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Heat Pump Water Heater Market Progress Evaluation Report #8

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Executive Summary

On behalf of the Northwest Energy Efficiency Alliance (NEEA), NMR Group completed the 8th Market Progress Evaluation Report (MPER) of NEEA's Heat Pump Water Heater (HPWH) program. This program works to push the supply chain to more rapidly adopt HPWHs, close the price gap between HPWHs and conventional electric tank water heaters, and drive the adoption of HPWHs to be the dominant and preferred technology for electric residential water heating in the Northwest region (Idaho, Montana, Oregon, and Washington).

MPER #8 overarching research objectives:



Document evidence of HPWH program outputs to confirm market progress is rooted in program efforts.



Measure key market progress indicators (MPIs) related to contractor recommendations and installation rates, consumer awareness, purchaser satisfaction, and federal standard adoption.



Conduct primary research on customer callbacks for HPWH.



Estimate and report on the size of the market for HPWHs.

Key research activities:

1. Confirm NEEA has made progress on outputs described in its program theory and logic model (PTLM)
2. Review the federal water heating rule docket
3. Interview stakeholders of the federal standard setting process
4. Survey water heater installers
5. Survey consumers
6. Survey HPWH purchasers
7. Estimate the size of the HPWH market

Key findings and recommendations:

1. NEEA has helped lay the groundwork for broad HPWH adoption. Increasing consumer awareness should drive further adoption.

HPWH market share has increased since MPER #7, driven by growth in Washington. This MPER estimates HPWH market share (the portion of electric water heater installations in a given year that are HPWHs) has increased from 14.6% in 2021 to 18.6% in 2024 (MPI 3a), a 27% increase. Almost all growth since the previous MPER (88%) was in Washington. NEEA’s 2022 Residential Building Stock Assessment (RBSA) estimated HPWHs represent only a small portion of in-service, residential water heaters in the Northwest (3% of all water heaters, 6% of electric units).¹ As seen in the RBSA results, HPWHs may represent only a small portion of units in operation, but they represent a growing percentage of new installations.

The number of HPWHs installed in the Northwest without an incentive doubled from 2021 to 2024. Along with energy code in Washington including HPWH-friendly provisions, expanded federal tax credits may have driven many of these purchases – far more purchasers reported getting those tax credits in this MPER than in previous MPERs.

Nearly half of single-family homeowners with an electric storage water heater were familiar with HPWHs (47%, consumer survey; MPI 9). Awareness was statistically similar across the four states.

Related recommendation. This study supports NEEA continuing robust HPWH consumer awareness campaigns. Because most consumers only replace water heaters upon failure, this urgency can remove their ability or desire to research the latest developments in the market. These customers often end up locked into the same system type, yielding another decade or more of lost opportunity to encourage consumers to switch to HPWH.

¹ NEEA. “2022 Residential Building Stock Assessment Findings Report”. April 2024. <https://neea.org/data/residential-building-stock-assessment>.

2. Installers are aware of HPWHs, but recommendation rates remain low, despite generally high customer satisfaction.

Negative installer perceptions persist, leading to low recommendation rates. Nearly all surveyed installers (99%, MPI 1a) were aware of HPWHs (96% in MPER #7). Similar to MPER #7, roughly 70% install HPWHs (MPI 1c), and only 30% of those who were aware of them agreed they regularly recommend them. Only half of surveyed installers agreed HPWHs are reliable (50%, vs. 55% in MPER #7, MPI 1a). Installers with direct experience tended to have more positive assessments of reliability. Half of installers (48%) said they would install a HPWH in their own homes. Ideally, far more installers would personally favor HPWHs, but this demonstrates a meaningful level of acceptance among installers, even if the market has yet to reach its full potential.

There is a disconnect between what customers think and what installers believe their customers think: many installers think their customers will not like HPWHs, but purchaser feedback suggests otherwise. Purchaser satisfaction is high (87%, MPI 4a) – it has hovered around 90% since MPER #4. As a result, HPWH owners are likely to recommend them to friends, colleagues, or family members (95% of 134 HPWH owners identified in the consumer survey, MPI 4b). Despite the initial cost, most HPWH purchasers said they were satisfied with the value of their HPWH (MPER #8: 78%, MPER #7: 83%). Satisfaction was similar among customers coming from fossil-fuel or electric resistance models.

After cost, installers cited customer preference as the most common reason they did not recommend HPWHs more. Supporting this, surveyed HPWH purchasers had a hard time finding installers. One purchaser from Washington reported that “[i]t was difficult to find a contractor who supported [HPWHs]. I solicited bids from at least three companies, and all recommended not installing.”

Related recommendation. Customers listen to their installers’ recommendations, so addressing installer concerns about HPWHs may be one of the most important things for NEEA to focus on with installers in the coming year. The study suggests the following activities to engage installers and help them better understand that customers like these products:

- A) Tweak trainings and marketing campaigns with distributors and installers to emphasize high customer satisfaction with HPWHs.
- B) Significantly increase recruitment and marketing efforts for NEEA’s Hot Water Solutions (HWS) installer trainings. Consider adding as many hands-on training opportunities as possible. This recruitment should target installers with limited experience with HWS and HPWHs.
- C) Highlight the ways manufacturers have been responsive to installer concerns, such as by including top and side plumbing connections or adding 120V models that do not require additional electrical work (which may reduce costs for HPWH customers switching from gas water heaters).

3. Challenging installations are an ongoing barrier to HPWHs, but there are indications that installers can better navigate these installations as their confidence increases.

The installer survey suggests the issues that were “challenging” to previous respondents may not be as challenging now. Installers may have simply learned to successfully deal with these issues. As examples, 33% of installers regularly found there was no nearby drain for condensate (down from 45% in MPER #7), 22% regularly encountered pipe configuration issues (down from 34% in MPER #7), and only 11% regularly encountered sound-related issues (down from 27% in MPER #7).

This shift in installer perceptions of HPWH barriers align with NEEA efforts to work with manufacturers to address common HPWH concerns. For example, manufacturers have reduced sound levels and recently included both top and side water connections for many models to increase installation flexibility.

Nearly one-third of homes are ready for HPWHs without additional accommodations. Installers estimated that nearly 29% of homes, on average, could accommodate a HPWH with limited additional work beyond what would normally be required for a typical water heater installation, consistent with MPER #7 (29%). Installers more familiar with HPWHs gave higher estimates than those with less experience.

Related recommendation. The previous MPER suggested focusing on “low-hanging fruit” – scenarios that could readily accommodate a HPWH. We suggest NEEA continue with this approach because these installers and customers are most likely to be satisfied with the unit, driving up overall confidence. That fewer installers seem to be encountering major issues indicates that as installers gain experience, more and more homes might qualify as “low-hanging fruit” in their eyes.

4. Installers still use workarounds to avoid installing HPWHs, a trend that could undermine compliance with new federal standards.

Most installers use workarounds to avoid installing HPWHs. Currently, only HPWHs can meet the efficiency requirements set by federal standards for large, electric storage water heaters (>55 gallons). And yet, even when installers encounter customers who need to replace large, electric storage water heaters, they rarely recommend HPWHs. Instead, installers suggest alternative options for their customers, or workarounds. In fact, only one in ten installers (11%, a decrease from what installers reported in MPER #7, MPI 1d) said installing a HPWH – the seemingly obvious choice – was their typical replacement strategy for a customer with a large, electric unit.

The most popular workaround is opting for large commercial electric resistance tanks (44% of installers, up from 33% in MPER #7). Other popular alternatives include smaller electric resistance tanks (sometimes with a mixing valve to boost hot water supply) or switching to gas units.

Related recommendation. Train distributors and installers aggressively on the 2029 federal standard. Installers need to become comfortable with HPWHs now to facilitate a successful transition. NEEA could follow the example of gas tankless units – at one point they too were a new technology, but industry efforts helped installers become comfortable with them. In advance of the 2029 standard, installers need to be ready to install HPWHs in situations that may not be the easiest installation scenarios.

5. Fewer installers reported chronic customer callbacks for HPWHs. Issues that do arise may require significant time to resolve.

HPWH callbacks are common but less frequent than in previous MPERs. Over one-third (39%) of installers in the previous MPER agreed, “My company is likely to get customer complaints or service requests soon after installing a HPWH,” but this was down to 25% in MPER #8 (MPI 1a). Notably, the proportion of respondents agreeing reduced substantially among installers “very familiar” with HPWHs (MPER #7: 50%, MPER #8: 25%).

HPWH callback rates are comparable to electric resistance. Only 12% of HPWH purchasers (n=449) said they had called a professional to have their HPWH serviced or repaired. Granted, most were fairly new (most less than 5 years old). This is comparable to the 14% of consumer survey respondents with electric resistance storage units less than 5 years old (n=82) who said they had needed service/repair on their units.

HPWH callbacks are expensive and time-consuming. Installers said 24% of cases required multiple conversations with the manufacturer, and 20% needed multiple visits to resolve the issue. HPWH purchasers said professional repairs could take a long time: 31% said one to two weeks and 11% said over two weeks. Installers commonly cited issues such as faulty components, long lead times for parts, and issues with cold weather performance (which may be a sign of less-than-ideal installation locations). Just over half of HPWH purchasers who needed a service or repair said their warranty covered all or part of the cost.

Related recommendation. Continue to work with manufacturers to focus on system reliability and other concerns raised by installers. While this study did not point to reliability as a major problem, it did confirm that problems are slow and costly to resolve. The fact that manufacturers have been responsive to NEEA’s suggestions in the past and improved or added requested features to their products is a tremendously positive sign. Similarly, NEEA should work with manufacturers and distributors to increase parts availability, so that customers are not left without hot water for extended periods.



Section 1 *Background*

NEEA's 8th evaluation of progress in the HPWH market in the Northwest.

The NEEA Heat Pump Water Heater (HPWH) Program. NEEA's HPWH Program operates with the goal of transforming the water heater market in the Northwest Region (Idaho, Montana, Oregon, and Washington), such that efficient HPWHs become the product of choice. Specific goals are to achieve the following:

- Increase customer awareness and demand among populations with low adoption.
- Increase confidence and technical capability of HPWH installers in the Northwest Region.
- Leverage national and extra-regional partnerships to increase consistent adoption of HPWHs nationally to ensure market readiness for the 2029 federal standard.
- Reduced barriers to HPWH adoption, including high upfront cost and lack of awareness/confidence from end-users and installers

HPWH Program Progress to Date. NEEA staff have engaged the water heater market since 2005, working with manufacturers with the goal of bringing new HPWH technology to the market. In 2007, NEEA staff worked with ENERGY STAR to release the first ENERGY STAR specifications for water heaters, which encouraged a large manufacturer to commit to building a qualifying product. NEEA also introduced requirements for HPWHs in northern climates into the Advanced Water Heater Specification (AWHS). Over the years, NEEA has also worked with manufacturers and advanced AWHS requirements to target improved customer experience.

In 2015, NEEA influenced the federal standard requiring all electric storage water heaters 55 gallons or larger to meet efficiency standards only achieved by HPWH technology. In 2024, NEEA again influenced the creation of new federal standards requiring most residential electric storage water heaters to use heat pump technology by 2029. The passage of this standard achieved a core goal of NEEA's heat pump water heater program. NEEA's work helped demonstrate that the market can support widespread adoption of heat pump technologies and paved the way for this new standard. Additional information about this effort is included in [Appendix E](#).

In 2023 and 2024, NEEA continued to strengthen the market for HPWH by addressing workforce and researching market barriers. NEEA offered trainings for HPWH installers, including 31 in-person trainings, nine shoptalk trainings at plumbing stores, one virtual training, three trainings at technical schools, and a train-the-trainer event to increase the number of qualified trainers. NEEA also engaged with a variety of market actors including manufacturers and stakeholders at the regional and national level. To address installer resistance to HPWHs, NEEA conducted one-on-one interviews, published the Challenging Installations Scenarios study,² and conducted a study on installer perceptions of customer callbacks, appended to this MPER ([Appendix I](#)). NEEA’s “Key Installers” program incentivizes installers to complete trainings on HPWH installations, stock HPWH equipment, and recommend HPWHs to customers. NEEA also completed outreach activities including 15 newsletters discussing key topics, a re-launch of the installer- and consumer-facing Hot Water Solutions (HWS) website, and a one-pager based on PNNL research that provides guidance about where to best install HPWHs in different Northwest climates.³

Market Progress Evaluation Report (MPER) #8. Achieving targeted market changes and long-term Market Transformation requires two key components: (1) consistent collection and analysis of market data, and (2) integrating that information into program design and operation. To help measure progress in the market, the NEEA HPWH Program uses a logic model to guide its work. The logic model methodically describes how NEEA’s activities can overcome barriers to HPWH adoption and lead to specific short, medium, and long-term market outcomes. The logic model also includes market progress indicators (MPIs)—metrics by which progress toward those outcomes can be measured.

By conducting periodic assessments of the HPWH market, NEEA follows evaluation best practices for achieving and documenting change in a complex market. NEEA completes regular MPERs approximately twelve to 18 months apart to document progress of its Market Transformation programs and provide evidence that the programs are influencing the market and leading to sustained market change. This MPER focused on progress in 2023 and 2024. As the single largest residential energy savings opportunity for the Northwest Region, it is critical to NEEA’s mission that the HPWH Program is effective and that progress in this market is tracked appropriately. Accordingly, MPER #8 follows and builds upon methodological approaches established in previous MPERs to enable consistent comparisons of market progress across time. The research goals of each MPER vary depending on NEEA’s immediate needs and how much time has passed since a given MPI has been measured. NEEA does not measure every MPI within each MPER, and each MPER is tailored to the current state of the market.

² Cadeo Group. “Heat Pump Water Heater Market Research: Challenging Installation Scenarios.” Prepared for the Northwest Energy Efficiency Alliance (NEEA), April 20, 2023. <https://neea.org/resources/heat-pump-water-heater-market-research-challenging-installations-scenarios>.

³ Hot Water Solutions (a NEEA initiative). “The Best Heat Pump Water Heater Locations in Your Region.” https://installers.hotwatersolutionsnw.org/wp-content/uploads/2024/12/NEEA-HPWH-Installation-Location-for-Contractors_2-1-2024-2.pdf.

Research Objectives

This MPER has four overarching research objectives:

1. **Document evidence of HPWH program outputs** to confirm market progress is rooted in program efforts.
2. **Measure key MPIS** related to contractor recommendations and installation rates, consumer awareness, purchaser satisfaction, and federal standard adoption.
3. **Conduct primary research on customer callbacks and HPWH reliability.**
4. **Estimate and report on the size of the market for HPWHs.**

Methodology

Additional details about the methodology of each research task can be found in the respective appendices. All survey guides can be found in [Appendix G](#).



Estimate the size of the HPWH market. The MPER reports on the size of the market for HPWHs in the Northwest. It includes installation estimates by attributes such as state, retail vs. distributor supply channel, and emergency vs. non-emergency replacement units. This report relies on estimates developed by NEEA, supplemented with primary data collection efforts, such as the installer survey. As both MPER #7 and MPER #8 did not have access to manufacturer data, comparisons to previous MPERs should be interpreted with caution.



Document NEEA's involvement in the federal rulemaking process. The team reviewed the summary of comments received by the U.S. Department of Energy (DOE) to document NEEA's support for new minimum standards for electric water heaters.



Interview staff and stakeholders (n=4). The team interviewed NEEA staff and stakeholder partners knowledgeable about NEEA's role supporting the new federal efficiency standards for electric water heaters.



Survey HPWH installers (n=101). The team conducted a web and phone survey with HPWH installers. Installers were recruited from commercially available directories of plumbers and from NEEA's list of Hot Water Solutions trainees. The survey assessed installers' experience with and perspectives on HPWHs, including challenges with installation and callbacks.



Survey with purchasers (n = 451). The team conducted a web-based survey with Northwest utility customers who received a rebate for the purchase of a HPWH or received a free HPWH. The survey assessed purchasers' experiences with their HPWH including installation and servicing.



Survey with consumers (n=810). The team conducted a web-based customer awareness survey with households across the NEEA region. The survey assessed customers' experiences with various types of water heaters and their awareness of HPWHs.



Synthesis session. On November 4, 2025, NMR and NEEA conducted a synthesis session to discuss preliminary findings from the research activities.

MPI Progress, Assessed by Research Activities

The table below identifies MPIs included in MPER #8 and provides a high-level summary of the progress seen for each metric (Table 1). A full inventory of all MPIs measured in the MPER can be found in Appendix F. In general, most metrics are stable or slightly improved relative to MPER #7, suggesting positive outcomes for the NEEA HPWH Program, despite the overall modest market share of HPWHs.

Table 1: Summary of MPER #8 MPIs

Topic Area	MPI	Data Source	Summary of Progress
Confidence, awareness, and recommendation rates	1a. Trained installers report higher confidence in and awareness of MPIs	Installer survey	Confidence: Strong progress Awareness: near universal , for trained and untrained
	1d. Installers' recommendations of HPWHs in emergency and/or non-emergency scenarios increase year-over-year	Installer survey	No increase, but stable
Installation rates	1b. HWS-trained installers' year-over-year installations of AWHs-qualified products increase	Installer survey	Metric satisfied (all installers, not just trained, not just AWHs)
	1c. Share of professional installers that have installed AWHs-qualified products increases year-over-year	Installer survey	No increase, but stable (all HPWHs, not just AWHs)
	1e. Share of sales for emergency replacements increases each year.	Installer survey, Purchaser survey	Metric satisfied
Purchaser satisfaction	4a. At least 90% of purchasers satisfied with qualified products	Purchaser survey, Consumer survey	Metric nearly satisfied (87%-90%)
	4b. Percentage of purchasers who would recommend HPWHs does not decline year-over-year	Purchaser survey, Consumer survey	Metric satisfied (some fluctuation in the past, but strong results overall)
Consumer awareness	9. Year-over-year increase in awareness and adoption of HPWHs among consumers in single-family homes.	Consumer survey	No increase, but stable (all HPWHs, not just AWHs)
Federal standard	12. Long Term Outcome: Federal Efficiency Standard <55 gallon is enacted	NEEA staff interviews, Stakeholder interviews	Outcome achieved; NEEA involvement confirmed
Market size	2. Year-over-year sales of AWHs-qualified products increase through the retail channel	Market sizing update	Stable, but slight decrease since MPER #7
	3a. Year-over-year sales of AWHs-qualified products increase.	Market sizing update	Metric satisfied



Section 2 *Research Findings*

The HPWH Program has laid the groundwork for broader HPWH adoption. Market share has increased, but there is room to grow.

Data show substantial growth since the last MPER. Estimated HPWH installations increased by 30%, rising from over 22,000 in 2021 (MPER #7) to over 29,000 in 2024 (MPER #8) (MPI 3a). NEEA sales data indicate HPWHs made up 15% of electric water heater installs in the Northwest in 2021 and 19% in 2024. These percentages describe HPWH “market share” – the portion of annual electric water heater installs that are HPWHs. The electric water heater market in the Northwest has been flat between 2021 and 2024, while HPWHs gained market share. This growth was almost entirely in Washington, which saw around 16,000 installations in 2021 and 22,000 in 2024 (+37%). Washington energy code encourages HPWHs in new construction, driving this trend. Oregon showed modest growth (9%); Idaho and Montana installations numbered only in the hundreds.

Room to grow. HPWHs have not yet become the dominant electric water heater technology in use in the Northwest. NEEA’s 2022 RBSA estimated HPWHs represent a small portion of in-service residential water heaters (3% of all water heaters, 6% of electric units). As HPWHs become a larger portion of new installs, penetration should be higher in future RBSAs.

Tax credits may drive uptake. Many HPWHs installs did not receive utility incentives, as their availability has decreased. The regional market saw notable gains in non-incentivized installations (particularly in Washington), in new and existing homes. Non-incentivized installs doubled, from roughly 9,000 in 2021 to 18,000 in 2024. Before 2023, HPWHs were eligible for tax credits of up to 30%, with a lifetime cap of \$500. In 2023, the Inflation Reduction Act increased the annual cap to \$2,000, with no lifetime limit.⁴ This robust credit may have increased HPWH market share, but it was discontinued in 2025.

Compared to MPER #6 (before IRA tax credits), twice as many MPER #8 purchasers (45%) said they got a tax credit (19% in MPER #6). Among purchasers who received a tax credit, over three-fourths in the past two MPERs said they were important in their purchasing decision.⁵ The increased installations seem to bear out the importance of these tax credits.

⁴ Internal Revenue Service. “Home Energy Task Credits”. <https://www.irs.gov/credits-deductions/home-energy-tax-credits>.

⁵ Rated a 4 or 5 on a 1 to 5 scale, where 5 is “very important.”

Installers are increasingly aware of and install HPWHs. Despite favorable opinions, many installers still avoid recommending HPWHs due to concerns about reliability or customer satisfaction.

Awareness is nearly universal among installers.

There continues to be high awareness among installers. NMR surveyed water heater installers with and without HPWH experience, similar to the approach used in MPER #7.⁶ Nearly all the installers surveyed for MPER #8 (99%) were aware of HPWHs. This was an increase from an already high value of 96% in MPER #7 (MPI 1a). Familiarity with HPWHs was highest among Washington installers (48% “very familiar”), compared to Oregon and Montana (34% and 36%), followed by Idaho (only 9%).

Despite increased awareness of HPWH, there is no increase in self-reported installations. The proportion of installers that install HPWHs is essentially unchanged from MPER #7 (70 vs 71%, MPI 1c). Installers who consider themselves “very familiar” with HPWHs report recommending them more often. In this MPER, fewer installers considered themselves “very familiar” with HPWHs (36%) than in MPER #7 (49%) (MPI 1a). This may reflect that the MPER #8 sample included a slightly different group of installers. Given the characteristics of the installers surveyed in MPER #8, no increase in overall recommendation rate may still be a positive sign.⁷

Installers report modest recommendation rates for retrofits. Overall recommendation rates for HPWHs are modest. Only 30% of installers reported that they regularly recommend them to their customers, similar to findings from MPER #7. Installers are more willing to personally adopt the technology than endorse it for a potential customer, with 48% of surveyed installers saying they would install a HPWH in their own home. This indicates installers have a higher level of comfort with the technology than implied by the recommendation rate.

Negative perceptions among installers remain a problem.

Many installers still have negative perceptions of HPWH. Like in MPER #7, most installers were unlikely to recommend a HPWH to a friend or colleague. This study calculated the overall net promoter score (NPS) for HPWHs among installers. The net promoter score is a market research metric that relies on a 0 to 10 scale to assess the rate at which respondents recommend something to a friend or colleague. The overall NPS was negative, meaning more installers⁸ said they were not likely to recommend one to a friend or colleague. This result is problematic given the importance of contractors’ opinions on customer decision making and shows substantial room for improvement.

⁶ In contrast, the MPER #5 survey focused on installers recruited from HWS’ trainee lists.

⁷ That many metrics of installer behavior, from satisfaction to installation rates, remain similar/better than MPER #7, even among those who reported a lower familiarity with HPWHs, on average, is a positive sign. This survey may have captured fewer “very familiar” installers. As seen in Appendix B, results for installers with similar levels of familiarity across the MPERs tend to be similar.

⁸ Asked only of those who were familiar with HPWHs (the vast majority).

Concerns about reliability are highest among installers with less direct HPWH experience. About half of surveyed installers⁹ agreed HPWHs are reliable (50%, compared to 55% in MPER #7, MPI 1a). This result is concerning, but when limited to the installers who said they were “very familiar” with HPWHs (n=37), this rises to 72%. This suggests those with HPWH experience have a more positive assessment of their reliability. This finding is comparable to results from MPER #5, which found that 70% of HWS-trained installers – again, those with more experience – agreed that HPWHs were reliable. Addressing installers’ concerns about reliability may be among the most critical tasks for the HPWH program, as it is understandable that installers may not want to recommend a product with questionable reliability.

Examples of complaints from installers about reliability include statements like those below.

“[HPWH] parts fail quickly, resulting in unhappy customers. They are also a nightmare to work on.” – Installer from Idaho

“Too big, too loud, makes the room cold. Too many error codes. Parts fail easily and very hard to replace said parts.” – Installer from Idaho

“It’s very expensive for us to travel back to a job site for call backs and we get lots of call backs on [HPWHs]. This outweighs the benefits to the customers.” – Installer from Washington

Installers in Idaho and Montana were less likely to express confidence in HPWHs. Around two-thirds of installers in Idaho (68%) and Montana (64%) reported their company’s technicians can easily install HPWHs correctly compared to 85% of installers in Oregon and 90% in Washington (MPI 1a). Installers in Idaho and Montana also expressed more difficulty getting HPWHs quickly from distributors and were less likely to say HPWHs are good replacements for electric resistance units or that HPWHs are reliable.

Recommendation rates differ wildly depending on installer opinions.

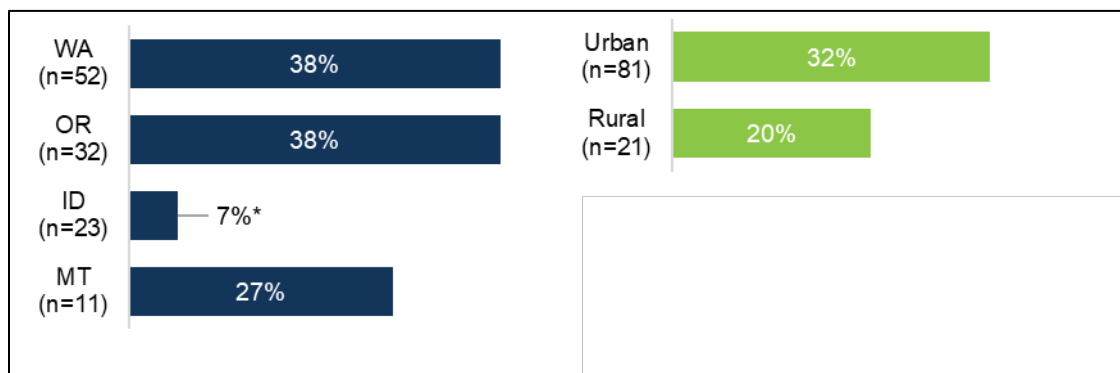
HPWH “promoters” are more likely to recommend them to customers. Using the net promoter score metric, “promoters” are those who rate their likelihood of recommending one to a friend or colleague at a 9 or 10. “Detractors” are those who rate it a 6 or below. These two groups of installers have remarkably different approaches to recommending HPWHs to their customers. “Promoters” said they would recommend a HPWH 84% of the time, on average, to customers to replace an old or near-failure water heater and 80% of the time to replace a failed water heater. In contrast, “detractors” only recommended HPWHs an average of 10% or 12% of the time in those scenarios.

Installers may assume customers will not accept HPWHs, limiting their recommendation of the technology. One in six installers (16%) who do not regularly recommend HPWHs (n=68) attributed the low recommendation rate to customer preferences. Along the same lines, 24% of consumer survey respondents who 1) recently purchased a water heater and 2) said they had not considered a HPWH, said they were not familiar enough with the technology to have considered it (20% in MPER #7).

⁹ Percentage of installers who were aware of HPWHs. Not asked of the small portion who did not know what HPWHs were.

Installer recommendations vary by state. Installers in Washington, Oregon, and urban areas in all four states were more likely to agree that “My company regularly recommends heat pump water heaters to customers” than installers in Idaho, Montana, or rural counties (Figure 1). In MPER #7, none of the installers in Montana said they regularly recommend HPWHs, compared to 27% in MPER #8.

Figure 1: Installers Regularly Recommend HPWH to Customers



Notes: Respondents who were aware of HPWH (Q10) responded to this question.

* Denotes that findings are statistically different from Washington.

Q16. Assess how much you agree/disagree with the statement: My company regularly recommends HPWH to customers.

Consumers report difficulty finding willing installers. Some surveyed HPWH purchasers recounted difficulties finding a contractor to install their HPWH:

“It was difficult to find a contractor who supported it. I solicited bids from at least 3 companies, and all recommended not installing. I did so anyways.” (Purchaser in WA)

“We spoke with a few contractors, some of whom recommended against heat pumps, but it seemed more on principle than any real reason.” (Purchaser in WA)

“Most contractors recommend against it, I had to do a lot of research to prove them wrong” (Purchaser in WA)

“The contractor was not enthused about installing a heat pump hybrid for us, but I insisted that was what I wanted.” (Purchaser in WA)

Importance of installer recommendations. In line with the results of MPER #5 and MPER #7, MPER #8 again found that installers reported that when they recommended a HPWH, customers typically accepted the recommendation about one-third of the time.¹⁰ Customers who are aware of and familiar with HPWHs are more likely to accept the recommendation. Installer interviews back in MPER #5 also noted that the likelihood of accepting a recommendation was highly correlated with a customer’s previous pre-existing awareness of HPWHs.

