)	https://www.energywisepa.org/category/fact-sheet-categories/electric/electric-resistance-storage-water-heaters	14 yrs	Using the "Medium" lifespan.
California Energy Commission (CEC)	http://www.consumerenergycenter.org/residential/appliances/waterheaters.html	10-15 yrs	
U.S. Department of Energy	http://energy.gov/eere/femp/energy-cost-calculator-electric-and-gas-water-heaters-0	13 yrs	13 years used as part of a U.S. DOE energy cost calculator.
Air-Conditioning, Heating, & Refrigeration Institute (AHRI)	http://www.ahrinet.org/site/579/Homeowners/Indoor-Comfort-Systems/Water-Heaters	10-13 yrs	

Distribution of Tier 2 HPWHs by Volume

Evergreen noted that in the "Inputs" table of the ACE Model's "Market" tab, NEEA assumes that 2015 Tier 2 installations track proportionally across volumes in the same manner that Tier 1 units were distributed across volumes in 2014. Evergreen considered the reasonableness of this estimate and it is reasonable for 2015. Evergreen will revisit the estimate once we have access to incentive data for the region as part of our MPER2 research.

As the NAECA standards update begins to impact the market, likely driving consumers with large hot water demand to purchase large volume HPWHs, this ratio should be adjusted. At present in the ACE Model, 75 percent of large tank HPWH sales are estimated to be Tier 2 HPWHs in 2016 (cell C87 of the "Key Assumptions" tab). This assumption should be revisited in MPER3, which will have access to market data covering 2016.

Appendix B – HPWH Purchaser Sampling Memo

The HPWH Purchaser Sampling Memorandum begins on the next page.

1648 Martin Luther King Jr. Way
Berkeley, CA 94709

Office: 510.899.5555
www.evergreenecon.com

MEMORANDUM

February 29, 2016

To: Amy Webb-Cabrera, NEEA

From: Kevin Price and Sarah Monohon, Evergreen Economics

Re: HPWH MPER2 HPWH Purchaser Sampling Memo

This memorandum describes the data provided to Evergreen to conduct the Northwest Energy Efficiency Alliance's Heat Pump Water Heater (HPWH) Market Progress Evaluation Report #2. As part of this ongoing study we plan to conduct a total of 150 computer-assisted telephone interview (CATI) surveys of households in the four Northwest states that have purchased a HPWH since January 2015.

Due to the small number of viable contacts provided for the evaluation, we must forgo a traditional sampling plan and instead target all viable contacts in the sample frame. The lack of contact data for the majority of known, incentivized HPWH purchases means that survey results will not necessarily be representative of all HPWH purchasers in the Northwest. Furthermore, there are possibly many more HPWH purchasers in the Northwest that received utility incentives from utilities that did not – or were not able to – provide data for the evaluation.

Efforts to improve contact data availability may lead to improved representativeness for future MPERs and, therefore, better market intelligence to inform Initiative activities. The paucity of data also increases the risk that, with such a small sample, evaluators will be unable achieve enough responses to produce statistically significant results at the 90% confidence level. Furthermore, it becomes difficult to describe submarkets – even at lower levels of confidence – because there are not enough contacts to support qualitative findings (e.g., only eight percent of HPWH purchasers in our dataset are from rural areas of the Northwest).

Data Aggregation and Cleaning

We received 1,485 utility downstream HPWH rebate records from CLEAResult and combined the datasets based on common variables. The combined dataset includes:

- 619 contacts from Puget Sound Energy (PSE),
- 607 from Energy Trust of Oregon (Energy Trust),
- 67 from Clark Public Utilities,

- 62 from Cowlitz PUD,
- 43 from Franklin PUD,
- 40 from Emerald PUD,
- 30 from Inland Power and Light, and
- 17 from Benton PUD.[21]

Only 739 records from Inland Power and Light, Energy Trust, Cowlitz PUD, and Emerald PUD included an installation date for the incentivized HPWH. However, we were able to estimate the installation date for an additional 743 records using the "date signed" for Clark Public Utilities, "incentive paid date" for PSE, "installation date or purchase date" for Franklin PUD, and "date" for Benton PUD. [22] Based on this estimated installation date we removed 252 records for households that installed their HPWH before January 1, 2015, leaving 1,233 records.

Population of HPWH Purchaser Households

After the above aggregation and cleaning, the database of HPWH purchasers contained 1,233 participant records in Oregon and Washington. The vast majority of the participants in our sample frame live in urban areas (92 percent) within heating zone 1 (96 percent). We did not receive any participant data for HPWHs incentivized in Montana or Idaho, so we will not be able to conduct any participant surveys in these states.

The 1,233 Oregon and Washington contacts included 709 records with no valid phone number and 117 duplicates, where a duplicate is defined as the same contact phone number and/or installation address from two or more records. It is possible that some of the duplicate phone numbers are records for different equipment installed in two separate locations. However, for the purposes of conducting a phone survey, we must omit these duplicates to avoid surveying the same person multiple times. We flagged one contact from Washington as not viable because they requested no phone calls, and removed three other contacts whose HPWH model number matched a water heater of a different type (e.g., electric resistance or natural gas storage water heaters).

[21] Unlike MPER #1, we did not receive any HPWH purchaser contact data from NEEA directly and the utility data did not contain any records for upstream HPWH incentives. The Cowlitz PUD and Emerald PUD records were provided as scanned HPWH rebate applications.
[22] Additionally, a few of the records from Cowlitz and Emerald PUD did not have an installation date, but we were able to estimate it using the "purchase receipt" date or installer signature date in all of these cases.

Table 1 shows the total number of homeowners that received downstream rebates for HPWHs installed on or after January 1, 2015 (total records), and the number of records that are viable contacts (i.e. unique contacts with phone numbers).

Table 1: HPWH Purchaser Sample Frame by State

State	Total Records	Viable Contacts
Idaho	0	0
Montana	0	0
Oregon	428	266
Washington	805	140
Total	**1,233**	**406**

Sample Design

Achieving our target of 150 completed participant surveys from these 406 viable contacts necessitates a response rate of 37 percent. During MPER #1 we achieved a response rate of 34 percent among HPWH purchasers (n=195/577) without an incentive. We attribute the achievement of such a high response rate to the high incentives and the technical complexity of HPWHs. We believe these factors led participants to be highly aware and invested in their water heater purchase, thereby making them more willing to participate in the survey. Since these conditions have been maintained for the current MPER, it is plausible that CIC Research will again achieve a response rate of 34 percent, resulting in 137 completed surveys.

Appendix C – General Population Sampling Memo

The Northwest General Population Sampling Memorandum begins on the next page.

1648 Martin Luther King Jr. Way
Berkeley, CA 94709

Office: 510.899.5555
www.evergreenecon.com

MEMORANDUM

January 29, 2016

To: Amy Webb-Cabrera, NEEA

From: Kevin Price and Sarah Monohon, Evergreen Economics

Re: HPWH MPER2 Sampling Plan for General Population Household Phone Surveys

This memorandum describes our proposed sampling plan for general population households in the Northwest, as part of NEEA's Heat Pump Water Heater MPER2. A subsequent memo will describe our sampling plan for households that have purchased a HPWH.

We plan to conduct a total of 150 computer-assisted telephone interview (CATI) surveys of Northwest general population households that have electric resistance water heaters, to be confirmed during survey recruitment. Households that do not own a HPWH are particularly important to include so that non-participant awareness, perceptions and intentions can be benchmarked and tracked over time, as these are leading indicators of more comprehensive market transformation.

General Population of Households

We used data from the American Community Survey (ACS)[23] to develop the sampling universe for the general population survey of Northwest Households. We also relied on 2013 Rural-Urban Continuum Codes (RUCC) developed by the United States Department of Agriculture (USDA), as well as the Northwest Regional Technical Forum's (RTF) definition of heating zone.

Table 1 provides a detailed overview of the percent of occupied single family homes in each of the four Northwest states (Idaho, Montana, Oregon, and Washington), by urban versus rural and by heating zone.

[23] http://www.census.gov/acs/www/

Table 1: Northwest General Population Statistics

State	Urban/ Rural	Heating Zone	Occupied Single- Family Detached Homes	% of Total (Specific)	% of Total (State)
Idaho	Rural	1	6,277	0.2%	12.8%
		2	98,493	2.9%	
		3	37,857	1.1%	
	Urban	1	184,526	5.5%	
		2	64,119	1.9%	
		3	36,014	1.1%	
Montana	Rural	2	51,656	1.5%	8.4%
		3	131,675	3.9%	
	Urban	2	39,364	1.2%	
		3	57,238	1.7%	
Oregon	Rural	1	245,745	7.3%	28.9%
		2	41,991	1.3%	
		3	4,037	0.1%	
	Urban	1	621,396	18.6%	
		2	53,131	1.6%	
Washington	Rural	1	242,517	7.2%	50.0%
		2	54,891	1.6%	
		3	2,119	0.1%	
	Urban	1	1,227,818	36.7%	
		2	144,884	4.3%	

Sample Design

Our sampling strategy involves oversampling of geographies with smaller populations. For example, if we utilized direct proportional sampling by state we would only target 9 homes in Montana, and only 9 homes from heating zone 3 (across Montana and Idaho locations).

Therefore, we propose the sampling plan shown in Table 10, by Northwest state and specific geography (either by heating zone or urban/rural within a state). This sample plan ensures that survey more equitably represents households across the four states, in both urban and rural areas, and in a range of heating zones.

Tabl3 10: Northwest General Population Household Survey Targets

Geography		Target	Overall (state)
Idaho	Heating Zone 1-2	14	22
	Heating Zone 3	8	
Montana	(all)	20	20
Oregon	Rural	14	53
	Urban	39	
Washington	Rural	15	55
	Urban	40	
Total		**150**	

Appendix D – HPWH Purchaser Survey Supplemental Findings

This appendix contains banner tables for each question in the purchaser survey, providing an un-weighted count (n) and weighted percentage (%) for each response. Most questions use the purchaser weight, questions that use the HPWH weight are noted with an asterisks before the question number (*Q). Responses of “don't know” or “refused” are excluded from these tables.

The HPWH Purchaser Survey Supplemental Findings begin on the following page.

Survey Question		Total		HPWH Tier: Tier 1		HPWH Tier: Tier 2/3		State: OR		State: WA		RUCC: Rural		RUCC: Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
Q1. To begin with, how did you first hear about heat pump water heaters?	Previously owned one	1	1%			1	1%	1	1%			1	6%		
	Friend or acquaintance	13	10%	5	11%	8	9%	9	9%	4	11%	2	13%	11	10%
	Utility print advertising, bill stuffer	16	12%			16	19%	11	12%	5	14%	1	6%	15	13%
	Utility website	2	2%	1	2%	1	1%			2	6%			2	2%
	Retail store display / saw it in store	12	9%	3	7%	9	11%	5	5%	7	20%	1	6%	11	10%
	Retail store salesperson	6	5%	3	7%	3	4%	6	6%			4	25%	2	2%
	Newspaper ad	9	7%	4	9%	5	6%	8	8%	1	3%			9	8%
	Newspaper story	2	2%	2	4%			2	2%					2	2%
	Television ad	1	1%			1	1%			1	3%			1	1%
	From contractor/installer	12	9%	6	13%	6	7%	10	10%	2	6%	1	6%	11	10%
	Internet research	16	12%	7	16%	9	11%	13	14%	3	9%	1	6%	15	13%
	Utility newsletter	3	2%			3	4%	3	3%					3	3%
	Retail store mailer	15	12%	5	11%	10	12%	8	8%	7	20%	1	6%	14	12%
	Energy Trust	8	6%	2	4%	6	7%	8	8%			2	13%	6	5%
	Water heater/plumbing store	3	2%	1	2%	2	2%	3	3%					3	3%
	Magazine	4	3%	4	9%			4	4%			2	13%	2	2%
	Conference/trade show	2	2%	1	2%	1	1%	1	1%	1	3%			2	2%
	Home show	2	2%	1	2%	1	1%	2	2%					2	2%
	Salesman came by house	1	1%			1	1%			1	3%			1	1%
	Someone from PUD/utility	1	1%			1	1%			1	3%			1	1%
	During energy audit	1	1%			1	1%	1	1%					1	1%
	Have known about them for many years	1	1%			1	1%	1	1%					1	1%
	Total	131	100%	45	100%	86	100%	96	100%	35	100%	16	100%	115	100%
Q2. Did you hear about	Previously owned one	1	1%			1	1%			1	3%			1	1%

Survey Question		Total		HPWH Tier: Tier 1		HPWH Tier: Tier 2/3		State: OR		State: WA		RUCC: Rural		RUCC: Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
them anywhere else or learn more about them from any other sources?	Friend or acquaintance has one	5	4%	2	4%	3	3%	2	2%	3	8%			5	4%
	Utility print advertising, bill stuffer	2	2%	1	2%	1	1%	2	2%			1	6%	1	1%
	Utility website	4	3%	1	2%	3	3%	2	2%	2	6%			4	3%
	Retail store display / saw it in store	14	10%	9	20%	5	6%	13	13%	1	3%	1	6%	13	11%
	Retail store salesperson	11	8%	5	11%	6	7%	7	7%	4	11%			11	9%
	Newspaper ad	4	3%	1	2%	3	3%	2	2%	2	6%	1	6%	3	3%
	Newspaper story	1	1%			1	1%			1	3%			1	1%
	From contractor/installer	7	5%	1	2%	6	7%	7	7%			1	6%	6	5%
	Internet research	39	29%	9	20%	30	34%	30	31%	9	25%	4	25%	35	30%
	Internet advertising	1	1%	1	2%			1	1%			1	6%		
	Nowhere else	48	36%	21	46%	27	31%	34	35%	14	39%	7	44%	41	35%
	Retail store mailer	2	2%			2	2%	1	1%	1	3%			2	2%
	Energy Trust	3	2%			3	3%	3	3%			1	6%	2	2%
	Magazine	1	1%	1	2%			1	1%					1	1%
	Home show	1	1%			1	1%	1	1%					1	1%
	Someone from utility/PUD	1	1%	1	2%					1	3%			1	1%
	NEEA	1	1%			1	1%			1	3%			1	1%
	Don't Know	8	6%	4	9%	4	5%	7	7%	1	3%			8	7%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q3. How did you first hear about the <Manufacturer> brand of heat pump water heaters?	Previously owned one	1	1%			1	1%	1	1%			1	6%		
	Friend or acquaintance has one	6	6%	3	9%	3	4%	5	7%	1	3%	1	6%	5	5%
	Utility print advertising, bill stuffer	11	10%			11	15%	7	9%	4	13%			11	12%
	Utility website	3	3%	1	3%	2	3%	1	1%	2	6%			3	3%

Survey Question		Total		HPWH Tier				State				RUCC			
				Tier 1		Tier 2/3		OR		WA		Rural		Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	Retail store display / saw it in store	27	25%	8	24%	19	25%	17	22%	10	31%	4	25%	23	25%
	Retail store salesperson	9	8%	5	15%	4	5%	4	5%	5	16%	3	19%	6	7%
	Newspaper ad	4	4%	1	3%	3	4%	4	5%			1	6%	3	3%
	Television ad	1	1%	1	3%			1	1%					1	1%
	From contractor/installer	18	17%	5	15%	13	17%	16	21%	2	6%	1	6%	17	18%
	Internet research	11	10%	3	9%	8	11%	10	13%	1	3%	2	13%	9	10%
	Utility newsletter	2	2%			2	3%	1	1%	1	3%			2	2%
	Retail store mailer	8	7%	2	6%	6	8%	3	4%	5	16%	2	13%	6	7%
	Energy Trust	2	2%	1	3%	1	1%	2	3%			1	6%	1	1%
	Water heater/plumbing store	2	2%	1	3%	1	1%	2	3%					2	2%
	Conference/trade show	2	2%	1	3%	1	1%	1	1%	1	3%			2	2%
	Home show	1	1%	1	3%			1	1%					1	1%
	During energy audit	1	1%			1	1%	1	1%					1	1%
	Total	109	100%	33	100%	76	100%	77	100%	32	100%	16	100%	93	100%
Q4 Did you hear about <Manufacturer> heat pump water heaters from anywhere else or learn more about it from any other sources?	Previously owned one	1	1%	1	2%			1	1%			1	6%		
	Friend or acquaintance has one	3	2%	1	2%	2	2%	1	1%	2	6%			3	3%
	Utility print advertising, bill stuffer	1	1%			1	1%	1	1%					1	1%
	Retail store display / saw it in store	5	4%	2	4%	3	3%	2	2%	3	8%			5	4%
	Retail store salesperson	4	3%			4	5%	2	2%	2	6%			4	3%
	Newspaper ad	2	2%	1	2%	1	1%	2	2%					2	2%
	Internet research	30	22%	9	20%	21	24%	22	22%	8	22%	4	25%	26	22%
	Internet advertising	2	2%	1	2%	1	1%	2	2%			1	6%	1	1%
	No other sources	66	49%	22	48%	44	50%	46	47%	20	56%	8	50%	58	49%

Survey Question		Total		HPWH Tier: Tier 1		HPWH Tier: Tier 2/3		State: OR		State: WA		RUCC: Rural		RUCC: Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	Retail store mailer	1	1%			1	1%			1	3%			1	1%
	Energy Trust	3	2%	1	2%	2	2%	2	2%	1	3%			3	3%
	Conference/trade show	1	1%			1	1%	1	1%					1	1%
	Don't Know	19	14%	9	20%	10	11%	17	17%	2	6%	2	13%	17	14%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q5. When making an appliance purchase decision, what are your typical sources of information regarding which product to purchase?	Friends or acquaintances	24	18%	7	15%	17	19%	15	15%	9	25%	3	19%	21	18%
	Utility print advertising, bill stuffer	1	1%			1	1%	1	1%					1	1%
	Retail store general	15	11%	8	17%	7	8%	11	11%	4	11%	3	19%	12	10%
	Retail store display / saw it in store	5	4%	2	4%	3	3%	4	4%	1	3%	1	6%	4	3%
	Retail store salesperson	16	12%	7	15%	9	10%	13	13%	3	8%	3	19%	13	11%
	Newspaper ad	7	5%	2	4%	5	6%	6	6%	1	3%			7	6%
	Newspaper story	1	1%			1	1%	1	1%					1	1%
	Television ad	2	2%			2	2%	1	1%	1	3%			2	2%
	From contractor/installer	6	5%	2	4%	4	5%	5	5%	1	3%			6	5%
	Internet research/internet reviews	100	75%	33	72%	67	76%	75	77%	25	69%	12	75%	88	75%
	Internet advertising	1	1%	1	2%					1	3%			1	1%
	Consumer Reports magazine	9	7%	6	13%	3	3%	7	7%	2	6%			9	8%
	Internet customer reviews (Amazon, YouTube, etc.)	3	2%	1	2%	2	2%	2	2%	1	3%			3	3%
	Manufacturers website	1	1%	1	2%			1	1%					1	1%
	Energy Trust	2	2%			2	2%	1	1%	1	3%			2	2%
	NEEA	1	1%			1	1%	1	1%					1	1%
	Energy Star labeling	2	2%	1	2%	1	1%	2	2%					2	2%
	Consumer Reports website	10	8%	5	11%	5	6%	5	5%	5	14%	1	6%	9	8%

Survey Question		Total		HPWH Tier: Tier 1		HPWH Tier: Tier 2/3		State: OR		State: WA		RUCC: Rural		RUCC: Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	Don't Know	4	3%	1	2%	3	3%	3	3%	1	3%	1	6%	3	3%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
*Q6. What was the brand of your previous water heater? (UNAIDED)	General Electric (GE)	9	18%	3	10%	6	24%	6	16%	3	20%	1	15%	8	18%
	A.O. Smith	7	14%	2	21%	5	9%	6	15%	1	13%	1	15%	6	14%
	American	3	4%	1	3%	2	4%	3	8%					3	4%
	Kenmore	5	11%	3	10%	2	13%	3	9%	2	13%	1	15%	4	11%
	Reliance	4	5%	3	10%	1	2%	4	11%			1	15%	3	4%
	Whirlpool	3	4%	1	3%	2	4%	3	8%					3	4%
	AirGenerate	1	1%			1	2%	1	2%					1	1%
	Rheem	9	27%	3	38%	6	20%	5	12%	4	40%			9	30%
	Bradford White	6	6%			6	11%	6	14%			2	24%	4	5%
	Montgomery Wards	1	1%	1	3%			1	3%			1	15%		
	Mor-Flo	1	4%			1	6%			1	7%			1	4%
	Rudd	1	4%			1	6%			1	7%			1	4%
	Alliance	1	1%	1	3%			1	3%					1	2%
	Total	51	100%	18	100%	33	100%	39	100%	12	100%	7	100%	44	100%
*Q7. What was the brand of your previous water heater? (AIDED)	General Electric (GE)	3	13%	1	6%	2	20%	2	15%	1	13%	1	42%	2	7%
	A.O. Smith	4	23%	1	34%	3	13%	3	19%	1	25%			4	28%
	American	2	18%	1	34%	1	4%	1	7%	1	25%			2	23%
	Kenmore	2	11%	1	6%	1	15%	1	8%	1	13%	1	16%	1	10%
	Reliance	1	2%			1	4%	1	7%					1	3%
	State	1	3%	1	6%			1	8%					1	4%
	Whirlpool	1	8%			1	15%			1	13%			1	10%
	Electrolux	1	2%			1	4%	1	7%					1	3%
	Rheem	1	2%			1	4%	1	7%					1	3%

Survey Question		Total		HPWH Tier				State				RUCC			
				Tier 1		Tier 2/3		OR		WA		Rural		Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	Rudd	1	3%	1	6%			1	8%					1	4%
	Grainger	1	8%			1	15%			1	13%	1	42%		
	King	1	3%	1	6%			1	8%					1	4%
	Westinghouse	1	2%			1	4%	1	7%					1	3%
	Total	20	100%	7	100%	13	100%	14	100%	6	100%	3	100%	17	100%
*Q8. How many gallons was your previous water heater tank? (only asked if in existing home)	0-45 gallons	9	8%	3	4%	6	10%	6	7%	3	8%			9	8%
	46-55 gallons	74	58%	28	65%	46	54%	58	66%	16	53%	13	100%	61	54%
	56-80 gallons	36	34%	8	30%	28	36%	24	26%	12	40%			36	37%
	Over 80 gallons	1	0%			1	1%	1	1%					1	1%
	Total	120	100%	39	100%	81	100%	89	100%	31	100%	13	100%	107	100%
*Q9. Under normal circumstances, was your old water heater able to provide sufficient hot water for your household?	Yes	108	87%	40	96%	68	81%	81	87%	27	87%	14	100%	94	86%
	No	18	13%	3	4%	15	19%	13	13%	5	13%			18	14%
	Total	126	100%	43	100%	83	100%	94	100%	32	100%	14	100%	112	100%
*Q10. Why did you choose to install a larger heat pump water heater?	(n/a)	115	87%	43	92%	72	83%	84	87%	31	87%	15	96%	100	86%
	Nearly the same size	2	2%			2	3%	1	1%	1	2%			2	2%
	Replacing two ERWHs with one HPWH	1	0%			1	1%	1	1%					1	0%
	This was smallest size HPWH available	3	1%	2	2%	1	1%	3	3%					3	2%
	To compensate for slower recovery	2	1%			2	1%	2	2%					2	1%
	Wanted more capacity	11	9%	1	6%	10	11%	7	7%	4	11%	1	4%	10	10%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
*Q11. Why did you choose to install a smaller heat pump	(n/a)	104	75%	36	74%	68	76%	78	80%	26	72%	14	90%	90	73%
	A larger HPWH would not fit	4	2%	1	1%	3	2%	4	4%			1	5%	3	1%

Survey Question		Total		HPWH Tier: Tier 1		HPWH Tier: Tier 2/3		State: OR		State: WA		RUCC: Rural		RUCC: Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
water heater?	Did not need as much capacity (e.g. lower occupancy)	12	12%	4	9%	8	13%	6	6%	6	15%			12	13%
	Don't know	1	1%	1	1%			1	1%			1	5%		
	Had to choose between 50 and 80 gallons	4	5%	1	6%	3	4%	2	2%	2	7%			4	5%
	It was the only size in stock	2	1%	1	1%	1	1%	2	2%					2	1%
	It was the recommended size (e.g. by contractor)	3	2%			3	4%	2	2%	1	2%			3	2%
	To improve efficiency/cost effectiveness	4	4%	2	7%	2	1%	3	3%	1	4%			4	4%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q12. Did you replace your previous water heater in an emergency situation, for example maybe it broke, or was it a planned replacement?	Emergency situation	15	12%	8	19%	7	8%	12	12%	3	10%	4	27%	11	10%
	Planned replacement	114	88%	35	81%	79	92%	86	88%	28	90%	11	73%	103	90%
	Total	129	100%	43	100%	86	100%	98	100%	31	100%	15	100%	114	100%
Q13. What was the reason you decided it was time to replace your previous water heater?	Not enough hot water	15	13%	4	11%	11	14%	9	11%	6	21%			15	15%
	Getting old, time for a replacement	68	60%	21	60%	47	60%	55	64%	13	46%	8	73%	60	58%
	Occasional malfunction	2	2%			2	3%	2	2%					2	2%
	Rusted	4	4%	1	3%	3	4%	4	5%			1	9%	3	3%
	Leaky	19	17%	9	26%	10	13%	11	13%	8	29%	2	18%	17	17%
	Cost to operate	11	10%	3	9%	8	10%	9	11%	2	7%	1	9%	10	10%
	Efficiency ("it was inefficient")	39	34%	14	40%	25	32%	29	34%	10	36%	2	18%	37	36%
	Could get rebates/tax credits/on sale	9	8%	3	9%	6	8%	8	9%	1	4%	1	9%	8	8%

Survey Question		Total		HPWH Tier: Tier 1		HPWH Tier: Tier 2/3		State: OR		State: WA		RUCC: Rural		RUCC: Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	Energy efficient model available	2	2%			2	3%			2	7%			2	2%
	Part of a remodel	1	1%	1	3%			1	1%					1	1%
	Wanted to change location	1	1%			1	1%			1	4%			1	1%
	New technology available	1	1%			1	1%			1	4%			1	1%
	Hard water creates problems with them	4	4%			4	5%	3	4%	1	4%	2	18%	2	2%
	Professional recommendation	1	1%			1	1%	1	1%					1	1%
	Don't Know	1	1%			1	1%	1	1%			1	9%		
	Total	114	100%	35	100%	79	100%	86	100%	28	100%	11	100%	103	100%
Q14. Besides heat pump water heaters, what other water heating solutions did you consider?	Standard electric storage water heaters	36	27%	16	35%	20	23%	27	28%	9	25%	8	50%	28	24%
	Tankless water heaters	74	55%	25	54%	49	56%	55	56%	19	53%	9	56%	65	55%
	Gas storage water heaters (requires natural gas service)	18	13%	10	22%	8	9%	16	16%	2	6%	3	19%	15	13%
	Solar water heating	17	13%	6	13%	11	13%	11	11%	6	17%	1	6%	16	14%
	No other types	38	28%	11	24%	27	31%	26	27%	12	33%	4	25%	34	29%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q15a. Why didn't you purchase a Standard electric storage waster heater instead of a heat pump water heater?	More expensive to purchase	5	14%	2	13%	3	15%	4	15%	1	11%	1	13%	4	14%
	More expensive to operate	2	6%	1	6%	1	5%	2	7%			1	13%	1	4%
	Less efficient	17	47%	10	63%	7	35%	13	48%	4	44%	4	50%	13	46%
	Heat pump water heaters were recommended	1	3%			1	5%	1	4%					1	4%
	No rebates/HPWH had rebates	8	22%	2	13%	6	30%	6	22%	2	22%	1	13%	7	25%
	Got HPWH for same price	2	6%	1	6%	1	5%	1	4%	1	11%	1	13%	1	4%