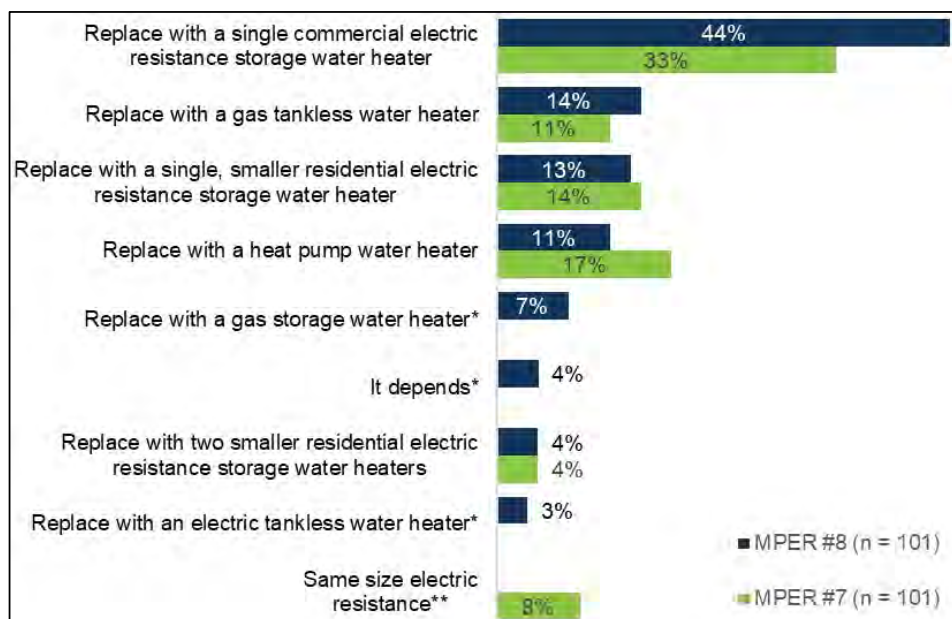
¹⁰ This was consistent for all retrofit scenarios, whether the pre-existing water heater was functioning, old/near failure, or failed.

Installers are still using workarounds to avoid installing HPWHs, a risk to compliance with the upcoming federal standard.

Installers prefer non-HPWH products to meet current standards, particularly commercial tanks, small residential tanks, and gas tankless models. In 2015, National Appliance Energy Conservation Act (NAECA) updates increased the federal efficiency requirements for large (> 55 gallon) residential electric water heaters. With limited exceptions, only HPWHs satisfy the new efficiency standards.

However, when faced with a large electric water heater in a retrofit scenario, installers rarely recommend replacing it with a HPWH. Instead, they often suggest alternative options, or workarounds. These alternatives allow them to comply with federal standards without having to install a HPWH. Only one in ten installers (11%), a decrease from 17% in MPER #7, said their typical replacement in that scenario was a HPWH, the choice prescribed by the standards. Choosing a large commercial tank that is exempt from the residential standards was the most common choice – nearly half of installers (44%) said this was their typical replacement strategy for a large electric storage heater in a home, up from 33% in MPER #7 (Figure 2). Other popular options include a smaller electric resistance tank (13%) or switching to a tankless gas or propane unit (14%). The new federal standard coming in 2029 should encourage HPWH adoption, as smaller residential electric water heaters will have to be HPWHs. But the continued hesitancy to promote HPWHs shows how much ground is left to cover to make the market comfortable with these products. In past MPERs (#5 and #7), HWS-trained installers were more likely than other installers to say they typically replaced large electric storage water heaters with HPWHs (40% and 43%, respectively).¹¹

Figure 2: Typical Replacement Strategy for >55 Gallon Electric Storage Water Heater



* Answer exclusive to MPER #8; ** Answer exclusive to MPER #7

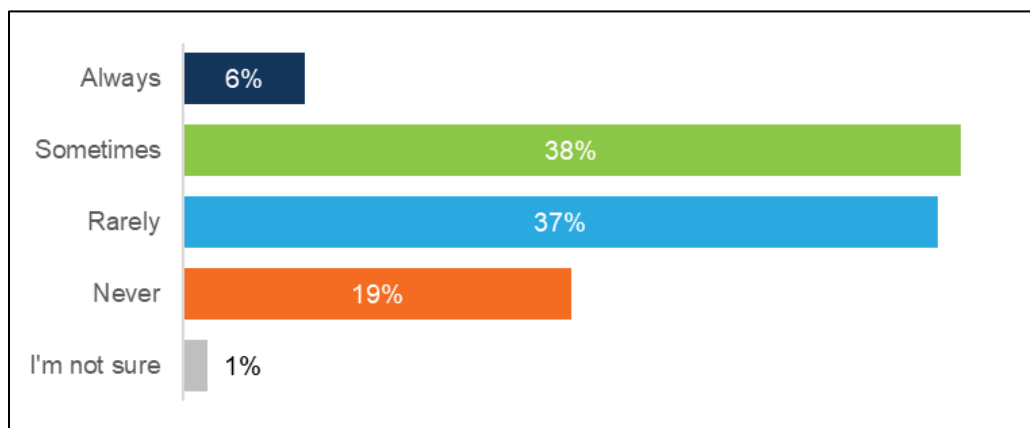
Q30. When replacing a ≥55 gal. elec. resistance unit for a res. customer, what is your typical replacement strategy?

¹¹ The number of verified HWS-trained installers in MPER #8 is too small to draw conclusions and is not included in this report.

Some installers install mixing valves on smaller tank water heaters instead of installing the larger HPWH models that comply with the 2015 NAECA standards. This approach enables them to install a smaller electric resistance model and still provide the water volume of a larger tank.

Nearly one-half of installers estimated that they always (6%) or sometimes (38%) install a mixing valve on smaller electric resistance storage tank water heaters to increase the amount of water they provide for the occupants (Figure 3). These findings are almost identical to MPER #7 results (7% and 37%). Of these respondents, 19% (or 8% of all installers surveyed) said they installed mixing valves to avoid installing a HPWH in place of a large electric resistance model (19% in MPER #7). Mixing valves also appear to be useful for addressing HPWH service calls; installers interviewed for NEEA’s Callbacks report (Appendix I) adding a mixing valve to address hot water demand issues.

Figure 3: Mixing Valve Installation Frequency (n=101)



Note: Asked only to respondents who reported installing electric resistance storage water heaters (Q13). Q31. When installing smaller electric resistance storage tank water heaters (<55 gallons), how often do you install mixing valves in order to increase the amount of hot water produced by the smaller tank?

Some installers also prefer fuel switching over HPWHs. Some installers default to gas water heaters to avoid replacing a large electric resistance storage unit with a HPWH, a trend that could continue under stricter efficiency standards in 2029. When asked about their typical replacement strategy for a large electric storage water heater (>55 gallons), nearly one-quarter of installers said they would replace it with a gas unit (14% said they would typically install a gas tankless unit and 7% a gas storage model). Thirteen percent of single-family homes with gas heating in the Northwest have an electric resistance water heater. These are homes that could readily choose a gas model over a HPWH.¹²

Although a growing number of purchasers chose to replace their gas, propane, or oil storage water heaters with a HPWH (9% of purchasers in MPER #7 and 17% in MPER #8), consumers and installers who are resistant to HPWH technology may turn to gas or other fuels to avoid installing a HPWH in 2029 under the new efficiency standards.

¹² NEEA. “2022 Residential Building Stock Assessment Findings Report”. April 2024. <https://neea.org/data/residential-building-stock-assessment>.

Most HPWH owners are happy with their HPWHs and are likely to recommend them to others, an important driver of future adoption.

HPWH owners report high satisfaction. Recent MPERs have consistently shown that HPWH owners are satisfied with their systems, an extremely positive sign for continued market progress. Satisfaction has hovered around 90% among purchasers surveyed in MPERs #4, 6, 7, and 8. Overall, 87% of purchasers¹³ surveyed for MPER #8 were satisfied with their HPWH (MPI 4a).

A similar percentage agreed that they were satisfied with its ability to provide sufficient hot water, undoubtedly the most important feature of any water heater (84%). This finding was also reflected in the consumer survey, which captured but did not specifically target HPWH owners: 90% of those consumers who self-reported they had a HPWH (n=134) were satisfied with the HPWH overall (MPI 4a).

Satisfaction is consistent across self- and professional installs. Customer satisfaction with their HPWHs is essentially the same whether they installed the HPWH themselves (89%) or had a professional do it (88%).¹⁴ Some installers interviewed for the Callback research ([Appendix I](#)) reported that the HPWH units customers get from retail channels are built differently and have lower-quality parts, but this does not appear to have been borne out in these relatively early satisfaction numbers.

Purchasers recommend HPWH to others. Unlike installers, HPWH purchasers are likely to recommend HPWHs, with a positive net promoter score of 46%. This favorable result indicates customers who have these products in their homes view them quite favorably. In fact, they view them so favorably that nearly all HPWH owners identified in the consumer survey¹⁵ (95% out of 134) said that they would or already have recommended a HPWH to a friend, colleague, or family member. That owners are happy enough with these products to recommend them is a key sign for installers to consider.

Recommendations from trusted sources are quite powerful. Nearly half of surveyed consumers said friends, family members, or colleagues were an important information source for purchasing equipment like water heaters. In fact, among HPWH purchasers, a recommendation from a friend or acquaintance was as important a source of their awareness of HPWHs (16%) as a contractor recommendation (15%).

HPWHs have been available long enough that satisfied HPWH owners are buying them again – 8% of HPWH purchasers in MPER #8 said their awareness about HPWHs came from having already owned one.

Consumers commonly use installers they already know or find them through utility-provided lists. Among purchasers who had a professional install their HPWH (n=195), 35% had a previous relationship with the installer, compared to 24% who found them through a utility-provided list of contractors. Other purchasers found installers through a personal recommendation (14%) or the Internet (12%). Since so many people go with installers they or a trusted associate already know, utility programs need to continue to expand their trainings grow the pool of HPWH-friendly firms.

¹³ “Purchasers” refers to the owner of the unit, whether they directly purchased it, received it for free through a low-income program, or bought it along with their home (whether the home was existing or new construction). These respondents were primarily participants in utility incentive programs. In this study, 89% of purchasers bought their unit for use in an existing home, i.e., retrofit scenario, rather than as part of a new home build. 92% of respondents are the actual purchaser.

¹⁴ This excludes customers who purchased a home with a HPWH. The previously mentioned overall satisfaction number does not.

¹⁵ This study included a survey with HPWH purchasers and a consumer survey that happened to identify people who owned them.

Consumer awareness of HPWHs is relatively steady, but not universal. Most water heater replacements occur when water heaters fail, limiting installation potential when customers are unfamiliar with HPWHs or their installer does not recommend one.

HPWH awareness has reduced slightly among a prime demographic: single-family homeowners with electric water heaters. Approximately half of such respondents included in the consumer survey were familiar with HPWHs (47%). This is lower than MPER #6 (57%).¹⁶

Consumers report similar awareness levels across Northwest states. Consumers in Montana and Idaho have slightly lower levels of awareness (41% and 42%, respectively) than consumers in Washington (46%) or Oregon (44%), but the differences are not statistically significant. Given the limited differences, this may not be the primary reason for lower adoption in Idaho and Montana.

Replacing water heaters early to save energy is relatively uncommon among consumers. Only about one-quarter of respondents in the MPER #8 consumer survey said they would consider replacing their water heater to lower utility bills and/or save energy if their current water heater still works (24%). Consumers who are aware of HPWHs are more likely to say they would purchase a new water heater to save energy (38%) than consumers who are not aware of HPWHs (12%). These figures are quite similar to values seen in past MPERs, though the sample frames included slightly different demographics.¹⁷

Most consumers rarely think about their water heaters when they are working properly. Customers are forced to make decisions quickly in emergency situations, and the urgency may limit their ability or desire to shop around or research the latest developments in the water heater market. Given these challenges, consumer education to increase HPWH awareness is an important element of NEEA's Market Transformation efforts.

¹⁶ Awareness of HPWHs among single-family owners with electric storage water heaters in MPER #7 was 46%, nearly identical to MPER #8. However, the sample frame in MPER #7 is not directly comparable to MPERs #6 and #8. MPER #6 surveyed single-family owners with electric storage water heaters; MPER #8 surveyed homeowners and renters with any type of water heater. Overall HPWH awareness from MPER #8 was 44% (n=811), compared to 47% of single-family owners with electric storage units (n=389).

¹⁷ Consumers who would consider replacing early to save energy: MPER #6: 28%, #7: 23%. Consumers who would consider replacing early to lower utility bills: MPER #6: 24%, #7: 29%. The MPER #6 consumer survey included single-family owners with electric storage water heaters; MPERs #7 and #8 included renters, multi-family residents, and people with non-electric water heaters; MPER #7 focused on consumers in ZIP Codes targeted by a NEEA media campaign, so results are not directly comparable.

Fewer installers reported customer callbacks after installing HPWHs. While less frequent, issues with HPWHs can be difficult and time-consuming to address.

Callback rates are declining but remain a meaningful concern for installers.

Post-install callbacks rates are declining. Well over one-third (39%) of installers in MPER #7 agreed “My company is likely to get customer complaints or service requests soon after installing a heat pump water heater,” but this was down to 25% (out of 101) in MPER #8 (MPI 1a). In MPER #7, 50% of the installers who were “very familiar” with HPWHs agreed they received callbacks soon after installing them; in MPER #8, that was down to 25%, indicating progress. This is a welcome reduction, though even 25% remains a concerning number that warrants additional research to understand the causes.

Installers are motivated to avoid callbacks. One can understand why installers might be hesitant to recommend a system that seems likely to end up triggering costly callbacks, particularly if the customer liked their previous system. Callbacks require installers to return to address issues, which can be expensive for the customer and the installer in part because not all service or repairs are covered by a warranty. Just over half of HPWH purchasers who needed a service or repair visit said they had a warranty that covered all or part of the cost.

One installer from Washington surveyed in MPER #8 noted, “It’s very expensive for us to travel back to a job site for callbacks, and we get lots of callbacks [for HPWHs]. This outweighs the benefit to the customer.”¹⁸

HPWHs and electric resistance water heaters require early repairs at comparable rates. Twelve percent of HPWH purchasers (n=449) said they had called to have their HPWH serviced or repaired. Granted, these HPWHs were relatively new (most less than 5 years old). This is similar to the number of consumers with typical electric water heaters have had to repair or service their units in that time: 14% of consumer survey respondents with electric resistance storage water heaters less than 5 years old (n=82).

Callbacks for HPWHs can be challenging. In MPER #8, installers who service HPWHs (n = 71) said that in one-quarter of service calls (24%) the technician needed to call the manufacturer to address the issue. They also said multiple service calls are needed to resolve roughly 20% of issues.

¹⁸ This installer also noted that standard electric resistance water heaters were the most profitable installation type for their firm.

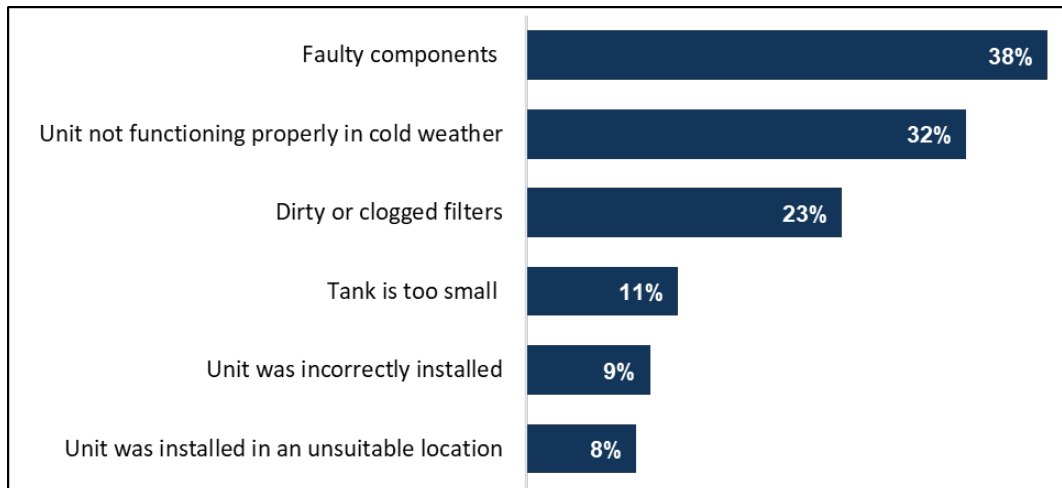
Callbacks for HPWH can take a long time to solve and are commonly due to faulty components or issues with performance in cold weather.

Callbacks for HPWH can take a long time to solve, a real problem for customers. HPWH purchasers who contacted a professional to repair their HPWH (n=35) said that most HPWH repairs took days or even weeks to resolve: 31% said the repair took one to two weeks, and 11% said over two weeks – a very long time to be without hot water. As explained by an installer in the Callbacks research, “sometimes it takes 10 to 12 days for the control board to show up.”

A lack of on-hand parts seems to be a barrier to rapid HPWH servicing. Only 10% of installers report keeping parts on hand to service HPWHs despite encountering faulty components in 38% (n=69) of HPWH service calls (Figure 4). Among purchasers that experienced an issue with their HPWH (n=80), over 50% had faulty components. An installer from Oregon surveyed for this MPER noted, “The parts... are not available when you need them.”

Cold weather can cause performance issues. Installers said one-third of service calls (32%) were due to the unit not functioning properly in cold weather. A retrofit installer interviewed for the Callbacks research confirmed they saw more service calls in the winter for this issue. In some cases, this may be due to installation in less-than-ideal locations (for example, in a garage in a particularly cold part of the Northwest), where major cold snaps may limit the unit’s recovery in heat pump mode. To solve these problems, installers may recommend switching HPWHs to a less efficient operating mode, at least temporarily.¹⁹

Figure 4: Issues Encountered During HPWH Service Calls (n = 72)



Notes: Weighted by the number of HPWH service/repair calls the installer reported in the last two years. Q44. In the approximately [PIPE IN Q43 VALUE (number of times respondent serviced or repaired a HPWH in past two years)] heat pump water heater service calls you have received in the past two years, how often did you encounter the following issues? Your best estimate is fine. If never, enter 0%.

¹⁹ If manually switched to resistance-only model to temporarily resolve an issue, most units automatically revert to a more efficient, default setting after a period of time.

Upfront costs remain a significant barrier to HPWH adoption.

High upfront costs prevent widespread adoption for both installers and consumers alike. Fifty-three percent of installers agreed that HPWHs are good replacements for electric resistance water heaters (MPI 1a). Installers who disagreed with this statement in MPER #8 (n=33) cited high upfront cost (72%) and a too-long payback period (53%). These figures are almost identical to MPER #7 results (73% and 50%, respectively).

Installers fault cost more than performance issues. When asked about other potential barriers to uptake, the most common reasons reported by installers were not based on poor product performance. A quarter or fewer of installers reported barriers that might indicate a product problem, such as “had a bad experience” with them (25% in MPER #8 and 31% in MPER #7) or “lack of manufacturer support” (16% in both MPER #8 and MPER #7)

Some customers rule out HPWHs based on cost. In MPER #8, more than one-half of consumers who purchased a water heater in the past three years said they considered purchasing a HPWH (56%), a similar finding to MPER #7 (57% of 150 homeowners). Nearly one in five (18%) MPER #8 consumer respondents who said they never considered a HPWH cited the cost, although this proportion has declined from 27% in MPER #7.

But other customers see the value. Despite the initial cost, 78% of HPWH purchasers were satisfied with the value of their HPWH (83% in MPER #7). Purchasers who replaced a gas, oil, or propane water heater rated their satisfaction with the value of the HPWH similarly to those who replaced their electric water heater with a HPWH (78% compared to 82%, not statistically significant). This finding is crucial to share with installers who are concerned about customer satisfaction.

High labor costs and challenging installation scenarios raise HPWH costs.

HPWHs take longer to install than many other types of water heaters. Installers estimate that HPWHs can take one to three additional hours to install than electric resistance storage water heaters.²⁰ This aligns with NEEA’s recent research that estimated that various complications can add an additional four hours for HPWH installations (Installer Callbacks qualitative research, [Appendix I](#)) and ducting can add up to 3.2 hours more labor (Challenging Installation Scenarios research).^{21, 22}

Increased labor time increases installation costs for consumers, but it could also boost installer profit if other issues do not eat into their costs. Forty-three percent of installers said gas tankless models are the most profitable water heaters for their company to install (comparable to 50% in MPER #7). Tankless units, on the other hand, tend to have the most labor-intensive installation (6.6 person hours, similar to ducted HPWHs at 6.9 person-hours).

²⁰ Installers estimated that electric storage water heaters take an average of 3.2 person-hours to install while HPWHs take 4.6 to 6.9, depending on whether ducting is required.

²¹ Cadeo Group. “Heat Pump Water Heater Market Research: Challenging Installation Scenarios.” Prepared for NEEA, April 20, 2023. <https://neea.org/resources/heat-pump-water-heater-market-research-challenging-installations-scenarios>.

²² MPER #8 measured labor time in “person hours” while the other studies report installation time in “hours.”

HPWHs are not the most profitable to install. Perhaps paradoxically at first glance, HPWHs are labor intensive to install, like gas tankless models, but installers rarely said that HPWHs were their most profitable water heater installation. Around 90% of installers overall (n=101) and 86% of installers who said their company installs HPWH (n=71) said something other than HPWHs was the most profitable water heater to install. The issue limiting HPWH profitability seems to be that installers run into issues with HPWHs – including callbacks or unbudgeted complications – that cut into their profits. In contrast, they have more experience successfully installing tankless units.²³

Sustainability-minded, higher-income consumers still drive HPWH adoption among retrofits.

HPWH purchasers tend to be higher income than consumers who choose other types of water heaters. Fifty-seven percent of respondents to the consumer survey who purchased a HPWH in the past three years (n=88) had household incomes of at least \$120,000, compared to only 28% of consumers who purchased a water heater that was not a HPWH.²⁴ Among HPWH owners surveyed in the purchaser survey, 40% of HPWH purchasers had household incomes of at least \$120,000.²⁵ To continue to gain market share, HPWHs will need to be accessible to more households, particularly after the federal tax credit is cut in 2026.

HPWH purchasers were also more likely to agree that energy efficiency was their primary consideration when choosing mechanical systems (87%; purchaser survey), compared to 70% of non-HPWH customers (consumer survey).

Unsurprisingly, **HPWH purchasers are also more likely to consider themselves early adopters of new technology** (40%), while only 9% of non-HPWH owners from the consumer survey agreed that “I am first among my friends to purchase new technology.”

²³ Gas tankless models have a reputation as having benefits beyond efficiency, such as a small form factor and unlimited hot water, boosting their desirability. If installers are unable to make a strong pitch for the value proposition of a HPWH, the increased upfront cost may not be as palatable as that of similarly costly tankless models, even if HPWHs are far more energy efficient.

²⁴ Consumer survey covered households in the Northwest (n=811); the HPWH purchaser survey included only verified HPWH owners identified via RBSA and/or utility rebate programs. (Statistically significant difference at 90% confidence level.)

²⁵ As noted, some of the purchasers may have received HPWHs for free or at a discount through a utility program, which could potentially explain some of this difference relative to the respondents included in the consumer survey.

Installers can better navigate challenging installations as their confidence increases.

Nearly one in three homes could accommodate a HPWH right away.

Many homes are ready for HPWHs. In MPER #8, installers familiar with HPWHs estimated that nearly one-third of existing homes (29%, on average) could accommodate a HPWH without making more changes to the installation area than is typical for a storage water heater, consistent with MPER #7 (29%). That market segment represents a clear opportunity for the HPWH program.²⁶

“Readiness” for HPWHs varies by installer. Installers with HPWH experience and/or training seem more capable of addressing various installation scenarios. For instance, installers who said they were “very familiar” with HPWHs (n=36) said 32% of existing homes could readily accommodate a HPWH without making any significant changes to the installation area. In contrast, the small number of installers who were *not* very familiar with HPWHs (n=16) estimated this was only true of 21% of homes, on average.²⁷

Installers’ ability to navigate common HPWH installation challenges may be improving (presence of a drain, sound concerns, etc.).

Installers report experiencing common installation issues less frequently. Like MPER #7, MPER #8 asked installers to identify how often they encountered various issues related to HPWH installations. Higher prevalence responses (“always” or “very frequently”) indicate that installers run into these issues often, and that HPWHs may be harder to install in many retrofit scenarios. Installers surveyed in MPER #8 were less likely to say they “always” or “frequently” encountered each issue listed in [Figure 5](#).

The housing stock in the Northwest has changed some, but not enough since the previous MPER that these differences could be explained by changes to homes themselves. For example, it is unlikely that a huge number of homes installed new drains for condensate since the past study. Rather, survey suggests that perhaps those issues that were “challenging” to previous installers may not be so challenging to installers now. Instead, installers’ ability to manage these issues may have improved. For example, some installers might have simply normalized a pump that can send condensate to a farther drain (like they might for a gas tankless unit) and no longer perceive this as a meaningful challenge.

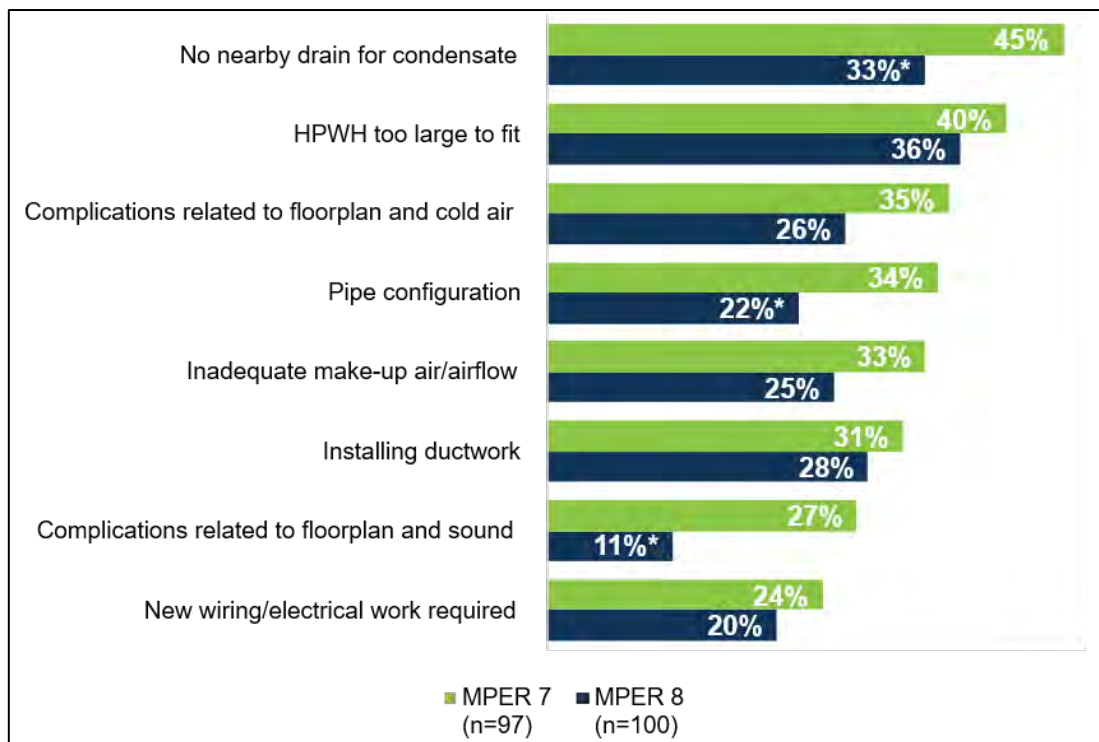
Reduced challenges align with NEEA efforts. Notably, these trends appear to reflect an increase in NEEA-sponsored installer trainings as well as efforts manufacturers have made (with NEEA support) to address HPWH installation concerns. For example, manufacturers now include top and side water connections for many models, increasing installation flexibility. Some manufacturers also addressed

²⁶ In MPER #5, HWS-trained installers estimated half of homes they visit (51%), on average, could readily accommodate HPWHs. This is much higher than MPER #8, but the way the studies identified HWS-trained respondents differed.

²⁷ The difference is not statistically significant. These MPER #8 results provide additional corroboration of findings from the 2023 study “Heat Pump Water Heater Market Research: Challenging Installations Scenarios”, conducted by Cadeo Group for NEEA (<https://neea.org/wp-content/uploads/2025/03/Heat-Pump-Water-Heater-Market-Research-Challenging-Installation-Scenarios.pdf>). The Challenging Installations installers reported encountering issues with condensate drains in 46% of homes and spaces that would not fit a HPWH in 38% of homes, on average. NEEA’s Callbacks research also confirmed these limitations.

sound concerns by introducing quieter HPWHs models.²⁸ NEEA trainings address installation challenges, which may also have contributed to fewer installers reporting they frequently encounter installation challenges compared to MPER #7 (Figure 5).

Figure 5: Frequently encountered installation challenges



Notes: Question was asked of respondents who were aware of HPWHs (Q11).

*Statistically different from MPER #7 at the 90% confidence level.

Q19. How frequently do install techs face challenges with the following aspects of a HPWH installation?

Customer satisfaction can vary by installation location.

Among HPWH purchasers, garages were the most common installation location (47%), followed by basements (35%) and closets or utility rooms (16%). Installers interviewed for the Callbacks research noted the benefits and drawbacks of different locations. For example, installing HPWHs in garages or unfinished basements can protect customers from cooler exhaust air or unwanted sound. The purchaser survey supported these results: customers with a HPWH in a garage or unfinished basement (n=229) report higher satisfaction with sound levels (68%) and room temperature (65%) than those with HPWHs in a closet or utility room (n=50, 48% and 58% satisfaction, respectively). However, installers said garages can be a challenge in cold climates, leading to hot water issues. Installers interviewed for the Callbacks research noted that callbacks happen more for garage and closet installs because customers restrict airflow by putting items too close to the unit.

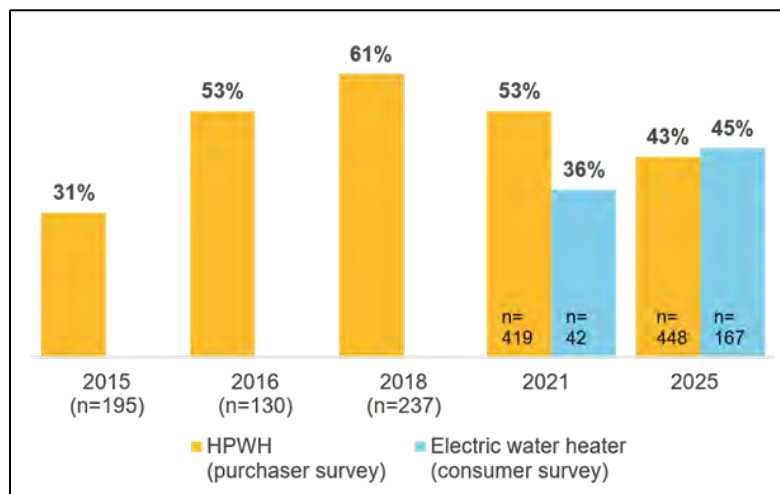
²⁸ CleanTechnica. “Two Leading Manufacturers Bring New Heat Pump Water Heater Updates to Market”, 2025. <https://cleantechnica.com/2025/05/21/two-leading-manufacturers-bring-new-heat-pump-water-heater-updates-to-market/>.

The Do-It-Yourself (DIY) market is robust but may lead to installation issues.

DIY installs represent nearly half of electric water heater installations in existing homes in consumer surveys. Most DIY respondents have some relevant professional experience.

DIY is common. Self-installs seem to be common among electric resistance and HPWH customers. Nearly one-half (45%) of recent electric water heater purchasers (consumer survey) and 43% of HPWH purchasers reported self-installing their water heater. The self-install rate for HPWHs has ranged from 31% to 61% since it was first measured in MPER #4 (Figure 6).

Figure 6: DIY Install Rate (Purchaser and Consumer Survey)



Many DIY installers have relevant professional experience. Half (51%) of DIY HPWH purchasers (n=188 HPWH owners surveyed in the purchaser survey who self-installed their HPWH) and 48% of the consumer survey respondents who self-installed their electric resistance tanks (n=29) indicated they had relevant professional experience. This included work as a plumber, contractor, handyman, and so forth.

DIY-ers are price conscious but not necessarily lower income. The most common reason HPWH purchasers with no professional experience chose to self-install (n=92) was a desire to save money (52%). The Hot Water Solutions DIY guide estimates that DIY-ers can save an estimated \$500 to \$750.²⁹ As one purchaser from Idaho noted, “A friend wanted to help [install the HPWH] and that immediately offset some of the higher up-front cost of the unit.”

²⁹ Hot Water Solutions (a NEEA initiative). “Do it Yourself Heat Pump Water Heater Installation Guide”. <https://hotwatersolutionsnw.org/diy/>.

A retailer interviewed in MPER #7 described customers who installed large appliances themselves as price-sensitive. While that may be true, there was no evidence from the consumer survey or purchaser survey that DIY installers had lower incomes than customers who opted for a professional install.³⁰ HPWH purchasers and consumers who recently purchased a water heater were more likely to self-install if they lived in rural areas (53% and 50%, respectively) than urban areas (42% and 41%), but the difference was not statistically significant.

When asked why they self-installed their HPWHs, customers said the following:

“[It was] cost prohibitive for a professional installer, and professionals seemed unfamiliar with them or their benefits. Professional installers require you to purchase heaters through them, and they jack the prices up far too much, negating all savings.” (Purchaser in WA)

“I am not a professional, but I have installed water heaters before and was confident I could install this one with the included guide.” (Purchaser in WA)

“Because I have the skills and it saves money.” (Purchaser in ID)

Notably, HPWH purchasers who self-installed their HPWH reported similarly high levels of overall satisfaction with their HPWH (87%, n=188) as purchasers who had it professionally installed (87%, n=263).

DIY HPWH purchasers commonly report major-issue-free installations and comparable installation times to professional installers.

Installation times are similar across DIY and professional installations. Among surveyed HPWH purchasers, 61% of DIY installers said it took half a day or less to install. This is essentially identical to values reported by those who used professional installers (62%). This finding aligns with information provided in the DIY Guide on the Hot Water Solutions website (half a day, or 4-5 hours). One purchaser who self-installed their HPWH explained, “The HPWH install was not complex – adding a condensation line to the outside was the only extra step.”

Overall, 28% of DIY HPWH purchasers recalled installation challenges, compared to 21% of those who had a professional install it. The difference is not statistically significant. Additionally, it is likely that purchasers who had a professional install would not have been aware of the challenges their installer encountered, particularly if the installer was well-equipped to handle it.

³⁰ While the survey did not find a statistically significant difference in incomes between customers who did and who did not install their HPWHs themselves, HPWH owners had higher incomes than non-HPWH owners, a statistically significant difference.

Installers report problems with DIY HPWH installations.

Installers have concerns about DIY installation quality. Seventy percent of surveyed installers said they service HPWHs their company did not install and estimated about 10% of those were installed by the customer.

Most installers who service DIY-installed HPWHs (84%, n=25) said they saw issues in these DIY installations that they did not see in professional installations. HPWHs that are not installed according to manufacturer specifications will not realize the advertised efficiency and energy savings. In particular, retrofitting HPWHs into tight spaces requires interventions to increase the air flow into the space, such as installing ducting or additional ventilation. DIY customers may be unaware of some of these requirements.³¹

An installer interviewed for the Callback research said, “I wish HPWHs were not available in home centers, like Home Depot or Lowe’s. I’ve had so many [situations] where people buy them, it’s a completely wrong application, and they’re very unhappy.”

The manufacturer is an important source of information for DIY-ers. Over one-half of HPWH purchasers (59%) who installed the HPWH themselves (n=188) got information for how to operate the HPWH from the manufacturer (59%), followed by online tutorial videos (22%) and DIY forums (10%). The HWS website has DIY resources, including installation instructions for five manufacturers’ HPWHs. Consumers might be more likely to use the website as a resource, rather than an initial source of information about HPWHs; only 1% of purchasers said they learned of HPWHs through the HWS website.

³¹ Larson Energy Research and Cascade Engineering Services. “Heat Pump Water Heaters in Small Spaces Lab Testing: The Amazing Shrinking Room.” Prepared for the Northwest Energy Efficiency Alliance (NEEA), November 21, 2022. <https://neea.org/resources/heat-pump-water-heaters-in-small-spaces-lab-testing-the-amazing-shrinking-room>. The research team estimated that ducting can increase the expected COP (coefficient of performance, a measure of energy efficiency) of a HPWH installed in an 84 square foot room by 38% to 116%, while two cheaper interventions that can be installed by a homeowner with basic tools can generate comparable gains: installing two wall grilles (107% increase in COP) or eight 3-inch holes with vent caps (42% increase).

Retail represents a small but important part of the market, particularly for DIY customers.

Roughly one in five HPWH installations were sourced through retailers in 2024. Retailers also play an important role in helping customers decide what type of water heater they want.

Eighteen percent of HPWHs in 2024 are estimated to be from the retail channel (MPI 2). The share of HPWHs from the retail channel appears to be higher in Montana (45%) and Idaho (34%) than in Washington (16%) and Oregon (25%) based on available data.³² As noted (which include substantial uncertainty, particularly for Montana and Idaho).

Retailers have the opportunity to influence customer decisions. When asked where they had heard of HPWHs, approximately one in ten consumers said they had heard about them from a retail salesperson (9% in both MPER #7 and #8) or retail store display (11% in MPER #7 and 13% in MPER #8). One in ten HPWH purchasers heard of HPWHs through a retail store display (11%) and 2% from a salesperson. More than one in five consumer survey respondents (21%) also indicated that retail salespeople are typical sources of information when deciding on mechanical equipment, such as a water heater, for their homes (similar to 26% in MPER #7).

Over two-thirds of emergency replacement HPWHs in the purchaser survey (n=41) were purchased at retail stores (71%), and the majority of those HPWHs were self-installed (62%), meaning that interactions with salespeople or retail store displays are an important way to connect with these undecided customers

³² As noted, there is substantial uncertainty surrounding sales figures, particularly for Montana and Idaho, given that manufacturers have not recently provided sales volume data to NEEA like they did for past MPERs and market sizing work.

Installers most frequently recommend using the “hybrid” setting, citing customer complaints with heat-pump-only mode, particularly in the winter. Most purchasers who use heat-pump-only mode were satisfied with the hot water supply, however.

One-half of purchasers who had their HPWH professionally installed said the installer told them which setting to use. HPWHs can be set on heat pump-only mode (most efficient), hybrid or mixed operations mode (uses electric resistance as needed to accommodate recovery), and electric mode (functions like a traditional electric resistance water heater). If purchasers received a recommendation, it was most likely hybrid mode. One-half of installers (53%, n =71) said they are most likely to recommend the hybrid mode to customers, and 29% said they are most likely to recommend HPWH only mode. Installers who recommended hybrid or mixed operation mode cited the local climate, the balancing of hot water supply and energy efficiency, and customer preference.

According to HPWH owners surveyed in the purchaser survey and verified by photos taken of their HPWH’s settings, purchasers most commonly set HPWHs to heat pump only mode followed by a hybrid or mixed operations mode. Almost one-half of purchasers (48%, n = 451) report they set their HPWH to heat pump only mode and 43% reported using a hybrid or mixed operation mode.

When dealing with customer callbacks to address issues with the hot water supply, installers often recommend that the customer use hybrid or electric resistance mode:

- “[We recommend hybrid mode] as a precaution. If it were to get too cold in a garage location, you might need back up electric heat just to keep up with demand.” (*Installer in WA*)
- “If the heat pump doesn’t have enough warm air, then it’s already switched over [to hybrid mode] and the customer doesn’t need to do anything further.” (*Installer in WA*)

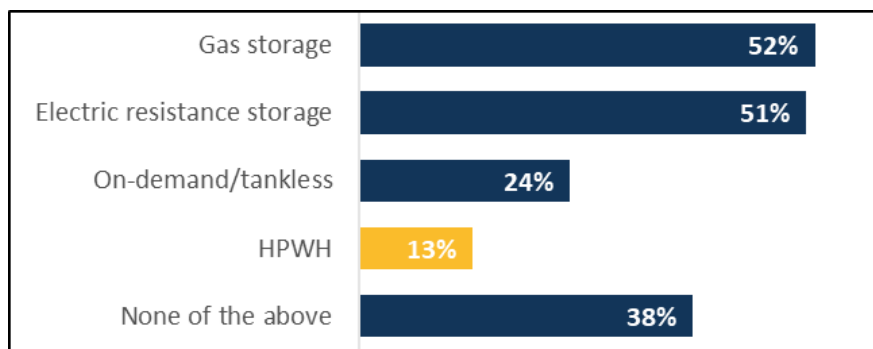
Over four-fifths (88%) of purchasers who use heat pump only mode said they are satisfied with the hot water supply (84% overall). The purchaser survey was fielded in the summer when winter performance may not have been top-of-mind. However, some installers recalled customer complaints whether using hybrid or heat pump mode:

- “Customers don’t feel their water gets as hot in hybrid or heat pump mode. They don’t like the noise. They don’t like the cold air.” (*Installer in OR*)
- “We get complaints about the recovery time on the heat pump only mode. In the winter we recommend electrical only mode because of too many [error] codes and alarms going off.” (*Installer in WA*)

Installers who keep HPWHs on hand for emergency replacement are more likely to recommend them to customers.

Thirteen percent of respondents reported that they keep HPWHs on hand for emergency replacements (Figure 7), similar to 14% in MPER #7. Installers with HPWHs on hand recommend HPWHs to replace a failed water heater twice as often as other installers: 56% of the time, on average, compared to 25% of the time, similar to findings from MPER #7. Installers who keep HPWHs on hand were also more likely to agree with the statement that HPWHs are good replacements for electric resistance storage water heaters. Four-fifths (84%) of installers with HPWHs on hand agreed or strongly agreed compared to 49% of installers who do not keep HPWHs on hand.

Figure 7: Water Heaters On-Hand for Emergency Replacement (n=101)



Q33. What types of water heating equipment does your company typically keep on hand for emergency replacements? Select all that apply.

Installers view the ANSI/CTA-2045 standard negatively, but more installers express a positive perception of the standard than observed in MPER #7.

Energy code in Washington requires electric water heaters (including electric resistance) to include a new communications port that gives the units demand response capabilities. Among installers who work in Washington state (n=52), nearly two-thirds (61%) were aware of the standard (similar to the 65% in MPER #7).³³

More installers who were aware of the standard expressed a positive opinion in MPER #8 than in MPER #7 (28%, up from 12%). That said, over half viewed it negatively (59%). These installers reported similar concerns as in MPER #7, such as invading customers' privacy, giving the government or utilities control of individual behavior, triggering more service calls, or simply offering no benefit to the customer.

- "It's just another part that can break down." (*Installer in WA*)
- "The cost of water heaters went up because of [the standard]. It also moved the electrical connection on the tank, and now the wires don't reach." (*Installer in WA*)

In theory, this should not negatively impact installers' perceptions about HPWHs because the change is not unique to heat pump models, but it could add to their concerns about HPWHs, particularly regarding their higher incremental cost.

³³ Energy code in Oregon was updated to include this standard, which went into effect on July 1, 2023. Future studies that ask installers' opinions about this standard should include Oregon. Office of the Secretary of State. Notice of Proposed Rulemaking. April 26, 2022. <https://www.oregon.gov/energy/Get-Involved/rulemakingdocs/Hearing-Notice-Water-Heater-Effective-Date.pdf>

Appendix A HPWH Market Update

To ensure consistent tracking of market progress over time, the team developed updated estimates of the size of the HPWH market in the Northwest region from 2022 through 2024, attempting to follow the methodology of MPERs #4, #5, #6, and #7 as closely as possible.

As with MPER #7, MPER #8 did not have access to the same primary data sources used in MPERs #5 and #6, so the values shown here were primarily derived based on various assumptions, including the trends seen in previous MPERs.

Accordingly, ***the market sizing values presented in this MPER are not as reliable as estimates from MPERs #5 and #6 and should be viewed with extreme caution.*** The market sizing assessment breaks down HPWH sales by the attributes shown in [Table 6](#) and compares the results to those from MPER #6 and MPER #7.

Table 2: Attributes Included in Market Sizing Update

Attribute
State
Home type (new construction vs. existing home)
Supply channel (retail vs. distributor)
Replacement type (emergency vs. planned)
Tank size (≤ 55 or > 55 gallons)

METHODOLOGY

As previously noted, significantly less primary data was available for this MPER compared to the previous ones, as shipment and sales data from manufacturers available for MPERs #5 and #6 were not available for MPER #7 or #8. To size the markets for this study, the team primarily relied on data and analyses from NEEA, incorporating raw data from NEEA, completed analyses provided by NEEA, secondary data sources, and selected MPER #8 survey results.

The team uses the term “market size” to represent an estimate of the number of electric water heaters installed each year, as these results focus purely on electric water heaters. HPWH “market share” represents the percentage of the electric water market made up of HPWHs. As with the past MPERs, this market update assumes that only negligible quantities of residential-sized HPWHs are installed outside of single-family homes. This assumption is supported by the lack of HPWHs in multifamily homes in the 2016-2017 and 2022 RBSAs, along with results from previous MPERs.

Table 3 identifies the data sources on which the team based the market update, showing which data sources were used to inform the different attributes of the market update effort. The subsections that follow describe the specific ways that data sources (or trends from past MPERs) were used to inform the various attributes.

Table 3: Data Sources Informing Key Market Attributes for 2022-2024

Data Source	State	New vs. Existing	Supply Channel	Utility Incentives	Emergency vs. Planned	Tank Size
Data provided by NEEA						
HPWH shipment estimates from distributors for the NW	●		●			
Utility-provided HPWH rebate counts				●		●
Retail sales estimates	●		●			
2024 Heat Pump Water Benefits Model		●				
2024 New Homes Model		●				
Secondary data						
U.S. Census: 2019-2023 American Community Survey (ACS) 5-year estimates ³⁴	●					
U.S. Census: 2024 American Community Survey (ACS) 1-year estimates	●					
U.S. Census: 2020-2024 Building Permits Survey ³⁵	●	●			●	
NEEA 2018 Water Heater Market Characterization Report ³⁶	●	●				
2022 NEEA Residential Building Stock Assessment (RBSA) ³⁷		●				
Primary data from MPER #8						
Installer survey					●	
Purchaser survey					●	

³⁴ United States Census Bureau. “American Community Survey (ACS)”. <https://www.census.gov/programs-surveys/acs>.

³⁵ United States Census Bureau. “Building Permits Survey (BPS)”. <https://www.census.gov/construction/bps/>.

³⁶ Russell Research. “Water Heater Market Characterization Report”. Prepared for the Northwest Energy Efficiency Alliance (NEEA), April 3, 2018. <https://neea.org/img/documents/water-heater-market-characterization-report.pdf>.

³⁷ NEEA. “2022 Residential Building Stock Assessment Findings Report”. April 2024. <https://neea.org/data/residential-building-stock-assessment>.

HPWH Market Share by State and Home Type. The team calculated HPWH market share as the ratio of HPWH shipments to the NEEA region to estimates of all electric water heater installations in the NEEA region. The formula below describes the calculation. Descriptions of each variable follow.

$$HPWH\ Market\ Share = \frac{HPWH\ Sales}{All\ Electric\ Water\ Heater\ Installations}$$

HPWH sales. NEEA provided estimates of shipments of HPWHs to distributors and retailers in the Northwest for 2022-2024. For the most recent MPERs, manufacturers provided this raw data to NEEA for use in MPERs, but as noted, not all manufacturers provided data for MPER #8, and NEEA developed estimates based on trends from past data sets to fill these gaps.

All electric water heater installations. The team reported on estimates of electric water heater installations in new and existing single-family homes, based on NEEA data. As in past MPERs, the electric water installation estimates were rounded to the nearest hundred.

- **New Construction.** NEEA’s Heat Pump Water Heater Benefits Model and NEEA’s 2024 New Homes Model indicate a 53% saturation rate for electric water heaters in new construction for 2024. The team applied the same 53% rate to the state-level Building Permits Survey (BPS) counts of new construction to estimate electric water heater installations in new, single-family homes for 2022-2024 in Washington, Oregon, Montana, and Idaho.³⁸
- **Existing Homes.** The American Community Survey (ACS) provides state-level counts of single-family existing homes. The NEEA 2018 Water Heater Market Characterization study estimated electric water heater replacements for single-family and low-rise multifamily homes. The electric water heater estimates for the Market Characterization study were calibrated to 2022-2024 housing estimates from the ACS and Council Housing Stock forecast. The team provided estimates of the count of multifamily installations using the estimates in the Council 53 Stock forecast for low-rise multifamily homes. Note that at the time of this study the Census did not provide data for 2025, leaving 2024 as the most recent year for market share estimates.

The team used the following method to estimate water heater installations in existing single-family homes:

$$\begin{aligned}
 &Electric\ Installs\ in\ Existing\ SF\ Homes \\
 &= Total\ Electric\ Installs\ (NEEA\ Market\ Characterization\ Study) \\
 &\quad - New\ Construction\ Electric\ Installs\ (BPS\ RNC\ counts) \\
 &\quad - Existing\ MF\ Electric\ Installs\ (Council\ forecasts)
 \end{aligned}$$

³⁸ Note that MPER #4 relied on Council forecasts for single-family housing counts, but MPERs #5 through #8 deviated from this approach because Census data offered more accurate single-family home data, based on retrospective assessments of housing stock rather than on the Council’s forward-looking forecasts made in 2012.

Supply Channel

The team used data provided by NEEA, including manufacturer data supplied directly by the manufacturers and estimates derived from past shipment data, to estimate the market share by supply channel for 2022-2024. The manufacturer shipment data used in previous MPERs and as the basis for NEEA's estimates included information on whether the purchaser was a retailer or a distributor. Additionally, for 2024, NEEA received sales data from a few retailers, which enabled more accurate market sizing estimates compared to previous years.

Replacement Type

NMR relied on the installer and purchaser surveys from MPER #8 to estimate the percentage of HPWHs installed in emergency scenarios. The team used the emergency replacement rate (37%) from NEEA's 2018 market characterization study to estimate the share of planned and emergency replacements in MPER #8 for all electric water heaters installed in existing homes.³⁹ The MPER #8 HPWH purchaser and installer surveys were used to develop the estimate for HPWH planned replacements and emergency replacements. In contrast, MPER #7 relied only on the installer survey and MPER #6 relied only on the purchaser survey to make estimates on the condition of the old water heater.⁴⁰

Tank Size

The team relied on utility-provided HPWH rebate counts to estimate the distribution of HPWH tank sizes for MPER #8.

HPWH MARKET SHARE BY STATE

Table 4 provides HPWH market share figures from 2021 through 2024. These figures include results from MPERs #7 (2021) and #8 (2022-2024) (with the methodological caveats described previously). This table describes the number of electric water heaters installed, the subsets that were HPWHs, and the percentage of the electric water heater market represented by HPWHs (i.e., market share). Because the estimates of overall market size for 2021 through 2024 were developed from an amalgam of sources, they are not definitive. For this reason, minor changes over time in HPWH market share, which relies on overall market size as the denominator, should be interpreted with caution.

³⁹ The MPER #8 consumer survey estimated that 27% of recent water heater purchasers had purchased water heaters in an emergency replacement scenario.

⁴⁰ MPER #6 relied on HPWH purchasers indicating their reason for installing HPWHs and MPER #7 relied on installers describing their HPWH installations while MPER #8 relied on both installer and purchaser surveys. These numbers are not directly comparable given the difference in data sources.

Recognizing these caveats, HPWH market share in the Northwest remains low, but still makes up a meaningful portion of the market. In 2024, HPWHs represented 19% of electric water heaters installations (MPI 3a), a substantial jump from the 15% seen in 2021 (up 4 percentage points, or 27%) (Table 4).^{41, 42} The estimated rates of adoption in Washington and Oregon continue to be far higher than in Idaho and Montana, which have negligible HPWH market shares – low single digit percentages in any given year. Washington continues to have the highest HPWH market share by a significant margin – HPWHs make up one-fourth (26%) of the electric water heater installations there.

The electric water heater market on the whole has been relatively flat since 2021, with annual installs ranging between roughly 155,000 and 158,000. Based on these figures, annual electric resistance installations appear to have slightly declined since 2021 (from about 132,000 in 2021 to about 128,000 in 2024), while HPWH installations have increased.

Table 4: Estimated Market Share of NW HPWH Installations, By State

State	2021 (MPER 7)			2022 (MPER 8)			2023 (MPER 8)			2024 (MPER 8)		
	Electric WH Installs	HPWH Installs	HPWH Market Share	Electric WH Installs	HPWH Installs	HPWH Market Share	Electric WH Installs	HPWH Installs	HPWH Market Share	Electric WH Installs	HPWH Installs	HPWH Market Share
Total	155,100	22,598	14.6%	154,800	26,619	17.2%	156,600	27,370	17.5%	157,800	29,416	18.6%
WA	84,800	16,038	18.9%	84,600	19,297	22.8%	85,600	20,470	23.9%	85,600	22,043	25.8%
OR	40,800	6,147	15.1%	41,100	6,652	16.2%	41,600	6,029	14.5%	42,300	6,715	15.9%
ID	17,000	352	2.1%	16,900	490	2.9%	16,900	594	3.5%	17,500	527	3.0%
MT	12,500	61	0.5%	12,200	180	1.5%	12,500	276	2.2%	12,400	131	1.1%

⁴¹ This includes installations in single-family new construction, existing homes, and manufactured homes in the Northwest.

⁴² MPER #8 included market share estimates by state for 2021, 2022, and 2023 because the MPER covered three years of market update data.

NEW VS. EXISTING CONSTRUCTION

HPWHs are fairly common in new construction – they were installed in 6 out of 10 new homes in the Northwest in 2024 (62%) (Table 5). New construction installations have been growing steadily, from around 11,000 in 2020 to 16,000 in 2024.

HPWHs are far less commonly installed in existing homes, but market share is still rising there. With the caveats previously noted about 2021 and 2024 values being speculative, NEEA estimates that HPWH installations in existing homes have increased from just over 6,000 in 2020 to over 13,000 in 2024, yielding a market share for 2024 of just over 8%.

The overall number of HPWH installations in 2024 was roughly split between new and existing homes: 55% of HPWHs appear to have been installed in new homes, with the remaining 45% going into existing homes. Readers should recognize that the market for electric water heaters in existing homes is over seven times larger than the new construction market. The fact that the number of annual HPWH installations in each market is reasonably comparable underscores the disparity in HPWH adoption rates between these two markets segments.

Table 5: Market Share of HPWH Installations in the NW – New vs. Existing Homes

Install Type	2020 (MPER 6)				2021 (MPER 7)				2024 (MPER 8)			
	Electric Water Heater Market	HPWH Installs	Relative Market Share	Overall Market Share	Electric Water Heater Market	HPWH Installs	Relative Market Share	Overall Market Share	Electric Water Heater Market	HPWH Installs	Relative Market Share	Overall Market Share
Total	150,200	17,442	11.6%	11.6%	155,100	22,598	14.6%	14.6%	157,800	29,416	18.6%	18.6%
New	19,200	11,413	59.4%	7.6%	17,500	11,751	67.1%	7.6%	26,154	16,296	62.3%	10.3%
Existing	131,000	6,029	4.6%	4.0%	137,600	10,847	7.9%	7.0%	131,646	13,120	10.0%	8.3%
<i>Planned replacements</i>	<i>82,530</i>	<i>5,902</i>	<i>7.2%</i>	<i>3.9%</i>	<i>86,688</i>	<i>6,074</i>	<i>7.0%</i>	<i>3.9%</i>	<i>82,937</i>	<i>10,459</i>	<i>12.6%</i>	<i>6.6%</i>
<i>Emergency replacements</i>	<i>48,470</i>	<i>490</i>	<i>1.0%</i>	<i>0.3%</i>	<i>50,912</i>	<i>4,773</i>	<i>9.4%</i>	<i>3.1%</i>	<i>48,709</i>	<i>2,661</i>	<i>5.5%</i>	<i>1.7%</i>

Sources: NEEA market analyses (2024 data), HPWH shipment counts from manufacturers in the Northwest (2024), U.S. Census: 2022-2025 Building Permits Survey, NEEA 2018 Water Heater Market Characterization Report, and 2022 NEEA Residential Building Stock Assessment (RBSA)

Blending the estimates of HPWH purchasers and installers together yielded an estimate that 20% of HPWH installations replaced old units that had completely failed – a true “emergency replacement” scenario. Another 40% said that the water heaters they replaced were old, in need of repair, or close to failure. This customer segment falls into the planned replacement category, but these customers may be more akin to true emergency replacement customers than those who replaced systems in good repair (also 40%).

Table 6 provides the MPER #8 estimates which rely on installer survey and purchaser survey responses, in comparison to the MPER #7 values that relied only on installer survey responses. Readers should note the methodological differences when considering the difference between results.

Table 6: HPWH Installations in Existing Homes in the NW – Condition of Old Water Heater

Install Type	2021 (MPER 7)		2024 (MPER 8)	
Total	22,598		29,416	
Installations in existing homes	10,847		13,279	
<i>Previous water heater fully functioning (Planned replacements)</i>	3,363	31%	5,312	40%
<i>Previous water heater near failure (Planned replacements)</i>	2,712	25%	5,285	40%
<i>Previous water heater failed completely (Emergency replacements)</i>	4,773	44%	2,696	20%

Sources: NEEA market analyses (2024 data), HPWH shipment counts from manufacturers in the Northwest (2024), MPER #8 purchaser survey, and MPER #8 installer survey.

UTILITY INCENTIVES

While the number of HPWH installations has grown over the past several years, the share of units receiving utility incentives appears inconsistent. In 2024, 40% of HPWH installations appear to have received incentives (Table 7). The total number that got incentives is up from 2020, but as a share of HPWH units, this is lower than the 49% seen in 2020 and 61% in 2021.