Survey Question		Total		HPWH Tier: Tier 1		HPWH Tier: Tier 2/3		State: OR		State: WA		RUCC: Rural		RUCC: Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	Wanted to go green	1	3%			1	5%			1	11%			1	4%
	Total	36	100%	16	100%	20	100%	27	100%	9	100%	8	100%	28	100%
Q15a. Why didn't you purchase a Standard electric storage waster heater instead of a heat pump water heater?	Heat pump water heaters were recommended	1	33%			1	33%			1	100%	1	50%		
	Wanted to go green	1	33%			1	33%	1	50%					1	100%
	Like HPWH technology/benefits	1	33%			1	33%	1	50%			1	50%		
	Total	3	100%			3	100%	2	100%	1	100%	2	100%	1	100%
Q15b. Why didn't you purchase a Tankless water heater instead of a heat pump water heater?	More expensive to purchase	21	30%	8	32%	13	28%	18	33%	3	18%	2	22%	19	31%
	More expensive to operate	1	1%			1	2%	1	2%					1	2%
	Less efficient	9	13%	5	20%	4	9%	8	15%	1	6%	1	11%	8	13%
	Requires unacceptable renovation	18	25%	5	20%	13	28%	12	22%	6	35%	1	11%	17	27%
	Heat pump water heaters were recommended	2	3%	1	4%	1	2%	1	2%	1	6%	1	11%	1	2%
	No rebates/HPWH had rebates	2	3%			2	4%	2	4%					2	3%
	Don't have gas	4	6%	1	4%	3	7%	3	6%	1	6%	3	33%	1	2%
	Didn't think it would be able to keep up	4	6%	2	8%	2	4%	3	6%	1	6%			4	7%
	Not familiar with the technology	2	3%			2	4%	1	2%	1	6%			2	3%
	Bad reviews	2	3%	1	4%	1	2%	2	4%			1	11%	1	2%
	Don’t like that technology	2	3%	1	4%	1	2%	2	4%					2	3%
	Like HPWH technology/benefits	1	1%	1	4%					1	6%			1	2%
	Climate too cold	1	1%			1	2%			1	6%			1	2%
	HPWH was easier to install	1	1%			1	2%			1	6%			1	2%

Survey Question		Total		HPWH Tier: Tier 1		HPWH Tier: Tier 2/3		State: OR		State: WA		RUCC: Rural		RUCC: Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	Didn't have electric service to support it	1	1%			1	2%	1	2%					1	2%
	Total	71	100%	25	100%	46	100%	54	100%	17	100%	9	100%	62	100%
Q15b. Why didn't you purchase a Tankless water heater instead of a heat pump water heater?	Don't have gas	1	100%			1	100%	1	100%					1	100%
	Total	1	100%			1	100%	1	100%					1	100%
Q15c. Why didn't you purchase a Gas storage water heater instead of a heat pump water heater?	More expensive to operate	2	11%	1	10%	1	13%	2	13%					2	13%
	Less efficient	2	11%	2	20%			2	13%					2	13%
	Requires unacceptable renovation	10	56%	4	40%	6	75%	8	50%	2	100%	1	33%	9	60%
	No rebates/HPWH had rebates	1	6%			1	13%	1	6%					1	7%
	Don't have gas	2	11%	2	20%			2	13%			1	33%	1	7%
	Don't like that technology	1	6%	1	10%			1	6%			1	33%		
	Total	18	100%	10	100%	8	100%	16	100%	2	100%	3	100%	15	100%
Q15d. Why didn't you purchase solar water heating instead of a heat pump water heater?	More expensive to purchase	4	25%	1	17%	3	30%	3	30%	1	17%			4	27%
	Less efficient	2	13%	2	33%			1	10%	1	17%			2	13%
	Requires unacceptable renovation	5	31%	2	33%	3	30%	3	30%	2	33%	1	100%	4	27%
	Like HPWH technology/benefits	1	6%			1	10%			1	17%			1	7%
	HPWH was easier to install	1	6%			1	10%			1	17%			1	7%
	Not enough sun on roof	3	19%	1	17%	2	20%	3	30%					3	20%
	Total	16	100%	6	100%	10	100%	10	100%	6	100%	1	100%	15	100%
Q15d. Why didn't you purchase solar water	Didn't think it would be able to keep up	1	100%			1	100%			1	100%			1	100%

Survey Question		Total		HPWH Tier: Tier 1		HPWH Tier: Tier 2/3		State: OR		State: WA		RUCC: Rural		RUCC: Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
heating instead of a heat pump water heater?	Total	1	100%			1	100%			1	100%			1	100%
*Q16. Where did you buy your heat pump water heater?	Home Depot	3	2%	1	1%	2	3%	2	2%	1	2%	2	19%	1	0%
	Sears	2	1%	1	1%	1	1%	2	2%					2	1%
	Lowe's	62	53%	19	36%	43	67%	38	40%	24	61%	8	51%	54	53%
	Contractor	12	9%	2	12%	10	7%	10	10%	2	9%			12	10%
	Plumber	21	19%	9	30%	12	10%	16	17%	5	20%	3	15%	18	19%
	Water heater installer	6	2%	1	1%	5	4%	6	6%			1	5%	5	2%
	Online / Internet / Website	1	0%			1	1%	1	1%					1	0%
	Oldfield's Appliance	12	5%	5	6%	7	5%	12	13%					12	6%
	HVAC / electric	3	2%	2	2%	1	2%	2	2%	1	2%	2	10%	1	2%
	Other local appliance store (Standard, Stover's, etc.)	7	6%	6	12%	1	1%	6	7%	1	5%			7	6%
	Total	129	100%	46	100%	83	100%	95	100%	34	100%	16	100%	113	100%
*Q18. Did you purchase a heat pump water heater at a reduced cost or 'on sale'?	Yes	83	73%	30	75%	53	72%	57	66%	26	78%	9	72%	74	73%
	No	38	27%	10	25%	28	28%	31	34%	7	22%	6	28%	32	27%
	Total	121	100%	40	100%	81	100%	88	100%	33	100%	15	100%	106	100%
Q19. Which statement BEST describes what initiated your new water heater purchase?	I needed a new water heater	47	36%	17	38%	30	35%	33	34%	14	40%	10	63%	37	32%
	I wanted to upgrade my water heater to something more efficient	69	52%	22	49%	47	54%	52	54%	17	49%	5	31%	64	55%
	I specifically wanted a heat pump water heater	5	4%	1	2%	4	5%	4	4%	1	3%			5	4%
	I noticed that heat pump water heaters were on sale	11	8%	5	11%	6	7%	8	8%	3	9%	1	6%	10	9%
	Total	132	100%	45	100%	87	100%	97	100%	35	100%	16	100%	116	100%

Survey Question		Total		HPWH Tier				State				RUCC			
				Tier 1		Tier 2/3		OR		WA		Rural		Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
Q20. Where did you get information about heat pump water heaters in general before you made your purchase?	NEEA website	1	1%	1	2%			1	1%					1	1%
	Utility website	5	4%	1	2%	4	5%	2	2%	3	8%			5	4%
	Internet (general)	73	55%	21	46%	52	59%	52	53%	21	58%	8	50%	65	55%
	Contractor provided materials	1	1%			1	1%	1	1%					1	1%
	Spoke to the contractor	9	7%	2	4%	7	8%	9	9%			1	6%	8	7%
	Spoke to someone who already had a heat pump water heater installed	5	4%	3	7%	2	2%	3	3%	2	6%	2	13%	3	3%
	Did not look for any information	4	3%	2	4%	2	2%	2	2%	2	6%	2	13%	2	2%
	Don't Know	10	8%	4	9%	6	7%	8	8%	2	6%			10	9%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q22. What initially interested you in a heat pump water heater, as opposed to other types of water heaters?	The rebates from your utility	24	18%	6	13%	18	21%	20	20%	4	11%	2	13%	22	19%
	The payback period	2	2%	1	2%	1	1%	2	2%			1	6%	1	1%
	The lower monthly operating cost	27	20%	9	20%	18	21%	20	20%	7	19%	4	25%	23	20%
	Saving energy	86	64%	30	65%	56	64%	64	65%	22	61%	12	75%	74	63%
	Concern of carbon footprint / greenhouse gases	1	1%			1	1%	1	1%					1	1%
	The product's appearance														
	The availability of the rebate	4	3%			4	5%	3	3%	1	3%	1	6%	3	3%
	The recommendation by contractor / plumber	5	4%	2	4%	3	3%	5	5%			2	13%	3	3%
	The water heater's programmability	3	2%	1	2%	2	2%	2	2%	1	3%			3	3%
	A desire to be high tech	3	2%	1	2%	2	2%	1	1%	2	6%			3	3%

Survey Question		Total		HPWH Tier: Tier 1		HPWH Tier: Tier 2/3		State: OR		State: WA		RUCC: Rural		RUCC: Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	Tax credit	3	2%			3	3%	3	3%					3	3%
	It was the only 80-gallon available	2	2%			2	2%	1	1%	1	3%			2	2%
	Other recommendations	2	2%			2	2%	1	1%	1	3%			2	2%
	Easy installation/ease of integrating into existing plumbing	5	4%	2	4%	3	3%	3	3%	2	6%	1	6%	4	3%
	Like/familiar with heat pump technology	3	2%	2	4%	1	1%	2	2%	1	3%			3	3%
	Heat transfer is good for their location	3	2%	1	2%	2	2%	2	2%	1	3%			3	3%
	Easy to maintain	1	1%	1	2%			1	1%					1	1%
	Resale value	1	1%			1	1%	1	1%					1	1%
	It was electric	1	1%			1	1%	1	1%					1	1%
	Don't know	9	7%	5	11%	4	5%	5	5%	4	11%	1	6%	8	7%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q23_2. How important was the payback period in your decision to purchase a heat pump water heater?	Not at all important														
	2														
	3														
	4														
	Very important	2	100%	1	100%	1	100%	2	100%			1	100%	1	100%
	Total	2	100%	1	100%	1	100%	2	100%			1	100%	1	100%
Q23_3. How important was the lower monthly operating cost in your decision to purchase a heat pump water heater?	Not at all important														
	2														
	3	1	4%			1	6%	1	5%					1	4%
	4	3	11%			3	17%	2	10%	1	14%			3	13%
	Very important	23	85%	9	100%	14	78%	17	85%	6	86%	4	100%	19	83%
	Total	27	100%	9	100%	18	100%	20	100%	7	100%	4	100%	23	100%

Survey Question		Total		HPWH Tier: Tier 1		HPWH Tier: Tier 2/3		State: OR		State: WA		RUCC: Rural		RUCC: Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
Q23_4. How important was saving energy in your decision to purchase a heat pump water heater?	Not at all important														
	2														
	3	4	5%	1	3%	3	6%	4	7%					4	6%
	4	16	19%	6	21%	10	19%	12	20%	4	18%	3	27%	13	18%
	Very important	63	76%	22	76%	41	76%	45	74%	18	82%	8	73%	55	76%
	Total	83	100%	29	100%	54	100%	61	100%	22	100%	11	100%	72	100%
Q23_5. How important was concern of carbon footprint / greenhouse gases in your decision to purchase a heat pump water heater?	Not at all important														
	2														
	3														
	4														
	Very important	1	100%			1	100%	1	100%					1	100%
	Total	1	100%			1	100%	1	100%					1	100%
Q23_7. How important was the availability of the rebate in your decision to purchase a heat pump water heater?	Not at all important														
	2														
	3	1	33%			1	33%	1	50%					1	50%
	4	1	33%			1	33%			1	100%	1	100%		
	Very important	1	33%			1	33%	1	50%					1	50%
	Total	3	100%			3	100%	2	100%	1	100%	1	100%	2	100%
Q23_9. How important was the recommendation by contractor / plumber in your decision to purchase a heat pump water heater?	Not at all important														
	2	1	20%	1	50%			1	20%			1	50%		
	3														
	4	2	40%			2	67%	2	40%					2	67%
	Very important	2	40%	1	50%	1	33%	2	40%			1	50%	1	33%
	Total	5	100%	2	100%	3	100%	5	100%			2	100%	3	100%
Q23_10. How important was the	Not at all important														
	2														

Survey Question		Total		HPWH Tier				State				RUCC			
				Tier 1		Tier 2/3		OR		WA		Rural		Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
water heater's programmability in your decision to purchase a heat pump water heater?	3														
	4	1	50%	1	100%			1	100%					1	50%
	Very important	1	50%			1	100%			1	100%			1	50%
	Total	2	100%	1	100%	1	100%	1	100%	1	100%			2	100%
Q23_13. How important was the desire to be high tech in your decision to purchase a heat pump water heater?	Not at all important														
	2														
	3														
	4														
	Very important	2	100%	1	100%	1	100%	1	100%	1	100%			2	100%
	Total	2	100%	1	100%	1	100%	1	100%	1	100%			2	100%
Q23_15. How important was 'Other' in your decision to purchase a heat pump water heater?	Not at all important														
	2	1	3%	1	13%					1	14%			1	4%
	3	1	3%	1	13%			1	5%					1	4%
	4	7	24%	2	25%	5	24%	5	23%	2	29%			7	27%
	Very important	20	69%	4	50%	16	76%	16	73%	4	57%	3	100%	17	65%
	Total	29	100%	8	100%	21	100%	22	100%	7	100%	3	100%	26	100%
Q25. How important was the discounted "sale" price in your decision to purchase a heat pump water heater?	Not at all Important	6	7%	2	7%	4	8%	4	7%	2	8%	1	11%	5	7%
	2	2	3%	1	3%	1	2%	2	4%			2	22%		
	3	11	14%	4	13%	7	14%	10	18%	1	4%	1	11%	10	14%
	4	15	19%	3	10%	12	24%	9	16%	6	24%	3	33%	12	17%
	Very Important	47	58%	20	67%	27	53%	31	55%	16	64%	2	22%	45	63%
	Total	81	100%	30	100%	51	100%	56	100%	25	100%	9	100%	72	100%
Q23_1 and Q27 combined. Importance of utility rebates on decision to install HPWH	Not at all important	1	1%			1	1%			1	3%			1	1%
	2	4	3%	2	5%	2	2%	3	3%	1	3%	2	13%	2	2%
	3	15	12%	3	7%	12	14%	12	12%	3	9%	2	13%	13	11%
	4	20	15%	8	18%	12	14%	14	14%	6	18%	5	31%	15	13%

Survey Question		Total		HPWH Tier: Tier 1		HPWH Tier: Tier 2/3		State: OR		State: WA		RUCC: Rural		RUCC: Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	Very important	91	70%	31	71%	60	69%	69	70%	22	67%	7	44%	84	73%
	Total	131	100%	44	100%	87	100%	98	100%	33	100%	16	100%	115	100%
Q29. How important was the ENERGY STAR label in your decision to purchase a HPWH?	Not at all important	5	4%	4	9%	1	1%	3	3%	2	6%	1	6%	4	4%
	2	8	6%			8	10%	5	5%	3	9%	2	13%	6	5%
	3	21	17%	6	14%	15	18%	13	14%	8	24%	1	6%	20	18%
	4	34	27%	17	40%	17	20%	29	31%	5	15%	7	44%	27	24%
	Very important	59	47%	16	37%	43	51%	43	46%	16	47%	5	31%	54	49%
	Total	127	100%	43	100%	84	100%	93	100%	34	100%	16	100%	111	100%
Q33. How important was your familiarity with the water heater brand in your decision to purchase a HPWH?	Not at all important	32	24%	14	31%	18	21%	22	23%	10	28%	4	27%	28	24%
	2	17	13%	4	9%	13	15%	10	10%	7	19%	4	27%	13	11%
	3	43	33%	15	33%	28	32%	35	37%	8	22%	4	27%	39	33%
	4	25	19%	6	13%	19	22%	18	19%	7	19%			25	21%
	Very important	15	11%	6	13%	9	10%	11	12%	4	11%	3	20%	12	10%
	Total	132	100%	45	100%	87	100%	96	100%	36	100%	15	100%	117	100%
Q35. Were there any other factors that were important in your decision to install a HPWH?	(No)	101	75%	36	78%	65	74%	71	72%	30	83%	11	69%	90	76%
	Easy installation	7	5%	2	4%	5	6%	5	5%	2	6%	1	6%	6	5%
	Efficiency/operating cost	3	2%	1	2%	2	2%	3	3%					3	3%
	In stock	1	1%	1	2%			1	1%			1	6%		
	Increases value of home	1	1%	1	2%			1	1%					1	1%
	Needed new water heater in general	3	2%	1	2%	2	2%	2	2%	1	3%	2	13%	1	1%
	New technology	2	2%			2	2%	1	1%	1	3%	1	6%	1	1%
	Operating cost	1	1%	1	2%					1	3%			1	1%
	Other	3	2%	1	2%	2	2%	3	3%					3	3%
	Rebates/incentives	2	2%			2	2%	2	2%					2	2%
	Reviews/ratings	1	1%			1	1%	1	1%					1	1%
	Smaller size than other	3	2%	2	4%	1	1%	3	3%					3	3%

Survey Question		Total		HPWH Tier: Tier 1		HPWH Tier: Tier 2/3		State: OR		State: WA		RUCC: Rural		RUCC: Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	options														
	Trust utility recommendation	2	2%			2	2%	2	2%					2	2%
	Upfront cost	2	2%			2	2%	1	1%	1	3%			2	2%
	Warranty	2	2%			2	2%	2	2%					2	2%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q36. Do you believe the heat pump water heater increased, decreased, or had no effect on the value of your home?	Increased the value	80	67%	29	69%	51	66%	58	66%	22	71%	8	57%	72	69%
	Decreased the value	1	1%			1	1%			1	3%			1	1%
	No effect on value of home	38	32%	13	31%	25	33%	30	34%	8	26%	6	43%	32	31%
	Total	119	100%	42	100%	77	100%	88	100%	31	100%	14	100%	105	100%
Q37. Would you have purchased the same water heater if the Smart Water Heat rebate were half as much?	Yes	71	57%	27	64%	44	54%	53	58%	18	55%	9	56%	62	57%
	Maybe	35	28%	11	26%	24	29%	27	30%	8	24%	4	25%	31	29%
	No	18	15%	4	10%	14	17%	11	12%	7	21%	3	19%	15	14%
	Total	124	100%	42	100%	82	100%	91	100%	33	100%	16	100%	108	100%
Q38. Was there anything you were concerned about when you were considering a heat pump water heater?	No concerns	39	29%	12	26%	27	31%	27	28%	12	33%	4	25%	35	30%
	Performance	3	2%	1	2%	2	2%	3	3%					3	3%
	Energy savings	8	6%	5	11%	3	3%	6	6%	2	6%	3	19%	5	4%
	Capability/functionality	10	8%	5	11%	5	6%	8	8%	2	6%	1	6%	9	8%
	Reliability	12	9%	2	4%	10	11%	9	9%	3	8%	1	6%	11	9%
	Noise	7	5%	2	4%	5	6%	6	6%	1	3%			7	6%
	Ducting	1	1%			1	1%	1	1%					1	1%
	Maintenance needs	2	2%	1	2%	1	1%	1	1%	1	3%			2	2%
	Manufacturer customer service/support	1	1%	1	2%			1	1%					1	1%
	Exhaust air	11	8%	2	4%	9	10%	8	8%	3	8%	2	13%	9	8%

Survey Question		Total		HPWH Tier: Tier 1		HPWH Tier: Tier 2/3		State: OR		State: WA		RUCC: Rural		RUCC: Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	Installation location space requirements	16	12%	4	9%	12	14%	12	12%	4	11%	2	13%	14	12%
	Installation - other issues	11	8%	7	15%	4	5%	7	7%	4	11%	2	13%	9	8%
	New technology	7	5%	1	2%	6	7%	4	4%	3	8%	1	6%	6	5%
	Longevity/life span	4	3%			4	5%	4	4%					4	3%
	Other, please specify:	6	5%	1	2%	5	6%	4	4%	2	6%			6	5%
	Condensate line/drain	10	8%	6	13%	4	5%	9	9%	1	3%	2	13%	8	7%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q39. How did you overcome the (performance) concern?	(n/a)	131	98%	45	98%	86	98%	95	97%	36	100%	16	100%	115	98%
	Did not overcome concern, bought it anyways	1	1%			1	1%	1	1%					1	1%
	Online reviews/ratings	1	1%			1	1%	1	1%					1	1%
	Retailer advice	1	1%	1	2%			1	1%					1	1%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q39. How did you overcome the (energy savings) concern?	(n/a)	126	94%	41	89%	85	97%	92	94%	34	94%	13	81%	113	96%
	Did additional research	1	1%	1	2%					1	3%			1	1%
	Did not overcome concern, bought it anyways	1	1%			1	1%			1	3%			1	1%
	Online reviews/ratings	2	2%			2	2%	2	2%			1	6%	1	1%
	Product specs	1	1%	1	2%			1	1%					1	1%
	Sale/rebate/incentive	1	1%	1	2%			1	1%			1	6%		
	Utilities and ETO validating it with their programs	2	2%	2	4%			2	2%			1	6%	1	1%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q39. How did you overcome the (capability/functionality) concern?	(n/a)	124	93%	41	89%	83	94%	90	92%	34	94%	15	94%	109	92%
	Did additional research	2	2%	1	2%	1	1%	1	1%	1	3%			2	2%
	Did not overcome concern, bought it anyways	3	2%	1	2%	2	2%	2	2%	1	3%	1	6%	2	2%

Survey Question		Total		HPWH Tier: Tier 1		HPWH Tier: Tier 2/3		State: OR		State: WA		RUCC: Rural		RUCC: Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	Leaned about efficiency settings	3	2%	3	7%			3	3%					3	3%
	Retailer advice	1	1%			1	1%	1	1%					1	1%
	Talked to friends/family	1	1%			1	1%	1	1%					1	1%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q39. How did you overcome the (cost) concern?	(n/a)	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q39. How did you overcome the (reliability) concern?	(n/a)	122	91%	44	96%	78	89%	89	91%	33	92%	15	94%	107	91%
	Did additional research	4	3%	1	2%	3	3%	3	3%	1	3%			4	3%
	Did not overcome concern, bought it anyways	2	2%			2	2%	1	1%	1	3%			2	2%
	Learned the issue was resolved for newer models	1	1%			1	1%	1	1%					1	1%
	Online reviews/ratings	1	1%			1	1%	1	1%					1	1%
	Talked to friends/family	1	1%			1	1%			1	3%			1	1%
	Trusted manufacturer	1	1%			1	1%	1	1%					1	1%
	Warranty	2	2%	1	2%	1	1%	2	2%			1	6%	1	1%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q39. How did you overcome the (brand) concern?	(n/a)	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q39. How did you overcome the (noise) concern?	(n/a)	127	95%	44	96%	83	94%	92	94%	35	97%	16	100%	111	94%
	Chose a different installation location	1	1%	1	2%			1	1%					1	1%
	Contractor advice	1	1%			1	1%	1	1%					1	1%
	Did not overcome concern, bought it anyways	2	2%			2	2%	2	2%					2	2%
	Expected it would not be a big issue	2	2%			2	2%	1	1%	1	3%			2	2%

Survey Question		Total		HPWH Tier				State				RUCC			
				Tier 1		Tier 2/3		OR		WA		Rural		Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	Self install	1	1%	1	2%			1	1%					1	1%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q39. How did you overcome the (physical size) concern?	(n/a)	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q39. How did you overcome the (ducting) concern?	(n/a)	133	99%	46	100%	87	99%	97	99%	36	100%	16	100%	117	99%
	Drilled new hole	1	1%			1	1%	1	1%					1	1%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q39. How did you overcome the (maintenance needs) concern?	(n/a)	132	99%	45	98%	87	99%	97	99%	35	97%	16	100%	116	98%
	Learned that the issue did not apply to our home/situation	1	1%			1	1%			1	3%			1	1%
	Warranty	1	1%	1	2%			1	1%					1	1%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q39. How did you overcome the (manufacturer customer service/support) concern?	(n/a)	133	99%	45	98%	88	100%	97	99%	36	100%	16	100%	117	99%
	Learned the issue was resolved for newer models	1	1%	1	2%			1	1%					1	1%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q39. How did you overcome the (exhaust air) concern?	(n/a)	123	92%	44	96%	79	90%	90	92%	33	92%	14	88%	109	92%
	Contractor advice	2	2%			2	2%	2	2%					2	2%
	Did not overcome concern, bought it anyways	3	2%			3	3%	2	2%	1	3%			3	3%
	Drilled new hole	1	1%	1	2%			1	1%			1	6%		
	Expected it would not be a big issue	2	2%	1	2%	1	1%	1	1%	1	3%			2	2%
	Learned that the issue did not apply to our home/situation	3	2%			3	3%	2	2%	1	3%	1	6%	2	2%

Survey Question		Total		HPWH Tier				State				RUCC			
		Total		Tier 1		Tier 2/3		OR		WA		Rural		Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q39. How did you overcome the (install location space requirements) concern?	(n/a)	118	88%	42	91%	76	86%	86	88%	32	89%	14	88%	104	88%
	Chose a different installation location	4	3%	2	4%	2	2%	3	3%	1	3%	1	6%	3	3%
	Contractor advice	1	1%			1	1%	1	1%					1	1%
	Downsized	1	1%	1	2%			1	1%					1	1%
	Measured available space	7	5%			7	8%	5	5%	2	6%	1	6%	6	5%
	Small renovation to make it fit	3	2%	1	2%	2	2%	2	2%	1	3%			3	3%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q39. How did you overcome the (other installation) concern?	(n/a)	123	92%	39	85%	84	96%	91	93%	32	89%	14	88%	109	92%
	Chose an installer they trusted	3	2%	2	4%	1	1%	3	3%					3	3%
	Did additional research	1	1%	1	2%			1	1%			1	6%		
	Learned that the issue did not apply to our home/situation	1	1%			1	1%			1	3%			1	1%
	Retailer advice	1	1%			1	1%	1	1%					1	1%
	Self install	4	3%	3	7%	1	1%	1	1%	3	8%	1	6%	3	3%
	Talked to friends/family	1	1%	1	2%			1	1%					1	1%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q39. How did you overcome the (new technology) concern?	(n/a)	127	95%	45	98%	82	93%	94	96%	33	92%	15	94%	112	95%
	Did not overcome concern, bought it anyways	1	1%			1	1%			1	3%			1	1%
	Learned the issue was resolved for newer models	2	2%	1	2%	1	1%	1	1%	1	3%			2	2%
	Online reviews/ratings	2	2%			2	2%	2	2%					2	2%
	Sale/rebate/incentive	1	1%			1	1%			1	3%	1	6%		
	Talked to friends/family	1	1%			1	1%	1	1%					1	1%

Survey Question		Total		HPWH Tier				State				RUCC			
		Total		Tier 1		Tier 2/3		OR		WA		Rural		Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q39. How did you overcome the (longevity/life span) concern?	(n/a)	130	97%	46	100%	84	96%	94	96%	36	100%	16	100%	114	97%
	Did additional research	1	1%			1	1%	1	1%					1	1%
	Did not overcome concern, bought it anyways	1	1%			1	1%	1	1%					1	1%
	Retailer advice	1	1%			1	1%	1	1%					1	1%
	Warranty	1	1%			1	1%	1	1%					1	1%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q39. How did you overcome the (condensate line/drain) concern?	(n/a)	124	93%	40	87%	84	96%	89	91%	35	97%	14	88%	110	93%
	Chose a different installation location	1	1%	1	2%			1	1%					1	1%
	Did not overcome concern, bought it anyways	2	2%	1	2%	1	1%	1	1%	1	3%	1	6%	1	1%
	Drilled new hole	3	2%	2	4%	1	1%	3	3%					3	3%
	Used existing drain	4	3%	2	4%	2	2%	4	4%			1	6%	3	3%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q39. How did you overcome the (other) concern?	(n/a)	128	96%	45	98%	83	94%	94	96%	34	94%	16	100%	112	95%
	Learned the issue was resolved for newer models	1	1%			1	1%			1	3%			1	1%
	Retailer advice	2	2%			2	2%	1	1%	1	3%			2	2%
	Sale/rebate/incentive	2	2%	1	2%	1	1%	2	2%					2	2%
	Trusted manufacturer	1	1%			1	1%	1	1%					1	1%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q40. Did you use a loan to pay for your new water heater?	Yes	6	5%	2	4%	4	5%	3	3%	3	8%	1	6%	5	4%
	No	128	96%	44	96%	84	96%	95	97%	33	92%	15	94%	113	96%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q41. From which of	Local bank or credit union	3	50%	2	100%	1	25%	1	33%	2	67%	1	100%	2	40%

Survey Question		Total		HPWH Tier: Tier 1		HPWH Tier: Tier 2/3		State: OR		State: WA		RUCC: Rural		RUCC: Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
the following sources did you get that loan?	Utility company	1	17%			1	25%	1	33%					1	20%
	Retailer credit	2	33%			2	50%	1	33%	1	33%			2	40%
	Total	6	100%	2	100%	4	100%	3	100%	3	100%	1	100%	5	100%
Q42. Please rate how important the availability of the loan was in your decision to purchase a heat pump water heater	Not at all important														
	2														
	3	1	25%	1	100%			1	33%					1	25%
	4														
	Very important	3	75%			3	100%	2	67%	1	100%			3	75%
	Total	4	100%	1	100%	3	100%	3	100%	1	100%			4	100%
Q44. What was the interest rate of the loan you received for the new water heater?	Variable interest rate														
	0	2	40%	1	100%	1	25%	2	67%					2	50%
	4	2	40%			2	50%	1	33%	1	50%	1	100%	1	25%
	18	1	20%			1	25%			1	50%			1	25%
	Total	5	100%	1	100%	4	100%	3	100%	2	100%	1	100%	4	100%
Q45. Did you use a credit card to pay for any portion of your new water heater?	Yes	81	66%	25	58%	56	70%	63	69%	18	56%	10	63%	71	66%
	No	42	34%	18	42%	24	30%	28	31%	14	44%	6	38%	36	34%
	Total	123	100%	43	100%	80	100%	91	100%	32	100%	16	100%	107	100%
Q46. What percent of the new water heater was purchased using a credit card?	50	1	1%			1	2%			1	6%			1	1%
	100	79	99%	25	100%	54	98%	62	100%	17	94%	10	100%	69	99%
	Total	80	100%	25	100%	55	100%	62	100%	18	100%	10	100%	70	100%
Q47. Please rate how important the ability to use your credit card to finance the water heater was in your decision to purchase a heat pump water heater	Not at all important	38	48%	14	56%	24	44%	23	37%	15	83%	5	50%	33	47%
	2	6	8%	1	4%	5	9%	6	10%			1	10%	5	7%
	3	11	14%	3	12%	8	15%	10	16%	1	6%			11	16%
	4	11	14%	2	8%	9	16%	11	18%			2	20%	9	13%
	Very important	14	18%	5	20%	9	16%	12	19%	2	11%	2	20%	12	17%
	Total	80	100%	25	100%	55	100%	62	100%	18	100%	10	100%	70	100%

Survey Question		Total		HPWH Tier				State				RUCC			
				Tier 1		Tier 2/3		OR		WA		Rural		Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
Q48. Did you, or will you, receive a FEDERAL tax credit for your new water heater?	Yes - received already	17	17%	9	25%	8	12%	13	17%	4	15%	1	7%	16	18%
	Yes - will receive	30	29%	9	25%	21	31%	23	30%	7	27%	2	14%	28	32%
	No	56	54%	18	50%	38	57%	41	53%	15	58%	11	79%	45	51%
	Total	103	100%	36	100%	67	100%	77	100%	26	100%	14	100%	89	100%
Q49. How important was the availability of the FEDERAL tax credit was in your decision to purchase a heat pump water heater?	Not at all important	12	26%	4	24%	8	28%	6	17%	6	60%			12	28%
	2	3	7%	1	6%	2	7%	3	8%			1	33%	2	5%
	3	5	11%	3	18%	2	7%	5	14%			1	33%	4	9%
	4	7	15%	2	12%	5	17%	5	14%	2	20%	1	33%	6	14%
	Very important	19	41%	7	41%	12	41%	17	47%	2	20%			19	44%
	Total	46	100%	17	100%	29	100%	36	100%	10	100%	3	100%	43	100%
Q51. Did you, or will you, receive a STATE tax credit for your new water heater?	Yes - received already	27	25%	11	31%	16	23%	27	33%			3	20%	24	26%
	Yes - will receive	40	37%	12	33%	28	39%	40	49%			4	27%	36	39%
	No	40	37%	13	36%	27	38%	15	18%	25	100%	8	53%	32	35%
	Total	107	100%	36	100%	71	100%	82	100%	25	100%	15	100%	92	100%
Q52. How important was the availability of the STATE tax credit was in your decision to purchase a heat pump water heater?	Not at all important														
	2	4	6%	3	13%	1	2%	4	6%			3	43%	1	2%
	3	8	12%	2	9%	6	14%	8	12%			1	14%	7	12%
	4	9	13%	3	13%	6	14%	9	13%					9	15%
	Very important	46	69%	15	65%	31	71%	46	69%			3	43%	43	72%
	Total	67	100%	23	100%	44	100%	67	100%	0	0%	7	100%	60	100%
*Q54. Did you install the new water heater yourself, or did you hire an installer to do it? (Existing)	Installed by respondent	56	53%	22	54%	34	53%	34	36%	22	67%	8	63%	48	52%
	Hired an installer	74	47%	21	46%	53	47%	64	64%	10	33%	7	37%	67	48%
	Total	130	100%	43	100%	87	100%	98	100%	32	100%	15	100%	115	100%
*Q55. Did you install	Installed by respondent	1	14%			1	100%			1	14%	1	100%		

Survey Question		Total		HPWH Tier: Tier 1		HPWH Tier: Tier 2/3		State: OR		State: WA		RUCC: Rural		RUCC: Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
the new water heater yourself, did you hire an installer to do it separate from your home build, or did the general contractor building your home manage the installation? (New)	General contractor managed installation	3	86%	3	100%					3	86%			3	100%
	Total	4	100%	3	100%	1	100%			4	100%	1	100%	3	100%
*Q56. Whose idea was it to purchase a heat pump water heater rather than another type of water heater?	Was customer's idea	63	83%	20	83%	43	82%	52	81%	11	84%	5	68%	58	84%
	Was contractor suggestion	12	16%	3	15%	9	16%	10	15%	2	16%	2	32%	10	15%
	A combo of the two	2	2%	1	2%	1	1%	2	3%					2	2%
	Total	77	100%	24	100%	53	100%	64	100%	13	100%	7	100%	70	100%
*Q57. How did you find the person or company that installed your new water heater?	Personal recommendation	5	8%	2	13%	3	4%	4	6%	1	11%			5	9%
	Retailer recommendation	15	18%	3	15%	12	21%	13	20%	2	16%	1	12%	14	18%
	Manufacturer recommendation	1	1%	1	2%			1	2%					1	1%
	Previous relationship with contractor	24	37%	13	52%	11	23%	19	32%	5	42%	4	60%	20	35%
	Utility contractor list/Sustainable Coalition	13	12%	2	4%	11	19%	12	18%	1	5%			13	13%
	Energy Trust	5	4%			5	7%	5	7%			1	12%	4	3%
	Internet search	3	4%	1	2%	2	6%	2	3%	1	5%	1	16%	2	4%
	Through my contractor	5	13%	2	21%	3	4%	3	4%	2	21%			5	13%
	Looked up plumbers/made many phone calls	3	6%			3	11%	1	1%	2	11%			3	6%
	Installers came door-to-door	2	2%			2	3%	2	3%					2	2%
	At the State Fair	1	1%			1	1%	1	1%					1	1%
	Don't Know	1	1%	1	2%			1	2%					1	1%

Survey Question		Total		HPWH Tier				State				RUCC			
		Total		Tier 1		Tier 2/3		OR		WA		Rural		Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	Total	77	100%	24	100%	53	100%	64	100%	13	100%	7	100%	70	100%
*Q58. What was the most important source for finding the person or company that installed your new water heater?	Previous relationship with contractor	1	100%	1	100%					1	100%			1	100%
	Total	1	100%	1	100%					1	100%			1	100%
Q59. Please rate your level of satisfaction with the installer who installed your new water heater	Not at all satisfied	2	3%			2	4%	2	3%					2	3%
	2	4	5%	2	8%	2	4%	2	3%	2	15%			4	6%
	3	3	4%	1	4%	2	4%	2	3%	1	8%			3	4%
	4	15	20%	4	17%	11	21%	13	20%	2	15%	1	14%	14	20%
	Very satisfied	53	69%	17	71%	36	68%	45	70%	8	62%	6	86%	47	67%
	Total	77	100%	24	100%	53	100%	64	100%	13	100%	7	100%	70	100%
*Q61. How long did the actual water heater installation take, in total?	Less than 2 hours	54	45%	14	34%	40	52%	37	39%	17	50%	9	58%	45	44%
	2-4 hours	47	34%	15	29%	32	36%	37	39%	10	29%	4	29%	43	34%
	4-6 hours	18	15%	9	26%	9	8%	15	16%	3	13%	2	10%	16	15%
	6-8 hours	4	2%	1	2%	3	2%	4	4%			1	4%	3	2%
	8-10 hours	1	2%			1	2%			1	3%			1	2%
	Over 10 hours	2	4%	2	10%			1	1%	1	5%			2	4%
	Total	126	100%	41	100%	85	100%	94	100%	32	100%	16	100%	110	100%
*Q62. Please rate your level of satisfaction with the amount of time it took to install the new water heater	Not at all satisfied	2	1%	1	1%	1	1%	2	2%					2	1%
	2	1	1%	1	1%			1	1%					1	1%
	3	14	20%	6	32%	8	12%	6	6%	8	30%	2	19%	12	20%
	4	27	21%	13	24%	14	19%	20	22%	7	20%	2	19%	25	21%
	Very satisfied	84	58%	21	41%	63	68%	66	68%	18	50%	12	63%	72	57%
	Total	128	100%	42	100%	86	100%	95	100%	33	100%	16	100%	112	100%
*Q64. Where is your	Basement	28	17%	7	8%	21	24%	22	22%	6	13%	3	24%	25	16%

Survey Question		Total		HPWH Tier: Tier 1		HPWH Tier: Tier 2/3		State: OR		State: WA		RUCC: Rural		RUCC: Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
new water heater located?	Garage	78	59%	29	71%	49	50%	59	60%	19	59%	8	44%	70	61%
	Utility room	15	12%	7	18%	8	9%	11	12%	4	13%	3	14%	12	12%
	Utility closet	3	4%			3	7%			3	7%	1	14%	2	3%
	Kitchen	2	2%			2	3%	1	1%	1	2%			2	2%
	Other closet inside your home	3	2%	1	1%	2	3%	2	2%	1	2%			3	2%
	Crawl space	2	2%	1	1%	1	2%	1	1%	1	2%			2	2%
	Alcove in family room	1	0%			1	1%	1	1%					1	0%
	Outside	1	1%	1	1%			1	1%			1	5%		
	Basement & laundry room	1	1%			1	2%			1	2%			1	1%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
*Q65. Was your previous water installed in the same location as your new HPWH?	Yes	124	96%	41	97%	83	96%	93	95%	31	97%	13	90%	111	97%
	No	6	4%	2	3%	4	4%	5	5%	1	3%	2	10%	4	3%
	Total	130	100%	43	100%	87	100%	98	100%	32	100%	15	100%	115	100%
*Q66. Where was your previous water heater located?	Basement	2	25%	1	50%	1	16%	2	41%			1	56%	1	15%
	Garage	2	22%			2	31%	2	36%			1	44%	1	15%
	Kitchen	1	38%			1	54%			1	100%			1	51%
	Out building	1	14%	1	50%			1	23%					1	19%
	Total	6	100%	2	100%	4	100%	5	100%	1	100%	2	100%	4	100%
*Q67. Is your new water heater installed in a part of your house that is heated?	Yes - heated	34	24%	10	11%	24	34%	23	24%	11	24%	7	59%	27	20%
	No - unheated	99	76%	36	89%	63	66%	74	76%	25	76%	9	41%	90	80%
	Total	133	100%	46	100%	87	100%	97	100%	36	100%	16	100%	117	100%
*Q68. Is your new water heater installed in a part of your house that is insulated?	Yes - insulated	101	82%	36	84%	65	80%	70	72%	31	89%	13	87%	88	81%
	No - not insulated	32	18%	10	16%	22	20%	28	28%	4	11%	3	13%	29	19%
	Total	133	100%	46	100%	87	100%	98	100%	35	100%	16	100%	117	100%
*Q69. Is your new	Yes - intake air is ducted	7	6%	2	8%	5	5%	5	5%	2	7%			7	7%

Survey Question		Total		HPWH Tier				State				RUCC			
				Tier 1		Tier 2/3		OR		WA		Rural		Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
water heater installed with the intake air ducted from the outside into the HPWH?	No - intake air is not ducted	125	94%	43	93%	82	95%	92	95%	33	93%	16	100%	109	93%
	Total	132	100%	45	100%	87	100%	97	100%	35	100%	16	100%	116	100%
*Q70. Is your new water heater installed with the exhaust ducted to the outside?	Yes, exhaust is ducted	9	7%	2	7%	7	6%	7	7%	2	7%			9	7%
	No, exhaust is not ducted	123	90%	42	86%	81	94%	90	92%	33	89%	15	95%	108	90%
	Don't know	2	3%	2	7%			1	1%	1	4%	1	5%	1	3%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q71. Did someone contact you and come to your home after the heat pump water heater was installed to conduct a quality assurance inspection?	Yes	44	34%	18	39%	26	32%	31	34%	13	36%	6	38%	38	34%
	No	84	66%	28	61%	56	68%	61	66%	23	64%	10	63%	74	66%
	Total	128	100%	46	100%	82	100%	92	100%	36	100%	16	100%	112	100%
Q72. Level of satisfaction with the quality assurance visit	Not at all satisfied	1	2%			1	4%			1	8%			1	3%
	2														
	3	2	5%	1	6%	1	4%	2	7%			1	17%	1	3%
	4	9	21%	4	22%	5	19%	5	16%	4	31%	2	33%	7	18%
	Very satisfied	32	73%	13	72%	19	73%	24	77%	8	62%	3	50%	29	76%
	Total	44	100%	18	100%	26	100%	31	100%	13	100%	6	100%	38	100%
Q74. Other than the quality assurance visits, did you have to contact anyone for any of the following reasons?	To service the water heater	6	5%	2	4%	4	5%	5	5%	1	3%	1	6%	5	4%
	To repair a broken part of the water heater	5	4%	2	4%	3	3%	4	4%	1	3%			5	4%
	To replace the entire water heater	1	1%	1	2%			1	1%					1	1%
	To answer questions about the water heater performance	3	2%	2	4%	1	1%	2	2%	1	3%			3	3%

Survey Question		Total		HPWH Tier: Tier 1		HPWH Tier: Tier 2/3		State: OR		State: WA		RUCC: Rural		RUCC: Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	No	117	87%	37	80%	80	91%	86	88%	31	86%	15	94%	102	86%
	Earthquake straps	2	2%	1	2%	1	1%	1	1%	1	3%			2	2%
	Contractor had to return stolen property	1	1%			1	1%	1	1%					1	1%
	Left an elbow out of water drop line	1	1%			1	1%	1	1%			1	6%		
	Help with rebate paperwork	1	1%	1	2%					1	3%			1	1%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q75. Did the installer/contractor educate you regarding which water heater settings to use?	Yes	53	70%	14	58%	39	75%	45	71%	8	62%	3	50%	50	71%
	No	23	30%	10	42%	13	25%	18	29%	5	39%	3	50%	20	29%
	Total	76	100%	24	100%	52	100%	63	100%	13	100%	6	100%	70	100%
*Q76. What setting - or operation mode - is your heat pump water heater set for?	Efficiency Mode	10	10%	2	9%	8	11%	6	7%	4	12%	3	26%	7	9%
	Heat Pump Only	26	29%	8	36%	18	24%	16	20%	10	34%	2	11%	24	30%
	Hybrid	66	52%	23	52%	43	52%	51	65%	15	44%	6	46%	60	52%
	High Demand/Boost	1	2%			1	3%			1	2%			1	2%
	Electric Only	6	6%	1	1%	5	9%	3	4%	3	7%	1	17%	5	5%
	Automatic	1	0%			1	1%	1	1%					1	1%
	Standard	1	1%	1	1%			1	2%					1	1%
	ECA/ NW climate	1	0%			1	1%	1	1%					1	1%
	Northern states setting (colder climate)	1	0%			1	1%	1	1%					1	1%
	Total	113	100%	35	100%	78	100%	80	100%	33	100%	12	100%	101	100%
*Q77. Have you changed the setting since the water heater was installed?	Yes	55	47%	16	43%	39	50%	36	37%	19	53%	3	26%	52	49%
	No	76	53%	29	57%	47	50%	60	63%	16	47%	12	74%	64	51%
	Total	131	100%	45	100%	86	100%	96	100%	35	100%	15	100%	116	100%
*Q78. What setting	Efficiency Mode	11	12%	3	12%	8	12%	7	9%	4	14%	3	31%	8	10%

Survey Question		Total		HPWH Tier: Tier 1		HPWH Tier: Tier 2/3		State: OR		State: WA		RUCC: Rural		RUCC: Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
was it set for when it was installed?	Heat Pump Only	26	25%	8	26%	18	24%	19	25%	7	25%	4	39%	22	24%
	Hybrid	64	58%	20	52%	44	62%	47	61%	17	56%	4	30%	60	61%
	Electric Only	3	1%			3	2%	3	4%					3	2%
	Standard	2	4%	2	10%			1	2%	1	6%			2	4%
	Total	106	100%	33	100%	73	100%	77	100%	29	100%	11	100%	95	100%
*Q79. Why did you change the setting?	(n/a)	79	54%	30	58%	49	52%	62	64%	17	48%	13	78%	66	52%
	Experimenting to see what would change (e.g. bill, condensation)	1	0%			1	1%	1	1%			1	4%		
	Long term change, improve efficiency	2	1%	1	1%	1	1%	2	2%					2	1%
	Long term change, wanted more capacity	5	8%	2	12%	3	5%	1	1%	4	13%			5	9%
	Seasonal change, different settings for cold weather	11	7%	1	1%	10	11%	8	8%	3	7%	1	14%	10	6%
	Short term change, had guests	13	13%	6	16%	7	10%	8	8%	5	15%			13	14%
	Short term change, high use days	6	4%	1	1%	5	7%	4	4%	2	4%			6	5%
	Short term change, reduce noise	2	1%	1	1%	1	1%	2	2%					2	1%
	Short term change, went on vacation	11	9%	4	9%	7	8%	8	8%	3	9%	1	5%	10	9%
	To alter temperature of the room it is in	2	2%			2	3%	1	1%	1	2%			2	2%
	Was having problems with capacity, but resolved	2	2%			2	3%	1	1%	1	2%			2	2%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q80. Prior to now, were you aware that	Yes	113	86%	37	82%	76	88%	84	88%	29	81%	15	94%	98	85%
	No	18	14%	8	18%	10	12%	11	12%	7	19%	1	6%	17	15%

Survey Question		Total		HPWH Tier: Tier 1		HPWH Tier: Tier 2/3		State: OR		State: WA		RUCC: Rural		RUCC: Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
the heat pump water heater's air filter must be cleaned?	Total	131	100%	45	100%	86	100%	95	100%	36	100%	16	100%	115	100%
Q81. Did the installer inform you that the air filter must be cleaned?	Yes	52	75%	10	53%	42	84%	45	78%	7	64%	4	80%	48	75%
	No	17	25%	9	47%	8	16%	13	22%	4	36%	1	20%	16	25%
	Total	69	100%	19	100%	50	100%	58	100%	11	100%	5	100%	64	100%
Q82. Has the air filter in your new water heater ever been cleaned, either by you or by someone you hired?	Yes	54	41%	22	49%	32	37%	39	41%	15	42%	8	53%	46	40%
	No	77	59%	23	51%	54	63%	56	59%	21	58%	7	47%	70	60%
	Total	131	100%	45	100%	86	100%	95	100%	36	100%	15	100%	116	100%
Q83. How often is the air filter cleaned, or how often do you plan to clean it in the future?	Every other year														
	Every year	6	12%	3	14%	3	10%	4	10%	2	15%	1	13%	5	11%
	More than once a year	45	87%	19	86%	26	87%	34	87%	11	85%	7	88%	38	86%
	By the indicator light	1	2%			1	3%	1	3%					1	2%
	Total	52	100%	22	100%	30	100%	39	100%	13	100%	8	100%	44	100%
Q84. From this list of possible reasons why people don't clean their HPWH's air filter, which of these apply to you?	Didn't know I needed to	14	67%	7	78%	7	58%	9	64%	5	71%	1	100%	13	65%
	It's too new, haven't had to yet	4	19%	1	11%	3	25%	4	29%					4	20%
	Forgot to	2	10%			2	17%	1	7%	1	14%			2	10%
	Don't Know	1	5%	1	11%					1	14%			1	5%
	Total	21	100%	9	100%	12	100%	14	100%	7	100%	1	100%	20	100%
Q85. How satisfied are you with the sound level of the heat pump water heater?	Not at all satisfied	6	5%	1	2%	5	6%	4	4%	2	6%			6	5%
	2	11	8%	3	7%	8	9%	8	8%	3	8%	1	6%	10	9%
	3	35	26%	14	30%	21	24%	23	24%	12	33%	5	31%	30	26%
	4	39	29%	13	28%	26	30%	33	34%	6	17%	4	25%	35	30%
	Very satisfied	42	32%	15	33%	27	31%	29	30%	13	36%	6	38%	36	31%

Survey Question		Total		HPWH Tier: Tier 1		HPWH Tier: Tier 2/3		State: OR		State: WA		RUCC: Rural		RUCC: Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	Total	133	100%	46	100%	87	100%	97	100%	36	100%	16	100%	117	100%
Q87. How satisfied are you with the change in your electricity bill?	Not at all satisfied	2	2%	1	3%	1	2%	2	3%					2	3%
	2	5	5%	2	6%	3	5%	2	3%	3	13%	2	15%	3	4%
	3	16	17%	2	6%	14	24%	9	13%	7	29%	1	8%	15	19%
	4	21	22%	12	33%	9	16%	20	29%	1	4%	3	23%	18	22%
	Very satisfied	50	53%	19	53%	31	53%	37	53%	13	54%	7	54%	43	53%
	Total	94	100%	36	100%	58	100%	70	100%	24	100%	13	100%	81	100%
Q89. How satisfied are you with your hot water supply?	Not at all satisfied	2	2%	1	2%	1	1%			2	6%			2	2%
	2														
	3	17	13%	7	15%	10	11%	13	13%	4	11%	4	25%	13	11%
	4	38	28%	15	33%	23	26%	29	30%	9	25%	5	31%	33	28%
	Very satisfied	77	58%	23	50%	54	61%	56	57%	21	58%	7	44%	70	59%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q91. How satisfied are you with the maintenance requirements of the heat pump water heater?	Not at all satisfied														
	2														
	3	6	5%	4	10%	2	2%	4	4%	2	6%			6	6%
	4	34	28%	10	25%	24	29%	27	30%	7	21%	3	21%	31	28%
	Very satisfied	83	68%	26	65%	57	69%	59	66%	24	73%	11	79%	72	66%
	Total	123	100%	40	100%	83	100%	90	100%	33	100%	14	100%	109	100%
Q93. How satisfied are you with the heat pump water heater overall?	Not at all satisfied	2	2%	1	2%	1	1%			2	6%			2	2%
	2														
	3	3	2%	1	2%	2	2%	3	3%					3	3%
	4	40	30%	15	33%	25	29%	29	30%	11	31%	5	31%	35	30%
	Very satisfied	88	66%	29	63%	59	68%	65	67%	23	64%	11	69%	77	66%
	Total	133	100%	46	100%	87	100%	97	100%	36	100%	16	100%	117	100%
Q95. Overall, has the	Yes	127	95%	43	94%	84	96%	94	96%	33	92%	15	94%	112	95%