Compared to 2020 results, the growth in the HPWH market in 2021 appears primarily to have occurred among installations in existing homes that received incentives from utilities. Installation volumes among this group went from less than 9,000 to nearly 14,000. Some of this could potentially be a post-COVID installation bump. The 2024 estimates look quite different – here the significant growth compared to 2021 is entirely among installations that did not receive incentives: nearly 18,000, essentially twice as many as in 2021.

Table 7: HPWH Installations by Utility Incentive Status in the NW

Install Type	2020 (MPER 6)		2021 (MPER 7)		2024 (MPER 8)	
Total	17,442		22,598		29,416	
Non-incentivized units	8,811	51%	8,758	39%	17,778	60%
Incentivized units	8,631	49%	13,840	61%	11,638	40%
		<i>% of incentives</i>		<i>% of incentives</i>		<i>% of incentives</i>
<i>Existing homes</i>	3,723	43%	8,719	63%	6,954	60%
<i>New homes</i>	4,908	57%	5,121	37%	4,684	40%

Sources: HPWH shipment estimates from NEEA and Utility-provided HPWH incentive counts

As noted above, the number of unincentivized HPWH installations grew substantially in 2024, with corresponding decreases in incentive utilization among installs in both new and existing homes. [Table 8](#) shows that about half of HPWHs installed in retrofit applications received an incentive in 2024 (52%), which is lower than in 2021 (80%) and 2020 (62%). In 2024 the percentage of incentivized HPWHs is also lower (29%) compared to 2021 (43%) and 2020 (44%).

Table 8: Utility Incentives in New vs. Existing Homes in the NW

Install Type	2020 (MPER 6)	2021 (MPER 7)	2024 (MPER 8)
Total	17,442	22,598	29,416
Installations in new homes	11,413	11,751	16,137
<i>Incentivized units</i>	4,980	5,077	4,684
<i>% incentivized</i>	44%	43%	29%
Installs in existing homes	6,029	10,847	13,279
<i>Incentivized units</i>	3,723	8,673	6,954
<i>% incentivized</i>	62%	80%	52%

Sources: HPWH shipment estimates from NEEA and Utility-provided HPWH incentive counts

SUPPLY CHANNEL

[Table 9](#) shows estimates of HPWH installations by supply channel. The portion of residential HPWHs moving through wholesale distributors is estimated at about 82% of manufacturer sales in MPER #8, while the portion moving through retailers is estimated at 18% (MPI 2).

Table 9: HPWH Installations by Supply Channel – Retail vs. Distributor by State⁴³

State	MPER 8 (2022)		MPER 8 (2023)		MPER 8 (2024)	
	Retail	Distributor	Retail	Distributor	Retail	Distributor
Region Total	19%	81%	19%	81%	18%	82%
Washington	20%	80%	17%	83%	16%	84%
Oregon	15%	85%	22%	78%	25%	75%
Montana	61%	39%	64%	36%	45%	55%
Idaho	46%	54%	46%	54%	34%	66%

Source: NEEA market analyses (2022-2024)

⁴³ Given the data limitations, readers should remember that these reported supply channel differences include substantial uncertainty, particularly for Montana and Idaho.

TANK SIZE

Across the four states, MPER #8 estimates indicate that over half (59%) of the HPWHs installed were 55 gallons or less, while 41% were larger than 55 gallons (Table 10). Given data limitations, the tank size breakdown by state was not available for 2021 or 2024.

Table 10: HPWH Installations by Tank Size

State	MPER 7 (2021)			MPER 8 (2024)		
	HPWH Installations	≤ 55 Gallons	> 55 Gallons	HPWH Installations	≤ 55 Gallons	> 55 Gallons
<i>Region Total</i>	<i>22,598</i>	<i>46%</i>	<i>54%</i>	<i>29,416</i>	<i>59%</i>	<i>41%</i>

Appendix B Installer Survey

As part of if this MPER, NMR surveyed HPWH installers to better understand the circumstances under which they recommend HPWHs to customers and the current barriers to adoption and installation, and to inform the market share estimates for heat pump water heaters. This appendix describes the detailed methodology and findings from that effort.

METHODOLOGY

NMR conducted a survey with 101 HPWH installers in the Northwest. Braun Research fielded the survey from July through September 2025 via web (15%) and phone (85%). The initial sample frame comprised 8,784 plumbing, heating, and air conditioning contracts (NAICS code 238220) purchased from the NAICS Association and Data Axle. Fifty-seven percent of these contacts were part of the sample frame in MPER #7. NMR identified and merged duplicates based on business name, contact name, address, email, and/or phone number.⁴⁴ NMR also removed obvious non-water heater installers (e.g., fire sprinkler installers) from the initial sample frame and added NEEA-trained installers not already on the list. Finally, NMR dropped participants in the MPER #7 installers survey and contacts who started the MPER #7 installer survey and failed to meet the screening criteria, leaving 6,581 contacts. Participants received \$75 gift cards for completing the survey. Although the team did not set hard quotas on response rates by state, the survey achieved a response rate proportional to the population of each state (Table 11).

Table 11: Overall Installer Survey Disposition

State	Eligible Sample Frame	Target by State Population	Achieved
Washington	2,998	45	52
Oregon	1,935	30	32
Idaho	978	15	23
Montana	670	10	11
Total	6,581	100	101

Notes: State-level counts do not sum to 101 because 17 respondents worked in more than one state.

⁴⁴ Duplicate contacts between the MPER #7 data and the new contacts for MPER #8 typically provided additional names, emails, and phone numbers.

The team classified installers as urban or rural based on the county of their primary business address.⁴⁵ While some installers have service territories covering multiple counties and/or multiple branches, this classification is consistent with methodology from MPER #7. Installers in rural counties are likely to serve rural communities. Most NEEA-trained installers are located in Washington and Oregon.

Table 12: Outreach Sample Composition

State	New sample added for MPER #8	Non-Response Sample from MPER #7	HWS-Trained	Total
Washington	819	514	85	1,333
Oregon	567	258	15	825
Idaho	325	108	4	433
Montana	203	86	16	289
Total	1,914	966	120	2,880

From the eligible sample frame, NMR randomly pulled an outreach sample (Table 12). BR Interviewing conducted seven waves of targeted outreach to meet survey targets, contacting all 2,880 firms at least once.⁴⁶ Contacts were randomly assigned to waves to reduce sampling bias. Later waves prioritized NEEA-trained installers to increase responses from that group. Most of the companies in the sample had multiple contacts listed, but only one response was accepted per company. Two-thirds (67%) of the contacted sample were new contacts while the other third were part of the MPER #7 sample.

One-quarter of the sample (26%) had at least one email address associated with a contact. Contacts with an email address received at least one email invitation. If the contacts who received an email invitation did not respond to the web survey, BR interviewing contacted them by phone. Installers without an email address were contacted at least once by phone. Table 13 shows the number of completes achieved.

Table 13: Survey Completes Achieved

State	Urban	Rural	Recalled HWS Training	Total*
Washington	47	5	11	52
Oregon	27	5	11	32
Idaho	18	5	2	23
Montana	5	6	5	11
Total*	81	20	24	101

Notes: State totals are shown for primary business address; Table 11 state totals reflect that some installers work in multiple states.

⁴⁵ U.S. Department of Agriculture Economic Research Service. *Rural-Urban Continuum Codes*. December 10, 2020. <https://www.ers.usda.gov/data-products/rural-urban-continuum-codes.aspx>.

⁴⁶ The first two of the seven outreach waves were soft launches.

All survey respondents were asked if they, or someone else at their company, had ever participated in a Hot Water Solutions training or orientation session about HPWHs sponsored by the Northwest Energy Efficiency Alliance. As shown in [Table 14](#), three of ten installers on the HWS training list did not recall the training, while 17 installers *not* on the HWS training list recalled attending an HWS training. To remain consistent with past MPERs, only the seven installers on the trained installer list who also recalled attending the training in the survey were counted as “trained” installers. However, it was not possible to draw conclusions from only seven trained installers so an analysis of “trained” versus “untrained” installers is omitted from this report.

Table 14: Recall of HWS Training or Orientation Session

Self-Reported Training	HWS-Trained (Sample Flag)	Not on HWS-Trained Installer List	Total
Recalled HWS Training	7	17	24
Did not recall training	3	70	73
Don't know	0	4	4
Total	10	91	101

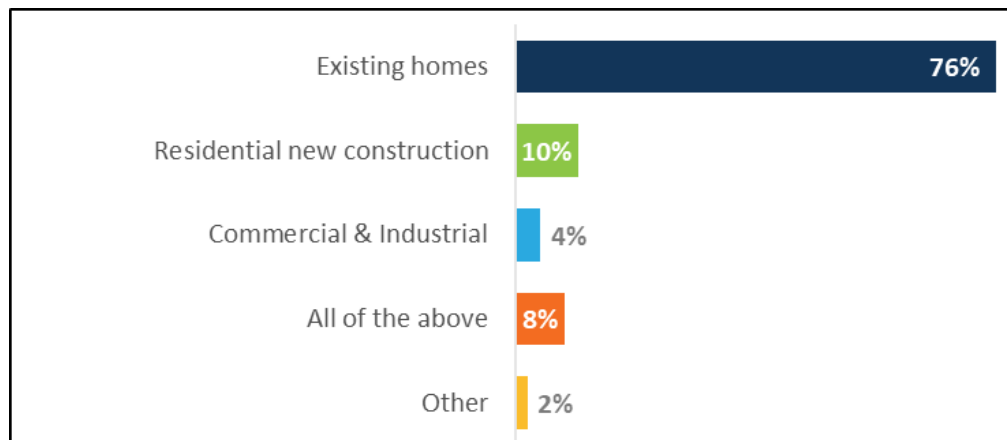
Q57. Have you, or has someone else at your company, ever participated in a Hot Water Solutions training or orientation session about heat pump water heaters sponsored by the Northwest Energy Efficiency Alliance? (Hot Water Solutions trainings have been offered in-person and via webinar, so you may have attended in person or online.)

The team reviewed qualitative research conducted by Lieberman Research, on behalf of NEEA, on HPWH installer installation practices, barriers, and callback issues (hereafter referred to as the “Callbacks research,” [Appendix I](#)). The team incorporated additional questions into the installer survey to quantify some of the themes from this qualitative, in-depth research effort.

FIRMOGRAPHICS

Figure 8 shows that most respondents (76%) said their company’s primary function was replacing or servicing equipment in existing homes. Respondents’ companies ranged in size from 1 to 551 employees, with an average of 30 employees. Eighty-five percent of respondents operated out of a single location.

Figure 8: Primary Company Customer Area (n=101)

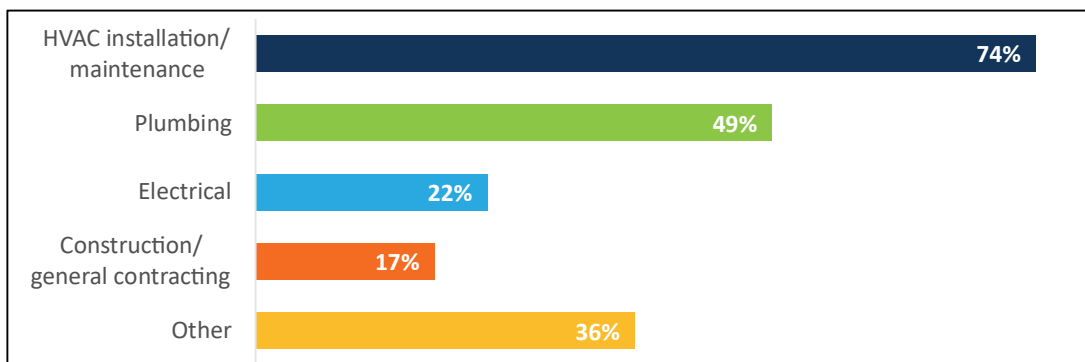


Does not sum to 100% due to rounding.

Q2. Which of the following activities represents your company’s main line of work?

Just under three-fourths (74%) and one-half (49%) of respondents’ companies offered HVAC installation/maintenance services and plumbing services, respectively, in addition to water heater installation (Figure 9). Installers (including those who do not install HPWHs) estimated that water heater sales and installation represent 15%, on average, of their company’s business revenue. In comparison, companies that install HPWHs estimated that the sale and installation of water heaters represents, on average, 17% of their company’s revenue, 7% of which comes from HPWHs.

Figure 9: Other Company Services (n=101)

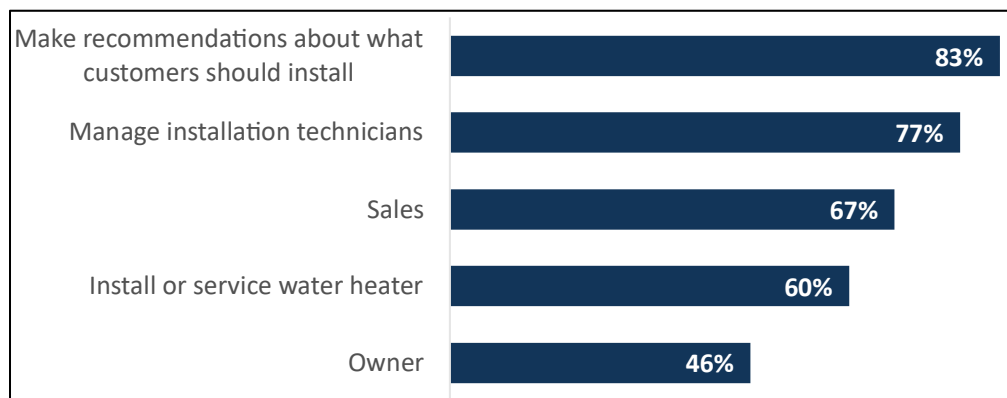


Multiple responses permitted.

Q4. Besides installing water heating equipment, what other services does your company provide? Please select all that apply.

Figure 10 shows that many respondents hold a variety of roles at their company. Respondents are most commonly responsible for making recommendations about what customers should install (83%), managing installation technicians (77%), sales (67%), and installing or servicing water heaters (60%). Nearly one-half (46%) of respondents own their company.

Figure 10: Respondents Role at Company (n=101)



Multiple responses permitted.

Q4. Please indicate your role(s) at the company. Notes: Respondents were allowed to select multiple options.

Just under one-fourth (24%) of respondents said they, or someone else at their company, had participated in a Hot Water Solutions training about heat pump water heaters.⁴⁷ NMR was able to verify training history for only 39% of respondents who reported training (7% overall). One-sixth (17%) of untrained respondents had heard of the Hot Water Solutions website.

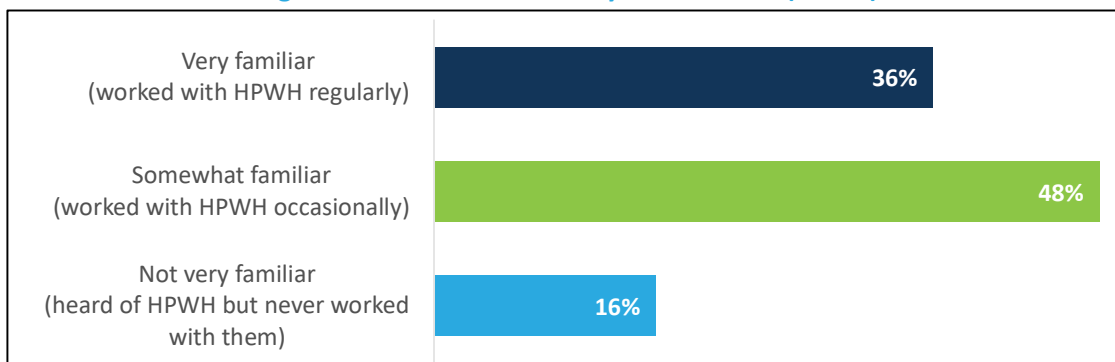
⁴⁷ MPER #5 also surveyed water heater installers and focused on the differences between trained and untrained respondents.

FAMILIARITY WITH HPWHs

Virtually all installers are aware of HPWHs. Ninety-nine percent of all respondents had heard of “heat pump water heaters” or “hybrid water heaters” (MPI 1a).

Most installers are familiar with HPWHs. Seventy percent of respondents said their companies installed HPWHs in residential homes (MPI 1c). Only 16% of installers said they were not very familiar with HPWHs (Figure 11).

Figure 11: Installer Familiarity with HPWHs (n=100)



Q12. Before this survey, which of the following best describes your level of familiarity with heat pump water heaters?

Installers who are familiar with HPWHs work for companies that install more of them, as a percentage of all electric resistance installations. Installers estimated how many electric resistance storage water heaters their company installed in the past year, and what percentage of them were HPWHs. Installers who described themselves as “very familiar” with HPWHs reported that HPWHs comprise, on average, 19% of all their company’s total electric resistance storage water heater installations (Table 15). Those who reported being “somewhat familiar” or “not very familiar” with HPWHs indicated that HPWHs represent a smaller percentage of their company’s electric resistance storage water heater installations, on average (12% and 4%, respectively).

Table 15: HPWHs as a Percentage of Electric Resistance Storage Heaters Installations

Reported Familiarity	n	Mean	Median	Min	Max
Very Familiar (Worked with HPWHs regularly)	38	19%	15%	0%	90%
Somewhat familiar (Worked with HPWHs occasionally)	48	12%	1%	0%	100%
Not very familiar (Heard of HPWHs but never worked with them)	16	4%	0%	0%	50%

Q25. Of the approximately [PIPE RESPONSE] residential electric storage water heaters your company installed in the past year, about what percent were heat pump water heaters? Your best estimate is fine. And Q12. Before this survey, which of the following best describes your level of familiarity with heat pump water heaters?

Respondents who described themselves as “very familiar” with HPWHs work at companies that installed 24 HPWHs, on average, in the past year. Respondents who described themselves as “somewhat familiar” and “not very familiar” work at companies that installed an average of five and one HPWHs in the past year (Table 16). These results suggest that respondents accurately assessed their familiarity with HPWHs relative to other installers.

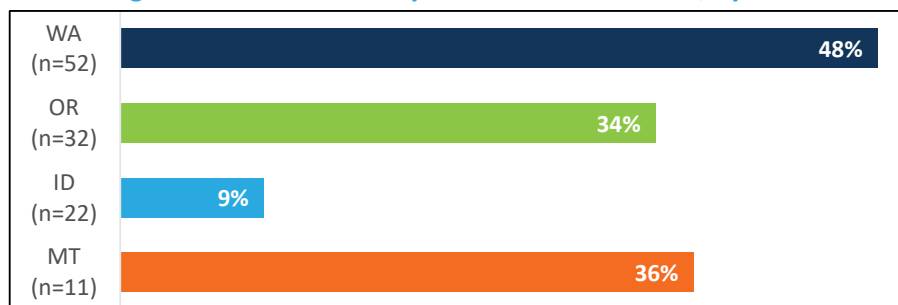
Table 16: Estimated Number of HPWH Installations in the Past Year

Reported Familiarity	n	Mean	Median	Min	Max
Very Familiar (Worked with HPWH regularly)	38	24	8	0	150
Somewhat familiar (Worked with HPWH occasionally)	48	5	1	0	60
Not very familiar (Heard of HPWHs but never worked with them)	16	1	0	0	20

Calculated from Q24. How many residential electric storage water heaters did your company install in the past year? [IF Q13 = 4 or 5 “Please include installations of heat pump water heaters in your estimate.”] Your best estimate is fine. Q25. Of the approximately [PIPE RESPONSE] residential electric storage water heaters your company installed in the past year, about what percent were heat pump water heaters? Your best estimate is fine. And Q12. Before this survey, which of the following best describes your level of familiarity with heat pump water heaters?

Figure 12 displays the percentage of respondents who described themselves as “very familiar” with HPWHs by state. Installers in Washington (48%), Montana (36%), and Oregon (34%) were more likely to say they were very familiar with HPWHs than those in Idaho (9%).

Figure 12: Installers “Very Familiar” with HPWHs, by State

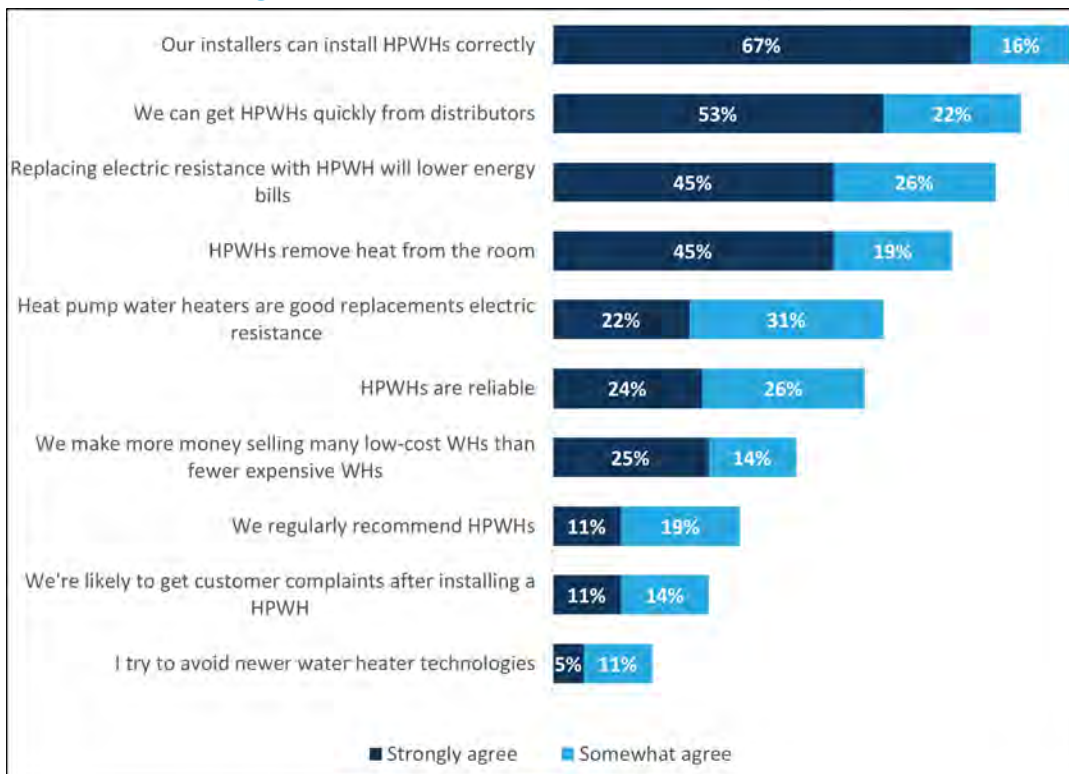


Notes: Figure shows percentage of respondents that describe themselves as “very familiar” with HPWHs.

Q12. Before this survey, which of the following best describes your level of familiarity with heat pump water heaters?

Installers are comfortable installing HPWHs but do not regularly recommend them. Figure 13 displays the percentage of respondents that agreed with various statements. The majority of respondents agreed that their company’s installers could install HPWHs correctly (83%), that they can obtain HPWHs quickly from local distributors (75%), and that replacing an electric resistance water heater with a HPWH would lower customers’ overall energy bills (71%). However, only one-half (50%) of respondents agreed that HPWHs are reliable, and fewer than one-third (30%) said their company regularly recommends them.

Figure 13: Installer Attitudes about HPWHs (n=101)



Notes: Figure shows percentage of respondents that “somewhat agree” or “strongly agree” with the statements about HPWHs.

Q16. Please assess how much you agree or disagree with the following statements.

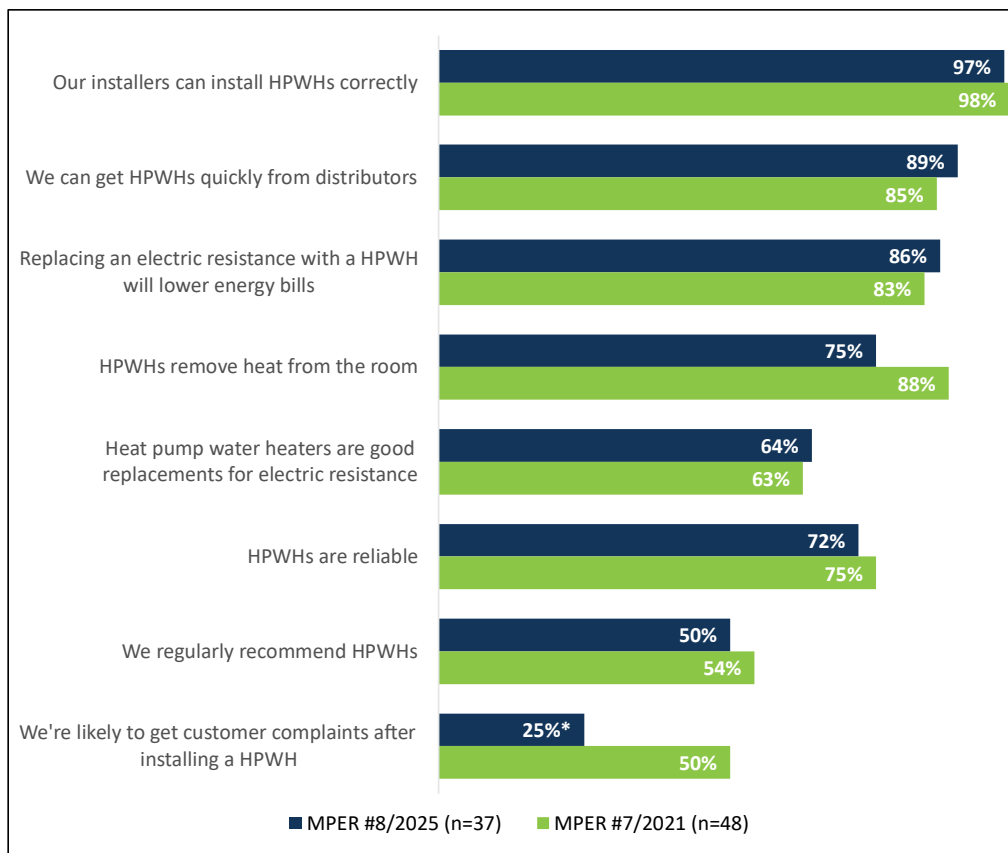
Installers who are familiar with HPWHs are more likely to positively view HPWHs. Seven in ten (73%) of installers who report they are “very familiar” with HPWHs “strongly agree” or “agree” that HPWHs are reliable compared to only four in ten (40%) installers who report they are “somewhat familiar” with HPWHs (Table 17). Installers who are “very familiar” are also more likely to agree they can get HPWHs quickly from local distributions, that their company’s technicians can easily install HPWHs correctly, and that HPWHs are a good replacement for traditional electric resistance water heaters and. “Very familiar” installers are also less likely to report that their company is likely to get customer complaints soon after installing a HPWH compared to “somewhat familiar” installers.

Table 17: Installer Attitudes about HPWHs by Installer Familiarity (n=101)

“Strongly Agree” or “Agree” with Statement	Not Very Familiar (n = 17)	Somewhat Familiar (n = 49)	Very Familiar (n = 37)
My company's installation technicians can easily install HPWH correctly.	44%	85%	97%
I can get HPWH quickly from local distributors.	44%	75%	89%
Replacing an electric resistance water heater with an HPWH will lower a customer's overall energy bill.	62%	62%	86%
HPWH remove heat from the room where they are located.	44%	62%	75%
HPWH are good replacements for traditional electric resistance water heaters.	38%	50%	64%
HPWH are reliable.	31%	40%	72%
My company makes more money when we sell a larger number of low-cost water heaters than when we sell a smaller number of high-cost water heaters.	31%	40%	39%
My company regularly recommends HPWHs to customers.	6%	23%	50%
My company is likely to get customer complaints or service requests soon after installing a HPWH.	0%	33%	25%
I try to avoid newer water heater technologies.	25%	10%	19%

Installers report similar attitudes about HPWHs by familiarity in MPER #8 compared to MPER #7. As shown in Figure 14, installers who report they are “very familiar” with HPWHs frequently “agree” or “strongly agree” with various statements about HPWHs at similar rates in MPER #7 and MPER #8. Notably, nearly all installers who are “very familiar” with HPWHs are confident in their ability to install them easily (97% in MPER #8 and 98% in MPER #7). In MPER #8, 50% of installers who regularly work with HPWHs (n=48) agreed that they are likely to get customer complaints shortly after installing a HPWH, compared with only 25% of very familiar installers in MPER #7 (n=37).