Survey Question		Total		HPWH Tier: Tier 1		HPWH Tier: Tier 2/3		State: OR		State: WA		RUCC: Rural		RUCC: Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
heat pump water heater met your expectations?	No	7	5%	3	7%	4	5%	4	4%	3	8%	1	6%	6	5%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q97. Have you, or would you, recommend a heat pump water heater to a friend, colleague or family member?	Yes, have	61	47%	23	52%	38	45%	47	50%	14	40%	5	33%	56	49%
	Yes, would	59	46%	18	41%	41	48%	42	45%	17	49%	8	53%	51	45%
	No	3	2%	2	5%	1	1%	1	1%	2	6%			3	3%
	Yes, with reservations	6	5%	1	2%	5	6%	4	4%	2	6%	2	13%	4	4%
	Total	129	100%	44	100%	85	100%	94	100%	35	100%	15	100%	114	100%
Q98. What are some of the reasons you recommended or would recommend a heat pump water heater?	Lower energy bills	102	85%	33	81%	69	87%	76	85%	26	84%	11	85%	91	85%
	Improved hot water supply	11	9%	6	15%	5	6%	9	10%	2	7%	2	15%	9	8%
	Equipment cost is reasonable	20	17%	6	15%	14	18%	16	18%	4	13%			20	19%
	Appearance is good/acceptable	3	3%	1	2%	2	3%	3	3%			1	8%	2	2%
	Good for the environment	7	6%	2	5%	5	6%	5	6%	2	7%	1	8%	6	6%
	Operates reliably	8	7%	5	12%	3	4%	4	5%	4	13%			8	8%
	Requires little maintenance	3	3%	3	7%			2	2%	1	3%			3	3%
	Don't Know	2	2%	1	2%	1	1%	2	2%					2	2%
	Total	120	100%	41	100%	79	100%	89	100%	31	100%	13	100%	107	100%
Q99. What type of home do you live in?	Single-family detached home	129	96%	42	91%	87	99%	93	95%	36	100%	14	88%	115	98%
	Single-family attached home	2	2%	1	2%	1	1%	2	2%					2	2%
	Mobile home	2	2%	2	4%			2	2%			2	13%		
	Condo	1	1%	1	2%			1	1%					1	1%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q100. Do you own or rent your home?	Own	133	99%	45	98%	88	100%	97	99%	36	100%	15	94%	118	100%
	Rent	1	1%	1	2%			1	1%			1	6%		
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%

Survey Question		Total		HPWH Tier				State				RUCC			
				Tier 1		Tier 2/3		OR		WA		Rural		Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
Q101-Q102. What year was your home built?	2011 to present	5	4%	3	7%	2	2%	1	1%	4	11%	1	6%	4	3%
	2006 – 2010	4	3%			4	5%	2	2%	2	6%			4	3%
	2000 – 2005	7	5%	2	4%	5	6%			7	19%			7	6%
	1990 – 1999	25	19%	8	17%	17	19%	16	16%	9	25%	6	38%	19	16%
	1980 – 1989	15	11%	3	7%	12	14%	12	12%	3	8%	3	19%	12	10%
	1970 – 1979	28	21%	14	30%	14	16%	23	24%	5	14%	1	6%	27	23%
	1960 – 1969	18	13%	5	11%	13	15%	16	16%	2	6%	2	13%	16	14%
	Prior to 1960	31	23%	10	22%	21	24%	27	28%	4	11%	3	19%	28	24%
	Dont know	1	1%	1	2%			1	1%					1	1%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q103. What is your home's primary heat source?	Electricity	87	65%	26	57%	61	69%	59	60%	28	78%	12	75%	75	64%
	Natural gas from a utility	22	16%	13	28%	9	10%	20	20%	2	6%	1	6%	21	18%
	Kerosene	2	2%			2	2%	2	2%					2	2%
	Wood/Wood pellet	19	14%	7	15%	12	14%	14	14%	5	14%	3	19%	16	14%
	Propane gas	1	1%			1	1%	1	1%					1	1%
	Oil	3	2%			3	3%	2	2%	1	3%			3	3%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q104. What type of electric heater is your primary heater?	Forced air furnace	21	24%	6	22%	15	25%	10	17%	11	38%	3	25%	18	24%
	Baseboards	6	7%	2	7%	4	7%	5	9%	1	3%	1	8%	5	7%
	Wall heaters	3	3%	1	4%	2	3%	2	3%	1	3%			3	4%
	Electric radiant heaters	4	5%	3	11%	1	2%	4	7%					4	5%
	Ductless heat pump (DHP)	53	61%	15	56%	38	63%	37	64%	16	55%	8	67%	45	60%
	Total	87	100%	27	100%	60	100%	58	100%	29	100%	12	100%	75	100%
Q105. What type of gas heater is your primary heater?	Forced air furnace	21	96%	12	92%	9	100%	19	95%	2	100%	1	100%	20	95%
	Free-standing gas stove	1	5%	1	8%			1	5%					1	5%
	Total	22	100%	13	100%	9	100%	20	100%	2	100%	1	100%	21	100%

Survey Question		Total		HPWH Tier: Tier 1		HPWH Tier: Tier 2/3		State: OR		State: WA		RUCC: Rural		RUCC: Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
Q106. How many people live in your household, including yourself?	1	8	6%	4	9%	4	5%	8	8%					8	7%
	2	69	52%	22	48%	47	53%	45	46%	24	67%	7	44%	62	53%
	3	23	17%	7	15%	16	18%	17	17%	6	17%	1	6%	22	19%
	4	19	14%	6	13%	13	15%	17	17%	2	6%	2	13%	17	14%
	5	5	4%	2	4%	3	3%	4	4%	1	3%	2	13%	3	3%
	6	5	4%	1	2%	4	5%	3	3%	2	6%	2	13%	3	3%
	7	2	2%	2	4%			2	2%			1	6%	1	1%
	8	1	1%			1	1%	1	1%			1	6%		
	9	2	2%	2	4%			1	1%	1	3%			2	2%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q107. Number of People in Household (by age group): Children <18	0	90	69%	30	67%	60	70%	64	67%	26	74%	7	47%	83	72%
	1	16	12%	3	7%	13	15%	13	14%	3	9%	1	7%	15	13%
	2	17	13%	8	18%	9	11%	14	15%	3	9%	5	33%	12	10%
	3	4	3%	2	4%	2	2%	3	3%	1	3%	1	7%	3	3%
	4	2	2%			2	2%	1	1%	1	3%	1	7%	1	1%
	6	1	1%	1	2%			1	1%					1	1%
	7	1	1%	1	2%					1	3%			1	1%
	Total	131	100%	45	100%	86	100%	96	100%	35	100%	15	100%	116	100%
Adults 18-64	0	36	28%	15	33%	21	24%	27	28%	9	26%	4	27%	32	28%
	1	19	15%	7	16%	12	14%	11	12%	8	23%	1	7%	18	16%
	2	56	43%	15	33%	41	48%	41	43%	15	43%	6	40%	50	43%
	3	13	10%	5	11%	8	9%	11	12%	2	6%	1	7%	12	10%
	4	5	4%	1	2%	4	5%	4	4%	1	3%	2	13%	3	3%
	5	2	2%	2	4%			2	2%			1	7%	1	1%
	Total	131	100%	45	100%	86	100%	96	100%	35	100%	15	100%	116	100%
Elderly 65+	0	74	57%	24	53%	50	58%	56	58%	18	51%	9	60%	65	56%

Survey Question		Total		HPWH Tier: Tier 1		HPWH Tier: Tier 2/3		State: OR		State: WA		RUCC: Rural		RUCC: Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	1	19	15%	6	13%	13	15%	12	13%	7	20%	1	7%	18	16%
	2	36	28%	15	33%	21	24%	26	27%	10	29%	4	27%	32	28%
	4	2	2%			2	2%	2	2%			1	7%	1	1%
	Total	131	100%	45	100%	86	100%	96	100%	35	100%	15	100%	116	100%
DK/Ref (still gives # occupants)	0	131	98%	45	98%	86	98%	96	98%	35	97%	15	94%	116	98%
	1	2	2%	1	2%	1	1%	2	2%					2	2%
	2	1	1%			1	1%			1	3%	1	6%		
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%
Q108. Which of the following includes the highest level of education you have completed?	Some high school	2	2%	1	2%	1	1%	1	1%	1	3%			2	2%
	High school graduate or GED	13	10%	5	11%	8	9%	9	9%	4	11%	3	19%	10	9%
	Trade or technical school (2 year degree)	12	9%	3	7%	9	11%	4	4%	8	23%	1	6%	11	10%
	Some college	21	16%	10	22%	11	13%	13	13%	8	23%	3	19%	18	16%
	College graduate	43	33%	15	33%	28	33%	32	33%	11	31%	6	38%	37	32%
	Some graduate school	7	5%	1	2%	6	7%	6	6%	1	3%			7	6%
	Graduate degree	34	26%	11	24%	23	27%	32	33%	2	6%	3	19%	31	27%
	Total	132	100%	46	100%	86	100%	97	100%	35	100%	16	100%	116	100%
Q109. Which of the following categories includes your approximate annual household income from all sources in 2014, before taxes?	Less than $40,000	14	13%	5	12%	9	13%	11	13%	3	10%	3	21%	11	11%
	Between $40,001 and $60,000	24	21%	10	24%	14	20%	17	21%	7	23%	4	29%	20	20%
	Between $60,001 and $80,000	21	19%	7	17%	14	20%	11	13%	10	33%	4	29%	17	17%
	Between $80,001 and $120,000	32	29%	12	29%	20	28%	27	33%	5	17%	1	7%	31	32%
	Between $120,001 and $250,000	19	17%	6	15%	13	18%	14	17%	5	17%	2	14%	17	17%
	Over $250,000	2	2%	1	2%	1	1%	2	2%					2	2%

Survey Question		Total		HPWH Tier				State				RUCC			
		Total		Tier 1		Tier 2/3		OR		WA		Rural		Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	Total	112	100%	41	100%	71	100%	82	100%	30	100%	14	100%	98	100%
Q110. Do you consider yourself Hispanic or Latino?	Yes	3	2%	1	2%	2	2%	3	3%			2	13%	1	1%
	No	129	98%	45	98%	84	98%	93	97%	36	100%	14	88%	115	99%
	Total	132	100%	46	100%	86	100%	96	100%	36	100%	16	100%	116	100%
Q111. Which of these ethnicities describe you? White	Yes	119	89%	41	89%	78	89%	86	88%	33	92%	14	88%	105	89%
Black or African American	Yes	2	2%			2	2%	1	1%	1	3%			2	2%
American Indian or Alaska Native	Yes	8	6%	3	7%	5	6%	5	5%	3	8%	2	13%	6	5%
Native Hawaiian or Other Pacific Islander	Yes	3	2%	2	4%	1	1%	3	3%					3	3%
Refused	Yes	7	5%	1	2%	6	7%	6	6%	1	3%	1	6%	6	5%
	Total	134	100%	46	100%	88	100%	98	100%	36	100%	16	100%	118	100%

Appendix E – General Population Households Survey Supplemental Findings

This appendix contains banner tables for each question in the general population survey, providing an un-weighted count (n) and weighted percentage (%) for each response by state and rural vs. urban. Responses of "don't know" or "refused" are excluded from these tables.

The Northwest General Population Households Survey Supplemental Findings begin on the following page.

Survey Question		Total		State								RUCC			
				ID		MT		OR		WA		Rural		Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
Q1. Before today, had you heard of the Northwest Energy Efficiency Alliance, or NEEA?	Yes	36	27%	2	12%	4	20%	13	25%	17	33%	8	15%	28	33%
	No	113	73%	20	88%	16	80%	37	75%	40	68%	43	85%	66	68%
	Total	149	100%	22	100%	20	100%	50	100%	57	100%	51	100%	94	100%
Q2. Before today, had you heard of the 'Hot Water Solutions' program?	Yes	6	4%	1	2%	1	5%	2	4%	2	4%	2	4%	4	4%
	No	141	96%	21	98%	19	95%	48	96%	53	96%	49	96%	88	96%
	Total	147	100%	22	100%	20	100%	50	100%	55	100%	51	100%	92	100%
Q3. How did you first hear of the 'Hot Water Solutions' program?	Utility print advertising, bill stuffer	1	26%					1	55%			1	69%		
	Utility website	1	12%			1	100%					1	31%		
	Retail store display / saw it in store	1	21%					1	45%					1	34%
	Magazine	1	41%							1	100%			1	66%
	Total	4	100%			1	100%	2	100%	1	100%	2	100%	2	100%
Q4. Before today, had you heard the term "heat pump" related to any appliances?	Yes	125	84%	11	60%	13	65%	49	94%	52	86%	42	84%	82	86%
	No	27	16%	10	41%	7	35%	3	6%	7	14%	10	16%	14	15%
	Total	152	100%	21	100%	20	100%	52	100%	59	100%	52	100%	96	100%
Q5. Before today, had you heard the term "heat pump water heater"?	Yes	34	24%	4	20%	4	20%	12	23%	14	27%	8	15%	26	28%
	No	115	76%	18	80%	16	80%	40	77%	41	73%	42	85%	69	72%
	Total	149	100%	22	100%	20	100%	52	100%	55	100%	50	100%	95	100%
Q6. [After thorough description of what HPWHs are] Have you heard of heat pump water heaters?	Yes - Aided	6	5%	1	2%			2	5%	3	7%	4	11%	2	3%
	No (SKIP to Q10)	113	95%	17	98%	16	100%	38	95%	42	93%	40	90%	69	97%
	Total	119	100%	18	100%	16	100%	40	100%	45	100%	44	100%	71	100%
Make AWARE variable	Yes (Q5 OR Q6=yes)	40	28%	5	22%	4	20%	14	27%	17	30%	12	23%	28	30%
	No	113	73%	17	78%	16	80%	38	73%	42	70%	40	77%	69	70%
	Total	153	100%	22	100%	20	100%	52	100%	59	100%	52	100%	97	100%
Awareness of HP and	Heard of HPWH	40	28%	5	22%	4	20%	14	27%	17	30%	12	23%	28	30%

Survey Question		Total		State								RUCC			
				ID		MT		OR		WA		Rural		Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
HPWH	Heard of "heat pump", but not HPWH	87	58%	7	38%	9	45%	35	67%	36	58%	31	62%	55	57%
	Never heard of a "heat pump"	26	15%	10	40%	7	35%	3	6%	6	12%	9	15%	14	13%
	Total	153	100%	22	100%	20	100%	52	100%	59	100%	52	100%	97	100%
Q7. Have you ever seen a heat pump water heater in person?	Yes	13	33%	3	83%	2	50%	3	22%	5	30%	3	37%	10	33%
	No	27	67%	2	17%	2	50%	11	78%	12	70%	9	64%	18	68%
	Total	40	100%	5	100%	4	100%	14	100%	17	100%	12	100%	28	100%
Q8. How did you first hear about heat pump water heaters?	Friend or acquaintance	9	22%	2	36%	2	50%	2	16%	3	20%	2	13%	7	25%
	Utility print advertising, bill stuffer	2	7%					1	10%	1	8%			2	10%
	Retail store display / saw it in store	3	7%					2	18%	1	4%	2	21%	1	3%
	Retail store salesperson	1	2%					1	8%					1	3%
	Newspaper ad	1	2%					1	8%					1	3%
	Newspaper story	1	2%					1	8%					1	3%
	Television ad	1	4%							1	8%			1	6%
	From contractor/installer	1	4%							1	8%	1	19%		
	Internet research	5	13%	1	9%	1	25%	1	8%	2	16%	2	9%	3	15%
	Internet advertising	1	3%					1	10%			1	12%		
	Magazine/trade magazine	5	13%	1	28%	1	25%	2	16%	1	8%	2	18%	3	12%
	at work	2	7%	1	28%					1	8%			2	10%
	utility unspecified	1	2%							1	4%	1	9%		
	seminar	1	4%							1	8%			1	6%
	something in the mail	1	4%							1	8%			1	6%
	Total	35	100%	5	100%	4	100%	12	100%	14	100%	11	100%	24	100%
Q9. Did you hear about	Previously owned one	0	0%												

Survey Question		Total		State								RUCC			
				ID		MT		OR		WA		Rural		Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
them anywhere else or learn more about them from any other sources?	Friend or acquaintance has one	1	4%							1	7%			1	5%
	Utility print advertising, bill stuffer	1	2%					1	7%					1	3%
	Television ad	1	4%							1	7%			1	5%
	Internet research	1	4%							1	7%			1	5%
	Internet advertising	1	4%							1	7%			1	5%
	Utility newsletter	1	2%					1	7%					1	3%
	At work	2	4%	1	28%					1	3%	1	8%	1	3%
	Mail (unspecified)	1	2%					1	7%					1	3%
	Total	40	100%	5	100%	4	100%	14	100%	17	100%	12	100%	28	100%
Q10. When making an appliance purchase decision, what are your typical sources of information regarding which product to purchase?	Friend or acquaintance has one	20	15%	3	14%			7	14%	10	17%	8	19%	12	13%
	Utility print advertising, bill stuffer	1	1%							1	2%			1	2%
	Utility website	6	6%	1	6%					5	10%			6	8%
	Retail store - general	49	32%	6	28%	6	30%	14	27%	23	36%	19	38%	27	28%
	Retail store displays	7	5%	1	6%	1	5%	2	4%	3	5%	2	5%	5	5%
	Retail store salesperson	2	1%					2	4%					2	2%
	Newspaper ad	3	2%					2	4%	1	1%	1	3%	2	2%
	From contractor/installer	13	8%	2	8%	1	5%	5	10%	5	8%	3	6%	10	9%
	Internet research/internet reviews	62	42%	4	24%	8	40%	25	48%	25	42%	23	46%	39	41%
	Utility newsletter	1	0%			1	5%					1	1%		
	Consumer Reports website	8	5%			2	10%	2	4%	4	7%	1	2%	7	7%
	Consumer Reports magazine	10	6%	1	2%	2	10%	3	6%	4	7%	3	4%	7	7%
	Manufacturer/dealer	3	2%	1	6%					2	3%			3	3%
	N/a (don't get info, always buy same brand, just go buy one)	5	2%	1	2%	2	10%	1	2%	1	2%	3	4%	2	2%

Survey Question		Total		State								RUCC			
				ID		MT		OR		WA		Rural		Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	Refused	2	1%			1	5%			1	2%	1	1%	1	2%
	Don't know	11	7%	4	16%	1	5%	4	7%	2	4%	3	5%	7	7%
	Total	153	100%	22	100%	20	100%	52	100%	59	100%	52	100%	97	100%
Q11. What would cause you to purchase a new water heater of any type?	Existing fails/breaks/leaks	137	87%	20	88%	19	95%	47	91%	51	84%	49	92%	85	86%
	Want on-demand, increased capacity, or faster heating (before complete failure)	10	8%	2	12%	1	5%	1	2%	6	11%	4	10%	6	8%
	Want higher efficiency/lower cost to run	9	7%	1	6%			5	9%	3	6%	2	4%	6	7%
	Existing gets old (planned replacement)	5	2%			2	10%	2	4%	1	1%	3	5%	2	1%
	During home remodel	2	1%			1	5%	1	2%					2	1%
	Other	6	5%	1	2%			2	4%	3	6%			6	6%
	Total	153	100%	22	100%	20	100%	52	100%	59	100%	52	100%	97	100%
Q12. Have you ever considered installing a heat pump water heater in your home?	Yes	9	24%	2	55%	1	25%	3	21%	3	20%	2	16%	7	26%
	No	31	76%	3	45%	3	75%	11	80%	14	80%	10	84%	21	74%
	Total	40	100%	5	100%	4	100%	14	100%	17	100%	12	100%	28	100%
Q13a. What was the primary reason you chose not to install one (yet)?	Existing equipment works fine	2	17%					2	67%					2	20%
	They cost too much	3	32%	1	50%	1	100%			1	33%	1	30%	2	32%
	Won't work/Don't know if will work in my space	2	27%	1	50%					1	33%	1	70%	1	19%
	Prefer another kind	1	9%					1	33%					1	10%
	May/plan to in the future	1	16%							1	33%			1	19%
	Total	9	100%	2	100%	1	100%	3	100%	3	100%	2	100%	7	100%
Q13b. What is the primary reason you've never considered installing one in your home?	Existing equipment works fine	10	41%					5	55%	5	41%	2	27%	8	45%
	Doesn't work in my climate	1	2%			1	33%					1	7%		
	They cost too much	4	15%	1	19%					3	23%	2	16%	2	15%
	Maintenance hassles	1	3%							1	4%	1	11%		

Survey Question		Total		State								RUCC			
				ID		MT		OR		WA		Rural		Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	Don't believe savings claims	1	3%					1	11%					1	4%
	Don't know enough/about them	4	15%	1	62%			1	11%	2	14%	2	35%	2	9%
	Won't work/Don't know if will work in my space	6	21%	1	19%	1	33%	2	24%	2	18%	1	5%	5	26%
	Technology too new	1	2%			1	33%							1	2%
	Total	28	100%	3	100%	3	100%	9	100%	13	100%	9	100%	19	100%
Q14. Were there other reasons why you chose not to install a heat pump water heater?	Existing equipment works fine	3	7%	2	36%					1	7%	1	4%	2	8%
	They cost too much	3	8%					2	14%	1	7%			3	10%
	They are noisy	1	2%							1	3%	1	8%		
	Maintenance hassles	1	2%					1	7%					1	3%
	Won't work/Don't know if it will work in my space	1	2%							1	3%	1	8%		
	Prefer another kind	1	4%							1	7%			1	5%
	Availability/not aware they were around	1	2%					1	7%					1	3%
	Don't hold enough water	1	2%					1	7%					1	3%
	NO other reasons	27	66%	3	64%	4	100%	9	62%	11	67%	9	80%	18	62%
	Don't know	1	4%							1	7%			1	5%
	Total	40	100%	5	100%	4	100%	14	100%	17	100%	12	100%	28	100%
Q15. Were you aware that many utilities in the Northwest offer their customers cash rebates or point-of-sale rebates for purchasing and installing a heat pump water heater?	Yes	22	59%	4	91%	1	25%	8	54%	9	59%	5	42%	17	63%
	No	18	41%	1	9%	3	75%	7	46%	7	41%	6	58%	12	37%
	Total	40	100%	5	100%	4	100%	15	100%	16	100%	11	100%	29	100%
Q16. Can you tell me the amount of your utility's	Yes	2	7%			1	100%	1	14%			1	13%	1	6%
	No	15	93%	4	100%			6	87%	5	100%	4	88%	11	94%

Survey Question		Total		State								RUCC			
		Total		ID		MT		OR		WA		Rural		Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
rebate for heat pump water heaters?	Total	17	100%	4	100%	1	100%	7	100%	5	100%	5	100%	12	100%
Q16amt. What is/was the amount of your utility's rebate for heat pump water heaters? [IF NOT SURE: can I get your best estimate?]	250	1	35%			1	100%					1	100%		
	500	1	65%					1	100%					1	100%
	Total	2	100%			1	100%	1	100%			1	100%	1	100%
Q17. Were you aware of manufacturer product markdowns - in the form of a promotional sale in retail stores - for specific types of heat pump water heaters?	Yes	8	19%			2	50%	4	29%	2	14%	2	16%	6	20%
	No	31	81%	5	100%	2	50%	10	71%	14	86%	10	84%	21	81%
	Total	39	100%	5	100%	4	100%	14	100%	16	100%	12	100%	27	100%
Q18. How did you first hear of the markdowns for heat pump water heaters?	Utility - print advertising/bill stuffer	1	13%					1	33%					1	14%
	Retail store - display/in store	2	20%			1	50%	1	33%					2	21%
	Newspaper - ad	1	13%					1	33%					1	14%
	Internet research	1	24%							1	50%			1	26%
	Internet advertising	1	7%			1	50%					1	100%		
	Through work	1	24%							1	50%			1	26%
	Total	7	100%			2	100%	3	100%	2	100%	1	100%	6	100%
Q19. Can you tell me the amount of the markdown for heat pump water heaters?	Yes	1	18%					1	31%					1	26%
	No	4	82%			1	100%	2	69%	1	100%	2	100%	2	74%
	Total	5	100%			1	100%	3	100%	1	100%	2	100%	3	100%
Q19amt. What is the amount of the markdown for HPWHs? [IF NOT SURE: Can I get your best estimate?]	200	1	100%					1	100%					1	100%
	Total	1	100%					1	100%					1	100%
Q20. [After description of	Not interested at all	47	31%	7	28%	10	56%	12	24%	18	33%	14	22%	32	34%

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		n	%	n	%	n	%	n	%	n	%	n	%	n	%
HPWH cost, maintenance needs, efficiency, etc.] Given this information, how interested would you be in installing a heat pump water heater in your home?	2	20	12%	6	31%	2	11%	7	14%	5	7%	6	12%	13	11%
	3	40	29%	5	28%	2	11%	18	36%	15	27%	18	45%	22	24%
	4	26	20%	1	7%	1	6%	10	19%	14	25%	5	10%	21	24%
	Very interested	12	8%	1	7%	3	17%	4	8%	4	7%	6	11%	6	7%
	Total	145	100%	20	100%	18	100%	51	100%	56	100%	49	100%	94	100%
Q21. Why do you say that [interest in HPWH<4]?	Existing new/recently replaced/works fine	16	13%	4	20%	4	29%	3	8%	5	13%	7	14%	8	12%
	Upfront cost	50	48%	9	58%	4	29%	17	45%	20	50%	15	38%	34	52%
	Incremental efficiency questions/cost to run	11	12%	2	10%	1	7%	3	8%	5	16%	3	9%	7	12%
	More info on the tech (how it works, installation steps)	23	25%	1	8%			13	36%	9	27%	10	35%	13	22%
	Prefer tankless	4	4%			1	7%	1	3%	2	6%	2	4%	2	5%
	Maintenance/Install more complicated than ERWH	5	4%	1	8%	2	14%	1	3%	1	3%	1	2%	4	6%
	Might not work for them (space, ventilation requirements, local weather, acidic or hard water, high enough capacity)	10	7%	2	10%	2	14%	5	14%	1	2%	2	6%	8	8%
	Not available in their area (equip or install)/don't know anyone who has one	2	1%			1	7%	1	3%			2	5%		
	Not sure/no reason	6	6%	2	10%			2	6%	2	6%	2	7%	4	6%
	Payback timeframe	10	9%	2	10%	2	14%	3	8%	3	8%	1	3%	8	11%
	Total	107	100%	18	100%	14	100%	37	100%	38	100%	38	100%	67	100%
Q22. What benefits of heat pump water heaters are especially attractive to you?	Rebates	1	2%					1	7%			1	10%		

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		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	Cost of the water heater	3	8%					2	14%	1	7%	1	10%	2	8%
	Lower utility bills/lower monthly operating cost	17	41%			4	100%	7	49%	6	36%	6	42%	11	40%
	Saving energy	22	60%	1	50%	2	50%	6	42%	13	71%	6	54%	16	62%
	Concern about carbon footprint/greenhouse gases/environment	1	4%							1	7%			1	5%
	Low maintenance costs	1	4%							1	7%			1	5%
	Longevity/reliability	2	5%	1	50%					1	3%	1	13%	1	2%
	Continuous hot water	3	7%	1	50%			1	9%	1	3%	2	25%	1	2%
	Total	38	100%	2	100%	4	100%	14	100%	18	100%	11	100%	27	100%
Q23. Have you heard of any brands that make heat pump water heaters?	Yes	7	20%	2	55%			2	14%	3	18%	2	20%	5	19%
	No	31	81%	3	45%	3	100%	12	86%	13	82%	9	80%	22	81%
	Total	38	100%	5	100%	3	100%	14	100%	16	100%	11	100%	27	100%
Q24. What heat pump water heater brands have you heard of? [UNPROMPTED]	General Electric (GE)	1	10%							1	19%	1	42%		
	American	1	14%	1	50%							1	59%		
	Rheem	4	59%	2	100%			1	50%	1	41%	1	59%	3	59%
	Bosch	1	11%					1	50%					1	14%
	Marathon	1	11%					1	50%					1	14%
	Don't know	1	21%							1	41%			1	27%
	Total	7	100%	2	100%			2	100%	3	100%	2	100%	5	100%
Q25. What heat pump water heater brands would you consider buying? [UNPROMPTED]	General Electric (GE)	1	14%					1	50%					1	19%
	A.O. Smith	1	14%					1	50%					1	19%
	American	2	31%	1	50%			1	50%			1	59%	1	19%
	Kenmore	1	14%					1	50%					1	19%
	Reliance	1	14%					1	50%					1	19%
	Whirlpool	1	14%					1	50%					1	19%

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		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	Rheem	2	31%	1	50%			1	50%			1	59%	1	19%
	Bradford White	1	14%					1	50%					1	19%
	Bosch	2	38%							2	100%	1	42%	1	37%
	European Brands	1	17%	1	50%									1	25%
	Don't know	1	14%					1	50%					1	19%
	Total	6	100%	2	100%			2	100%	2	100%	2	100%	4	100%
Q26. Would you consider buying a heat pump water heater made by ...? [READ ANY NOT ALREADY MENTIONED IN PREVIOUS Q]	General Electric (GE)	6	12%	1	9%	1	25%	2	14%	2	10%	3	16%	3	10%
	A.O. Smith	7	15%	1	28%	2	50%	3	23%	1	7%	4	38%	3	9%
	American	5	13%			1	25%	1	7%	3	17%	2	13%	3	13%
	Kenmore	9	20%	1	9%			4	27%	4	20%	3	20%	6	20%
	Reliance	5	13%	1	28%	1	25%	1	7%	2	13%	2	16%	3	13%
	State	4	10%	1	28%	1	25%	1	7%	1	7%	2	16%	2	8%
	Stiebel Eltron	2	5%			1	25%			1	7%	1	5%	1	5%
	U.S. Craftmaster	1	1%			1	25%					1	5%		
	Whirlpool	5	10%	1	9%			2	14%	2	10%	2	12%	3	10%
	AirGenerate	1	1%			1	25%					1	5%		
	Electrolux	3	5%			1	25%	2	14%			2	14%	1	3%
	Rheem	8	20%			2	50%	3	21%	3	20%	2	14%	6	21%
	Bradford White	3	8%					2	15%	1	7%	1	11%	2	8%
	None	20	54%	2	36%	2	50%	6	42%	10	64%	4	34%	16	60%
	Don't know	4	10%	1	28%			1	7%	2	10%			4	13%
	Total	40	100%	5	100%	4	100%	14	100%	17	100%	12	100%	28	100%
Q27a. Much more likely to buy a new heat pump water heater: The cost of heat pump water heaters declines.	Yes	109	78%	16	84%	13	68%	40	83%	40	75%	43	88%	64	74%

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		n	%	n	%	n	%	n	%	n	%	n	%	n	%
Q27b. Much more likely to buy a new heat pump water heater: Your current water heater breaks down.	Yes	94	71%	12	66%	10	53%	33	72%	39	74%	31	72%	62	72%
Q27c. Much more likely to buy a new heat pump water heater: A contractor or retail business offers a special promotion.	Yes	59	48%	7	48%	5	28%	24	54%	23	46%	25	66%	34	42%
Q27d. Much more likely to buy a new heat pump water heater: Your household finances improve.	Yes	46	34%	4	20%	6	32%	18	38%	18	35%	19	41%	27	32%
Q27e. Much more likely to buy a new heat pump water heater: Your local utility rebate increases.	Yes	82	64%	11	68%	9	53%	30	65%	32	64%	31	79%	50	60%
Q28. [IF Q27=NONE] Is there any combination of these things that would make you much more likely to buy a heat pump water heater for your home?	Yes														
	No	18	100%	2	100%	4	100%	7	100%	5	100%	3	100%	13	100%
	Total	18	100%	2	100%	4	100%	7	100%	5	100%	3	100%	13	100%
Q29. Is there anything in particular about heat pump water heaters that you wish you knew more about?	Everything	3	10%							3	18%			3	15%
	Incremental efficiency & cost (comparison to ERWH)	14	38%			2	40%	7	42%	5	37%	4	26%	10	44%
	Reliability/longevity	3	8%					1	6%	2	11%	1	6%	2	9%
	Time on market	2	4%					1	6%	1	4%	1	6%	1	3%
	How they work	8	20%			1	20%	6	39%	1	8%	5	33%	3	13%

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		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	Installation requirements/limitations (space, ventilation, condenser - often specific to their home)	8	22%			1	20%	3	18%	4	26%	4	22%	4	22%
	Components (HP and WH separate, same as HVAC system, tankless, tank size options)	4	9%	1	100%	1	20%	2	13%			4	26%		
	Reviews	2	5%					2	13%			1	8%	1	3%
	Maintenance requirements	2	5%			1	20%			1	8%	1	4%	1	6%
	Operation (heat loss, noise, efficiency vs. weather)	4	11%					2	13%	2	11%	2	14%	2	9%
	Total	37	100%	1	100%	5	100%	16	100%	15	100%	16	100%	21	100%
Q30. Where would you go if you wanted more information about heat pump water heaters?	Utility	14	9%	2	8%	2	10%	4	8%	6	9%	4	6%	9	9%
	HVAC contractor/installer	6	4%					2	4%	4	6%	2	4%	4	4%
	Plumbing contractor/installer	9	5%	1	6%	3	15%	2	4%	3	4%	3	6%	6	5%
	Electrical contractor/installer	5	3%	2	8%	1	5%			2	3%	1	3%	4	3%
	Contractor - unknown type/general	5	3%			1	5%	3	6%	1	2%	2	4%	3	3%
	NEEA/Smart Water Heat initiative/Hot Water Solutions Initiative	1	1%					1	2%					1	1%
	Manufacturer	4	2%	1	2%	1	5%	1	2%	1	2%	1	1%	2	2%
	Friends/family I trust	11	8%	2	8%	1	5%	2	4%	6	10%	4	9%	7	8%
	Internet/online	89	62%	14	68%	9	45%	29	55%	37	66%	30	60%	58	63%
	Retail store	26	15%	1	6%	4	20%	14	27%	7	10%	11	22%	14	12%
	Consumer Reports	1	1%							1	2%			1	2%
	Library	2	1%					2	4%					2	2%
	Energy conservation group/Dept. of Energy/the City	2	2%							2	3%			2	2%

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		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	People who maintain water heaters	1	1%					1	2%					1	1%
	N/a, I am in the business	2	2%							2	4%			2	3%
	Don't know	6	5%	1	6%			2	4%	3	5%	2	4%	3	4%
	Total	153	100%	22	100%	20	100%	52	100%	59	100%	52	100%	97	100%
WHAGE. Age of water heater - Categories	0-1	10	4%	1	2%	3	15%	4	8%	2	2%	6	10%	4	3%
	1-5	39	27%	7	35%	4	20%	14	27%	14	26%	7	14%	31	32%
	5-10	44	31%	6	37%	5	25%	12	23%	21	35%	15	29%	28	32%
	10+	59	38%	7	26%	8	40%	22	43%	22	37%	24	48%	33	34%
	Total	152	100%	21	100%	20	100%	52	100%	59	100%	52	100%	96	100%
WH Size (gallons)	Don't know	52	37%	9	42%	1	5%	17	33%	25	42%	19	44%	32	34%
	0-45 gallons	19	11%	6	24%	5	25%	3	6%	5	10%	6	9%	11	11%
	46-55 gallons	61	38%	7	34%	12	60%	20	39%	22	35%	25	44%	35	36%
	56-80 gallons	15	10%			2	10%	7	13%	6	11%	2	3%	13	13%
	Over 80 gallons	6	4%					5	9%	1	2%			6	5%
	Total	153	100%	22	100%	20	100%	52	100%	59	100%	52	100%	97	100%
Q32. Under normal circumstances, is your water heater able to provide sufficient hot water for your household?	Yes	150	98%	20	92%	20	100%	52	100%	58	98%	51	96%	96	100%
	No	3	2%	2	8%					1	2%	1	4%	1	0%
	Total	153	100%	22	100%	20	100%	52	100%	59	100%	52	100%	97	100%
Q33. Where is your water heater located?	Basement	54	35%	9	34%	9	45%	15	28%	21	38%	16	29%	37	38%
	Garage	24	17%	1	6%			16	30%	7	13%	2	5%	21	21%
	Utility room	25	17%	1	6%	4	20%	6	12%	14	22%	12	23%	13	15%
	Utility closet	21	13%	4	16%	2	10%	10	20%	5	8%	11	19%	9	10%
	Kitchen	2	1%	1	6%	1	5%							2	1%
	Other closet inside your home	10	8%	1	6%	1	5%	2	4%	6	11%	5	11%	5	7%

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		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	bathroom	2	1%	1	2%	1	5%							1	0%
	crawl space	4	2%	2	12%	2	10%					2	4%	2	1%
	laundry room	3	2%	1	6%			1	2%	1	1%	1	3%	2	2%
	under the stairs	2	1%	1	6%					1	1%	1	3%	1	1%
	attic	2	1%					1	2%	1	1%	2	4%		
	1 in basement & 1 in crawl space	1	1%							1	2%			1	2%
	outside closet	1	1%							1	2%			1	2%
	outside in a shed	1	1%					1	2%					1	1%
	Total	152	100%	22	100%	20	100%	52	100%	58	100%	52	100%	96	100%
Q34. Is your water heater located in a part of your house that is heated?	Yes - heated	109	70%	17	74%	16	80%	30	58%	46	76%	39	74%	67	69%
	No - unheated	44	30%	5	26%	4	20%	22	43%	13	24%	13	26%	30	31%
	Total	153	100%	22	100%	20	100%	52	100%	59	100%	52	100%	97	100%
Q35. Is your water heater located in a part of your house that is insulated?	Yes - insulated	127	84%	18	76%	16	84%	44	85%	49	86%	47	92%	77	82%
	No - not insulated	22	16%	4	24%	3	16%	8	15%	7	14%	4	8%	17	18%
	Total	149	100%	22	100%	19	100%	52	100%	56	100%	51	100%	94	100%
Q36. How important is it for you to have an energy-efficient home?	Not important at all	3	1%			1	5%	2	4%			1	1%	2	2%
	2	8	6%	1	6%			1	2%	6	9%	2	4%	5	6%
	3	18	11%	3	19%	2	10%	7	13%	6	9%	6	11%	12	12%
	4	51	35%	8	37%	5	25%	16	31%	22	38%	15	32%	36	38%
	Very important	70	46%	8	37%	12	60%	26	50%	24	44%	27	52%	41	43%
	Total	150	100%	20	100%	20	100%	52	100%	58	100%	51	100%	96	100%
Q37. How quickly do you, personally, adopt new technology?	I am the first among my friends to purchase new technology	3	3%							3	6%			3	4%
	I purchase new technology sooner than most of my friends	18	15%	2	13%	2	11%	5	10%	9	19%	4	7%	14	19%

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		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	I am typically in the middle of the group when purchasing new technology	59	44%	7	36%	8	42%	21	44%	23	45%	19	40%	39	46%
	I purchase new technology after most of my friends have purchased it	22	16%	3	19%	2	11%	10	21%	7	12%	8	16%	13	15%
	I am one of the last people to purchase new technology	39	23%	9	31%	7	37%	12	26%	11	18%	21	37%	17	17%
	Total	141	100%	21	100%	19	100%	48	100%	53	100%	52	100%	86	100%
Q38. What type of home do you live in?	Single-family detached home	132	87%	18	84%	19	100%	44	85%	51	87%	45	85%	84	87%
	Single-family attached home	6	4%	1	2%			3	6%	2	4%			6	6%
	Mobile home	12	8%	3	14%			4	8%	5	7%	7	15%	5	5%
	Condo	2	2%					1	2%	1	2%			2	2%
	Total	152	100%	22	100%	19	100%	52	100%	59	100%	52	100%	97	100%
Q39. Do you own or rent your home?	Own	150	98%	22	100%	19	100%	51	98%	58	98%	52	100%	95	98%
	Rent	2	2%					1	2%	1	2%			2	2%
	Total	152	100%	22	100%	19	100%	52	100%	59	100%	52	100%	97	100%
Q40-Q41. Year home was built	2011 to present	3	2%	1	6%	1	5%			1	2%	1	1%	2	3%
	2006 - 2010	5	4%	1	6%			3	6%	1	2%	2	5%	2	2%
	2000 - 2005	6	3%			3	15%	1	2%	2	3%	4	5%	2	2%
	1990 - 1999	21	14%	4	16%	1	5%	5	10%	11	18%	10	22%	11	12%
	1980 -1989	20	12%	4	20%	6	30%	3	6%	7	11%	9	13%	11	11%
	1970 - 1979	42	27%	9	38%	2	10%	18	34%	13	22%	12	25%	30	28%
	1960 - 1969	9	7%	1	6%	1	5%	3	6%	4	7%	3	6%	6	7%
	Prior to 1960	42	29%	2	8%	5	25%	19	37%	16	29%	9	20%	31	32%
	Refused	1	0%			1	5%								
	Don't know	4	3%							4	6%	2	4%	2	3%

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		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	Total	153	100%	22	100%	20	100%	52	100%	59	100%	52	100%	97	100%
Q42. How many people live in your household, including yourself?	1	28	18%	5	18%	5	26%	6	11%	12	22%	6	10%	22	22%
	2	82	53%	12	56%	11	58%	28	54%	31	51%	35	67%	45	47%
	3	13	11%					7	14%	6	13%	5	13%	8	10%
	4	10	6%	3	14%	2	11%	3	6%	2	3%	4	7%	5	4%
	5	10	7%	2	12%	1	5%	4	8%	3	6%	1	1%	9	10%
	6	2	1%					1	2%	1	1%			2	2%
	7	3	2%					3	6%			1	2%	2	2%
	8	2	2%							2	4%			2	3%
	Total	150	100%	22	100%	19	100%	52	100%	57	100%	52	100%	95	100%
Q43. Which of the following groups includes your age? (1 person household)	18 - 24 years old														
	25 - 34 years old														
	35 - 44 years old	1	6%							1	10%			1	7%
	45 - 54 years old														
	55 - 64 years old	8	24%	2	45%	1	20%	2	32%	3	19%	2	27%	6	24%
	65 and older	19	70%	3	55%	4	80%	4	68%	8	72%	4	73%	15	69%
	Total	28	100%	5	100%	5	100%	6	100%	12	100%	6	100%	22	100%
Children <18	0	129	85%	17	78%	17	85%	43	84%	52	87%	46	91%	79	82%
	1	8	6%	2	8%			3	6%	3	6%	2	4%	6	7%
	2	8	4%	3	14%	3	15%	1	2%	1	2%	3	3%	5	5%
	3	3	2%					2	4%	1	1%	1	2%	2	2%
	4	4	3%					3	6%	1	2%			4	4%
	5	1	1%							1	2%			1	2%
	Total	153	100%	22	100%	20	100%	52	100%	59	100%	52	100%	97	100%
Adults 18-64	0	74	49%	12	52%	11	55%	21	41%	30	52%	22	42%	48	50%

Survey Question		Total		State								RUCC			
				ID		MT		OR		WA		Rural		Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	1	19	11%	5	22%	2	10%	7	13%	5	8%	6	11%	13	12%
	2	39	24%	3	14%	6	30%	15	28%	15	23%	18	33%	21	21%
	3	12	9%	1	6%	1	5%	5	10%	5	9%	5	12%	7	8%
	4	6	5%	1	6%			2	4%	3	6%	1	2%	5	6%
	5	3	2%					2	4%	1	2%			3	3%
	Total	153	100%	22	100%	20	100%	52	100%	59	100%	52	100%	97	100%
Elderly 65+	0	73	49%	10	48%	9	45%	25	48%	29	50%	26	50%	44	47%
	1	29	19%	5	22%	5	25%	7	13%	12	21%	6	11%	23	23%
	2	49	31%	7	30%	6	30%	18	35%	18	29%	19	37%	29	29%
	3	2	1%					2	4%			1	3%	1	1%
	Total	153	100%	22	100%	20	100%	52	100%	59	100%	52	100%	97	100%
Don't know/Ref (still gives # occupants)	0	149	97%	20	88%	20	100%	52	100%	57	96%	52	100%	95	97%
	2	2	2%	1	6%					1	2%			1	2%
	3	1	1%							1	2%			1	2%
	4	1	1%	1	6%										
	Total	153	100%	22	100%	20	100%	52	100%	59	100%	52	100%	97	100%
Q44. Which of the following includes the highest level of education you have completed?	Some high school	4	2%	2	9%	1	6%	1	2%			2	2%	2	2%
	High school graduate or GED	19	12%	3	11%	6	35%	5	11%	5	10%	10	16%	9	11%
	Trade or technical school (2 year degree)	15	12%			1	6%	6	12%	8	15%	6	12%	9	12%
	Some college	28	22%	6	32%	2	12%	11	23%	9	21%	9	21%	19	23%
	College graduate	37	27%	6	27%	4	24%	14	29%	13	27%	15	34%	21	24%
	Some graduate school	4	4%					1	2%	3	8%			4	6%
	Graduate degree	25	20%	3	21%	3	18%	11	22%	8	19%	7	16%	18	22%
	Total	132	100%	20	100%	17	100%	49	100%	46	100%	49	100%	82	100%
Q45. Which of the	Less than $40,000	32	26%	9	44%	2	17%	10	26%	11	23%	15	38%	17	21%

Survey Question		Total		State								RUCC			
				ID		MT		OR		WA		Rural		Urban	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
following includes your approximate annual household income from all sources in 2015, before taxes?	Between $40,001 and $60,000	24	19%	4	19%	4	33%	7	18%	9	19%	5	11%	19	22%
	Between $60,001 and $80,000	19	19%	2	9%			9	23%	8	20%	5	14%	14	20%
	Between $80,001 and $120,000	27	24%	3	21%	4	33%	11	27%	9	21%	13	32%	14	20%
	Between $120,001 and $250,000	11	11%	1	7%	2	17%	2	5%	6	15%	3	5%	8	13%
	Over $250,000	2	2%					1	2%	1	3%			2	3%
	Total	115	100%	19	100%	12	100%	40	100%	44	100%	41	100%	74	100%
Q46. Do you consider yourself Hispanic or Latino?	Yes	1	1%							1	1%			1	1%
	No	144	100%	20	100%	19	100%	50	100%	55	99%	51	100%	92	99%
	Total	145	100%	20	100%	19	100%	50	100%	56	100%	51	100%	93	100%
Q47. Which of these ethnicities describe you? White	Yes	136	89%	20	88%	17	85%	48	92%	51	87%	48	93%	87	89%
Black or African American	Yes	2	2%					1	2%	1	2%			2	2%
American Indian or Alaska Native	Yes	4	2%			1	5%	3	6%			3	6%	1	1%
	Total	153	100%	22	100%	20	100%	52	100%	59	100%	52	100%	97	100%

Appendix F – Market Actor Business Scope and Practices

In this appendix we describe the business scope and practices of interviewed market actors, by market actor type.

Manufacturer Business Scope and Practices

Evergreen Economics interviewed representatives from three HPWH manufacturers currently producing HPWHs that meet at least Tier 1 of the Northern Climate Specification.

The three manufacturers were represented by a total of four people, with two from one manufacturer. The two from the same company include a wholesale market manager and an account manager for a large national retailer. The other two are both product marketing managers that each supports a sales staff.

Two of the companies have been selling water heaters since the 1800s, with one selling HPWHs starting in 2009 and the other in 2014. The third manufacturer has been selling water heaters since 2012 (only HPWHs), but sell a wide range of other technologies beyond water heating equipment. Of the two that could estimate the percentage of revenues from HPWHs, both said that they currently make up a very small percentage of their business (less than 1%).

Only two manufacturers were able to discuss the relative sales of their different models of HPWHs. One noted that they make models that are web enabled and have touch controls, which have sold better in the Northwest than in the rest of the country (attributed to a willingness to pay a slightly higher purchase price). The other said that their larger capacity HPWH is more popular than their smaller model.

Distributor Business Scope and Practices

The Evergreen team conducted in-depth interviews with representatives from four of the HPWH distribution companies that stock and supply water heaters for the residential market in the Northwest.

Three of the four distributor respondents were branch managers and the fourth was the water heater division manager of their business. Respondents reported their companies had been selling HPWHs for an average of 3.5 years, compared to 53 years selling water heaters in general.

Three of the distributors said that HPWH sales comprise a very small portion of their business revenues (<5%), with a larger portion coming from other types of water heaters (15-20%). The interviewees reported stocking and selling multiple water heater brands. Three of the four distributors sell Rheem, two sell Bradford White, two sell GE, one sells Navien, and one sells Heat Transfer (that is, Everlast). All four distributors offer the same brands of electric water heaters as gas water heaters.

Two of the distributors offer multiple brands of HPWHs, but the vast majority of the models they stock and sell are from GE. These two people also said residential HPWHs are a high priority market for their company. The other two distributors each offer one brand of HPWH to their customers, including one that stocks and sells Bradford White and another that sells Rheem.

Three of the four distributors maintain a stock of HPWHs as opposed to purchasing them upon receiving an order. All four source their HPWHs directly from the manufacturer(s) and did not report any issues getting the HPWHs they need. The two distributors that sell GE HPWHs said they are currently receiving manufacturer markdowns; the other two have not seen any markdowns available.

Two of the distributors began stocking HPWHs four to five years ago, motivated by customer demand for HPWHs, but also either a desire to boost their company's image as a source for energy efficient equipment in general (n=1) or in response to incentives (n=1). The third distributor that stocks HPWHs began doing so in 2015, motivated by the new NAECA requirements. The last distributor does not maintain a stock of HPWHs because "the demand just isn't there". This person does not believe their stocking practices have much impact on the total number of HPWHs that get installed, because the installation timeframe is similar across all types of water heaters. However, they also indicated that during an emergency replacement situation (not common), they typically select from water heaters currently in stock.

All four distributors said they expected to increase their stock of HPWHs over the next two years in response to additional demand for the product. Two believe that this additional demand will be created by an increase in energy prices and/or interest in energy efficiency, while the other two expect additional demand as HPWHs become more common and widely adopted.

Retailer Business Scope and Practices

The Evergreen team conducted in-depth interviews with six water heater retailers serving the Northwest market. Of the six firms interviewed, three were large retailers and three were smaller retailers. The interviewees from the three larger retailers were all sales people, and the interviewees of the smaller retailers consisted of two store managers and one storeowner.

Of the six retailer respondents, three large and two small had sold HPWHs. The small retailer who had not sold any HPWHs reported that they could order HPWHs as needed. The five retailers that have sold HPWHs have been doing so for an average of five years.

Four of the retailers estimated that they generate from approximately 1 to 5 percent of total revenue from HPWHs. Interviewees at larger retailers found this figure more difficult to estimate than the interviewees at smaller retailers, as they do not work in a management role.

Two large retailers and one small retailer source HPWHs directly from the manufacturer(s). The remaining retailers source from distributors and retailer cooperatives.

Four of the six retailers (two large and two smaller) reported that they have HPWHs in stock or have access to HPWHs in a nearby warehouse. The remaining two retailers (one small and one large) said that they do not stock HPWHs but can order them as needed.

Installer Business Scope and Practices

Evergreen Economics interviewed a total of 16 water heater installers. Of the 16 interviewed, nine were categorized as HVAC and plumbing installers, five were plumbing only installers, one was HVAC only, and one was a general contractor.

Overall, the responding installers reported a variety of roles and responsibilities at their respective companies. Among the 16 participating installers, five were company owners, four were project managers or executives, three were install supervisors, two were sustainability consultants, and two were sales representatives.

Installers reported varying amounts of overall water heater installations and experience with HPWHs. For normal electric storage water heaters (excluding heat pump water heaters), 10 out of 15 participants estimated that sales accounted for less than 5 percent of company revenues. This was especially true for larger HVAC installation companies whose primary installation business is HVAC equipment, not water heating equipment, and the three installers that specifically target efficiency and non-traditional water heater projects. Of the remaining five installers, participants estimated that electric storage water heaters accounted for 15 to 40 percent of their company's revenues.

Additionally, all but three of the participating installers indicated that less than 5 percent of their overall company revenues come from HPWH installations. The remaining three installers indicated HPWH installations are a primary focus for their company, with two installers estimating between 30 and 50 percent of their revenues come from HPWH installations and one installer indicating that 100 percent of their revenues comes from HPWH installations as they focus exclusively on HPWH projects.

Appendix I – Survey Instruments / Interview Guides

This appendix contains the interview guides and survey instruments developed by Evergreen Economics in conjunction with NEEA.

Partner Utilities Interview Guide

Recruitment (if needed):

Hi, this is _____ with Evergreen Economics, an energy program evaluation firm based in Portland, Oregon. We're calling on behalf of the Northwest Energy Efficiency Alliance (NEEA) who engaged us to conduct heat pump water heater research.

NEEA has asked us to speak with its partner utilities to learn more about the HPWH market, so NEEA can potentially adjust and improve its Initiative for customers, utilities, suppliers and installers. Anything you tell us will be kept confidential.

Is now a good time to talk about the Initiative, or can we schedule a time to talk for about one hour?

(If they have any concerns, ask them to contact Amy Webb (NEEA) at 503-688-5448 for more information about the evaluation.)

Program Characteristics

Let's start by discuss your own utility's residential heat pump water heater rebate program.

NOTE: If utility program started in 2015 start here, else start with Q3 for mature programs.

Q1. First, what motivated your utility to provide incentives for heat pump water heaters?

Q2. Are your heat pump water heater rebates tied to NEEA's Northern Climate Specification? Do you provide different incentives for Tier 1 vs. Tier 2 or 3 products? (Get details on rebate levels, reasoning)

Q3. What types of customer homes are you targeting with your program? Why? (Probe for new construction vs. existing, single family vs. multifamily, remodels/additions)

Q4. What rebate amount(s) are you currently offering? (Probe to distinguish Tier 1 from Tier 2, if they provide incentives for large volume Tier 1, different housing types or ducting scenarios, etc.)

Q5. Do you offer rebates specifically for Tier 3 installations?

   a. If YES: How do you confirm that Tier 3 qualifying models are being used in heat pump mode?

   b. If NO: Do you have plans to offer rebates for Tier 3 products?

      i. If YES: At what rebate level, and starting when?

Q6. In the next two years, are your utility's rebate amounts most likely to increase, decrease, or remain the same? Why do you say that? (Get details on specific planned changes)

Q7. Do you offer customer financing for heat pump water heaters?

a. If NO: Why not?

b. If NO: Do you refer customers to financing from other sources?

i. If YES: Get details

ii. Do you have a sense for how often this financing is used?

c. If utility offers financing: What percent of your heat pump water heater customers use this financing if they are eligible?

i. Is financing driving participation up?