Figure 14: Agreement with HPWH Statements Among “Very Familiar” Installers (MPER #7 vs. #8)

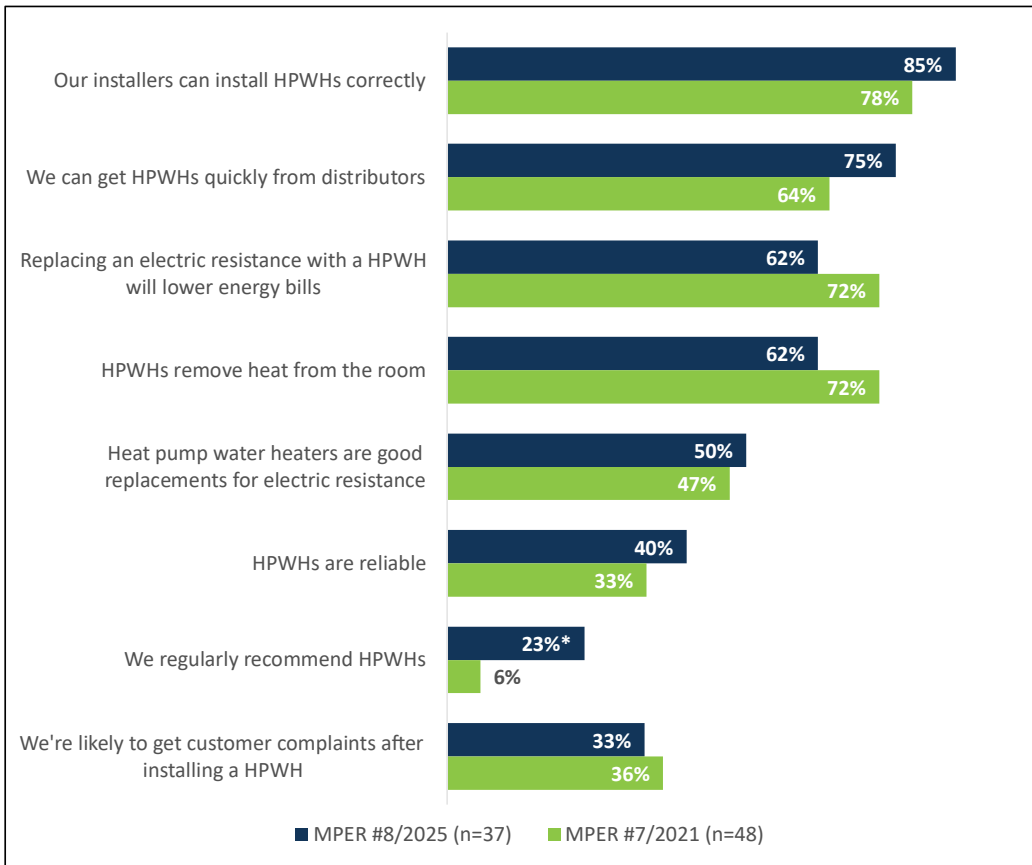


* Statistically different from MPER #7 at the 90% confidence level

Q16. Please assess how much you agree or disagree with the following statements.

MPER #8 installers who assessed themselves as “somewhat familiar” with HPWHs were more likely to recommend HPWHs to their customers than in those in MPER #7. As shown in [Figure 15](#), 23% of installers who considered themselves “somewhat familiar” with HPWHs agreed that they regularly recommend HPWHs, compared to 6% of “somewhat familiar” installers in MPER #7.

Figure 15: Agreement with Statements about HPWHs among “Somewhat Familiar” Installers

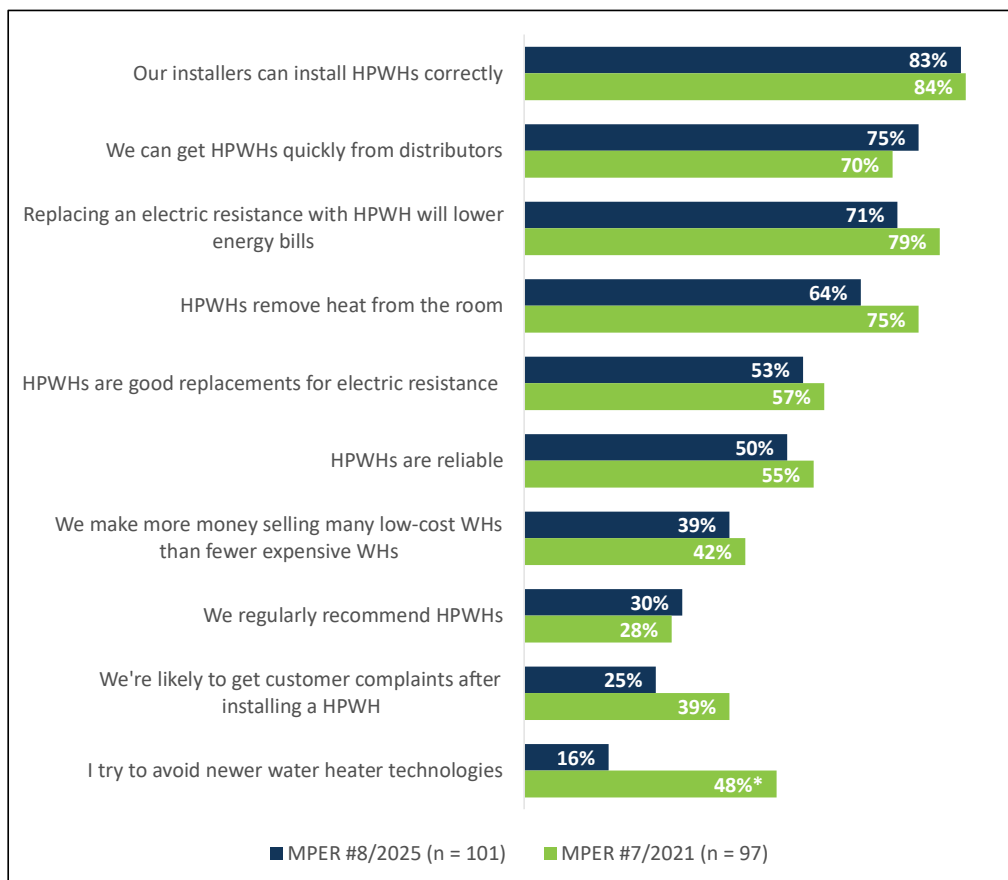


* Statistically different from MPER #7 at the 90% confidence level
 Q16. Please assess how much you agree or disagree with the following statements.

Installer knowledge and attitudes about HPWHs were generally similar to findings from MPER #7.

Figure 16 shows respondent attitudes on various HPWH aspects in MPER #7 and MPER#8. Most results were comparable, but installers in MPER #8 were less likely to expect customer complaints after installing HPWHs (25% in MPER #8 compared to 39% in MPER #7).

Figure 16: Installer Attitudes about HPWHs in MPER #7 and MPER #8



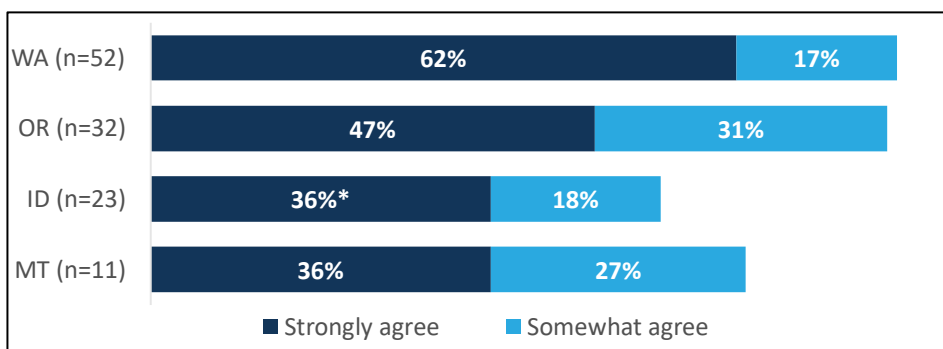
Notes: Figure shows percentage of respondents that “somewhat agree” or “strongly agree” with the statements about HPWH.

* Statistically different from MPER #7 at the 90% confidence level

Q.16. Please assess how much you agree or disagree with the following statements.

Installers in Idaho, Montana, and rural areas of the Northwest experience more limited access to HPWHs. Overall, 75% of respondents said that they can get HPWHs quickly from local distributors, an increase from 70% in MPER #7.⁴⁸ This is a key factor in whether HPWHs are suitable for emergency replacement for customers who want to minimize the time they are without hot water while they wait for a replacement water heater. Figure 17 shows that respondents in Washington (79%) and Oregon (78%) thought they were more likely have quick access to HPWHs from local distributors than those in Idaho (54%) and Montana (63%).⁴⁹ Across all states, respondents in urban areas (80%) were slightly more likely to agree that they could get HPWHs quickly from distributors than respondents in rural areas (74%); however, this difference is not statistically significant.

Figure 17: Ability to Obtain HPWHs Quickly from Distributors (n=101)



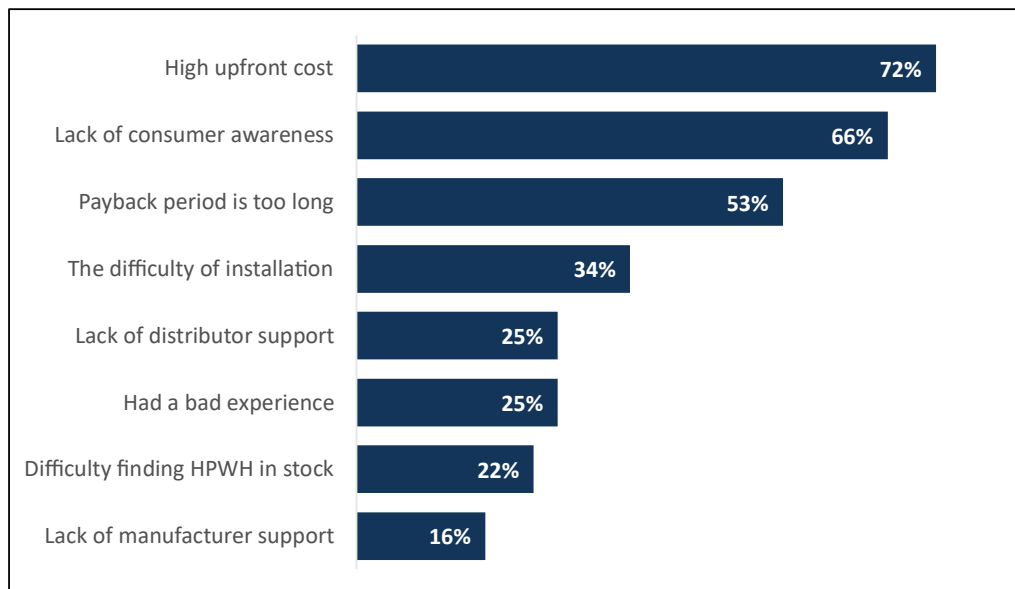
* Statistically different from Washington at the 90% confidence level
 Q16. Please assess how much you agree or disagree with the following statements: I can get heat pump water heaters quickly from local distributors.

⁴⁸ This difference is not statistically significant.

⁴⁹ The percent of installers who agreed they could get HPWHs from distributors quickly in Washington (79%) is statistically different from Idaho installers (54%) at the 90% confidence level.

Approximately one-half of installers perceive high upfront cost and lack of consumer awareness as key barriers to HPWH adoption. Just over one-half (53%) of installers agreed that HPWHs are good replacements for electric resistance water heaters. Those who disagreed cited high upfront costs (72%), lack of consumer awareness (66%), and the long payback period (53%) as primary barriers to HPWH adoption (Figure 18).

Figure 18: Reasons Why HPWHs are not Perceived to be Good Replacements for Electric Resistance (n=33)

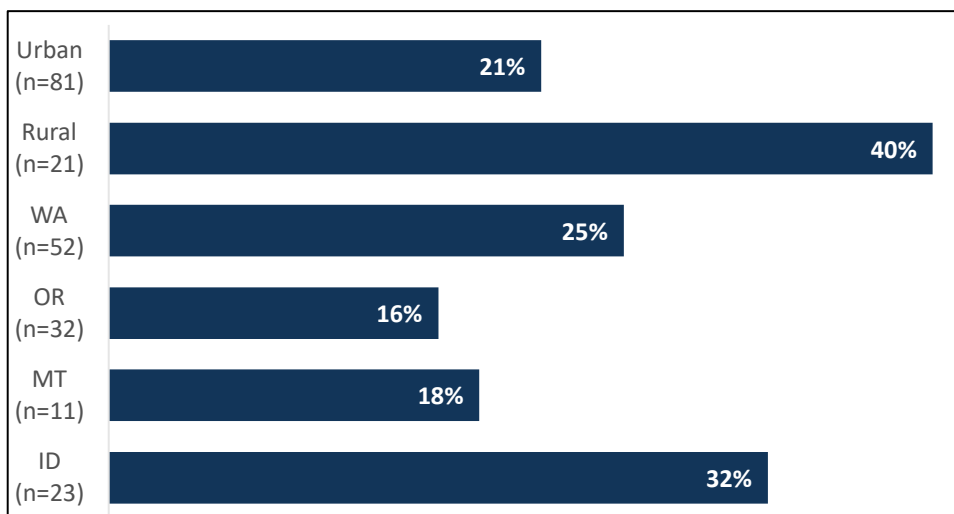


Multiple responses permitted.

Notes: Question was asked of respondents who “strongly agreed” or “somewhat agreed” with the statement that “Heat pump water heaters are not good replacements for traditional electric resistance water heaters” (Q16c). Q17. Why do you feel that heat pump water heaters are not good replacements for electric resistance water heaters? Select all that apply.

One in four installers (25%) anticipate customer complaints after installing HPWHs. One-fourth (25%) of respondents agreed that they were likely to get customer complaints or service requests after installing a HPWH.⁵⁰ Rural installers were twice as likely to say they were likely to get customer complaints than urban installers (40% versus 21%). **Figure 19** displays the percentage of respondents who agree they were likely to get customer complaints or service requests by business location.

Figure 19: Perceived Likelihood to Receive Customer Complaints or Service Requests for HPWHs



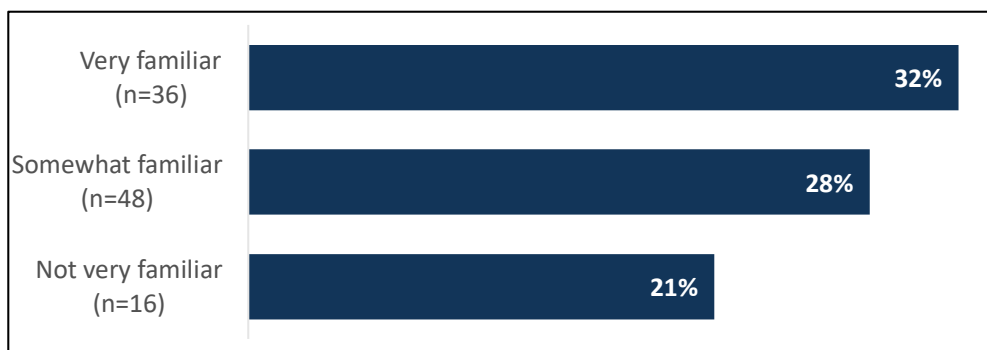
Notes: Question asked of respondents who were aware of HPWHs and “strongly agreed” or “somewhat agreed” with the statement, “My company is likely to get customer complaints or service requests soon after installing a heat pump water heater” (Q16e).

⁵⁰ This question was asked of all installers that were aware of HPWH (n=100) to assess whether installers perceived HPWHs as having a high rate of callbacks, even if the installer did not have any personal experience installing HPWH. Seven installers who were aware of HPWHs but did not have experience installing them (n=31) agreed with the statement “My company is likely to get customer service complaints or service requests soon after installing a HPWH.”

HPWH INSTALLATION

Most HPWH installations require changes to the installation area. On average, respondents estimated that fewer than one-third (29%) of homes could accommodate a HPWH without making more changes to the installation area than are typical for a storage water heater (n=101). This result is consistent with MPER # 7, where installers estimated, on average, they could install a HPWH in 29% of homes they visit without making more changes.⁵¹ Installers with higher levels of awareness of HPWHs estimated that more homes could accommodate HPWHs without making changes (Figure 20).

Figure 20: Percentage of Homes that Could Easily Accommodate a HPWH, by Installer Familiarity



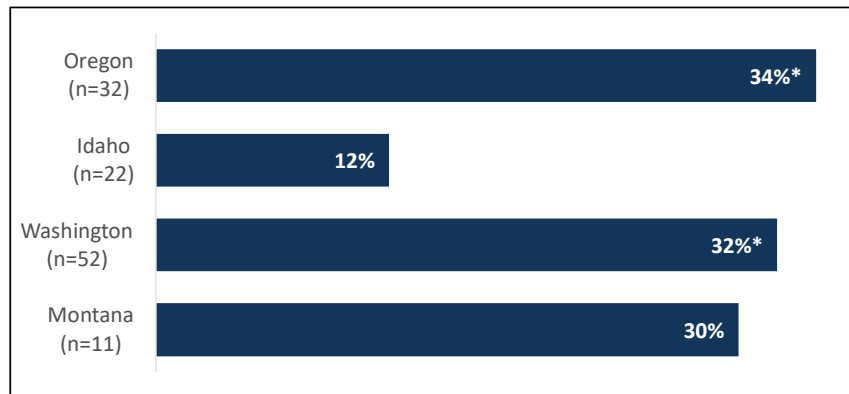
Q34. In what percent of the homes that you visit could you install a heat pump water heater without making more changes to the installation area than is typical for a standard storage water heater? Think only of existing homes, not newly built homes.

Q12. Before this survey, which of the following best describes your level of familiarity with heat pump water heaters?

⁵¹ As reported in MPER #7, installers in the Challenging Installation study (Cadeo Group. “Heat Pump Water Heater Market Research: Challenging Installation Scenarios.” Prepared for NEEA, April 20, 2023. <https://neea.org/resources/heat-pump-water-heater-market-research-challenging-installations-scenarios>.) estimated that a HPWH would not fit in 38% of existing homes, corroborating the results of this survey.

Installers in Idaho are less likely to encounter homes that would easily accommodate a HPWH. On average, installers in Idaho reported fewer than one in ten (12%) homes could accommodate a HPWH without making changes (Figure 21).

Figure 21: Percentage of Homes that Could Easily Accommodate a HPWH



*Significantly different from Idaho at the 90% confidence level.

Q34. In what percent of the homes that you visit could you install a heat pump water heater without making more changes to the installation area than is typical for a standard storage water heater? Think only of existing homes, not newly built homes. Your best guess is fine.

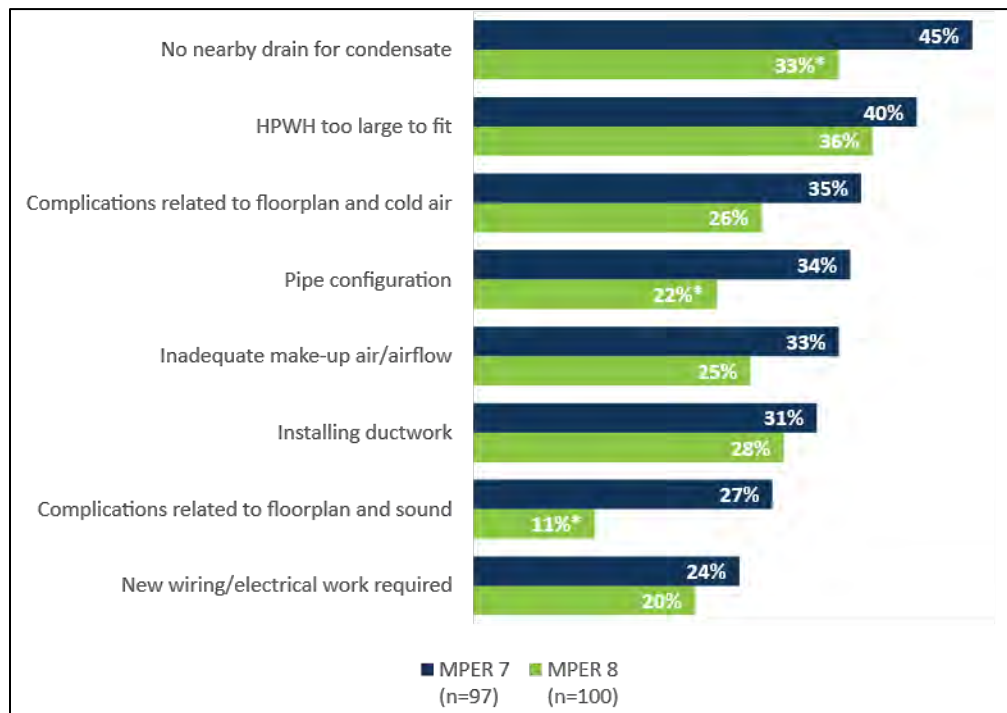
HPWHs require at least one to three additional hours of installation time, especially if ductwork is required. Respondents estimated the average time to install an electric resistance water heater in a typical home was 3.2 person hours. On-demand or tankless water heaters are more time-intensive to install; respondents estimated 6.6 person hours. In comparison, respondents estimated 4.6 person hours for a HPWH with no ducting or 6.9 person hours for a ducted HPWH. These results are consistent with findings from the Liberman research that retrofit requirements can add up to four hours to a HPWH installation. MPER #8 asked specifically for person-hours rather than just flat hours to account for multiple installers. As expected, the average person-hours are more than the average flat hours measured by previous MPERs and the Callbacks research. These results also line up with findings from the Challenging Installations Scenarios study,⁵² where installers estimated that HPWH require 1.6 to 2.0 more hours to install than a “typical” water heater, while ducting requires 3.2 hours more labor, on average.

⁵² Cadeo Group. “Heat Pump Water Heater Market Research: Challenging Installation Scenarios.” April 20, 2023. <https://neea.org/resources/heat-pump-water-heater-market-research-challenging-installations-scenarios>.

The most common installation challenge is space challenges followed by no nearby drain for condensate. Figure 22 displays the percentage of respondents that frequently encountered various installation challenges. Two-thirds (66%) of respondents said they frequently encounter at least one challenge to installing heat pump water heaters. Over one-third (36%) of respondents said they frequently found the HPWH too large to fit in the old water heater’s place. One-third (33%) of respondents said there was frequently no nearby drain for condensate.

Around one-quarter of respondents said they frequently encountered challenges involving complications related to installing ductwork (28%), the floorplan and cold air (26%), or inadequate make-up air or airflow (25%). The percentage of respondents reporting they frequently encountered each installation challenge declined from MPER #7.

Figure 22: Installers “Always” or “Very Frequently” Encounter HPWH Installation Challenges



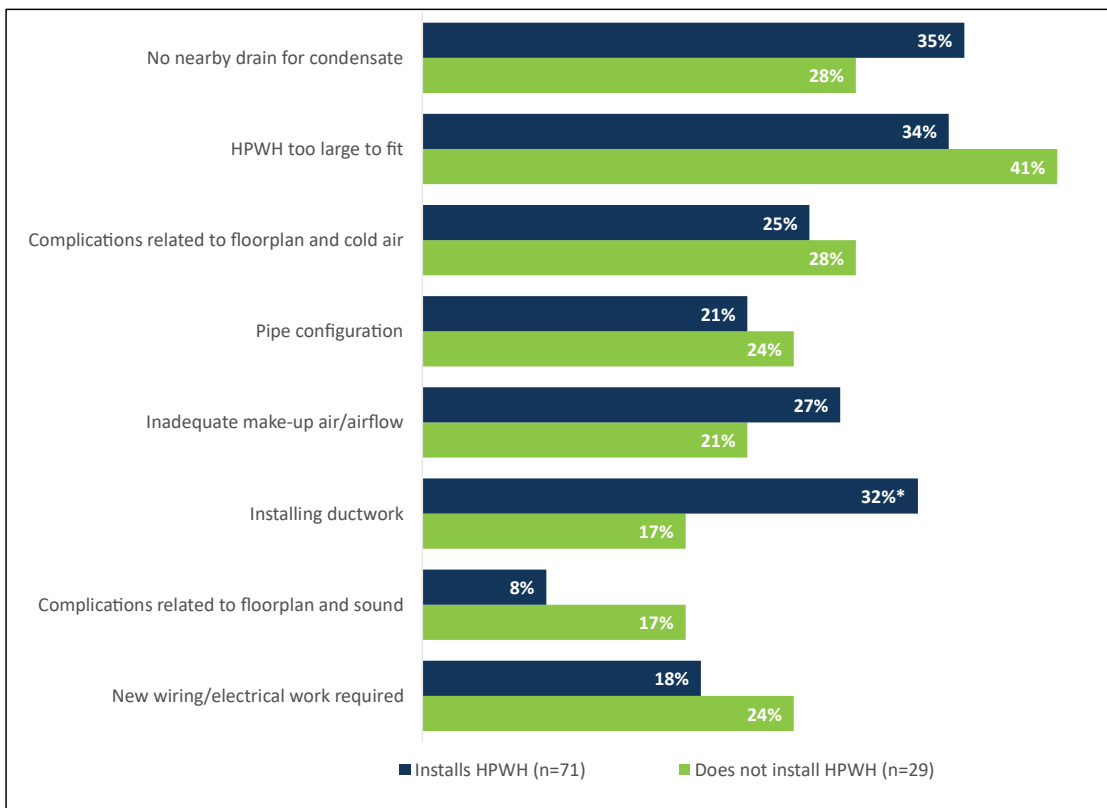
*Significantly different from MPER #7

Notes: Question was asked of respondents who were aware of HPWHs (Q11).

Q19. How frequently do installation technicians face challenges with the following aspects of a heat pump water heater installation?

Installers whose companies install HPWHs believe that installation technicians encounter installation issues at a similar frequency to those whose companies do not install HPWHs. The survey asked all installers aware of HPWHs about the rate of frequency “installation technicians” (not necessarily themselves) encounter these issues to measure prevailing perceptions about the difficulty of installing HPWHs. With the exception of installing ductwork, which 32% installers at companies that install HPWHs indicate are “always” or “very frequently” a challenge (compared to 17% of installers at companies that do not install HPWHs), the frequency of challenges encountered by installation technicians are similar across all other installation challenges (Figure 23).

Figure 23: “Always” or “Very Frequently” Encounter HPWH Installation Challenges by Installation Experience



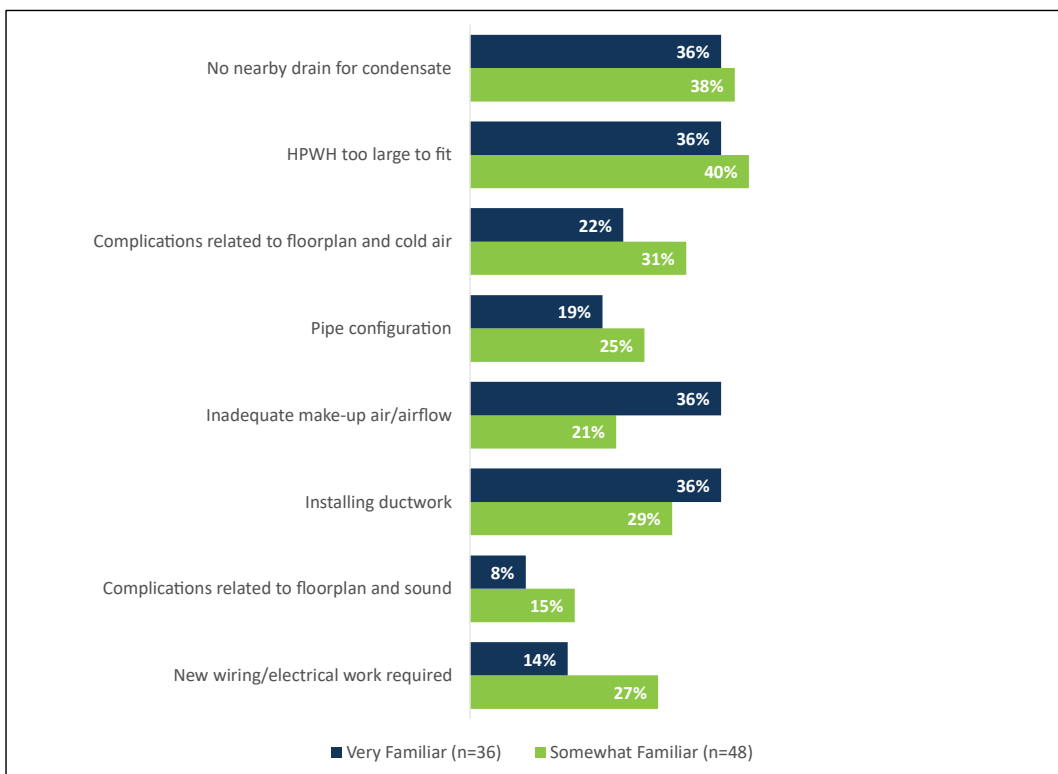
Notes: Question was asked of respondents who were aware of HPWHs (Q11).

*Significantly different from installers that do not install HPWHs at the 90% confidence level.

Q19. How frequently do installation technicians face challenges with the following aspects of a heat pump water heater installation? And Q13. What types of water heaters does your company install in residential homes? Heat pump water heaters?

Frequency of installation challenges does not vary between installers who consider themselves “very familiar” or “somewhat familiar” with HPWHs. Installers reported encountering installation issues at a statistically similar rate across familiarity levels (Figure 24).

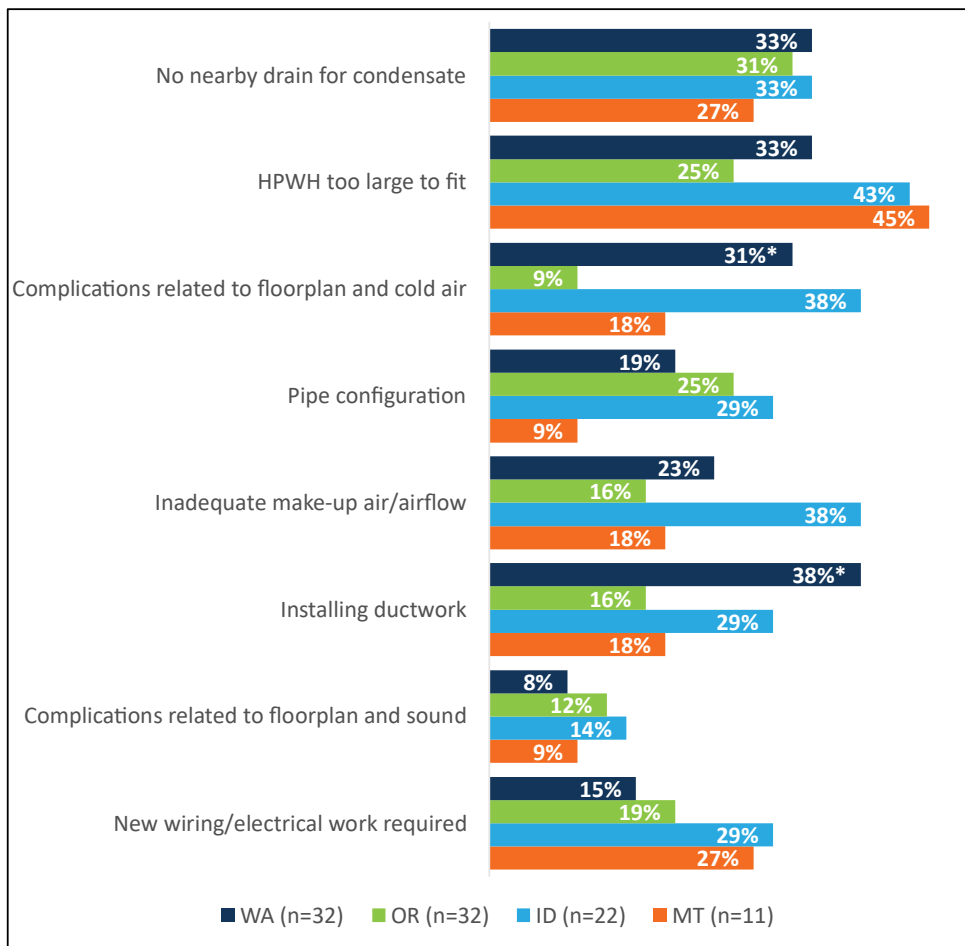
Figure 24: Always” or “Very Frequently” Encounter HPWH Installation Challenges, by Familiarity



Notes: Question was asked of respondents who were aware of HPWHs (Q11).
 Q19. How frequently do installation technicians face challenges with the following aspects of a heat pump water heater installation?

Installers in different states reported encountering installation issues at a similar rate. Overall, differences in installation challenges reported by installers working in different states were statistically similar, with the exception of *installing ductwork* and *complications related to the floorplan and cold air*, for which more installers in Washington than in Oregon said they encountered it “always” or “very frequently” (Figure 25). Installers in rural areas were also more likely to report they “always” or “very frequently” encountered each of the various challenges compared to urban installers (Figure 26).

Figure 25: “Always” or “Very Frequently” Encounter HPWH Installation Challenges by State

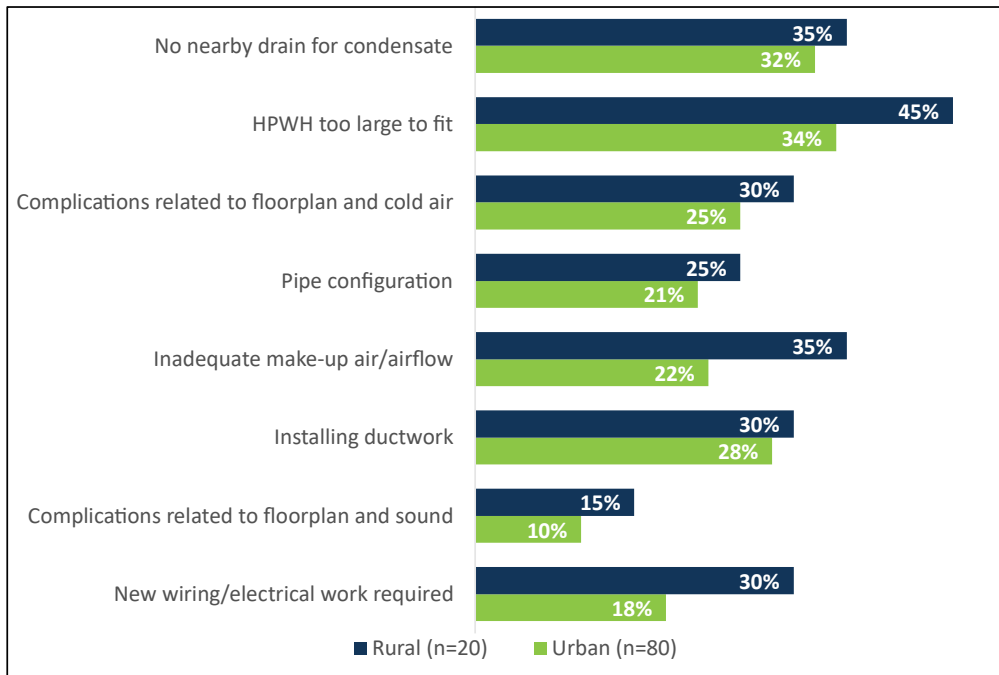


Notes: Question was asked of respondents who were aware of HPWHs (Q11).

*Statistically different from Oregon at the 90% confidence level.

Q19. How frequently do installation technicians face challenges with the following aspects of a heat pump water heater installation?

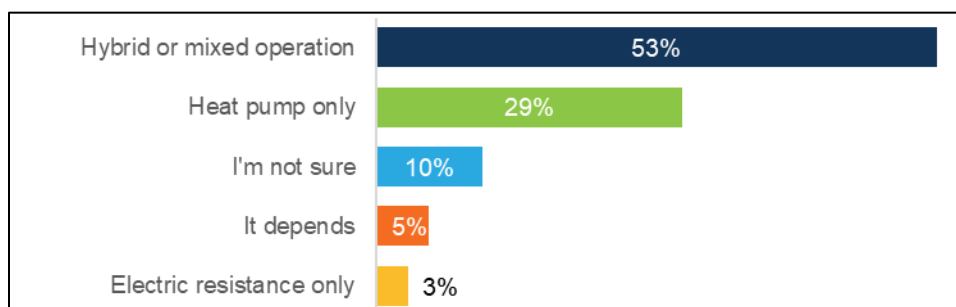
Figure 26: “Always” or “Very Frequently” Encounter HPWH Installation Challenges by Area



Notes: Question was asked of respondents who were aware of HPWHs (Q11).
 Q19. How frequently do installation technicians face challenges with the following aspects of a heat pump water heater installation?

Installers generally recommend hybrid or mixed operation mode. Around one-half of respondents (53%) recommended hybrid or mixed operation when installing a HPWH in a customer’s home—which is likely the setting generally recommended by manufacturers to balance energy savings with ensuring customers do not run out of hot water (Figure 27). Under one-third (29%) recommended heat pump-only mode. Five percent of respondents said what they recommended depended on factors such as the customers’ needs or ambient temperatures. The primary reason for recommending hybrid or mixed operation (n = 53) was the local climate (25%) followed by the balancing of hot water supply and efficiency (19%) and customer preference (19%).

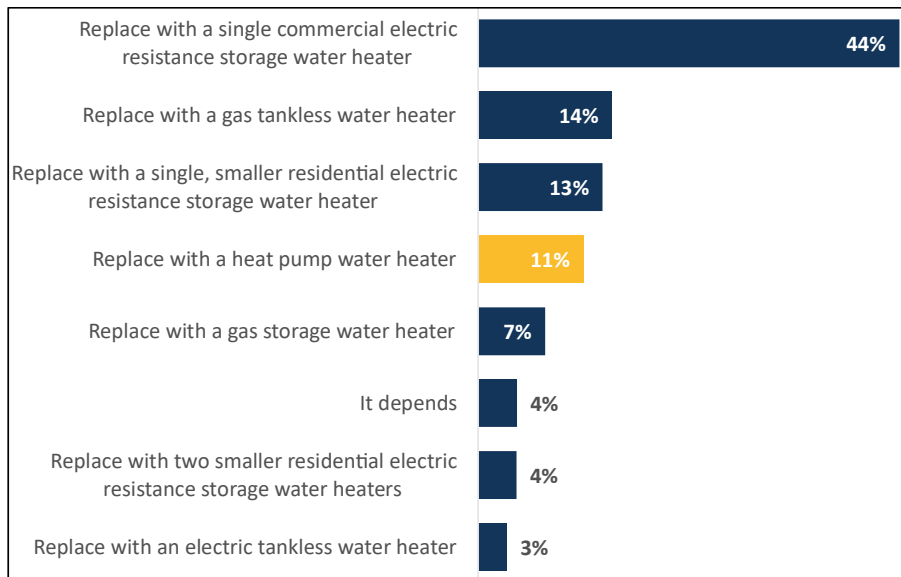
Figure 27: Recommended HPWH Mode (n=100)



Notes: Question was asked of respondents who were aware of HPWHs (Q11).
 Q22. When installing a heat pump water heater in a customer’s home, what mode would you usually recommend to the customer?

HPWHs are the typical replacement option for fewer than one-eighths (11%) of installers for large-capacity electric resistance storage water heaters. Figure 28 shows respondents' typical replacement strategies for replacing a large capacity (>55 gallons) electric resistance storage water heater for a residential customer. The most common strategy, cited by two-fifths (44%) of respondents, is to install a single commercial electric resistance storage water heater. Installing a gas tankless water heater was the second most common replacement strategy, cited by fewer than one-fifth (14%) of respondents.

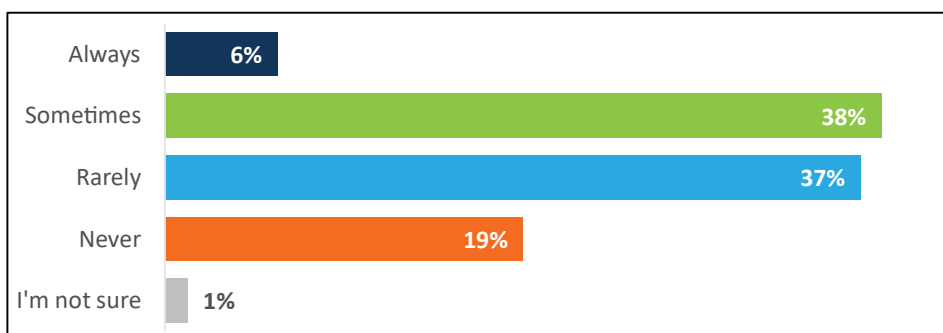
Figure 28: Large Capacity Water Heater Replacement Strategy (n=101)



Q30. When you replace a large capacity (≥ 55 gallons) electric resistance storage water heater for a residential customer, what is your typical replacement strategy?

Nearly one in ten respondents (8%) install mixing valves on smaller electric resistance storage water heaters to avoid installing a HPWH. Figure 29 displays how often respondents reported installing mixing valves to increase the amount of hot water produced by smaller (<55 gallons) electric resistance storage water heaters. Over two-fifths (44%) said they installed mixing valves on smaller electric resistance tanks sometimes or always. Almost two in ten (19%) of these respondents said they did it to avoid installing a HPWH – the technology essentially required for all large, residential electric water heaters given the 2015 NAECA updates that increased the efficiency requirements for those systems.

Figure 29: Install Mixing Valves to Increase Production (n=101)



Notes: This question was asked only to respondents who reported installing electric resistance storage water heaters (Q13).

Q31. When installing smaller electric resistance storage tank water heaters (<55 gallons), how often do you install mixing valves in order to increase the amount of hot water produced by the smaller tank?

“DIY” INSTALLATIONS

Installers report there are additional issues with do-it-yourself (“DIY”) installed HPWH. One-half (50%) of installers report servicing heat pump water heaters they did not install and half of that group (25% of installers overall) report servicing purchaser-installed heat pump water heaters. On average, installers report an average of 10% of HPWHs they service but did not install are self-installed. Four-fifths (84%) of installers who reported servicing self-installed HPWH reported seeing issues that they do not see when a professional is responsible for the installation.

HPWH SERVICING AND CALLBACKS

Seven-in-ten installers report servicing HPWHs in the past year. Seventy-one respondents report servicing at least one HPWH in the past year and respondents serviced, on average, 29 HPWHs in the past year (Table 18). Two respondents were from large, multi-location companies and reported servicing 500 HPWHs in the past year. Excluding these outliers, installers serviced 15 HPWHs in the past year, on average (Table 19).

Table 18: HPWHs Serviced in the Past Year (Outliers Included)

State	Number of Installers	Mean	Median	Min	Max
Washington	39	39.7	56	1	500
Oregon	23	31.0	6	1	500
Idaho	13	63.8	2	1	500
Montana	9	29.8	2	1	250
Total	71	28.9	4	1	500

Notes: This question was asked only of respondents who reported being aware of HPWHs (Q11). Q43. In the past two years, how many times have you serviced or repaired a heat pump water heater? Your best estimate is fine.

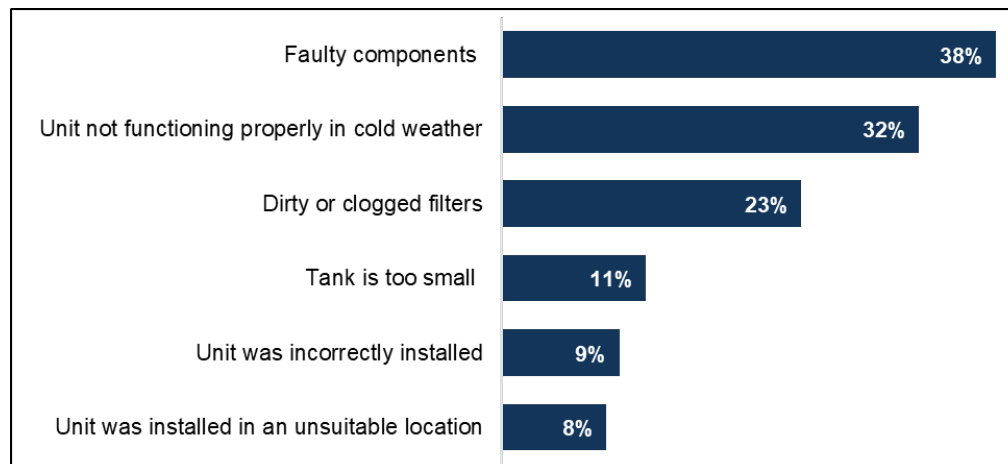
Table 19: HPWHs Serviced in the Past Year (Outliers Excluded)

State	Number of Installers	Mean	Median	Min	Max
Washington	37	14.8	5	1	200
Oregon	22	9.7	5.5	1	30
Idaho	12	27.5	2	1	200
Montana	9	29.9	2	1	250
Total	69	15.3	4	1	250

Notes: This question was asked only of respondents who reported being aware of HPWHs (Q11). Q43. In the past two years, how many times have you serviced or repaired a heat pump water heater? Your best estimate is fine.

Faulty components are the most common HPWH servicing issue. Figure 30 displays the average percentage of service calls installers report encountering various issues. Respondents estimated encountering faulty components in almost two-fifths (38%) of service calls on average. Respondents also estimated that in nearly one-quarter of service calls they encountered dirty or clogged filters

Figure 30: Weighted Frequency of Servicing Issues (n=71)



Notes: This question was asked only to respondents who report servicing HPWH (Q43). Responses are weighted by the number of service calls.

Q44. In the approximately [PIPE IN Q43 VALUE (number of times respondent has serviced or repaired a heat pump water heater in the past two years)] heat pump water heater service calls you have received in the past two years, how often did you encounter the following issues? Your best estimate is fine. If never, enter 0%.

Table 20: Frequency of Servicing Issues

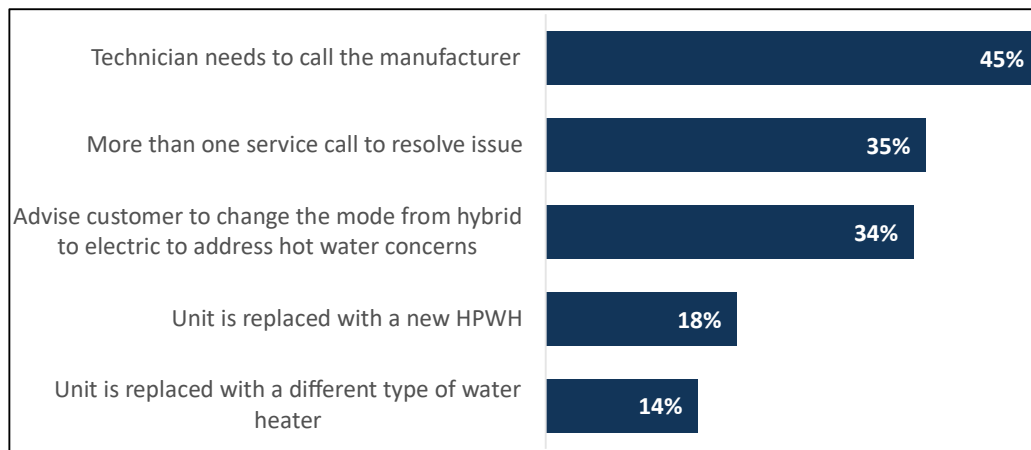
Service Issue	Average of Responses (Unweighted)	Weighted by Number of HPWH Service Calls	Weighted by Number of HPWH Service Calls Excluding Outliers
<i>N</i>	71	71	69
Faulty components (e.g. control board, compressor)	38%	23%	38%
Dirty or clogged filter	23%	15%	23%
Unit not functioning properly in cold weather	23%	25%	32%
Unit was incorrectly installed	11%	10%	9%
Unit was installed in an unsuitable location	10%	8%	8%
Tank is too small (not enough hot water)	8%	28%	11%
Average number of service and repair calls	28.9	28.9	15.3

Notes: This question was asked only to respondents who report servicing HPWH (Q43). Two outliers who said they serviced 500 HPWHs each were excluded. Weighted responses weighted by the number of HPWH service calls.

Q44. In the approximately [PIPE IN Q43 VALUE (number of times respondent has serviced or repaired a heat pump water heater in the past two years)] heat pump water heater service calls you have received in the past two years, how often did you encounter the following issues? Your best estimate is fine. If never, enter 0%.

Installers report needing to call the manufacturer or multiple service calls to resolve almost one-half of HPWH service calls. Installers who service HPWHs report in nearly one-half (45%) of all service calls the technician needs to call the manufacturer. Other frequent issues include needing more than one service call to resolve issues (35%) and advising the customer to change the mode to address hot water concerns (34%). [Figure 31](#) displays the average reported frequency of various events during service calls.

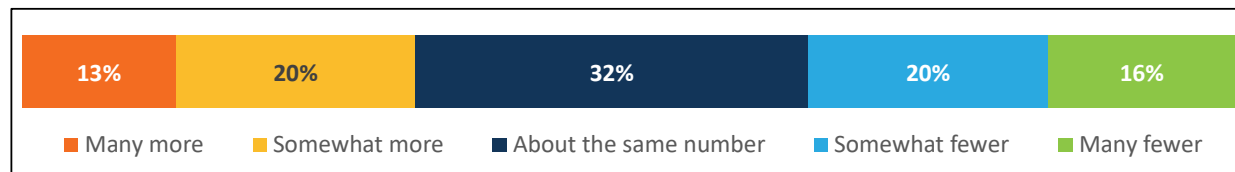
Figure 31: Frequency of Events During Servicing Calls (n=71)



Notes: This question was asked only to respondents who report servicing HPWH (Q43). Q46. In what percentage of heat pump water heater service calls does the following happen...

Installers have mixed opinions on whether HPWHs require more service requests than other water heaters. Overall, 33% of installers say HPWHs have more issues compared to other types of water heaters, similar to the 36% who say HPWHs have fewer issues than other water heaters ([Figure 32](#)). Two in five installers who serviced a HPWH in the last year and who consider themselves “very familiar” with HPWHs (n = 36) said they experience more issues with HPWHs than other water heaters, compared to 26% of installers who consider themselves “somewhat familiar” (n = 34). This trend might reflect that these installers work with HPWHs more often.

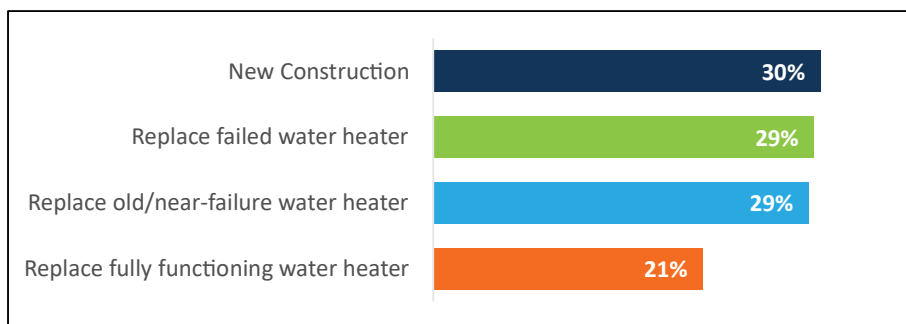
Figure 32: Relative Number of Servicing Issues (n=71)



HPWH RECOMMENDATIONS

HPWHs are more likely to be recommended in new construction. Figure 33 displays the average percentage of time respondents would recommend HPWH in various scenarios. Respondents were most likely to recommend HPWHs for new construction at an average of 30% of the time. Respondents who indicated their company’s primary function included installing equipment for residential new construction (n = 20) indicated they recommend HPWHs for residential new construction 54% of the time, on average. On average, respondents would recommend a HPWH replace a failed water heater 29% of the time (MPI 1d) and a near-failure water heater 29% of the time.⁵³ Respondents indicated customers to whom a HPWH had been recommended in a near-failure or complete-failure scenario installed one around one-third of the time (32% and 33%, respectively.) This is comparable to findings from MPER #7, where installers estimated that customers accept their recommendation to install a HPWH to replace a failed water heater 33% of the time and a near-failure water heater 28% of the time.

Figure 33: Percentage of Time Installers Recommend HPWH by Scenario (n=101)



Notes: This question was asked only to respondents who reported installing at least one HPWH in 2022 (Q25). Q34. Thinking about all the heat pump water heaters your company installed in the past year, about what percent of units were to customers who were [installation scenarios].

⁵³ Figure 32 displays average recommendation rates. Median recommendation rates were as follows: install in a new construction scenario, 0%; to replace a failed water heater, 15%; to replace an old/near failure water heater, 13%; and to replace a fully functioning water heater, 5%.

Customers agree to install HPWHs about one-third of the time. Installers report that when they recommend a HPWH to customers, they agree to install one at similar rates across all scenarios. Installers report, on average, one-third of installers agree to install a HPWH to replace a fully functioning water heater (31%), an old/near-failure water heater (32%), or a failed water heater (33%).

Average HPWH recommendation rates did not vary much by state (Table 21), particularly when looking at median recommendation rates (Table 22). Installers in Idaho were less likely to recommend HPWHs than installers in other states. Recommendation rates were also similar for new construction versus replacing a failed or near-failure water heater and lower for replacing a fully functioning water heater.

Table 21: Percentage of Time Installers Recommend HPWH in Each Scenario (Mean)

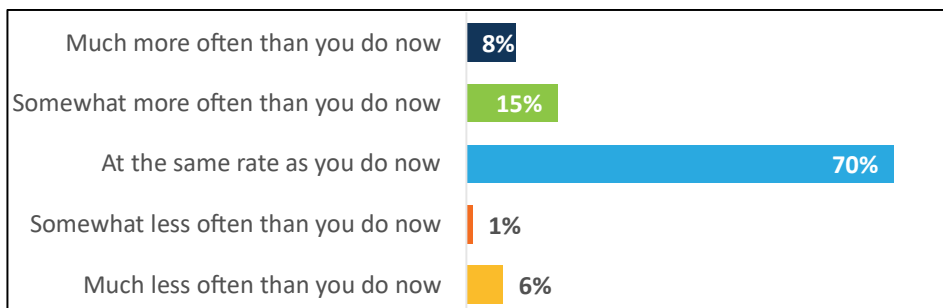
State	New construction	Replace failed water heater	Replace near-failure water heater	Replace fully functioning water heater
Washington (n=52)	34%	34%	32%	23%
Oregon (n=32)	21%	33%	29%	23%
Idaho (n=23)	22%	12%	14%	13%
Montana (n=11)	35%	31%	31%	18%
Total (n=101)	30%	29%	29%	21%

Table 22: Percentage of Time Installers Recommend HPWH in Each Scenario (Median)

State	New construction	Replace failed water heater	Replace near-failure water heater	Replace fully functioning water heater
Washington (n=52)	4%	20%	20%	3%
Oregon (n=32)	5%	13%	20%	0%
Idaho (n=23)	0%	4%	1%	0%
Montana (n=11)	10%	25%	25%	25%
Total (n=101)	5%	13%	15%	0%

Almost one-fifths (23%) of installers expect to recommend HPWHs to customers more often over the next two years. Around two-thirds (70%) of respondents expect to recommend HPWHs at the same rate over the next two years, while 23% expect to recommend them more often and 7% expect to recommend them less often (Figure 34). This finding is similar to MPER #7, in which 70% of respondents indicated they planned to install HPWHs “at the same rate” in the future than they did at the time of the survey.

Figure 34: Expected Frequency of Recommending HPWH in the Future (n=100)



Notes: This question was asked only of respondents who were aware of HPWHs (Q11). Q41. In the next year or two, how often do you expect you will you recommend heat pump water heaters to your customers?

Reasons installers gave for expecting to recommend HPWHs in the future at the same rate include the fact that recommendations are fit dependent (20%), customer demand conditions (20%), and the high cost (14%). Installers who expect to recommend HPWHs “somewhat” or “much less often” cited reasons including the local climate (mentioned by installers in Washington, Idaho, and Montana) and customer demand. Reasons respondents gave for expecting to recommend HPWHs “somewhat” or “much more often” include increasing installer and customer awareness, the energy efficiency benefits, and improved ease of servicing. Table 23 shows that installers who expect to recommend HPWHs “somewhat” or “much more often” in the future already are relatively more likely to recommend HPWHs in various scenarios.

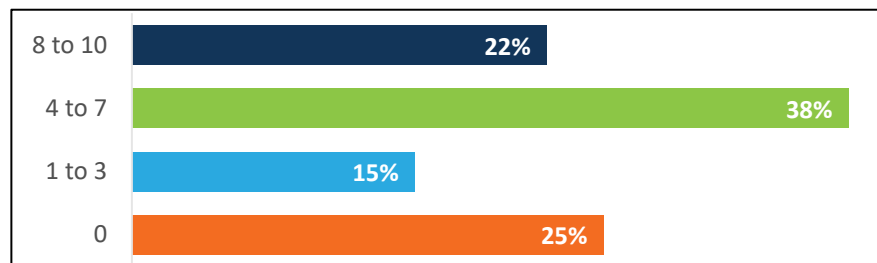
Table 23: HPWH Recommendation Rate by Expected Frequency of Recommending HPWHs in the Future (n=100)

Expected Frequency of Recommending HPWHs	Fully functioning water heater	Old/near-failure water heater	Failed water heater	New construction
Much more often than you do now (n=8)	52%	61%	51%	31%
Somewhat more often than you do now (n=15)	20%	32%	42%	40%
At the same rate as you do now (n=70)	19%	27%	26%	30%
Somewhat less often than you do now (n=1)	10%	10%	10%	30%
Much less often than you do now (n=6)	1%	2%	3%	2%

Q41. In the next year or two, how often do you expect you will you recommend heat pump water heaters to your customers? And Q35. In each of the following scenarios, what percent of the time would you recommend heat pump water heaters to a customer?

Installers are unlikely to recommend HPWHs to friends and colleagues. Respondents were asked how likely they were to recommend a HPWH to a friend or colleague, using a score of 0 to 10, where 0 meant “not at all likely” and 10 meant “extremely likely.” As shown in [Figure 35](#), one-quarter (25%) of respondents indicated they were not at all likely to recommend a HPWH to a friend or colleague by providing a score of 0. An additional 15% of respondents indicated they were unlikely to recommend HPWHs by providing a score from 1 to 3. Fewer than one-quarter (22%) of respondents indicated they were likely to recommend a HPWH to a friend or colleague by providing a score from 8 to 10. As shown in [Table 24](#) below, respondents who indicated they were likely to recommend HPWHs to a friend or colleague also were more likely to recommend HPWHs to customers in various scenarios.