Q8. Do you have a sense of what proportion of your customers who are buying heat pump water heaters are relying on their existing credit cards as a means of financing the purchase?

Q9. How does your utility promote its heat pump water heater incentives to customers? Do you use…

a. Your utility website?

b. Direct mailings, like bill stuffers?

c. Newspaper ads?

d. TV ads?

e. Radio ads?

f. Social media?

g. Retail promotions?

h. Homeowner magazines (e.g., Sunset, Ruralite)?

i. Anything else?

Q10. What marketing media and/or messages have been most effective in getting customers to buy heat pump water heaters?

Q11. Do you have one or more heat pump water heater display units?

a. Where is it located? Is it functional, interactive, or just a display? Has it increased customer interest?

Q12. (If not already discussed) Are you familiar with any of NEEA's retail efforts, for instance, with Sears, Home Depot, Lowes, or others?

a. If YES: How has your utility worked with local retailers and NEEA to promote heat pump water heaters? How successful has this been?

b. If YES: In your opinion, how effective is the point-of-purchase educational material in the stores? Could this be improved in any way?

Q13. Are you working directly with distributors or manufacturers in any ways? How so? How is this going?

Q14. Are you promoting the Tier 2 or Tier 3 heat pump water heaters? Why/why not?

Q15. Will your promotion efforts or budget increase or decrease in 2016, compared to 2015? Why, and how so? (Probe for amount or percent increase)

Q16. What services, if any, does your utility provide to heat pump water heater installers? (E.g., free or subsidized training, marketing assistance/referrals, other? Get details.)

a. If YES: Have any of these services changed in the last year? How so/Why not?

Q17. Have you had any significant problems with heat pump water heater installations in your area? (Probe on issues related to HVAC versus plumbers, plumbers potential unfamiliarity with utility rebates and install requirements.)

a. If YES: How are you working to resolve these issues?

b. If YES: Is NEEA assisting? How so? (If NO, should NEEA assist?)

Q18. What types of feedback do you get from customers regarding their heat pump water heater installation, if any?

Q19. Do you have any concerns about high or variable installation costs for heat pump water heaters?

a. If YES: Have you considered any strategies to mitigate this going forward? Please explain.

Q20. Which aspects of your program (e.g., rebates, retail partnering, technical training, contractor referrals, financing) have had the most impact on driving customer participation?

Q21. What are/were your goals for heat pump water heater installations in 2015? Are you likely to achieve these goals? Why or why not? (Probe on program challenges, successes)

Q22. Are your goals for 2016 different or the same? Why is that? (Probe to see if local awareness and demand are increasing.)

Q23. What are the biggest challenges for heat pump water heaters in your service territory? (Probe on local codes, consumer awareness/understanding, deficient installer infrastructure, low retail presence, etc.) Are there different challenges for Tier 1 models versus Tier 2 or Tier 3 models?

Q24. Is your utility doing any heat pump water heater inspections, in addition to the inspections conducted by CLEAResult (on behalf of NEEA)?

a. What kind of feedback are you getting from customers and installers on heat pump water heater installations in your territory?

Q25. What additional assistance, if any, would you like to see from NEEA or CLEAResult to improve the inspections process in your area?

Q26. What are your utility's longer-term goals, say in five years, with respect to the heat pump water heater market?

Market Perspective

Now I'd like to ask some questions about the broader Northwest market for heat pump water heaters.

Q27. For what types of residential customers or applications are heat pump water heaters most feasible, and where should NEEA be focusing its promotion attention?

Q28. Do you have any technical reservations about heat pump water heaters?

a. If YES: Like what?

b. If YES: Are your concerns for all HPWHs, or specific models or Tiers? Which? Why?

Q29. How do you believe the emergency replacement market can be tapped into most effectively?

Q30. Do you have a sense of how many of your utility projects are for emergency versus planned replacements? Are the customers doing planned replacements differently in any way than typical consumers?

Q31. Is your utility doing anything specifically to target emergency replacements?

a. If YES: How well does this appear to be working?

NEEA's HPWH Initiative

Now I have some last questions regarding NEEA's regional Initiative for heat pump water heaters, and then we'll be done.

Q32. How do you and/or other utility staff stay informed about NEEA's Initiative?

a. Are you or other staff usually able to attend NEEA's webinars covering program updates?

b. Do you find the update webinars worthwhile? Are they informative? Helpful? Useful? How so? Why not?

c. Do you have suggestions for improving communications between the utilities, NEEA, CLEAResult and/or BPA? (Probe to see if more personal meetings desired)

Q33. Do you work with BPA in your program delivery?

a. If YES: How is it going working with BPA, and also working with NEEA? Is there good coordination regarding eligible equipment, installer training and regional marketing?

Q34. Have you visited the Hot Water Solutions (hotwatersolutionsnw.org) website in the past 3 months?

IF YES:

a. How many times?

b. For what purposes?

c. Did you find the information you were looking for?

i. If NO, ask: What other resources did you use to find the information you needed?

d. Do you have any recommendations for improving the website?

IF NO:

e. Why not?

Q35. How satisfied have you been with the technical and informational resources that are available through NEEA and CLEAResult? Why? How could these be improved?

Q36. And how satisfied have you been with the marketing assistance and tools from the Initiative? Why? How could these be improved?

Q37. Does NEEA's regional support adversely affect your program or ability to deliver your program to your customers in any way? How so?

Q38. How could NEEA better support your endeavors in the heat pump water heater market? (PROBE to see if any specific marketing to customers or installers needed, other activities).

Q39. Lastly, do you anticipate any future water heater standards that may impact electric storage water heaters below 55 gallons? If so, around when do you anticipate this standard to take effect?

Is there anything else that you think would be important for us to know regarding heat pump water heaters, the NEEA heat pump water heater team, the Hot Water Solutions program, or anything else?

Thank you VERY MUCH for your time!

HPWH Suppliers Interview Guide

The findings and recommendations in this report that are associated with distributors and large retailers are not based on a representative sample of the four state region – Idaho, Montana, Oregon and Washington. NEEA and its contractor did not conduct interviews in Idaho with these supply chain market actors for this report at the request of Idaho Power Company.

Recruitment (if needed):

Hi, this is _____ with Evergreen Economics, an energy program evaluation firm based in Portland, Oregon. We're calling on behalf of the Northwest Energy Efficiency Alliance (NEEA) who engaged us to conduct heat pump water heater research. Please know that this is not a sales call.

NEEA has asked us to speak with heat pump water heater **<Supplier Type>**s to learn more about the HPWH market, so NEEA can potentially adjust and improve its Initiative to be successful for both customers and suppliers. Anything you tell us will be kept confidential.

(If no NEEA contact provided) Can you please direct me to the person in your company that is most experienced with your water heating equipment sales?

When correct person is on the phone: Is now a good time to talk about your water heaters and NEEA's Initiative, or can we schedule a time to talk for about one hour?

(If they have any concerns, ask them to contact Amy Webb (NEEA) at 503-688-5448 for more information about the evaluation.)

Company Characteristics and Product Offerings

First, I'd like to get some general information about you and your company.

Q1. Can you please describe your role at your company? (Probe to see if they are a manufacturer's national or regional sales manager, retail store manager or department manager, sales associate, etc.)

Q2. And how long have you been in this role?

Q3. How long has your company been [selling/making] water heaters, in general?

Q4. When did your company start [selling/making] heat pump water heaters?

Q5. (RETAILERS & DISTRIBUTORS) Which brands of electric and gas water heaters do you stock? (Make sure to differentiate between electric and gas)

Electric water heater brands	Gas water heater brands

Q6. (RETAILERS & DISTRIBUTORS) And which brands and models of heat pump water heaters do you offer to customers?

Q7. (RETAILERS & DISTRIBUTORS) Does your company maintain a stock of heat pump water heaters, or do you purchase them upon receiving orders? (Account for all brands mentioned above)

Q8. (RETAILERS & DISTRIBUTORS) How has your stocking of heat pump water heaters changed since the new federal water heating standards took affect in April 2015?

a. IF NEEDED: Have you increased the stock of certain heat pump water heater brands?

b. IF NEEDED: Did you increase your supply of older large water heaters before the April 2015 change date, and are you still working through that stock?

i. If YES: how long did it take, or how long do you think it will take, to work through that stock of older water heaters?

ii. Have you changed the sale price for these older, large volume electric water heaters since April 2015? How so?

Q9. (RETAILERS & DISTRIBUTORS) About what percent of your business revenues come from heat pump water heater sales and installations vs. other water heaters? And overall?

Q10. (MANUFACTURERS) About what percent of your business revenues comes from heat pump water heater sales vs. all other water heaters? And overall?

Q11. (MANUFACTURERS) How has your production of heat pump water heaters changed since the new federal water heating standards took effect in April 2015? (Probe on new models offered, volume changes, price changes)

Q12. (MANUFACTURERS) Did your orders for electric models larger than 55 gallons increase significantly prior to April 2015?

Q13. (MANUFACTURERS) How long do you think it will take Northwest distributors and retailers to deplete their stocks of older, large electric water heaters? (Probe to see if just a few months, years?)

Stocking and Procurement (Manufacturers SKIP to Marketing Section)

Now I would like to ask you a few questions about your supply of heat pump water heaters.

Q14. From what company or companies do you source your heat pump water heaters? (For retailers distinguish distributors from manufacturers)

IF THEY MAINTAIN HPWHs STOCK:

a. What motivated you to stock heat pump water heaters? (PROBE for demand, rebates, NEEA/utilities, etc.)

b. What year did you begin stocking heat pump water heaters?

c. What brands and models do you keep in stock?

IF THEY DO NOT MAINTAIN STOCK:

a. Why don't you stock heat pump water heaters?

b. What, if any, impact does this have on the number of heat pump water heaters that get installed, in emergency replacement situations in particular? How so?

Q15. Do you sell HPWHs to customers in the Northwest at reduced cost due to manufacturer markdowns? (If NEEDED: the manufacturer markdowns as part of the Hot Water Solutions Initiative sponsored by the Northwest Energy Efficiency Alliance) If so, what impact does this have on your sales of HPWHs in the Northwest?

Q16. What changes, if any, do you foresee for your heat pump water heater stocking in the next 2 years?

Q17. Do you have a sense for the percentage of your heat pump water heater sales that are going into new homes, versus retrofits in existing homes? (If YES, get estimates)

Q18. Do you have any problems getting the heat pump water heaters you need from the companies you work with? (If YES get details)

Marketing

Now let's discuss your marketing activities.

Q19. How does your company market heat pump water heaters for the residential market? (IF NECESSARY: For instance, do you have info in building trade publications, have info on a website, or use social media or newspaper/radio/TV advertising, or trade shows?) Anything else?

a. (If NO marketing) Why do you choose not to market heat pump water heaters for households?

Q20. Who are your primary target markets for heat pump water heaters? For instance, do you focus on general households or specific demographics, new homebuilders, home remodelers, realtors or other groups?

Q21. And what are your key marketing messages? (PROBE on energy savings, more control over settings, desire for improved technology, bill savings, rebates, etc.)

Q22. (RETAILERS) For your homeowner customers, what messages or information is most persuasive in getting them to purchase a heat pump water heater?

Q23. Is your marketing any different in the Pacific Northwest than the rest of the country?

a. If YES: How is it different, and why is this?

b. (IF NEEDED) Has NEEA influenced your marketing efforts in any way? (PROBE to see if more marketing focused in NW due to rebates, if focusing more on specific home types, new messages, etc.)

Q24. In the past year, have you changed your marketing for heat pump water heaters in any way?

a. IF YES: What changes have you made? (Probe for messaging, channels and amounts)

b. Why did you make these changes?

Q25. Have there been any times when NEEA's and/or a utility's heat pump water heater messaging or marketing efforts have conflicted with your company's marketing?

a. If YES: What was done to resolve the issue?

Q26. What types of marketing support have you received from NEEA's Initiative? (PROBE on ad templates, sales fact sheets, signage, website or publication content, co-op ad funding, other)

a. Are there any types of support you would like going forward? (If YES: Get details and probe for how it will be useful to the respondent)

Q27. Do you have any recommendations for NEEA or the Northwest utilities regarding how best to market heat pump water heaters to homeowners?

Sales Volumes

Q28. What are your most popular heat pump water heater models in the Northwest?

a. Why are these sales highest? [Probe for rebate amount, brand recognition, physical characteristics including volume, etc.]

Q29. What impacts have NEEA's efforts in the Northwest had on your sales of residential heat pump water heaters in the past year? Have sales of any particular types or sizes increased significantly?

Q30. What are your expectations regarding your company's overall heat pump water heater sales volume or market share in the Northwest in 2016?

a. How about in the next 3 years?

b. How much does this depend on the availability of utility incentives?

HPWH Pricing

Q31. (NOT MANUFACTURERS) In the past year, have there been any changes in the prices that you pay to obtain your heat pump water heaters?

If YES:

a. How have prices increased or decreased, and for which models (get details on percentage changes)?

b. Why have these prices increased/decreased (PROBE on changing manufacturer/materials costs, bulk purchase discounts, improved features, etc.)?

Q32. (MANUFACTURERS) In the past year, have the prices you charge to heat pump water heater distributers and retailers changed in any way?

If YES:

a. Have prices increased or decreased, and for which models (get details on percentage changes)?

b. Why have these prices increased/decreased (PROBE on changing manufacturer/materials costs, strategic product positioning, bulk purchase discounts, improved features, etc.)?

Q33. In the past year, have the prices paid by residential customers for heat pump water heaters changed in any way?

If YES:

a. Have prices increased or decreased, and for which models (get details on percentage changes)?

b. Why have these prices increased/decreased (PROBE on changing manufacturer/materials costs, strategic product positioning, bulk purchase discounts, improved features, etc.)?

Q34. (RETAILERS) Do you offer financing for heat pump water heaters?

a. If YES: Get details on financing terms

b. IF YES: What percent of household purchasers use your financing?

c. What percent of purchasers pay with a credit card, versus pay with cash or check?

Q35. Do you think prices that households pay for heat pump water heaters will increase or decrease in the next two years? (PROBE for percentage increase/decrease) And how about five years?

a. Why do you say that? (PROBE on specific tiers and potential reasons: changing manufacturer costs, supply chain changes, etc.)

Q36. What is the average installation price charged by installers? (Note if retailers are using their own staff)

a. Do you have any concerns about installation prices charged by contractors (RETAILERS: that do not work for your company)? (Probe for too high or

variable price; to see if NEEA/utility rebates are being "captured" by installers; too few installers; other issues)

b. Do you think the price for heat pump water heater installations will increase or decrease in the next two years? (PROBE for percent increase/decrease) And how about five years?

Interaction with Other Market Actors

Now let's talk about the contractors that install heat pump water heaters.

Q37. (FOR DISTRIBUTORS AND MANUFACTURERS) What technical training do you provide to installers?

Q38. Are there any technical issues that installers have more difficulties with?

Q39. (FOR DISTRIBUTORS AND MANUFACTURERS) Do you also rely on contractors to promote your HPWHs?

a. If YES: How do you ensure that contractors use appropriate messaging to households?

Q40. (MANUFACTURERS) How do you work with Northwest distributors to promote your heat pump water heaters? (PROBE to see if co-funding advertising, teaming on technical training to installers, just sending them product literature to distribute, other.)

a. Which distributors are you working with?

b. Are you trying to get additional distributors to carry your products?

c. Have you had any challenges working with specific distributors? (If YES get details)

Q41. (DISTRIBUTORS) How is it going working with the manufacturers that sell to you?

a. Have you had any challenges working with specific manufacturers? (If YES get details)

b. What could be improved?

Q42. (FOR DISTRIBUTORS AND MANUFACTURERS) Do you work with any Northwest retailers to promote heat pump water heaters?

IF YES, or have worked with retailers in past (adjust questions for past experience):

a. Which retailers do you work with?

b. How do you work with these retailers? (Probe to see if coordinating discounts/rebates, co-funding advertising, giving them technical sales training, etc.)

c. Have you had any challenges working with specific retailers to promote your heat pump water heaters? (If YES get details)

IF NO:

d. Is there any particular reason why your company doesn't work with retailers on heat pump water heaters?

Q43. (RETAILERS SOURCING DIRECTLY FROM MANUFACTURERS) How is it going working with the manufacturers that sell to you?

a. Have you had any challenges working with specific manufacturers? (If YES get details)

b. What could be improved?

Q44. (RETAILERS SOURCING FROM DISTRIBUTORS) How is it going working with the distributors that sell to you?

a. Have you had any challenges working with specific distributors? (If YES get details)

b. What could be improved?

Interactions with NEEA and CLEAResult

Q45. What interactions have you had with NEEA or its implementation contractor, CLEAResult, in the past year? (Get name of primary contact if they are unsure of affiliation)

Q46. How has this coordination helped your efforts in the heat pump water heater market?

Q47. Has NEEA's Initiative influenced your view of the heat pump water heater market in the Northwest in any way?

Q48. Thinking of 2015 only, did you have any challenges working with these organizations? (PROBE on rebates eligibility, NEEA/CLEAResult delivery, training or marketing issues)

Q49. Do you plan to assist the Initiative in any way in 2016? (Probe on technology training, marketing, funding, etc.)

Q50. Overall, how satisfied would you say you are working with NEEA and CLEAResult? Would you say you are:

a. Extremely satisfied

b. Very satisfied

c. Somewhat satisfied

d. Not very satisfied

e. Not at all satisfied

Q51. Why do you say that?

Barriers and Challenges

We're almost done and I'd like to get your feedback on challenges for HPWHs…

Q52. What are the biggest, current consumer barriers to purchasing heat pump water heaters? (PROBE on new technology concerns, lack of familiar brands, local codes, capital costs, install time/costs, availability for emergency replacement)

Q53. We've noticed many heat pump water heaters are purchased as part of a planned replacement as opposed to an emergency situation (where the existing water heater failed). What does this indicate, if anything, about the types of consumers purchasing heat pump water heaters at this point in time?

Q54. Are there any ways that NEEA or utilities could increase the rate at which heat pump water heaters are selected in emergency replacement situations? How?

Q55. In the past year have you had any consumers call you after an installation and need assistance with their water heater? (If YES get details)

a. Was their situation resolved? How?

Q56. What are the main technological challenges associated with the installation and use of heat pump water heaters?

Q57. In the past year have any of your heat pump water heaters been returned due to technical failures?

a. If YES: Get details (percentage and typical models, reasons)

b. Are all of the returned products covered by warranty? If not, what percent?

Future Expectations

Let's finish by talking about the future potential for heat pump water heaters.

Q58. (MANUFACTURERS) What technological trends are you seeing with heat pump water heaters?

a. Are there any new developments with heat pump water heaters in cold climate applications?

b. (MANUFACTURERS) Is your company considering or planning to make future models that meet the more rigorous Northern Climate Specification Tier(s)? Why is that? (PROBE for return on investment, timeframe)

Q59. How have the new federal standards that prohibit the manufacture of electric resistance water heaters 55 gallons or larger impacted your sales of heat pump water heaters or other types of water heaters? (IF NEEDED: Starting on April 16 2015, companies were not able to manufacture electric resistance water heaters that are above 55 gallons in size)

Q60. Going forward, do you believe that households requiring at least 55-gallon hot water capacity will generally opt for HPWH technologies to meet their water heating needs? Or do you have evidence that households will increase their purchases of on-

demand water heaters, downsize their equipment, or purchase two or more small water heaters?

Q61. Are residential heat pump water heaters a high priority market for your company?

Q62. What are the fastest growing market segments for heat pump water heaters, such as new residential construction, major remodels, upgrades during home sales, manufactured housing, etc.?

Is there anything else that you think would be important for us to know regarding heat pump water heaters, NEEA, the Smart Water Heat program, or anything else?

Thank you VERY MUCH for your time!

HPWH Installers Interview Guide

Recruitment

Hi, this is _____ with Evergreen Economics, an energy program evaluation firm based in Portland, Oregon. We're calling on behalf of the Northwest Energy Efficiency Alliance, also known as NEEA, and the Smart Water Heat Initiative, who engaged us to conduct research on heat pump water heaters. Please know that this is not a sales call.

We are speaking with heat pump water heater installation contractors to learn more about the HPWH market, so NEEA can potentially adjust and improve its Initiative to be successful for both customers and suppliers. Anything you tell us will be kept confidential.

Can you please direct me to a sales manager or the person who is most knowledgeable about your firm's sales of residential water heating equipment, especially heat pump water heaters?

[When the correct person is on the phone: Repeat Intro above.]

Is now a good time to talk about your water heater sales and NEEA's Initiative, or can we schedule a time to talk for about 30 minutes?

(If they have any concerns, ask them to contact Amy Webb (NEEA) at 503-688-5448 for more information about the evaluation.)

Respondent and Company Characteristics

First, I'd like to get some general information about you and your company.

Q1. Can you please describe your role at your company? (Probe to see if they are a company owner, sales/marketing manager, installation specialist, etc.)

Q2. And how long have you been in this role?

Q3. About what percentage of your company's total revenues at the location we have called are from installations of the following types of residential water heaters:

- a. Electric storage water heaters, excluding heat pump water heaters
- b. Heat pump water heaters
- c. Electric on-demand or tankless water heaters
- d. Natural gas water heaters

Product Stocking

Now I have some questions about the products you offer to customers.

Q4. Which brands of electric resistance storage water heaters – excluding heat pump water heaters – does your firm currently offer to customers?

Q5. And which brands of heat pump water heaters does your firm currently offer to customers?

Q6. Are you planning to offer any other HPWH brands in the next 12 months?

Q7. (IF YES:) Which brands?

Q8. Does your company maintain a stock of:

a. Electric resistance storage water heaters?

b. Heat pump water heaters?

c. On-demand or tankless water heaters?

d. Natural gas storage water heaters?

Q9. Do you sometimes special-order products for customers, or do you only recommend your stocked products? (Probe on how often, what types/brands)

Q10. (IF STOCKING HPWHs) Which HPWH brands does your firm currently have in stock?

Q11. Thinking about heat pump water heaters and other electric storage heaters, is there any difference in the time it typically takes your company to obtain and install the unit after the customer requests a purchase? (Get details on time differences and causes)

Q12. If TIME DIFFERENCE: How often does this cause customers to reverse their HWPH selection, and pick a different type of water heater?

HPWH Experience and Sales

Next, I'd like to ask about your firm's experiences with HPWHs.

Q13. About how many total HPWHs has your firm installed in residential homes?

Q14. In what year did your company install its first residential HPWH?

Q15. Do you view HPWH sales as a positive opportunity for your business? Why do you say that?

Q16. Excluding all equipment costs – just considering labor – how much does it cost your residential customers, on average, to install a HPWH? Please consider a typical installation in unconditioned space that does not require any wall modifications or additional ducting or venting.

Q17. And how much does it cost to install a typical electric resistance storage water heater?

Q18. Again, just considering labor, how much more does it cost for a typical HPWH installation in conditioned space, which requires some modifications like ducting or venting?

Q19. Have your installation costs changed in the past year in any way? (If YES get details, see if costs have stabilized)

Q20. Some HPWHs, like GE products, can be switched from Cold Climate Efficiency Mode to less energy efficient modes that use more electric resistance heating. How often do residential customers request that the initial setting is not Cold Climate Efficiency Mode?

a. For HPWHs that are installed in Cold Climate Efficiency Mode, do you think that any of the homeowners change the mode? What percent?

b. Is there any indication why customers change the settings?

Q21. Do you have any significant technical challenges installing HPWHs in residential locations? (If YES get details)

Q22. Have any customers reported problems operating their equipment after it was installed? (If YES get details, distinguish install issues versus manufacturing defects)

Q23. About how many residential electric storage water heaters did you install in 2015, and how many of these were HPWH installations?

Now I have some questions just about your HPWH installations in 2015.

Q24. How many of these HWPH installations received incentives from a utility or through the Smart Water Heat or Hot Water Solutions program? Do not count projects that only received a manufacturer or retailer markdown.

Q25. Are you aware of any HPWH markdown promotions or sales over the past year or currently?

a. [If Q25 = Yes] And do the markdowns have any impact on what water heater you recommend to your customers? What impact? (PROBE for increase/decrease in recommendation frequency)

b. [If Q25 = Yes] Do the markdowns change what you tell customers about HPWHs? (If YES get details)

c. [If Q25 = Yes] And now, about how many of your 2015 HPWH installations received a manufacturer or retailer markdown, such as a promotional sale in a hardware or home improvement store?

d. [If Q25 c > 0] Do you pass on none, some, or all of the cost savings to your customers (if needed: in order to help close sales)? (Probe for reasons why)

Q26. What do you consider an emergency replacement? Does the water heater have to be completely nonfunctional?

Q27. What percentage of your 2015 HPWH installations were for emergency replacements because an existing water heater had failed?

Q28. On average, for emergency replacements, how long does it take from the time the homeowner contacted you until they have a functional HPWH installed in their home?

a. Does this vary for situations in which it is not an emergency replacement, but rather a planned replacement? How so? Why?

Q29. And what percentage of your 2015 HPWH installations went into home retrofits, versus new construction?

Q30. HPWHs come in a range of volumes. How do you determine which size is appropriate for your customers? (PROBE for actions taken when previous water heater >55gal versus <55gal)

Q31. As you may know, federal standards that took effect in April 2015 now prohibit the manufacture of standard efficiency electric storage heaters 55 gallons or larger. Have the new standards or any other industry trends affected your company's stock of water heaters in any way, or the types of water heaters that customers are choosing? (If YES get details on changes occurring)

Q32. Since April 2015, when a customer who requires a large volume of electrically heated water reaches out to you to acquire a new water heater, what options do you present to them? What do they typically purchase? (PROBE for percent of purchases by water heater type)

a. Has this changed recently, since November 2015? How so?

Q33. Compared to your 2015 sales of residential HPWHs, do you think your sales in the next 2 years will… (READ LIST)

a. Increase significantly

b. Increase somewhat

c. Remain about the same as 2015

d. Decrease somewhat

e. Decrease significantly

Q34. (IF Q31 not c) Why do you say that?

Q35. (IF SALES EXPECTED TO INCREASE) For which brands and tank sizes do you expect HPWH sales to increase?

Marketing and Customer Demand

Q36. What types of HPWH marketing, if any, does your company do? [DO NOT READ, LISTEN FOR]

a. None

b. Print – fliers, brochures, or other marketing collateral

c. Print – newspaper ads

d. Print – magazine ad/article
e. Print – direct mail outreach
f. Radio
g. TV
h. Online advertising or Google AdWords
i. Outdoor advertising, including billboards and buses
j. Company webpage
k. Social media
l. Home/trade shows

Q37. [If any marketing mentioned in Q34] Who sponsored the marketing effort? (Go through all types selected in Q34 and assign a sponsor; pay close attention for anything that sounds like cooperative marketing with a utility and/or NEEA involvement)

Q38. Have you found that any of these modes are more effective than others?

Q39. Have you done any coordinated promotions with HWPH manufacturers or distributors?

a. If YES: How has this gone; what were the sales impacts?