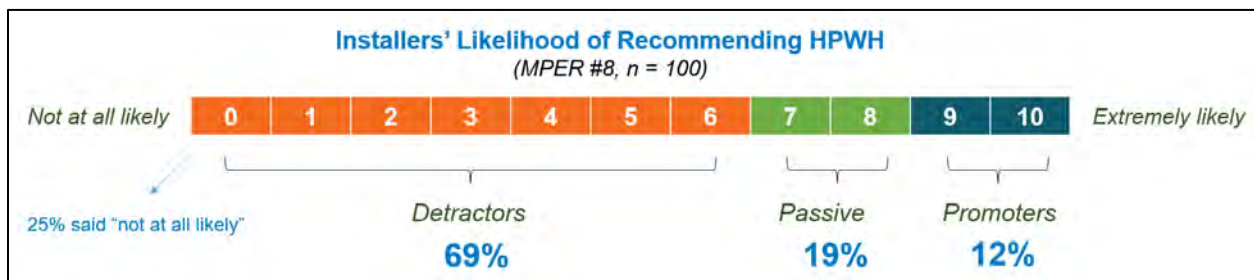
Figure 35: Likelihood of Recommending HPWH (n=100)



Notes: This question was asked only of respondents who were aware of HPWHs (Q11). Q62. In closing, how likely are you to recommend heat pump water heaters to a friend or colleague? Please use a score of 0 to 10 where 0 is “not at all likely” and 10 is “extremely likely”.

The responses to this question can be used to calculate a *net promoter score*. A net promoter score is calculated by subtracting the percentage of *promoters* (respondents who provided an answer of 9 or 10) from the percentage of *detractors* (respondents who provided an answer from 0 to 6, [Figure 36](#)). A net promoter score below zero means there are more detractors than promoters. The responses to this question produce a net promoter score of -57%. This result is not particularly surprising given that it is a relatively new technology with some adoption barriers, but this metric can be used to track changing attitudes over time.

Figure 36: Net Promoter Score (n=100)



Notes: This question was asked only of respondents who were aware of HPWHs (Q11). Q62. In closing, how likely are you to recommend heat pump water heaters to a friend or colleague? Please use a score of 0 to 10 where 0 is “not at all likely” and 10 is “extremely likely”.

Installers who are more likely to personally recommend HPWHs are also more likely to recommend HPWHs to customers. Installers who scored as promoters said they would recommend HPWHs more frequently in all scenarios (for new construction or to replace a fully functioning water heater, an old/near-failure water heater or a failed water heater) compared to installers who scored as passive or detractor (Table 24).

Table 24: HPWH Recommendation Rate by Promoter Score

Promotion Score	Fully functioning water heater	Old/near-failure water heater	Failed water heater	New construction
Detractor (n=69)	6%	10%	12%	21%
Passive (n=19)	41%	60%	58%	40%
Promoter (n=12)	74%	84%	80%	63%

Q62. In closing, how likely are you to recommend heat pump water heaters to a friend or colleague? Please use a score of 0 to 10 where 0 is “not at all likely” and 10 is “extremely likely”. And Q35. In each of the following scenarios, what percent of the time would you recommend heat pump water heaters to a customer?

However, installers are more willing to install HPWHs in their own home. Nearly one-half (48%) of installers said they would install a HPWH in their own home. The remainder of respondents (52%) said they would never install HPWH in their own home.

WATER HEATER SALES AND REVENUE

Installers estimated that 13% of electric resistance water heaters installed in the past year were HPWH. Responding installers estimated their companies had installed 82 electric storage water heaters, on average, in the past year. [Table 25](#) shows HPWH installations in the past year as a percentage of electric storage water heater installations. On average, installers reported that 13% of electric storage water heaters installed were HPWH; when weighted by units, the estimate is 14% (MPI 1b).

The average number of HPWHs installed in 2022 per company was 11, with a median value of 2 HPWH installations ([Table 26](#)). Installers whose companies had installed at least one HPWH (n=66) indicated that HPWHs made up about 7% of their company’s revenues from sales and installations of water heaters in the past year, on average.

Table 25: HPWH Installed in Past Year as a Percentage of Electric Storage Water Heaters

State	Unit-Weighted	Mean	Median
Washington (n=52)	19%	18%	8%
Oregon (n=32)	19%	12%	5%
Idaho (n=23)	9%	5%	0%
Montana (n=11)	10%	6%	1%
Total (n=101)	14%	13%	5%

Notes: This question was only asked of respondents who installed at least one electric storage water heater in the past year (Q24).

Q25. Of the residential electric storage water heaters your company installed in the past year, about what percent were HPWHs?

Table 26: HPWH Units Installed Per Company in Past Year

State	Mean	Median
Washington (n=52)	15	3
Oregon (n=32)	15	3
Idaho (n=23)	8	0
Montana (n=11)	8	<1
Total (n=101)	11	2

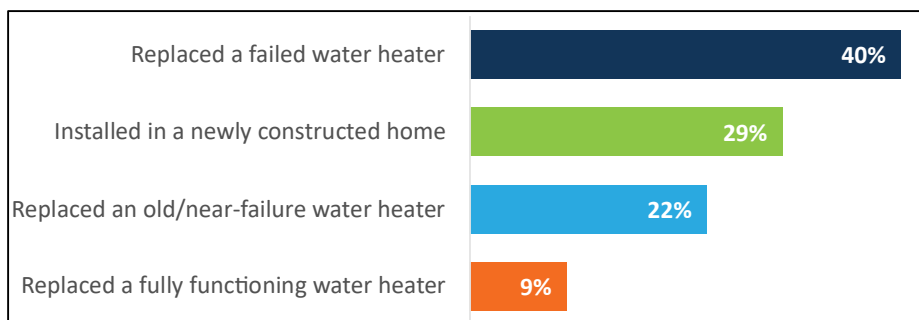
Notes: This question was only asked of respondents who installed at least one electric storage water heater in the past year (Q24).

Q25. Of the residential electric storage water heaters your company installed in the past year, about what percent were HPWHs?

Installers in Washington and Oregon reported installing more HPWHs in the past year than those in Idaho or Montana. More than half of the installers in Idaho (14 of 23 installers) reported that their company did not install any HPWHs in the past year. In Montana, only three of 11 installers reported that their company did not install any HPWHs in the past year.

HPWH installations in the past year were most often replacing a failed water heater. Among HPWHs installed by installers surveyed in MPER #8, 71% were installed in existing homes. Over one-half (56%) of HPWHs installed in existing homes were installed to replace failed water heaters (emergency replacements, MPER 1e). This is an increase from the 44% of HPWHs in existing homes that were installed to replace failed water heaters in MPER #7 (21% of all water heaters overall).⁵⁴

Figure 37: Unit-Weighted Sales of HPWHs by Replacement Scenario (n=73)



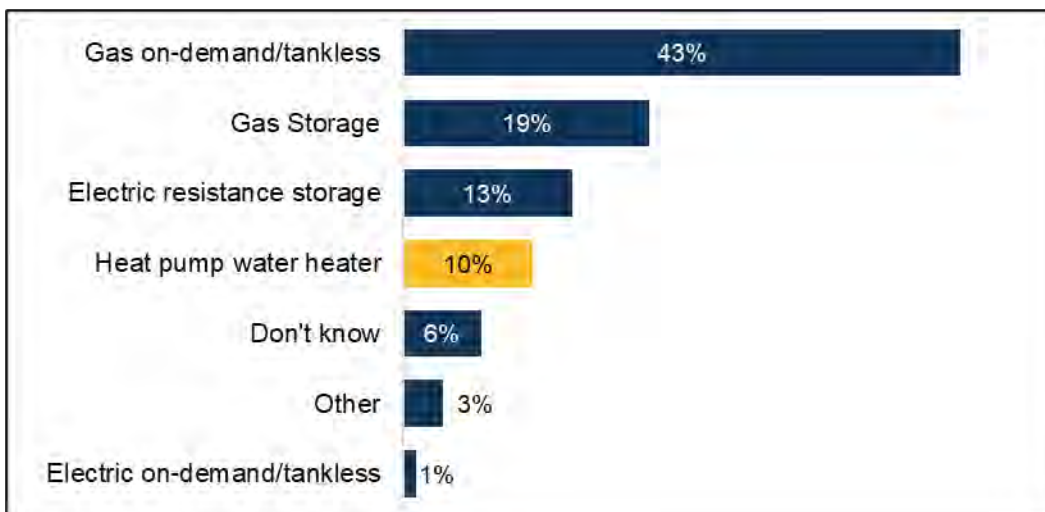
Notes: This question was only asked of respondents that installed at least 1 HPWH in the past year (Q25).

Q27. Thinking about all the HPWHs your company installed in the past year, what percent of units were to customers who were... [installation scenario].

⁵⁴ Just over one-quarter of HPWHs installed in the past year (29%) by the surveyed installers were installed in new construction, indicating that there were more water heater installers in the MPER #8 survey focused on retrofit installations than MPER #7, where installers reported that 52% of HPWHs were installed in new construction. For reference, the MPER #8 market sizing task estimates that 55% of HPWHs installed in the Northwest in 2024 were installed in new construction (Appendix A).

On-demand/tankless water heaters are the most profitable to install because they take longer to install. Figure 38 displays the distribution of installers' responses to the question, "What is the most profitable type of water heater for your company to install in residential homes?" The most common response, provided by two-fifths of respondents (43%), was on-demand/tankless water heaters. Over two-thirds (69%) of respondents who said on-demand/tankless water heaters were the most profitable explained they were the most labor intensive to install; therefore, they charged more per installation. Only one in ten respondents (10%) said HPWHs were the most profitable type for their company to install.

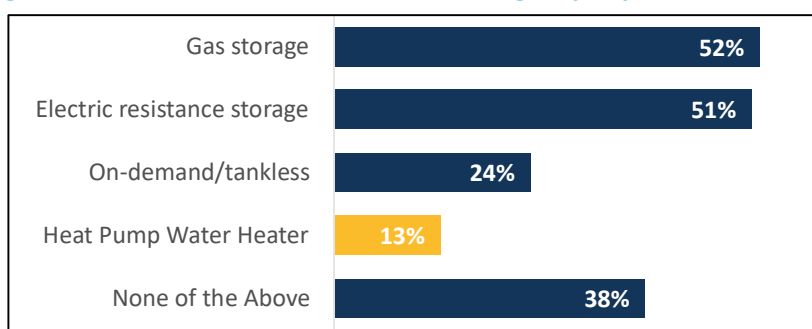
Figure 38: Most Profitable Water Heater (n=101)



Notes: Respondents were only shown options for water heaters their company installs (Q12). Q13. What is the most profitable type of water heater for your company to install in residential homes?

Most installers do not keep HPWHs on hand for emergency replacements. Only 13% of respondents kept HPWHs on hand for emergency replacements (Figure 39). Surprisingly, installers with HPWHs on hand recommend HPWH to replace a failed water heater 42% of the time; less often, on average, than installers who do not keep HPWHs on hand (52%, though the difference is not statistically significant). In MPER #7, installers who kept HPWHs on hand recommended HPWHs to replace a failed water heater at a similar rate (42% of the time) but installers who did not keep HPWHs on hand recommended HPWHs to replace failed water heaters at a much lower rate (19% of the time).⁵⁵ Installers who keep HPWHs on hand were more likely to “strongly” or “somewhat agree” that HPWHs are good replacements for traditional electric resistance storage water heaters than installers who do not keep HPWHs on hand. This result is a reversal of the pattern observed in MPER #7.

Figure 39: Water Heaters On Hand for Emergency Replacement (n=101)



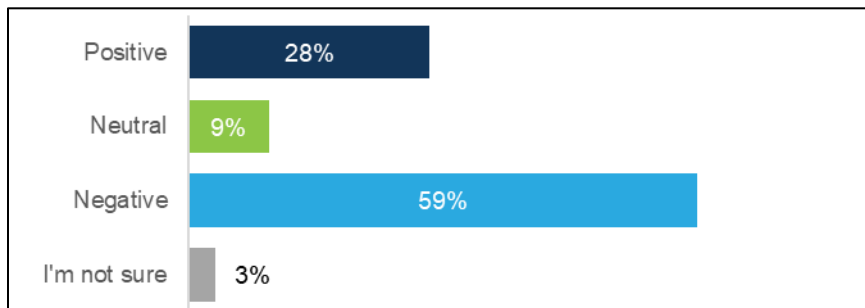
Q33. What types of water heating equipment does your company typically keep on hand for emergency replacements? Select all that apply.

⁵⁵ The difference in recommendation rates is also not statistically significant.

UPDATED STANDARDS AND ACCESS TO INFORMATION

Installers are generally not in favor of communications ports on water heaters. Nearly two-thirds (61%) of respondents working in Washington (n=52) had heard of ANSI/CTA-2045, which requires electric storage water heaters manufactured after January 1, 2023 (electric resistance and HPWHs alike) to have a communications port. Just over one-half (59%) of these respondents viewed it as a negative development (Figure 40), citing reasons such as giving utilities or government control over water heaters (24%), more opportunities for issues (24%), no benefit to customers (5%), and increased costs (2%). However, compared to MPER #7, more installers viewed the standard positively (28%, vs. 12% in MPER #7). Fewer installers held a “neutral” perception (26% in MPER #7 to 9% in MPER #8) rather than from a negative perception to a neutral or positive one.

Figure 40: Installer Perception of ANSI/CTA-2045 (n=32)



Notes: Only respondents that work in WA and had heard of ANSI/CTA-2045 (Q54) were asked the question.

Q55. Do you think the new standard is a positive or negative development?

DETAILED RESULTS

See [Appendix H](#) for tables with detailed results.

Appendix C Purchaser Survey

NMR conducted a survey of individuals who recently purchased or received an HPWH to gain insights about HPWH purchaser satisfaction and decision-making.⁵⁶ This appendix describes the detailed methodology and findings from that effort.

Survey topics included the following:

- Satisfaction (initial and current) (MPI 4a)
- Willingness to recommend (MPI 4b)
- Installation type (emergency vs. planned, MPI 1e)
- Complaints and problems experienced
- Installation challenges
- Frequency and types of service/repair
- Installer (DIY vs. professional) and skill
- Customer decision-making
- Other water heating systems considered
- Household characteristics and demographics

METHODOLOGY

A subset of Northwest utility funders who provided HPWH rebates from 2015 to 2025 distributed the survey to their customers who received a rebate or a no-cost HPWH through a grant program. Across nine utility funders and participants from the 2022 RBSA with a HPWH who consented to participate in additional research, 3,446 contacts received an email invitation to complete the web survey. The team sent reminders to RBSA participants who had not completed the survey. As the utility funders sent the email invitation out on NMR's behalf, no reminder emails were sent to utility program non-respondents. The team fielded the web survey from August 6 to October 6, 2025.

As [Table 27](#) shows, the team achieved 451 valid responses from verified purchasers. The total responses include 450 complete surveys and 95 partially complete surveys (545 total).⁵⁷ NMR omitted from analysis 75 Seattle City Light respondents that had applied for a rebate coupon but did not purchase the HPWH. The final sample size was 451.

The RBSA data contained the HPWH brand, model number, and installation location. Participating utility funder customers were asked to self-report and/or upload a photo of the HPWH's manufacturer label and mode settings. The team leveraged these details to conduct analyses by HPWH brand and other relevant details.

The team did not weight survey results. This approach is consistent with the methodology in past MPERs with a purchaser survey: MPER #1, MPER #2, MPER #4, and MPER #6.

⁵⁶ The team invited respondents who recently moved into a home with a HPWH to take the survey but did not ask them questions specific to the purchase or installation processes. These respondents represent less than 2% of the HPWH purchaser sample.

⁵⁷ Partially complete responses were counted if they completed all substantive survey questions (up to demographics questions).

Table 27: Purchaser Survey Disposition

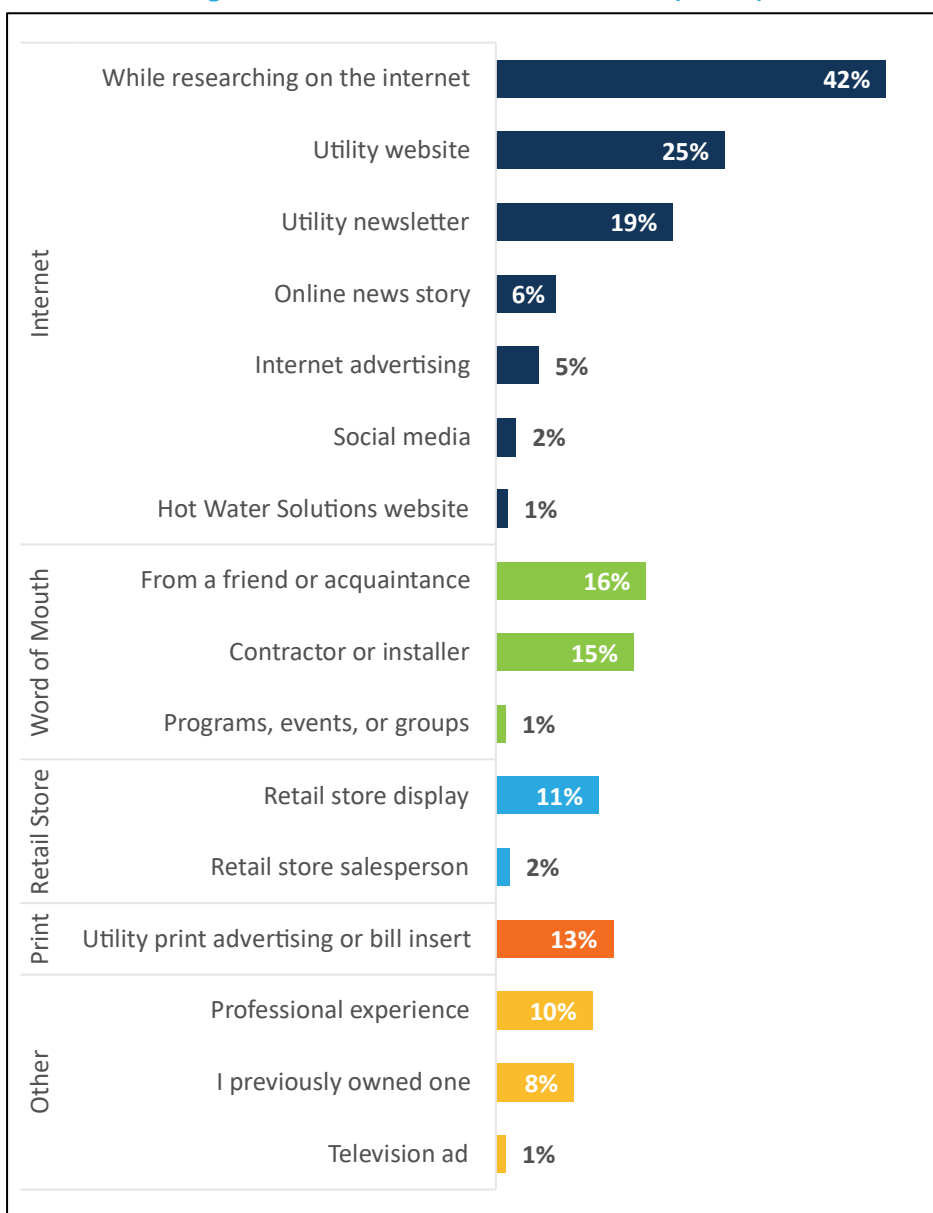
Utility Funder or Source	State	Eligible Sample	Responses Achieved	Response Rate
Chelan PUD	WA	204	25	12%
Clark PUD	WA	137	32	23%
EPUD	OR	100	11	11%
General Pacific	OR	443	33	7%
Idaho Power	ID	125	63	50%
NorthWestern	MT	40	11	28%
Puget Sound Energy	WA	1,037	145	14%
Seattle City Light*	WA	1,167	73	6%
Tacoma Power – Market Rate	WA	116	25	22%
Tacoma Power – Low Income	WA	45	15	33%
RBSA	All	52	18	35%
Total	-	3,446	451	13%

*The survey was initially sent to a more comprehensive list of customers, including those who applied for the rebate but did not apply it towards a purchase of a HPWH, not only customers who received a rebate. The team checked the emails from survey completes against the email list of rebate recipients and only analyzed survey responses verified to be from an email of a customer who received a rebate.

AWARENESS AND PERCEPTIONS

Internet is the most common source of awareness. Figure 41 shows that the top three ways respondents heard of HPWHs were internet research (42%), utility websites (25%), and utility newsletters (19%). Only 15% of respondents heard of HPWH from a contractor or installer.

Figure 41: Sources of HPWH Awareness (n=451)



Multiple responses permitted.

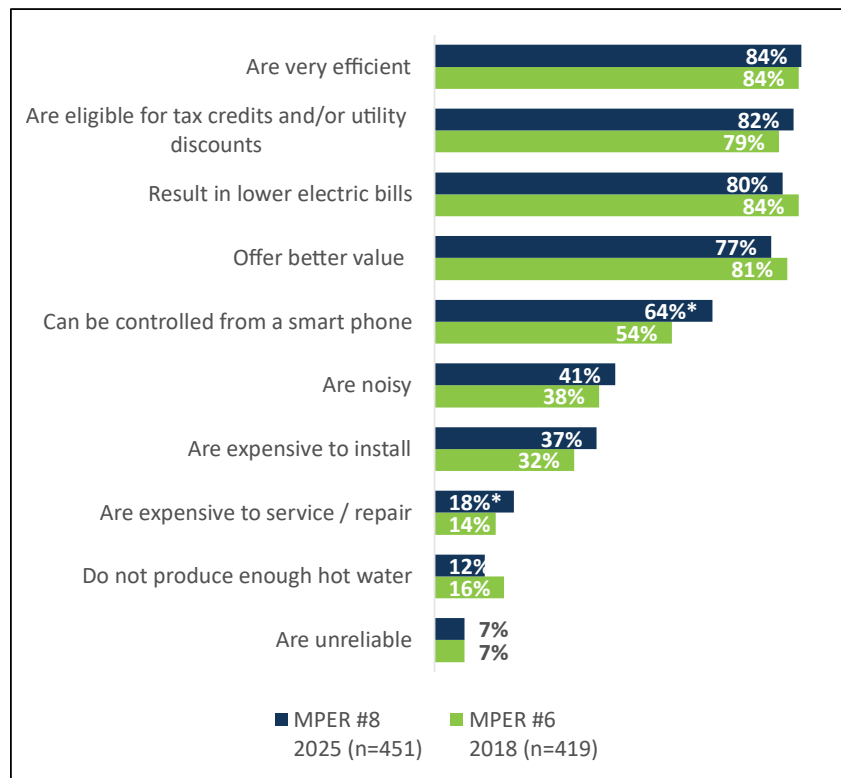
Q30. Where or how have you heard about heat pump water heaters?

Perceptions and awareness of HPWH capabilities. Figure 42 shows the percentage of respondents that agreed with various statements about HPWHs. Five were positive, five were negative. Four-fifths or more of purchasers agreed with three of the positive statements: HPWHs are very efficient (84%), HPWHs are eligible for tax credits and/or utility discounts (82%), and HPWHs lower electric bills (80%).

While HPWH purchasers were less likely to agree with the negative perceptions of HPWHs than the positive statements, over two-fifths of HPWH purchasers (41%) agreed that HPWHs are noisy and over one-third of purchasers (37%) agreed that HPWHs are expensive to install. Close to one-fifth of HPWH purchasers (18%) agreed that they are expensive to service or repair (up from 14%), 12% agreed that they do not produce enough hot water (down from 16%), and 7% agreed that they are unreliable. Purchasers who reported that they had their HPWH serviced or repaired by a professional were more likely to agree that they are expensive to service or repair (39%) than those who performed their own service/repair (23%) and those who had not had their HPWH serviced or repaired (14%).⁵⁸

As is to be expected from purchasers who obtained a utility rebate, over four-fifths of HPWH purchasers (82%) were aware they are eligible for tax credits and/or utility discounts. Nearly two-thirds (64%) were aware HPWHs can be controlled via smart phone, up from 54%. Results were consistent with MPER #6.

Figure 42: Purchaser Perceptions of HPWHs



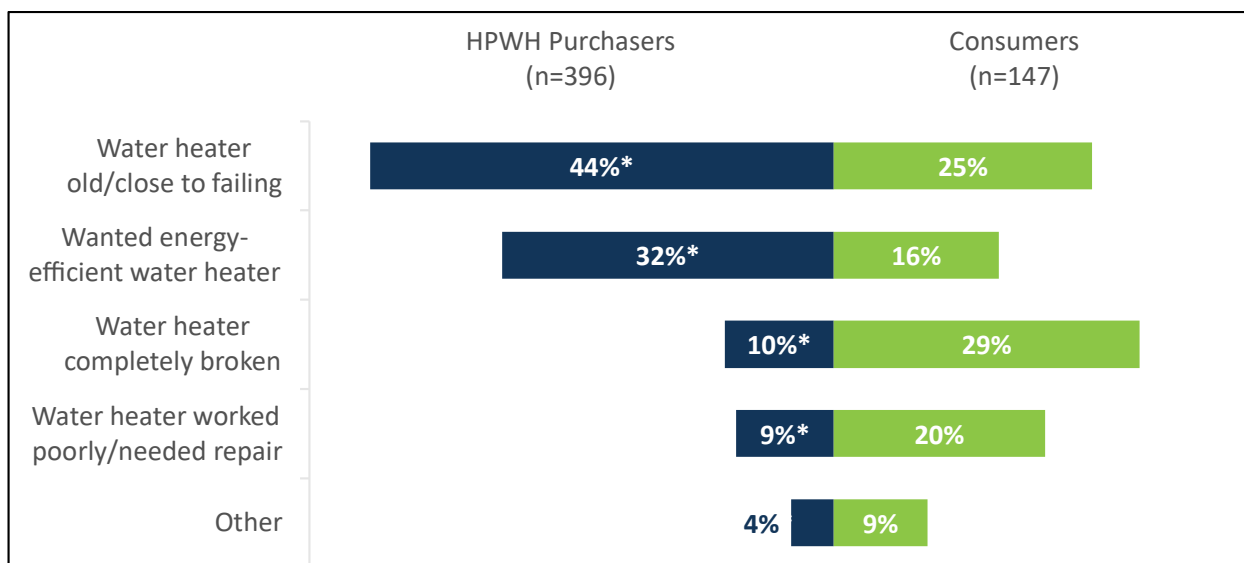
Q31. Assess how much you agree or disagree with the following statements. "Heat pump water heaters..."
 *Statistically different from MPER #6 at the 90% confidence level.

⁵⁸ Difference is statistically significant at the 90% confidence level.

WATER HEATER PURCHASE FACTORS

Why people bought new water heaters. Figure 43 displays the reasons why HPWH purchasers bought a new water heater for an existing home and compares them to the reasons given by consumer survey respondents who purchased a water heater in the past three years that was not a HPWH. Among purchasers, the most common reason was having a water heater that was old and/or close to failing (44%), followed by wanting to install a more energy-efficient water heater (32%). HPWH purchasers were twice as likely to say they purchased their water heater because they wanted a more energy-efficient water heater (32%) than consumers with other types of water heaters (16%). Meanwhile, consumers with other types of water heaters were more likely to have purchased a new water heater because their water heater had completely broken (29% vs. 10%) or worked poorly and/or needed repair (20% vs. 9%).

Figure 43: Reason for Purchasing Water Heater by Population



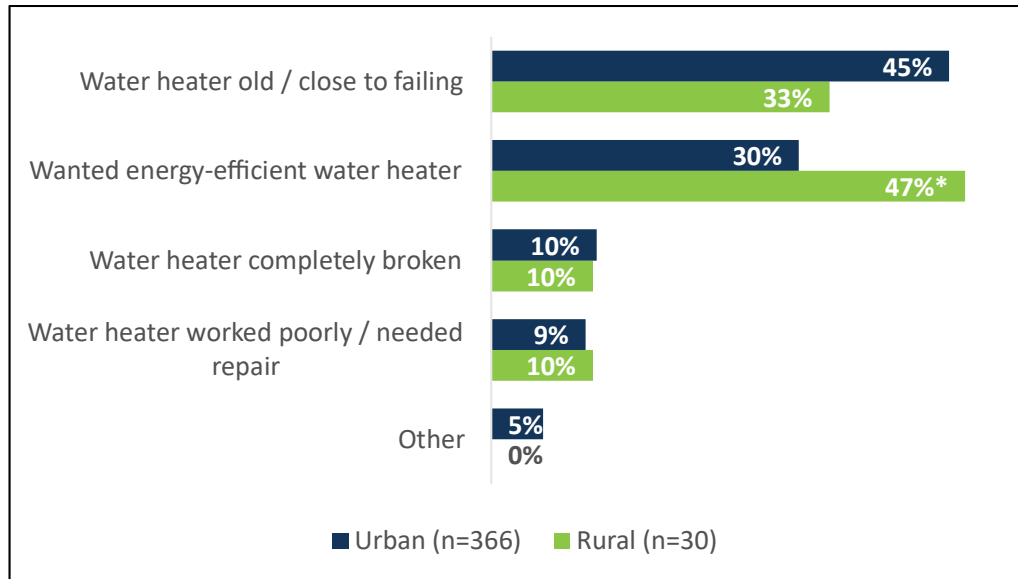
Only purchasers who bought a water heater for an existing home answered this question.