Q40. About what percentage of your HPWH purchasers come to you seeking a HPWH specifically, versus another type of water heater?

a. Has this percentage changed much in the past year?

Q41. What type or types of customers are most likely to inquire about HPWHs? (If needed: are there any segments of the population that are more likely to ask about HPWHs?)

a. And what types are most likely to purchase a HPWH? (If needed: are there any segments of the population that are more likely to purchase HPWHs?)

Q42. When your staff promotes HPWHs to residential customers, what benefits do you discuss? [DO NOT READ, LISTEN FOR]

a. More efficient/lower operating costs than other water heating types
b. Lower installation costs than other water heating types
c. Better setting controls
d. Easy to operate
e. Longer operating life than other water heating types
f. Reliability

g. Warranty

h. Save energy

Q43. How important would you say that utility rebates are to residential HPWH sales? Would you say they are:

a. Extremely important

b. Very important

c. Somewhat important

d. Not very important

e. Not at all important

Q44. What are the primary barriers to HPWH sales?

Q45. What do you think NEEA and the Smart Water Heat Initiative should do to increase residential awareness and demand for HPWHs?

Initiative Services

We just have a few more questions and then we're done.

Q46. How many water heater installation staff are employed by your firm at this location?

Q47. And how many staff have attended a contractor orientation session for NEEA's Smart Water Heat (newly rebranded Hot Water Solutions) Initiative?

Q48. Thinking about the technical equipment and installation information that was presented, how would you rate the effectiveness of the orientation training? Would you say the trainings were:

a. Extremely effective

b. Very effective

c. Somewhat effective

d. Not very effective

e. Not at all effective

Q49. Why do you say that?

Q50. Now, thinking about the marketing techniques that were presented, how would you rate the effectiveness of the orientation training? Would you say the trainings are:

a. Extremely effective

b. Very effective

c. Somewhat effective

d. Not very effective

e. Not at all effective

Q51. Why do you say that?

Q52. Have your staff contacted Smart Water Heat/Hot Water Solutions staff about any issues?

Q53. (If YES) Regarding what issues or questions? (DO NOT READ, LISTEN FOR)

a. HPWH equipment eligibility

b. Utility rebates

c. Marketing/promotional assistance

d. Technical installation/best practices

e. Dissatisfied customers

f. Poor performing water heaters

Q54. How responsive was the Initiative staff? Would you say they were:

a. Extremely responsive

b. Very responsive

c. Somewhat responsive

d. Not very responsive

e. Not at all responsive

Q55. Is there any marketing or technical support that the Initiative could provide that might help you to increase the number of HPWHs you sell?

Is there anything else that you think would be important for us to know regarding heat pump water heaters, the Smart Water Heat Initiative, or anything else?

Thank you VERY MUCH for your time!

HPWH Purchasers Survey Guide

Recruitment:

Hi. This is _____ with CIC Research. We're calling on behalf of the Northwest Energy Efficiency Alliance (NEEA) for a survey on heat pump water heaters.
We're surveying households who recently purchased and installed a heat pump water heater and received a financial incentive from your local utility. The information you give will help NEEA improve the program for homeowners in the future.

(Anything you tell us will be kept confidential.)(This is not a sales call.)
(Our contact at NEEA: Amy Webb, 503-688-5448)
(IF CUSTOMER NAME IN SAMPLE SAY:) May I speak to _____?
(ALL OTHER SAY:) Could I speak to the person most familiar with your home's decision to purchase a heat pump water heater? (REPEAT INTROS TO NEW PERSON, IF NECESSARY)

The survey takes about 20 minutes. Is this a good time? (ARRANGE CALLBACK IF NECESSARY)

PROGRAMMING NOTE:
SAMPTYPE = T1 if Tier 1 HPWH purchased and installed
SAMPTYPE = T2 if Tier 2 HPWH purchased and installed
CONST = "New" if installed in new construction
CONST = "Existing" if installed in existing home
WHV = Volume of new HPWH
INCENTIVE$ = Amount of utility incentive

SCREEN:

A. Our records indicate that you purchased a heat pump water heater around <DATE>. Is this correct? [FOCUS IS ON WHETHER THEY PURCHASED OR NOT, NOT THE DATE – DATE ONLY TO JOG MEMORY]
   1. Yes [CONTINUE]
   2. No [THANK AND TERMINATE]
   88. Refused [THANK AND TERMINATE]
   89. Don't know [SKIP TO EXPLAIN]

[IF A = 89, CONTINUE. OTHERWISE SKIP TO C]

B. **EXPLAIN:** A heat pump water heater would have replaced your previously existing water heater. It is a different technology, but it serves the same purpose: providing hot water for your household. Do you recall having a heat pump water heater installed?
   1. Yes – aided [CONTINUE]
   2. No [THANK AND TERMINATE]

88. Refused [THANK AND TERMINATE]
89. Don't know [THANK AND TERMINATE]

C. Was the heat pump water heater installed in your home?

1. Yes [CONTINUE]
2. No [SKIP TO E]
88. Refused [SKIP TO E]
89. Don't know [SKIP TO E]

D. Was the heat pump water heater installed in your existing home or was it part of a new home construction?

1. Existing home [CONST = EXISTING; SKIP TO Q 1]
2. New home construction [CONST = NEW; SKIP TO Q 1]
88. Refused [THANK AND TERMINATE]
89. Don't know [THANK AND TERMINATE]

E. Where was the heat pump water heater installed? (PROGRAMMER: WE NEED TO BE ABLE TO REPORT THIS BREAKDOWN)

1. Family member's home [THANK AND TERMINATE]
2. Friend's home [THANK AND TERMINATE]
3. Rental property (respondent is landlord) [THANK AND TERMINATE]
4. Not installed [THANK AND TERMINATE]
77. Other [SPECIFY]
88. Refused [THANK AND TERMINATE]
89. Don't know [THANK AND TERMINATE]

Terminate: Those are all my questions. Thank you for your time. Good-bye.

Sources of Awareness

Q 1. To begin, how did you first hear about heat pump water heaters? [DO NOT READ; CHOOSE ONE - THE FIRST PLACE THEY HEARD OF IT]

1. Previously owned one
2. Friend or acquaintance
3. Utility print advertising, bill stuffer
4. Utility website
5. "Smart Water Heat" website
6. "Hot Water Solutions" website
7. Retail store display / saw it in store
8. Retail store salesperson
9. Newspaper ad
10. Newspaper story
11. Television ad

12. Social media
13. From contractor/installer
14. Internet research
15. Internet advertising
16. Installed prior to respondent moving in to the home (TERMINATE)
17. Utility newsletter
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 2. Did you hear about them anywhere else or learn more about them from any other sources? [DO NOT READ; ACCEPT MULTIPLES]

1. Previously owned one
2. Friend or acquaintance has one
3. Utility print advertising, bill stuffer
4. Utility website
5. "Smart Water Heat" website
6. "Hot Water Solutions" website
7. Retail store display / saw it in store
8. Retail store salesperson
9. Newspaper ad
10. Newspaper story
11. Television ad
12. Social media
13. From contractor/installer
14. Internet research
15. Internet advertising
16. Installed prior to respondent moving in to the home (TERMINATE)
17. Nowhere else
18. Utility newsletter
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 3. And how did you first hear about the <Manufacturer> brand of heat pump water heaters? [DO NOT READ; CHOOSE ONE, THE FIRST PLACE THEY HEARD OF IT]

1. Previously owned one
2. Friend or acquaintance has one
3. Utility print advertising, bill stuffer
4. Utility website
5. "Smart Water Heat" website
6. "Hot Water Solutions website
7. Retail store display / saw it in store

8. Retail store salesperson
9. Newspaper ad
10. Newspaper story
11. Television ad
12. Social media
13. From contractor/installer
14. Internet research
15. Internet advertising
16. Installed prior to respondent moving in to the home (TERMINATE)
17. Utility newsletter
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 4. Did you hear about <Manufacturer> heat pump water heaters from anywhere else or learn more about it from any other sources? [DO NOT READ; ACCEPT MULTIPLES]

1. Previously owned one
2. Friend or acquaintance has one
3. Utility print advertising, bill stuffer
4. Utility website
5. "Smart Water Heat" website
6. "Hot Water Solutions" website
7. Retail store display / saw it in store
8. Retail store salesperson
9. Newspaper ad
10. Newspaper story
11. Television ad
12. Social media
13. From contractor/installer
14. Internet research
15. Internet advertising
16. Installed prior to respondent moving in to the home (TERMINATE)
17. Utility newsletter
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 5. When making an appliance purchase decision, what are your typical sources of information regarding which product to purchase?

1. Friends or acquaintances
2. Utility print advertising, bill stuffers
3. Utility website

4. Retail store – general
5. Retail store displays
6. Retail store salespeople
7. Newspaper ads
8. Newspaper stories
9. Television ads
10. Social media
11. From contractor/installer
12. Internet research / Internet reviews
13. Internet advertising
14. Specific Internet website, please specify: _____
15. Utility newsletter
77. Other, please specify: _____
88. Refused
89. Don't Know

Replaced Water Heater Characteristics

Now I would like to ask you some questions about the water heater that you replaced, and your reason for replacing it.

Q 6. What was the brand of your previous water heater? [DO NOT READ; ACCEPT ONE RESPONSE]

1. General Electric ("GE")
2. A.O. Smith
3. American
4. Kenmore
5. Reliance
6. State
7. Stiebel Eltron
8. U.S. Craftmaster
9. Whirlpool
10. AirGenerate
11. Electrolux
12. Rheem
13. Bradford White
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 7. [If **Q 6** = 89] Do you think it was a … [READ LIST; ROTATE LIST; ACCEPT ONE RESPONSE]

1. General Electric ("GE")

2. A.O. Smith
3. American
4. Kenmore
5. Reliance
6. State
7. Stiebel Eltron
8. U.S. Craftmaster
9. Whirlpool
10. AirGenerate
11. Electrolux
12. Rheem
13. Bradford White
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 8. How many gallons was your previous water heater tank?

Gallons: _____
7777. Tankless / On demand / Instantaneous
8888. Refused
9999. Don't Know

Q 9. Under normal circumstances, was your old water heater able to provide sufficient hot water for your household?

1. Yes
2. No
88. Refused
89. Don't Know

Q 10. [IF **Q 8** < 55 gallons and WHV => 55 gallons] Why did you choose to install a larger heat pump water heater?

RECORD VERBATIM: _____
88. Refused
89. Don't Know

Q 11. [IF **Q 8** => 55 gallons and WHV < 55 gallons] Why did you choose to install a smaller heat pump water heater?

RECORD VERBATIM: _____
88. Refused
89. Don't Know

[READ If **CONST** = Existing] My next question is about your decision to install ANY new water heater. The question includes the term "emergency replacement", which we are defining as the need to replace your previous water heater because it became non-functional and incapable of providing hot water for your home. If your water heater was in working condition – even if it wasn't working very well or you didn't like it for one reason or another – we want to consider that a planned replacement.

Q 12. [If **CONST** = Existing] Did you replace your previous water heater in an emergency situation, for example maybe it broke, or was it a planned replacement?

1. Emergency situation
2. Planned replacement
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 13. [**Q 12** = 2] What was the reason you decided it was time to replace your previous water heater? [DO NOT READ LIST; ACCEPT MULTIPLE]

1. Not enough hot water
2. Getting old, time for a replacement
3. Occasional malfunction
4. Rusted
5. Noisy
6. Leaky
7. Cost to operate
8. Efficiency ("it was inefficient")
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 14. Besides heat pump water heaters, what other water heating solutions did you consider? Did you consider… [READ LIST; ACCEPT MULTIPLE]

1. Standard electric storage water heaters
2. Tankless water heaters
3. Gas storage water heaters, which would require natural gas service
4. Solar water heating
5. No other types
88. Refused
89. Don't Know

Purchase Decision / Importance of Incentives

Next I would like to ask you some questions about your decision to purchase a heat pump water heater.

Q 15. [If **Q 14** = 2 through 5] Why didn't you purchase a <**Q 14**> instead of a heat pump water heater?

1. None available
2. More expensive to purchase
3. More expensive to operate
4. Less efficient
5. Requires unacceptable renovation
6. Heat pump water heaters were recommended
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 16. Where did you buy your heat pump water heater?

1. Home Depot
2. Sears
3. Lowe's
4. ACE Hardware
5. Contractor
6. Plumber
7. Water heater installer
8. Online / Internet / Website
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 17. What website?

RECORD VERBATIM: _____
88. Refused
89. Don't Know

Q 18. Did you purchase a heat pump water heater at a reduced cost or "on sale"?

1. Yes
2. No
88. Refused
89. Don't Know

Q 19. Which of the following four statements best describes what initiated your new water heater purchase: [READ ALL BEFORE ACCEPTING AN ANSWER; ACCEPT ONE]

1. "I needed a new water heater"

2. "I wanted to upgrade my water heater to something more efficient"
3. "I specifically wanted a heat pump water heater"
4. "I noticed that heat pump water heaters were on sale"
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 20. Where did you get information about heat pump water heaters in general before you made your purchase? [CHECK ALL THAT APPLY]

1. NEEA website
2. Smart Water Heat website
3. Hot Water Solutions website
4. Utility website
5. Internet (general)
6. Contractor provided materials
7. Spoke to the contractor
8. Spoke to someone who already had a heat pump water heater installed
9. Did not look for any information
10. Utility provided information
11. Manufacturer website
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 21. [If **Q 20** = 6 or 7] What specific information did the contractor provide before the water heater was purchased?

RECORD VERBATIM: _____
88. Refused
89. Don't Know

Q 22. What initially interested you in a heat pump water heater, as opposed to other types of water heaters? [DO NOT READ, PROBE TO CODE, CHECK ALL THAT APPLY]

1. The rebates from your utility
2. The payback period
3. The lower monthly operating cost
4. Saving energy
5. Concern of carbon footprint / greenhouse gases
6. The product's appearance
7. The availability of the rebate
8. Past participation in similar program
9. The recommendation by contractor / plumber
10. The water heater's programmability

11. A bad experience with previous water heater
12. The product warranty
13. A desire to be high tech
14. It was "on sale" / markdown
77. Other, please specify: _____
88. Refused
89. Don't Know

[REPEAT **Q 23** AND **Q 24** FOR ALL ANSWERS TO **Q 22**]

Q 23. How important was <**Q 22**> in your decision to purchase a heat pump water heater, where 1 is not at all important, and 5 is very important?

IMPORTANCE: 1 2 3 4 5
88. Refused
89. Don't Know

Q 24. [If **Q 23** = 1 or 2] Why do you say that?

RECORD VERBATIM: _____
88. Refused
89. Don't Know

Q 25. [If **Q 18** = 1 and **Q 22** ≠ 14] How important was the discounted "sale" price in your decision to purchase a heat pump water heater, where 1 is not at all important, and 5 is very important?

IMPORTANCE: 1 2 3 4 5
88. Refused
89. Don't Know

Q 26. [If Q25 = 1 or 2] Why do you say that?

RECORD VERBATIM: _____
88. Refused
89. Don't Know

Q 27. [IF **Q 22** ≠ 1] How important were the rebates from your utility in your decision to purchase a heat pump water heater, where 1 is not at all important, and 5 is very important?

IMPORTANCE: 1 2 3 4 5
88. Refused
89. Don't Know

Q 28. [If **Q 27** = 1 or 2] Why do you say that?

RECORD VERBATIM: _____
88. Refused
89. Don't Know

Now I am going to ask you to rate how important each of the following factors was in your decision to purchase a heat pump water heater, where 1 is not at all important, and 5 is very important.

How important was…	[Rating of Importance]	[If = 1 or 2] Why do you say that?
Q 29. … the ENERGY STAR® label?	1 2 3 4 5 77 88 99	Q 30.
Q 31. [If **Q 1** or **Q 2** = 5 or 6] … the information on the Smart Water Heat or Hot Water Solutions website?	1 2 3 4 5 77 88 99	Q 32.
Q 33. … your familiarity with the water heater brand?	1 2 3 4 5 77 88 99	Q 34.

Q 35. Were there any other factors that were important in your decision to install a heat pump water heater?

1. Yes, please specify: _____
2. No
88. Refused
89. Don't Know

Q 36. Do you believe the heat pump water heater increased, decreased, or had no effect on the value of your home?

1. Increased the value
2. Decreased the value
3. No effect on value of home
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 37. Would you have purchased the same water heater if the utility rebate were half as much, that is, [1/2 INCENTIVESWH$] instead of [INCENTIVESWH$]?

1. Yes
2. Maybe
3. No
88. Refused
89. Don't Know

Q 38. Was there anything you were concerned about when you were considering a heat pump water heater? [DO NOT READ; CHECK ALL THAT APPLY; IF MORE THAN 1 OTHER, LIST EACH SEPARATELY IN PREPARATION FOR Q39]

1. No concerns
2. Appearance
3. Performance
4. Energy savings
5. Capability/functionality
6. Cost
7. Reliability
8. Brand
9. Noise
10. Physical size
11. Ducting
12. Maintenance needs
13. Equipment warranty
14. Manufacturer customer service/support
15. Exhaust air
16. Installation location space requirements
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 39. [ASK FOR EACH RESPONSE TO **Q 38** IF **Q 38** ≠ 1, 88 or 89] How did you overcome the <**Q 38**> concern?

RECORD VERBATIM: _____
88. Refused
89. Don't Know

Q 40. Did you use a loan to pay for your new water heater?

1. Yes
2. No
88. Refused
89. Don't Know

Q 41. [IF **Q 40** = 1] From which of the following sources did you get that loan? Was it from a… [READ CHOICES]

1. Local bank or credit union
2. Utility company
3. Installation contractor
4. Manufacturer

5. Retailer credit
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 42. [If **Q 40** = 1] Please rate how important the availability of the loan was in your decision to purchase a heat pump water heater, where 1 is not at all important, and 5 is very important.

IMPORTANCE: 1 2 3 4 5
88. Refused
89. Don't Know

Q 43. [If **Q 42** = 1 or 2] Why do you say that?

RECORD VERBATIM: _____
88. Refused
89. Don't Know

Q 44. [If **Q 40** = 1] What was the interest rate of the loan you received for the new water heater?

RATE: _____%
88. Refused
89. Don't Know

Q 45. Did you use a credit card to pay for any portion of your new water heater?

1. Yes
2. No
88. Refused
89. Don't Know

Q 46. [If **Q 45** = 1] What percent of the new water heater was purchased using a credit card?

RATE: _____%
88. Refused
89. Don't Know

Q 47. [If **Q 45** = 1] Please rate how important the ability to use your credit card to finance the water heater was in your decision to purchase a heat pump water heater, where 1 is not at all important, and 5 is very important.

IMPORTANCE: 1 2 3 4 5
88. Refused
89. Don't Know

Q 48. Did you, or will you, receive a federal tax credit for your new water heater?

1. Yes – received already
2. Yes – will receive
3. No
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 49. [If **Q 48** = 1 or 2] Please rate how important the availability of the federal tax credit was in your decision to purchase a heat pump water heater, where 1 is not at all important, and 5 is very important.

IMPORTANCE: 1 2 3 4 5
88. Refused
89. Don't Know

Q 50. [If **Q 49** = 1 or 2] Why do you say that?

RECORD VERBATIM: _____
88. Refused
89. Don't Know

Q 51. Did you, or will you, receive a state tax credit for your new water heater?

1. Yes – received already
2. Yes – will receive
3. No
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 52. [If **Q 51** = 1 or 2] Please rate how important the availability of the state tax credit was in your decision to purchase a heat pump water heater, where 1 is not at all important, and 5 is very important.

IMPORTANCE: 1 2 3 4 5
88. Refused
89. Don't Know

Q 53. [If **Q 52** = 1 or 2] Why do you say that?

RECORD VERBATIM: _____
88. Refused
89. Don't Know

Installation, Inspections, Experience and Satisfaction

Now I would like to ask a few questions about the installation itself.

Q 54. [If **CONST** = EXISTING] Did you install the new water heater yourself, or did you hire an installer to do it?

1. Installed by respondent
2. Hired an installer
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 55. [If **CONST** = NEW] Did you install the new water heater yourself, did you hire an installer to do it separate from your home build, or did the general contractor building your home manage the installation?

1. Installed by respondent
2. Hired an installer separate from home build
3. General contractor managed installation
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 56. [If **Q 54** = 2 or **Q 55** = 2 or 3] Whose idea was it to purchase a heat pump water heater rather than another type of water heater? Was it your idea or was it the installer or contractor's suggestion?

1. Was customer's idea
2. Was contractor suggestion
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 57. [If **Q 54** = 2 or **Q 55** = 2 or 3] How did you find the person or company that installed your new water heater? [DO NOT READ; ACCEPT MULTIPLE]

1. Smart Water Heat website / Hot Water Solutions website / contractor finder
2. Angie's List
3. Craigslist
4. Personal recommendation
5. Retailer recommendation
6. Manufacturer recommendation
7. Previous relationship with contractor
8. Utility contractor list
77. Other, please specify: _____
88. Refused

89. Don't Know

Q 58. [IF **Q 57** = 1–77 and MULTIPLE RESPONSES GIVEN] What was the most important source for finding the person or company that installed your new water heater? [DO NOT READ; ACCEPT ONE]

1. Smart Water Heat website / Hot Water Solutions website / contractor finder
2. Angie's List
3. Craigslist
4. Personal recommendation
5. Retailer recommendation
6. Manufacturer recommendation
7. Previous relationship with contractor
8. Utility contractor list
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 59. [If **Q 54** = 2 or **Q 55** = 2 or 3] Please rate your level of satisfaction with the installer who installed your new water heater, where 1 is not at all satisfied, and 5 is very satisfied.

SATISFACTION: 1 2 3 4 5
88. Refused
89. Don't Know

Q 60. [If **Q 59** = 1 or 2] Why do you say that?

RECORD VERBATIM: _____
88. Refused
89. Don't Know

Q 61. How long did the actual water heater installation take, in total? Did it take… [READ LIST; ACCEPT ONE]

1. Less than 2 hours
2. 2-4 hours
3. 4-6 hours
4. 6-8 hours
5. 8-10 hours or
6. Over 10 hours?
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 62. Please rate your level of satisfaction with the amount of time it took to install the new water heater, where 1 is not at all satisfied, and 5 is very satisfied.

SATISFACTION: 1 2 3 4 5
88. Refused
89. Don't Know

Q 63. [If **Q 62** = 1 or 2] Why do you say that?

RECORD VERBATIM: _____
88. Refused
89. Don't Know

Q 64. Where is your new water heater located? Is it in a… [READ LIST; ACCEPT ONE]

1. Basement
2. Garage
3. Utility room / Laundry room
4. Utility closet
5. Kitchen
6. Other closet inside your home
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 65. [IF CONST = EXISTING] Was your new heat pump water heater installed in the same location as your previous water heater?

1. Yes
2. No
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 66. [IF **Q 65** ≠ 1 Where was your previous water heater located? Was it in a… [READ LIST; ACCEPT ONE]

1. Basement
2. Garage
3. Utility room / Laundry room
4. Utility closet
5. Kitchen
6. Other closet inside your home
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 67. Is your new water heater installed in a part of your house that is heated?

1. Yes – heated
2. No – unheated
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 68. Is your new water heater installed in a part of your house that is insulated?

1. Yes – insulated
2. No – not insulated
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 69. Is your new water heater installed with the intake air ducted from the outside into the heat pump water heater? This would have required a 6-inch hole be drilled into the wall of your house.

1. Yes – intake air is ducted
2. No – intake air is not ducted
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 70. Is your new water heater installed with the exhaust ducted to the outside? This would have required a 6-inch hole be drilled into the wall of your house.

1. Yes – exhaust is ducted
2. No – exhaust is not ducted
77. Other, please specify: _____
88. Refused
89. Don't Know

And now I would like to talk about inspections that may have taken place since the new water heater was installed.

Q 71. Did someone contact you and come to your home *after the heat pump water heater was installed* to conduct a quality assurance inspection?

1. Yes
2. No
88. Refused
89. Don't Know

Q 72. [If **Q 71** = 1] Please rate your level of satisfaction with the quality assurance visit, where 1 is not at all satisfied, and 5 is very satisfied.

SATISFACTION: 1 2 3 4 5
88. Refused
89. Don't Know

Q 73. [If **Q 72** = 1 or 2] Why do you say that?

RECORD VERBATIM: _____
88. Refused
89. Don't Know

Q 74. Other than the quality assurance visits, did you have to contact anyone for any of the following reasons? How about … [READ LIST; ACCEPT MULTIPLE]

1. To service the water heater?
2. To repair a broken part of the water heater?
3. To replace the entire water heater?
4. To answer questions about the water heater performance?
5. [No]
77. Other, please specify: _____
88. Refused
89. Don't Know

Next, I'd like to ask about your experiences with your heat pump water heater.

Q 75. [IF **Q 54** = 2 or **Q 55** = 2 or 3] Did the installer/contractor educate you regarding which water heater settings to use?

1. Yes
2. No
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 76. What setting – or operation mode – is your heat pump water heater set for?

1. Efficiency Mode
2. Heat Pump Only
3. Hybrid
4. High Demand/Boost
5. Electric Only
6. Vacation Mode
77. Other, please specify: _____

88. Refused
89. Don't Know

Q 77. Have you changed the setting since the water heater was installed?

1. Yes
2. No
88. Refused
89. Don't Know

Q 78. What setting was it set for when it was installed?

1. Efficiency Mode
2. Heat Pump Only
3. Hybrid
4. High Demand/Boost
5. Electric Only
6. Vacation Mode
77. [all SAMPTYPE SHOW:] Other, please specify: _____
88. Refused
89. Don't Know

Q 79. [If **Q 77** = 1] Why did you change the setting?

RECORD VERBATIM: _____
88. Refused
89. Don't Know

Q 80. Prior to now, were you aware that the heat pump water heater's air filter must be cleaned?

1. Yes
2. No
88. Refused
89. Don't Know

Q 81. [IF **Q 80** = 1 and **Q 54** = 2 or **Q 55** = 2 or 3] Did the installer inform you that the air filter must be cleaned?

1. Yes
2. No
88. Refused
89. Don't Know

Q 82. Has the air filter in your new water heater ever been cleaned, either by you or by someone you hired?

1. Yes
2. No
88. Refused
89. Don't Know

Q 83. [If **Q 82** = 1] How often is the air filter cleaned? Would you say it's cleaned… [READ LIST; ACCEPT ONE]

1. Every other year
2. Every year
3. More than once a year
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 84. [IF **Q 82** = 2 or 89] Now I'll read a list of possible reasons why people don't clean their heat pump water heater's air filter. Can you tell me which of these apply to you?

1. Didn't know I needed to
2. It's too new, haven't had to yet
3. Not sure how
4. Too difficult
5. Just haven't gotten around to it
6. Forgot to
7. Need to find someone to do it
77. Other, please specify: _____
88. Refused
89. Don't Know

Since installing your water heater, please rate your satisfaction with the following items on our 5-point scale (where 1 means "very dissatisfied" and 5 means "very satisfied") How about …?

	[Rating of Satisfaction]	[If = 1 or 2] Why do you say that?
Q 85. … the sound level of the heat pump water heater?	1 2 3 4 5 88 99	Q 86.
Q 87. … the change in your electricity bill?	1 2 3 4 5 88 99	Q 88.
Q 89. … your hot water supply?	1 2 3 4 5 88 99	Q 90.
Q 91. … the maintenance requirements of the heat	1 2 3 4 5 88 99	Q 92.

pump water heater?		
Q 93. … the heat pump water heater overall?	1 2 3 4 5 88 99	Q 94.

Q 95. Overall, has the heat pump water heater met your expectations?

1. Yes
2. No
88. Refused
89. Don't Know

Q 96. [If **Q 95** =2] Where did it fall short of meeting your expectations?

RECORD VERBATIM: _____
88. Refused
89. Don't Know

Q 97. Have you, or would you, recommend a heat pump water heater to a friend, colleague or family member?

1. Yes, have
2. Yes, would
3. No
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 98. [If **Q 97** = 1 or 2] What are some of the reasons you recommended or would recommend a heat pump water heater? (DO NOT READ, ACCEPT MULTIPLES)

1. Lower energy bills
2. Improved hot water supply
3. Equipment cost is reasonable
4. Appearance is good/acceptable
5. Good for the environment
6. Operates reliably
7. Requires little maintenance
77. Other, please specify: _____
88. Refused
89. Don't Know

Household Demographics

Lastly, I would like to ask a few questions about you and your household.
[IF NEEDED] The questions are for classification purposes only. All your answers will be kept confidential.

Q 99. What type of home do you live in? Is it a . . . [READ LIST; ACCEPT ONE]

1. Single-family detached home
2. Single-family attached home
3. Mobile home
4. Apartment
5. Condo
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 100. Do you own or rent your home?

1. Own
2. Rent
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 101. What year was your home built?

YEAR: _____
88. Refused
89. Don't Know

Q 102. [If **Q 101** = 89] Would you say… [READ LIST; ACCEPT ONE]

1. 2011 to present?
2. 2006 – 2010?
3. 2000 – 2005?
4. 1990 – 1999?
5. 1980 – 1989?
6. 1970 – 1979?
7. 1960 – 1969?
8. Prior to 1960?
8888. Refused
9999. Don't Know

Q 103. What is your home's primary heat source? Is it… [NOTE: WE'RE LOOKING FOR A **FUEL** TYPE HERE, NOT A TYPE OF HEATER] [READ LIST; ACCEPT ONE]

1. Electricity
2. Natural gas from a utility
3. Kerosene
4. Wood/Wood pellet

5. Propane gas
77. Something else? (Please specify:) _____
88. Refused
89. Don't Know

Q 104. [If **Q 103** = 1] What type of electric heater is your primary heater? [DO NOT READ LIST UNLESS NECESSARY; CHECK ONE ONLY]

1. Forced air furnace
2. Baseboards
3. Wall heaters
4. Electric radiant heaters
5. Ductless heat pump (DHP)
6. Space heaters
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 105. [If **Q 103** = 2] What type of gas heater is your primary heater? [DO NOT READ LIST UNLESS NECESSARY; CHECK ONE ONLY]

1. Forced air furnace
2. Wall heaters
3. Natural gas radiant heaters
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 106. How many people live in your household, including yourself?

NUMBER OF PEOPLE: _____
88. Refused
89. Don't Know

Q 107. [If **Q 106** = 1] Which of the following groups includes your age? [BEGIN WITH CATEGORY C]

[If **Q 106** > 1] How many people in your household are in each of the following age groups? Be sure to include yourself. [STOP READING WHEN TOTAL = **Q 106**]

[Age Group]	Number of People
A. 5 years and under	
B. 6 - 17 years old	
C. 18 - 24 years old	

D. 25 - 34 years old	
E. 35 - 44 years old	
F. 45 - 54 years old	
G. 55 - 64 years old	
D. 65 and older	

88. Refused
89. Don't Know

Q 108. Which of the following includes the highest level of education you have completed? [READ LIST; ACCEPT ONE]

1. Some high school
2. High school graduate or GED
3. Trade or technical school (2 year degree)
4. Some college
5. College graduate
6. Some graduate school
7. Graduate degree
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 109. Which of the following categories includes your approximate annual household income from all sources in 2012, before taxes?

1. Less than $40,000
2. Between $40,001 and $60,000
3. Between $60,001 and $80,000
4. Between $80,001 and $120,000
5. Between $120,001 and $250,000
6. Over $250,000
88. Refused
89. Don't Know

Q 110. Do you consider yourself Hispanic or Latino?

1. Yes
2. No
88. Refused
89. Don't Know

Q 111. Which of these ethnicities describe you? I'll read a list and you can tell me all that apply. [READ ALL, ACCEPT MULTIPLES]

1. White
2. Black or African American
3. American Indian or Alaska Native
4. Asian
5. Native Hawaiian or Other Pacific Islander
77. Or another ethnicity? (Please specify:) _____
88. Refused
89. Don't Know

Q 112. For verification purposes only, may I have your name? [BE SURE TO GET BOTH FIRST AND LAST NAMES IF THEY'LL GIVE IT]

NAME: _____
88. Refused

Q 113. For verification purposes only, what is the zip code of your home, where the heat pump water heater was installed?

Zip code: _____ 88. Refused

Q 114. [Interviewer: Record Gender]

1. Male
2. Female
89. Don't Know

Thank you VERY MUCH for your time.

Northwest General Population Households Survey Guide

Recruitment:

Hi. This is _____ with CIC Research. We're calling on behalf of the Northwest Energy Efficiency Alliance (NEEA) to talk with you about water heaters. The research will help NEEA better understand the Northwest water heating market and they would very much appreciate your input.

(Anything you tell us will be kept confidential.)(This is not a sales call.)
(Our contact at NEEA: Amy Webb, 503-688-5448)

Could I speak to the person most familiar with your home's appliance purchase decisions? (REPEAT INTROS TO NEW PERSON, IF NECESSARY)
The survey takes about 10 minutes. Is this a good time? (ARRANGE CALLBACK IF NECESSARY)

SCREEN:

A. What state do you live in? [IF NEEDED: Your primary residence]

1.	Oregon	[CONTINUE]
2.	Washington	[CONTINUE]
3.	Idaho	[CONTINUE]
4.	Montana	[CONTINUE]
5.	ALL ELSE	[THANK AND TERMINATE]
88.	Refused	[THANK AND TERMINATE]
89.	Don't know	[THANK AND TERMINATE]

THANK AND TERMINATE: "Ok, we are only interested in talking with residents of the Northwest, but we appreciate your time. Have a nice day."

B. Does your home have its own water heater?

1.	Yes	[CONTINUE]
2.	No	[THANK AND TERMINATE]
88.	Refused	[THANK AND TERMINATE]
89.	Don't know	[THANK AND TERMINATE]

C. Is your water heater a storage water heater, or an on demand water heater? A storage water heater is typically located on the floor, and is typically a large cylinder shape, whereas an on demand water heater is a smaller metal box typically affixed to a wall.

1.	Storage	[CONTINUE]

2. On Demand [THANK AND TERMINATE2]
88. Refused [THANK AND TERMINATE2]
89. Don't know [THANK AND TERMINATE2]

THANK AND TERMINATE2: "We are only interested in conducting this research with homeowners whose water heater is an electric storage water heater, but we do appreciate your time. Thank you"

D. Does your home's water heater use natural gas or electricity?

1. Electricity [SKIP TO H]
2. Natural Gas [THANK AND TERMINATE3]
88. Refused [THANK AND TERMINATE3]
89. Don't know [CONTINUE]

E. **EXPLAIN1:** If you can locate your water heater, I can walk you through a quick way of identifying whether it uses gas or electricity. [If they agree, wait until they are in front of the water heater] First check for a yellow "ENERGY GUIDE" label, and see if it indicates gas or electric. It may not say gas or electric, but it may say "therms" if it is gas, or "kWh" . If not, or if you are not sure, that is ok.

1. Label says gas/natural gas/therms [THANK AND TERMINATE3]
2. Label says electric/kWh [SKIP TO H]
3. No label [CONTINUE]
88. Refused [THANK AND TERMINATE3]
89. Don't know [CONTINUE]

F. **EXPLAIN2:** Now, coming out of the top of the water heater, do you see a vent pipe that is more than 2 inches wide, along with two other smaller pipes? If so, you have a gas water heater.

1. Yes – GAS [THANK AND TERMINATE3]
2. No [CONTINUE]
88. Refused [THANK AND TERMINATE3]
89. Don't know [CONTINUE]

G. **EXPLAIN3:** If you see the two pipes, but not the vent pipe that is wider than 2 inches, can you find an electrical plug connected to the tank? It might also be coming out of the top of the tank, although some are located on the side.

1. Yes – ELECTRIC [CONTINUE]
2. No [THANK AND TERMINATE3]
88. Refused [THANK AND TERMINATE3]
89. Don't know [THANK AND TERMINATE3]

THANK AND TERMINATE3: "At this point, we can't figure out what type of water heater you have. We are only interested in conducting this research with homeowners whose water heater is an electric storage water heater, but we do appreciate your time. Thank you"

H. Approximately how old is your water heater? Would you say it is… [READ ALL; SELECT ONE]

1. Less than one year old? [PROGRAM "WHAGE" = "0-1"]
2. One to five years old? [PROGRAM "WHAGE" = "1-5"]
3. Five to ten years old? [PROGRAM "WHAGE" = "5-10"]
4. More than ten years old? [PROGRAM "WHAGE" = "10+"]
88. Refused [PROGRAM "WHAGE" = "R"]
89. Don't know [PROGRAM "WHAGE" = "DK"]

Awareness, Interest, and Perceptions

Q 1. Before today, had you heard of the Northwest Energy Efficiency Alliance, or NEEA ("KNEE-UH")?

1. Yes
2. No
88. Refused
89. Don't Know

Q 2. Before today, had you heard of the "Hot Water Solutions" program?

1. Yes
2. No
88. Refused
89. Don't Know

Q 3. [IF **Q 2** = 1] How did you first hear of the "Hot Water Solutions" program? [DO NOT READ; CHOOSE ONE - THE FIRST PLACE THEY HEARD OF IT]

1. Hot Water Solutions website (hotwatersolutionsnw.com)
2. Friend or acquaintance
3. Utility print advertising, bill stuffer
4. Utility website
5. Retail store display / saw it in store
6. Retail store salesperson
7. Newspaper ad
8. Newspaper story
9. Television ad
10. Social media
11. From contractor/installer
12. Internet research

13. Internet advertising
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 4. Before today, had you heard the term "heat pump" related to any appliances?

1. Yes
2. No
90. Refused
91. Don't Know

Q 5. Before today, had you heard the term "heat pump water heater"?

1. Yes [CODE: AWARE = Y]
2. No
88. Refused
89. Don't Know

Q 6. [IF **Q 5** = 2, 88, 89] Heat pump water heaters use an electric heat pump to transfer heat from outside of the unit to the water in the tank rather than generating heat directly. This method of heating works like a refrigerator, but in reverse. This is not the same as a tankless water heater; heat pump water heaters have a cylinder-shaped tank just like a standard water heater. Have you heard of heat pump water heaters?

1. Yes – aided [CODE: AWARE = Y]
2. No – SKIP TO **Q 10**
88. Refused
89. Don't Know

Q 7. [IF AWARE = Y] Have you ever seen a heat pump water heater in person?

1. Yes
2. No
88. Refused
89. Don't Know

Q 8. [IF AWARE = Y] How did you first hear about heat pump water heaters? [DO NOT READ; CHOOSE ONE - THE FIRST PLACE THEY HEARD OF IT]

1. Currently own one [SWITCH TO HPWH USER SURVEY, Q2]
2. Previously owned one
3. Friend or acquaintance
4. Utility print advertising, bill stuffer
5. Utility website

6. "Smart Water Heat" website
7. "Hot Water Solutions" website
8. Retail store display / saw it in store
9. Retail store salesperson
10. Newspaper ad
11. Newspaper story
12. Television ad
13. Social media
14. From contractor/installer
15. Internet research
16. Internet advertising
17. Installed prior to respondent moving in to the home (TERMINATE)
18. Utility newsletter
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 8a. [IF **Q 8** = 1] We are also conducting interviews with people who currently have heat pump water heaters. We would like to include you in that survey but I don't have that survey in front of me at the moment. Could I arrange a date and time to call you back to do that survey?

1. Yes (ARRANGE CALLBACK ON PAPER, THEN THANK & TERMINATE)
2. NO (THANK & TERMINATE)

Q 9. [IF AWARE = Y and IF **Q 8** = 1–16 or 77] Did you hear about them anywhere else or learn more about them from any other sources? [DO NOT READ; ACCEPT MULTIPLES]

1. Previously owned one
2. Friend or acquaintance has one
3. Utility print advertising, bill stuffer
4. Utility website
5. "Smart Water Heat" website
6. "Hot Water Solutions" website
7. Retail store display / saw it in store
8. Retail store salesperson
9. Newspaper ad
10. Newspaper story
11. Television ad
12. Social media
13. From contractor/installer
14. Internet research
15. Internet advertising
16. Installed prior to respondent moving in to the home (TERMINATE)

17. Nowhere else
18. Utility newsletter
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 10. When making an appliance purchase decision, what are your typical sources of information regarding which product to purchase?

1. Friends or acquaintances
2. Utility print advertising, bill stuffers
3. Utility website
4. Retail store – general
5. Retail store displays
6. Retail store salespeople
7. Newspaper ads
8. Newspaper stories
9. Television ads
10. Social media
11. From contractor/installer
12. Internet research / Internet reviews
13. Internet advertising
14. Specific Internet website, please specify: _____
15. Utility newsletter
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 11. What would cause you to purchase a new water heater of any type?

RECORD VERBATIM: _____
88. Refused
89. Don't Know

Q 12. [IF AWARE = Y] Have you ever considered installing a heat pump water heater in your home?

1. Yes
2. No
88. Refused
89. Don't Know

Q 13a. [IF AWARE = Y and IF **Q 12** = 1] What was the primary reason you chose not to install one (yet)?

1. Existing equipment works fine

2. Can't find a local installer
3. Doesn't work in my climate
4. Aesthetics/they are ugly
5. They cost too much
6. They are too noisy
7. Maintenance hassles
8. Don't believe savings claims
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 13b. [IF AWARE = Y and IF **Q 12** = 2] What is the primary reason you've never considered installing one in your home?

1. Existing equipment works fine
2. Can't find a local installer
3. Doesn't work in my climate
4. Aesthetics/they are ugly
5. They cost too much
6. They are too noisy
7. Maintenance hassles
8. Don't believe savings claims
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 14a. [IF AWARE = Y and IF **Q 13a.** = 1– 8 OR 77] Were there other reasons why you chose not to install a heat pump water heater?

1. Existing equipment works fine
2. Can't find a local installer
3. Doesn't work in my climate
4. Aesthetics/they are ugly
5. They cost too much
6. They are too noisy
7. Maintenance hassles
8. Don't believe savings claims
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 14b. [IF AWARE = Y and IF **Q 13b.** = 1– 8 OR 77] Were there other reasons you've never considered installing one in your home?

1. Existing equipment works fine

2. Can't find a local installer
3. Doesn't work in my climate
4. Aesthetics/they are ugly
5. They cost too much
6. They are too noisy
7. Maintenance hassles
8. Don't believe savings claims
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 15. [IF AWARE = Y] Were you aware that many utilities in the Northwest offer their customers cash rebates or point-of-sale rebates for purchasing and installing a heat pump water heater?

1. Yes
2. No
88. Refused
89. Don't Know

Q 16. [IF AWARE = Y and IF **Q 15** = 1] Can you tell me the amount of your utility's rebate for heat pump water heaters? [IF NOT SURE: Can I get your best estimate?]

1. Yes
2. No
88. Refused
89. Don't Know

Q 16a. (IF **Q 16** = 1] What is the amount of your utility's rebate for heat pump water heaters?

Amount $____ 88. Refused 89. Don't Know

Q 17. [IF AWARE = Y] Were you aware of manufacturer product markdowns – in the form of a promotional sale in retail stores – for specific types of heat pump water heaters?

1. Yes
2. No
88. Refused
89. Don't Know

Q 18. [IF **Q 17**= 1] How did you first hear of the markdowns for heat pump water heaters? [DO NOT READ; CHOOSE ONE - THE FIRST PLACE THEY HEARD OF IT]

1. Hot Water Solutions website (hotwatersolutions.com)
2. Friend or acquaintance

3. Utility print advertising, bill stuffer
4. Utility website
5. Retail store display / saw it in store
6. Retail store salesperson
7. Newspaper ad
8. Newspaper story
9. Television ad
10. Social media
11. From contractor/installer
12. Internet research
13. Internet advertising
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 19. [IF AWARE = Y and IF **Q 17** = 1] Can you tell me the amount of the markdown for heat pump water heaters? [IF NOT SURE: Can I get your best estimate?]

1. Yes
2. No
88. Refused
89. Don't Know

Q 19a. [IF **Q 19** = YES] What is the amount of the markdown for heat pump water heaters?

Amount $_____ 88. Refused 89. Don't Know

Q 20. Now I would like to tell you a little more about heat pump water heaters:

- The typical cost of an installed heat pump water heater is between $2,000 and $2,500, and rebates range from $300 to $800 and tax credits can be up to $600.
- Heat pump water heaters are about as easy to maintain as your typical electric storage water heater, but they do require that you clean the filter occasionally. Most homeowners are easily capable of doing the maintenance themselves, without having to hire anyone.
- Heat pump water heaters use about half the energy as a typical storage water heater of similar volume.
- Heat pump water heaters are roughly the same size and shape as typical storage water heaters, and can usually be installed in the same location.

Given this information, if you were in the market for a new water heater, how interested would you be in installing a heat pump water heater in your home? Please rate your level of interest on a five-point scale, with 1 being not at all interested, and 5 being very interested.

INTEREST: 1 2 3 4 5

88. Refused
89. Don't Know

Q 21. [IF **Q 20** 1, 2, or 3] Why do you say that?

RECORD VERBATIM: _____
88. Refused
89. Don't Know

Q 22. [IF **Q 20** = 4 or 5] What benefits of heat pump water heaters are especially attractive to you? [DO NOT READ; ACCEPT MULTIPLES]

1. The rebates
2. The tax credits
3. The cost of the water heater
4. The payback period
5. Lower utility bills / The lower monthly operating cost
6. Saving energy
7. Concern of carbon footprint / greenhouse gases / environment
8. The product's appearance
9. The availability of the rebate
10. Past participation in similar program
11. The recommendation by contractor / plumber
12. The water heater's programmability
13. A bad experience with previous water heater
14. The product warranty
15. A desire to be high tech
16. New equipment
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 23. [IF AWARE = Y] Have you heard of any brands that make heat pump water heaters?

1. Yes
2. No
88. Refused
89. Don't Know

Q 24. [IF AWARE = Y and IF **Q 23** = 1] What heat pump water heater brands have you heard of? [DO NOT READ; ACCEPT MULTIPLES]

1. General Electric ("GE")
2. A.O. Smith
3. American
4. Kenmore

5. Reliance
6. State
7. Stiebel Eltron
8. U.S. Craftmaster
9. Whirlpool
10. AirGenerate
11. Electrolux
12. Rheem
13. Bradford White
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 25. [IF AWARE = Y and IF **Q 24** = 1–13 or 77] What heat pump water heater brands would you consider buying? [DO NOT READ; ACCEPT MULTIPLES]

1. General Electric ("GE")
2. A.O. Smith
3. American
4. Kenmore
5. Reliance
6. State
7. Stiebel Eltron
8. U.S. Craftmaster
9. Whirlpool
10. AirGenerate
11. Electrolux
12. Rheem
13. Bradford White
14. None
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 26. [IF AWARE = Y] Would you consider buying a heat pump water heater made by: [READ BRANDS BELOW NOT ALREADY MENTIONED IN **Q 25**, RANDOMIZE]

[Note: For each brand, record Yes=1, No=2, or Don't Know=89]

1. General Electric ("GE")
2. A.O. Smith
3. American
4. Kenmore
5. Reliance
6. State

7. Stiebel Eltron
8. U.S. Craftmaster
9. Whirlpool
10. AirGenerate
11. Electrolux
12. Rheem
13. Bradford White

Q 27. Which of these reasons – if any – would make you much more likely to buy a new heat pump water heater? [READ EACH ITEM AND GET A YES OR NO BEFORE CONTINUING TO NEXT ITEM; RANDOMIZE]

1. The cost of heat pump water heaters goes down
2. Your current water heater breaks down
3. A contractor or retail business offers a special promotion
4. Your household finances improve
5. Your local utility rebate increases
6. None
77. Some other reason (GET DETAILS)

Q 28. [IF **Q 27** = NONE (6)] Is there any combination of those things I just mentioned that would make you much more likely to buy a heat pump water heater for your home?

1. Yes
2. No
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 28a. What combination of those things would make you much more likely to buy a heat pump water heater for your home? (READ LIST FROM **Q 27** AGAIN.)

RECORD VERBATIM: _____
88. Refused
89. Don't Know

Q 29. Is there anything in particular about heat pump water heaters that you wish you knew more about?

1. Yes (What would that be? RECORD DETAILS)
2. No
88. Refused
89. Don't Know

Q 30. Where would you go if you wanted more information about heat pump water heaters? (NOTE: If they say "contractor" or "installer" ask them to specify HVAC or Plumbing) (DO NOT READ; MULTIPLES OK)

1. Utility
2. HVAC contractor
3. Electrical contractor
4. Contractor – unknown / general
5. NEEA / Smart Water Heat Initiative / Hot Water Solutions Initiative
6. Manufacturer
7. Friends/family I trust
8. Internet/online
77. Other, please specify: _____
88. Refused
89. Don't Know

Water Heater Characteristics

Now I have a few questions about your current water heater.

Q 31. How many gallons is your water heater tank?

Gallons: _____
7777. Tankless / On demand / Instantaneous
8888. Refused
9999. Don't Know

Q 32. Under normal circumstances, is your water heater able to provide sufficient hot water for your household?

1. Yes
2. No
88. Refused
89. Don't Know

Q 33. Where is your water heater located? Is it in a… [READ LIST; ACCEPT ONE]

1. Basement
2. Garage
3. Utility room
4. Utility closet
5. Kitchen
6. Other closet inside your home
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 34. Is your water heater located in a part of your house that is heated?

1. Yes – heated
2. No – unheated
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 35. Is your water heater located in a part of your house that is insulated?

1. Yes – insulated
2. No – not insulated
77. Other, please specify: _____
88. Refused
89. Don't Know

Household Demographics

Lastly, I would like to ask a few questions about you and your household.
[IF NEEDED] The questions are for classification purposes only. All your answers will be kept confidential.

Q 36. How important is it for you to have an energy-efficient home? Please rate your level of importance on a five-point scale, with 1 being not at all important, and 5 being very important.

IMPORTANCE: 1 2 3 4 5
88. Refused
89. Don't Know

Q 37. Now I'd like you to think about how quickly you, personally, adopt new technology. Which of the following do you think best describes you? (READ; ONE ANSWER ONLY?)

1. I am the first among my friends to purchase new technology
2. I purchase new technology sooner than most of my friends
3. I am typically in the middle of the group when purchasing new technology
4. I purchase new technology after most of my friends have purchased it
5. I am one of the last people to purchase new technology
88. Refused
89. Don't Know

Q 38. What type of home do you live in? Is it a . . . [READ LIST; ACCEPT ONE]

1. Single-family detached home
2. Single-family attached home
3. Mobile home

4. Apartment
5. Condo
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 39. Do you own or rent your home?

1. Own
2. Rent
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 40. What year was your home built?

YEAR: _____
88. Refused
89. Don't Know

Q 41. [If **Q 40** = 89] Would you say… [READ LIST; ACCEPT ONE]

1. 2011 to present?
2. 2006 – 2010?
3. 2000 – 2005?
4. 1990 – 1999?
5. 1980 – 1989?
6. 1970 – 1979?
7. 1960 – 1969?
8. Prior to 1960?
8888. Refused
9999. Don't Know

Q 42. How many people live in your household, including yourself?

NUMBER OF PEOPLE: _____
88. Refused
89. Don't Know

Q 43. [If **Q 42** = 1] Which of the following groups includes your age? [BEGIN WITH CATEGORY C]

[If **Q 42** > 1] How many people in your household are in each of the following age groups? Be sure to include yourself. [STOP READING WHEN TOTAL = **Q 42**]

[Age Group]	Number of People

A. 5 years and under	
B. 6 - 17 years old	
C. 18 - 24 years old	
D. 25 - 34 years old	
E. 35 - 44 years old	
F. 45 - 54 years old	
G. 55 - 64 years old	
D. 65 and older	

88. Refused
89. Don't Know

Q 44. Which of the following includes the highest level of education you have completed? [READ LIST; ACCEPT ONE]

1. Some high school
2. High school graduate or GED
3. Trade or technical school (2 year degree)
4. Some college
5. College graduate
6. Some graduate school
7. Graduate degree
77. Other, please specify: _____
88. Refused
89. Don't Know

Q 45. Which of the following categories includes your approximate annual household income from all sources in 2015, before taxes?

1. Less than $40,000
2. Between $40,001 and $60,000
3. Between $60,001 and $80,000
4. Between $80,001 and $120,000
5. Between $120,001 and $250,000
6. Over $250,000
88. Refused
89. Don't Know

Q 46. Do you consider yourself Hispanic or Latino?

1. Yes
2. No
88. Refused
89. Don't Know

Q 47. Which of these ethnicities describe you? I'll read a list and you can tell me all that apply. [READ ALL, ACCEPT MULTIPLES]

1. White
2. Black or African American
3. American Indian or Alaska Native
4. Asian
5. Native Hawaiian or Other Pacific Islander
77. Or another ethnicity? (Please specify:) _____
88. Refused
89. Don't Know

Q 48. What is the ZIP code of your home?

Zip code: _____
88. Refused

Q 49. [Interviewer: Record Gender]

1. Male
2. Female
88. Don't Know

Thank you VERY MUCH for your time!

Appendix J – Urban / Rural Markets Definitions

2003 Rural-Urban Continuum Codes	
Code	**Description**
Urban Counties:	
1	Counties in metro areas of 1 million population or more
2	Counties in metro areas of 250,000 to 1 million population
3	Counties in metro areas of fewer than 250,000 population
Higher-Density Rural Counties:	
4	Urban population of 20,000 or more, adjacent to a metro area
5	Urban population of 20,000 or more, not adjacent to a metro area
6	Urban population of 2,500 to 19,999, adjacent to a metro area
Lower-Density Rural Counties:	
7	Urban population of 2,500 to 19,999, not adjacent to a metro area
8	Completely rural or less than 2,500 urban population, adjacent to a metro area
9	Completely rural or less than 2,500 urban population, not adjacent to a metro area

Appendix K – References

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