* Statistically different from Consumers without HPWHs at the 90% confidence level.

36. Why did you purchase a new water heater?

Figure 44 shows HPWH purchasers’ reasons for purchasing a new water heater by region (urban vs. rural). Respondents residing in rural areas were more likely to have purchased their HPWH because they wanted a more energy-efficient water heater (47%) than respondents residing in urban areas (30%).

Figure 44: Reason for Purchasing HPWH by Region



* Statistically different from Urban at the 90% confidence level
Q36. Why did you purchase a new water heater?

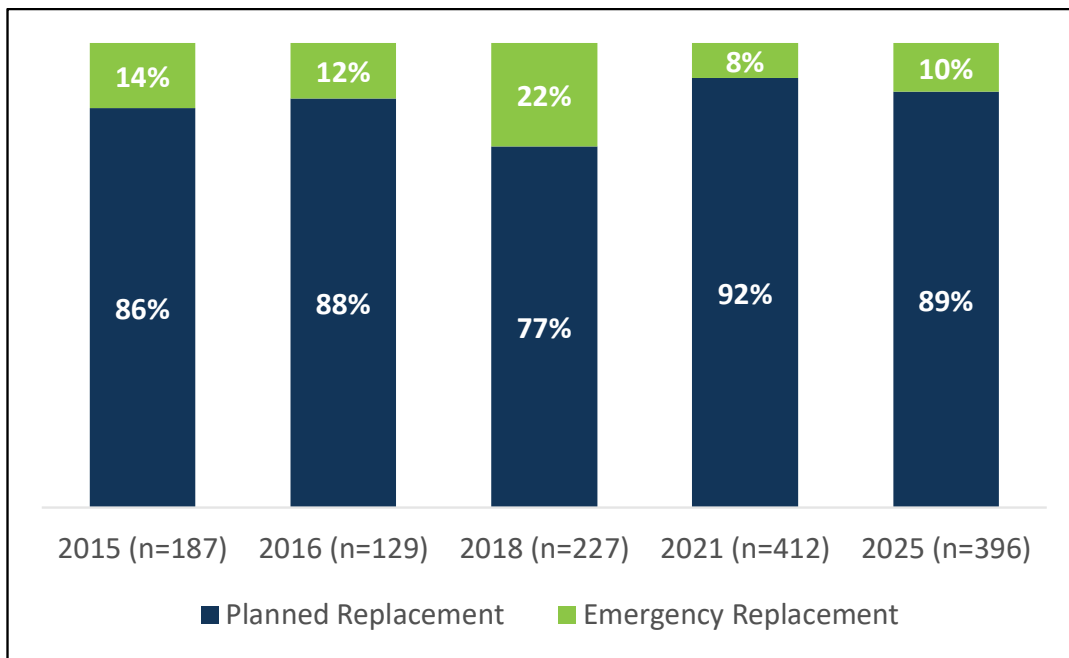
Figure 45 shows that planned replacements comprised a similar proportion of HPWH purchases in 2025 (89%) than in past MPEs. ⁵⁹ Only 10% of HPWH purchasers in the 2025 survey were emergency replacements (MPI 1e). The change from 8% in 2021 to 10% in 2025 is not statistically significant.

It should be noted that the definition of an emergency replacement varied between survey guides for the different MPEs. For MPE #1 and MPE #2, HPWH purchasers were asked, “Did you replace your previous water heater in an emergency situation, for example maybe it broke, or was it a planned replacement?” Before asking respondents if it was an emergency or planned replacement, the MPE #4 survey defined an emergency replacement as “the need to replace your previous water heater because it completely failed and was incapable of providing hot water for your home.” Both the MPE #6 and MPE #8 surveys did not ask respondents to differentiate between planned and emergency replacements, but instead presented “my water heater was completely broken and did not provide any hot water” as one of various response choices to the question “Why did you purchase a new water heater?”

⁵⁹ MPE #4 through MPE #7 used the term “emergency replacement” to refer to replacements of completely failed systems that provide no hot water, and MPE #8 continues this practice. NEEA may also consider using the more neutral term “replace-on-failure” (ROF) instead, given that the 2018 NEEA market characterization described such scenarios as “an inconvenience, not a catastrophe.” 2018 NEEA Water Heater Market Characterization Report, page 34. (Russell Research. “Water Heater Market Characterization Report. Prepared for NEEA, April 3, 2018. <https://neea.org/wp-content/uploads/2025/03/water-heater-market-characterization-report.pdf>.)

Among HPWHs owned by respondents in the purchaser survey, over two-thirds of emergency replacements (71%) were purchased at retail stores, and nearly two-thirds of those were DIY (62%).

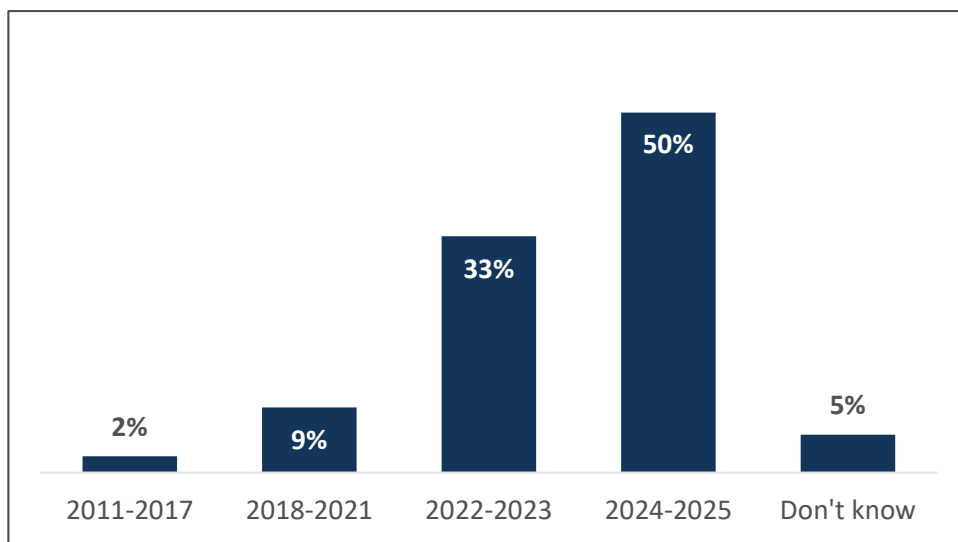
Figure 45: Planned and Emergency HPWH Purchases over Time



Q36. Why did you purchase a new water heater?

HPWH age, brand, and model. Figure 46 displays the year in which respondents purchased their HPWH. One-half (50%) of HPWH were purchased in 2024 or 2025, one-third (33%) were purchased in 2022 or 2023, and 11% were purchased prior to 2022.

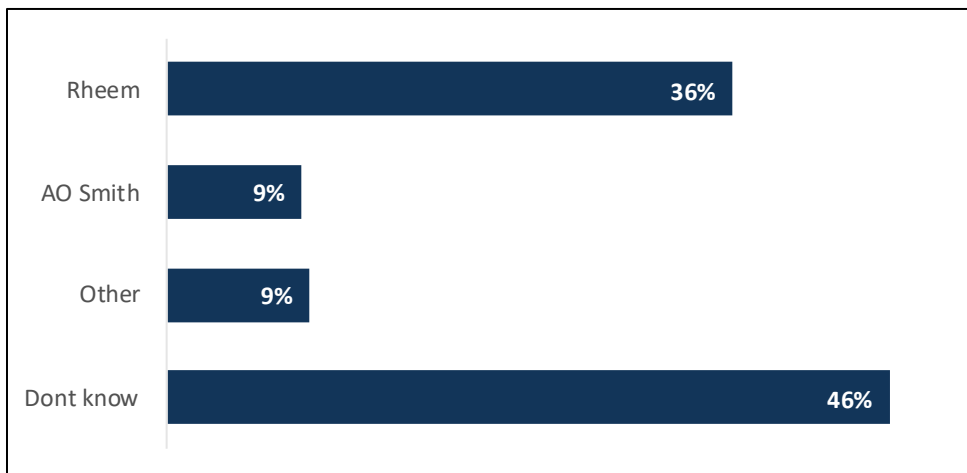
Figure 46: Year Purchased HPWH (MPER #8, n=451)



Q11. In which year did you purchase/move into the home with the heat pump water heater?

Figure 47 displays the brands of HPWHs that respondents purchased. Rheem was the most common (36%), followed by AO Smith (9%).⁶⁰ Nearly half (46%) of respondents were unable either to photograph the manufacturer’s label of their water heater or recall the brand of their HPWH.

Figure 47: HPWH Brand (n=451)

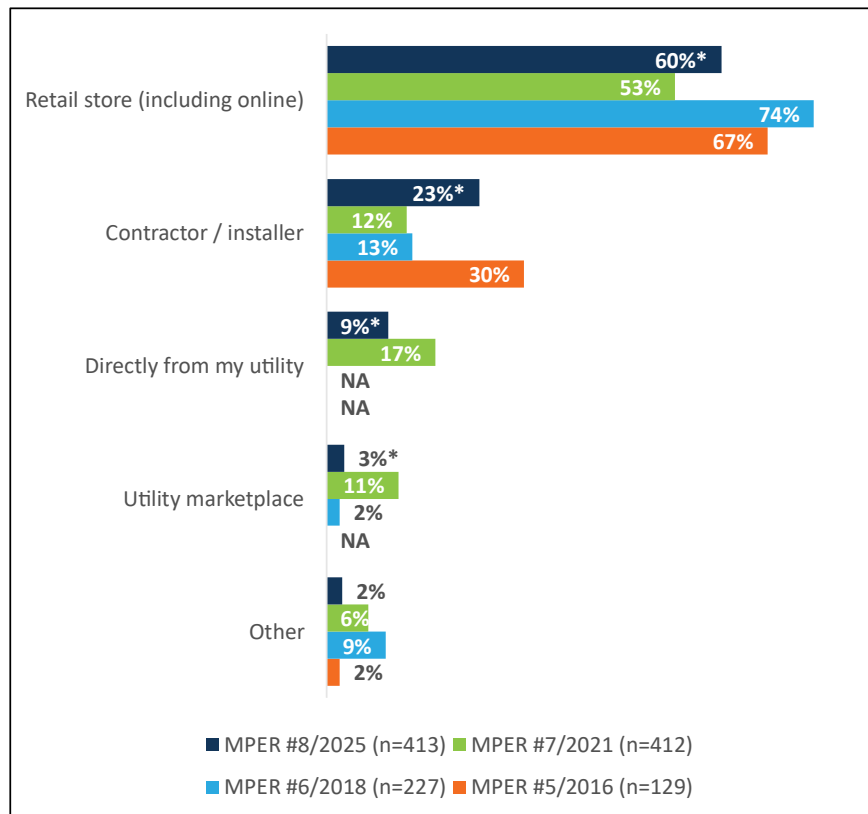


Q93. What brand is your heat pump water heater?

⁶⁰ Other brands include Bradford White, General Electric, SANCO2, Ruud, State, Friedrich, Richmond, and Rinnai.

Where respondents purchased HPWHs. Over one-half of respondents purchased their HPWH from a retail store (60%), up from 53% in 2021 (MPER #6). Close to one-quarter of respondents obtained their HPWH from a contractor or installer (23%), up from 12% in 2021. Around one-tenth of respondents purchased their HPWH directly from their utility (9%) and only 3% purchased their HPWH from a utility marketplace (Figure 48).

Figure 48: Where HPWH was Purchased

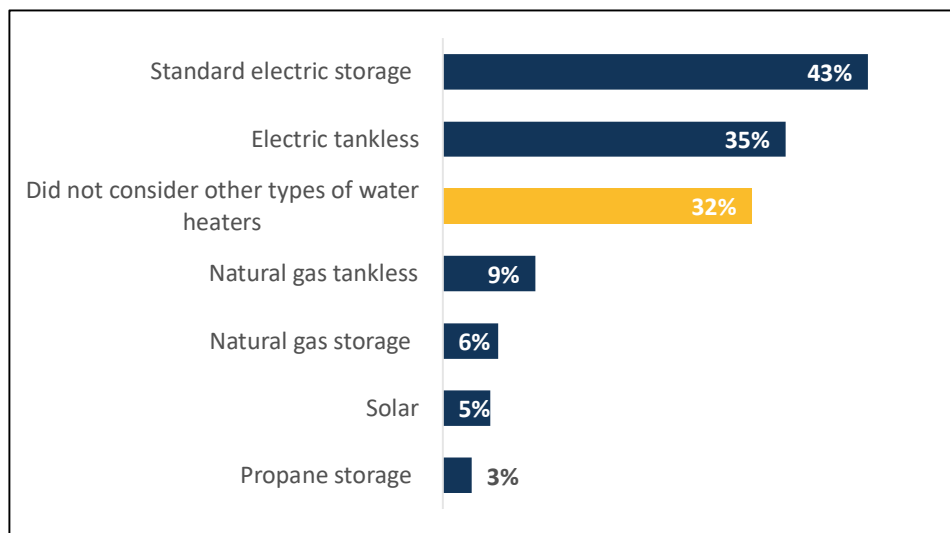


Q39. Where did you purchase your heat pump water heater?

* Statistically different from 2021 at the 90% confidence level

Other water heating options considered. Figure 49 displays the other water heating options respondents considered before purchasing their HPWH. Over two-fifths (43%) of HPWH purchasers considered standard electric storage water heaters, and over one-third (35%) considered electric tankless water heaters. Close to one-third (32%) of respondents said they did not consider other types of water heaters.

Figure 49: Other Water Heating Options Considered (n=413)

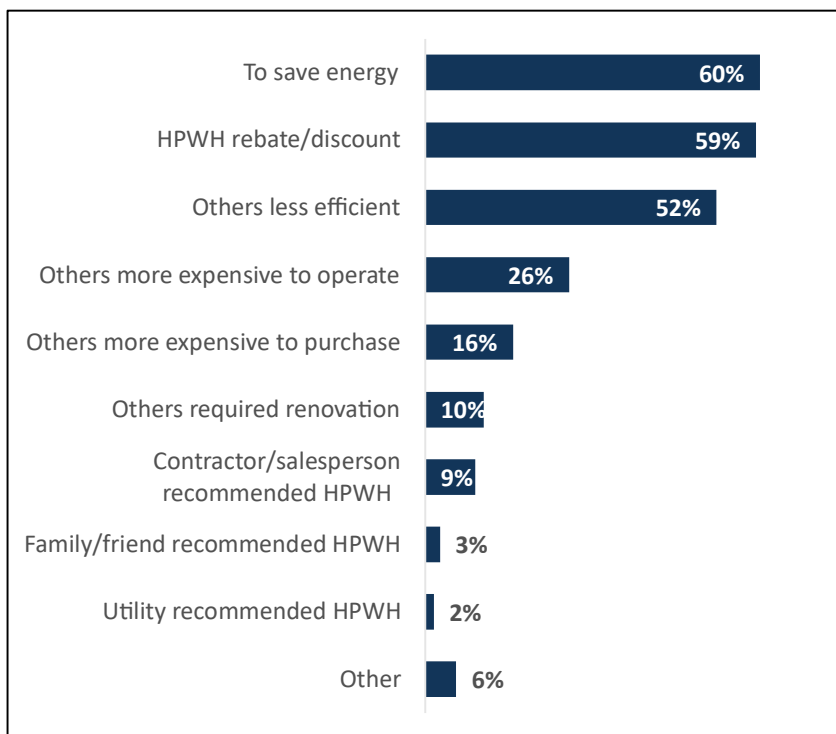


Multiple responses permitted.

Q37. WH_OPTIONS. Besides heat pump water heaters, what other water heating options did you consider?

Figure 50 displays the reasons respondents gave for choosing HPWHs over other options they considered. HPWH purchasers most commonly cited a desire to save energy as a factor in choosing HPWHs over other options (60%), followed by the availability of rebates or discounts (59%), and HPWH efficiency (52%).

Figure 50: Why Respondents Chose HPWHs (n=270)



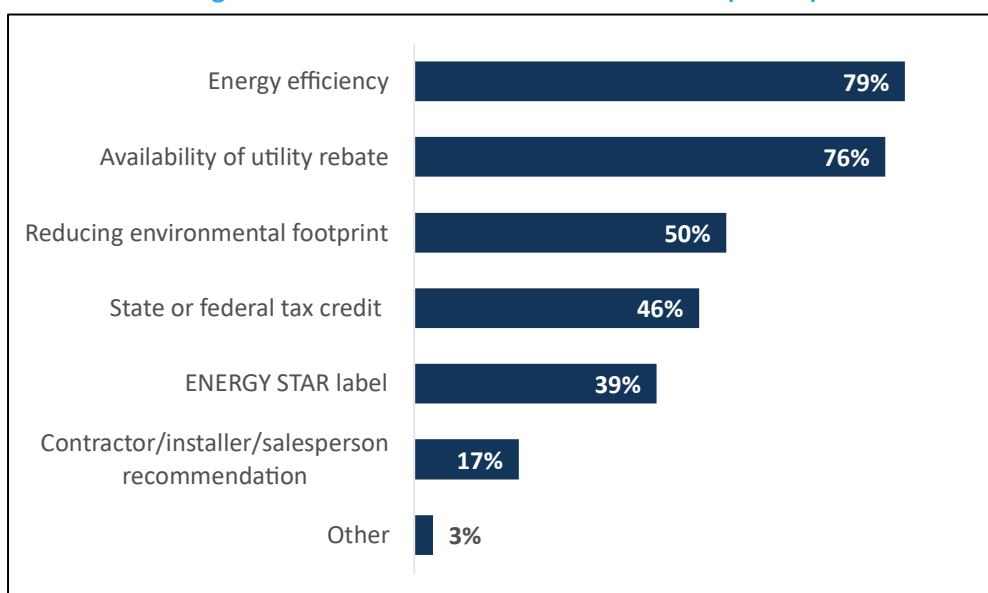
Multiple responses permitted.

Q38. Why did you decide to install a heat pump water heater instead of the other water heating options you considered?

Other reasons included: reducing carbon footprint, availability of tax credits, cooling effect of HPWHs during summer, and electrifying home.

Factors important to decision to purchase HPWH. HPWH purchasers were asked to identify which factors were important in their decision to purchase a HPWH (Figure 51). Three of the five most important factors were financial, including energy efficiency (79%), the availability of utility rebates (76%), and state or federal tax credits (46%). A large majority of HPWH purchasers (86%) received a rebate or discount from their utility, while close to one half (45%) received a federal or state tax credit. Non-financial factors ranked as follows: (1) reducing environmental footprint, (2) ENERGY STAR label, (3) contractor recommendation. When asked in a follow-up about any other factors that influenced the HPWH purchase decision, the most common responses were the ability to cool/dehumidify the space around the HPWH (20%), to save money (14%), the ease of installation/ability to install oneself (10%), and the presence of smart features such as remote access via Wi-Fi (10%).

Figure 51: HPWH Purchase Decision Factors (n=410)



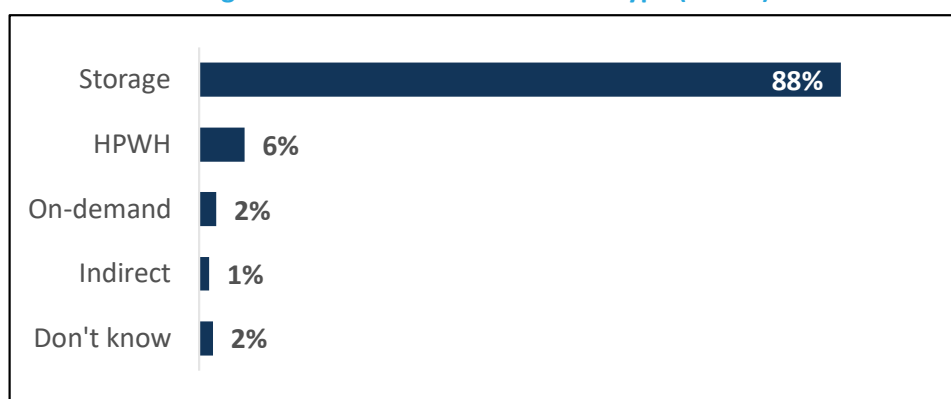
Multiple responses permitted.

Q40. HPWH_FACTOR. Which of the following were important factors in your decision to purchase a heat pump water heater? Please select all that apply.

External influence on HPWH purchase decision. A large majority (85%) of respondents reported that they knew they wanted a HPWH before speaking to a salesperson or contractor. Of the 15% that were undecided until their contractor, installer, or salesperson recommended an HPWH, close to three-fifths (59%) said they were persuaded by the prospect of higher energy efficiency and/or long-term cost savings while over one-fifth (22%) said they were persuaded by the availability of rebates.

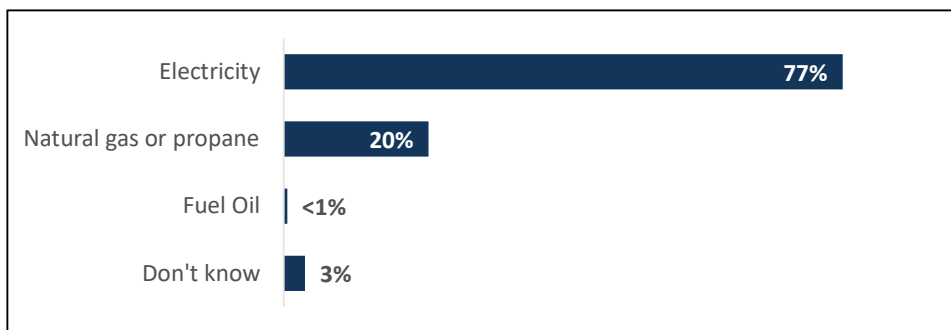
Previous water heater characteristics. Figure 52 shows that a large majority of HPWH purchasers (88%) had storage water heaters prior to purchasing a HPWH. Figure 53 shows that most (77%) respondents' previous water heaters were electric, and that one-fifth (20%) of HPWH purchasers had switched away from fossil fuels.

Figure 52: Previous Water Heater Type (n=413)



Q32. PREVIOUS_WH. What type of water heater did you have before you purchased the heat pump water heater?

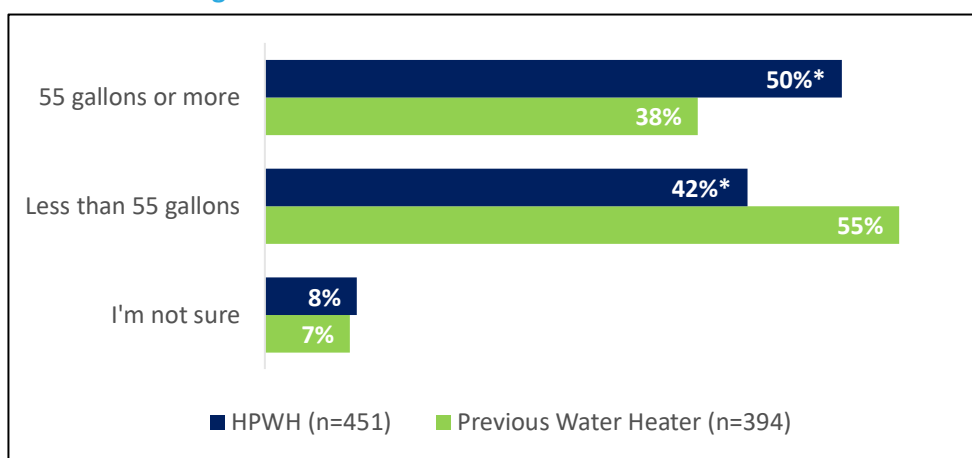
Figure 53: Previous Water Heater Fuel (n=405)



Does not sum to 100% due to rounding.
Q33. What fuel did that water heater use?

Figure 54 shows purchasers' previous and current water heater sizes in gallons. One-half (50%) of HPWH purchasers said their current water heater was 55 gallons or more, while 38% said their previous HPWH was less than 55 gallons. While the differences between previous and current water heater sizes are statistically significant, previous water heater size is not something one would expect respondents to recall with great accuracy. However, it is relevant because sizing HPWHs appropriately to meet household hot water needs is critical to satisfaction with the product. Most purchasers purchased a HPWH that was the same size as their previous tank (66%), while 16% sized up with their HPWH and 6% got a smaller HPWH than their previous storage tank.⁶¹ Among the purchasers who installed a HPWH that was smaller than their previous tank size (n=24), only two (8%) expressed dissatisfaction with their hot water supply (but still said they were satisfied with the HPWH overall).

Figure 54: Previous and Current Water Heater Size



Q34. What was the size of the water heater you replaced with the heat pump water heater?

Q35. How many gallons is your current water heater?

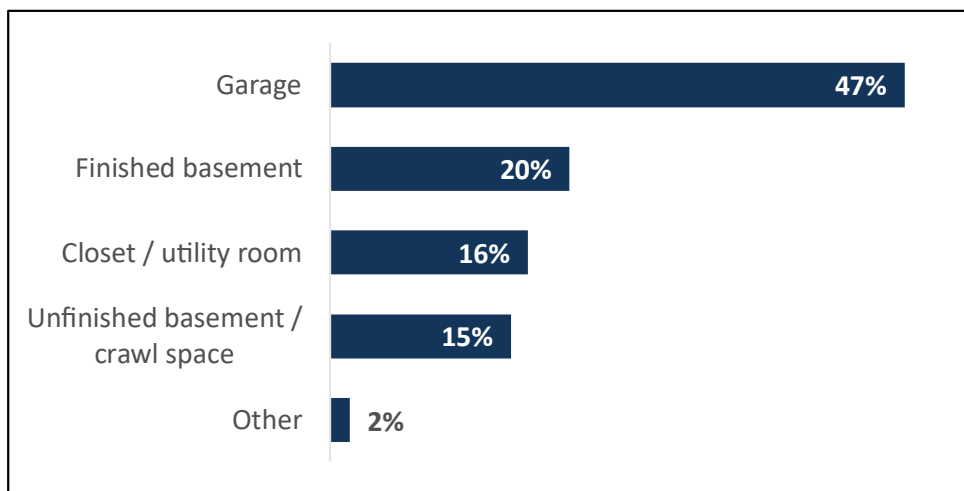
* Statistically different from Previous Water Heater at the 90% confidence level

⁶¹ 11% of respondents were not sure of either their previous or current water heater's tank size.

INSTALLATION

HPWH location. Nearly all (97%) of the HPWHs were installed at respondents' primary residences.⁶² Eighty-nine percent were installed in an existing home, while 11% were installed in a newly built home. Over one-third (35%) of HPWHs were installed in a heated space. [Figure 55](#) displays the part of the home where the HPWHs were located.⁶³ Close to one-half (47%) of HPWHs were installed in a garage, over one-third (35%) were installed in a basement, and close to one-fifth (16%) were installed in a closet or utility room not located in a basement.

Figure 55: HPWH Location (n=438)



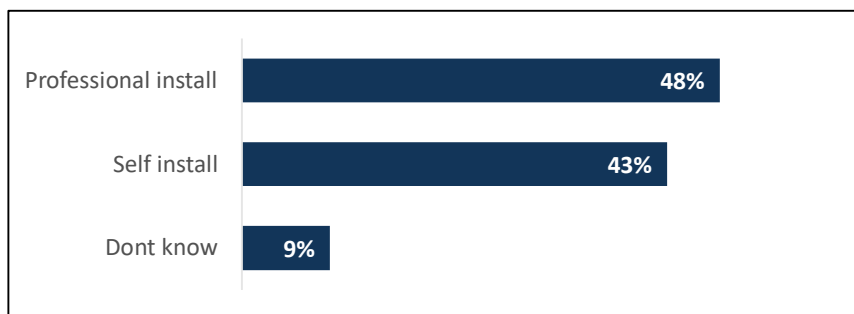
Q24. Where is the heat pump water heater located?

⁶² One percent were installed at a vacation home and 1% were installed at a property rented to others.

⁶³ Figure does not sum to 100% due to rounding.

Installation Process. Close to one-half (48%) of HPWH purchasers hired a professional to install it, while 43% installed it themselves (Figure 56). This marks a statistically significant decrease compared to the 53% of purchasers who installed HPWHs themselves in 2021 (MPER #6) and 61% who installed HPWHs themselves in 2018 (MPER #4). Of those who installed the HPWH themselves, over one-half (51%) reported having professional experience installing water heaters or other mechanical equipment. Reasons DIY installers gave for installing HPWHs themselves include the desire to save money (52%), confidence in their own abilities (40%), and the expectation that it would be easy (32%).

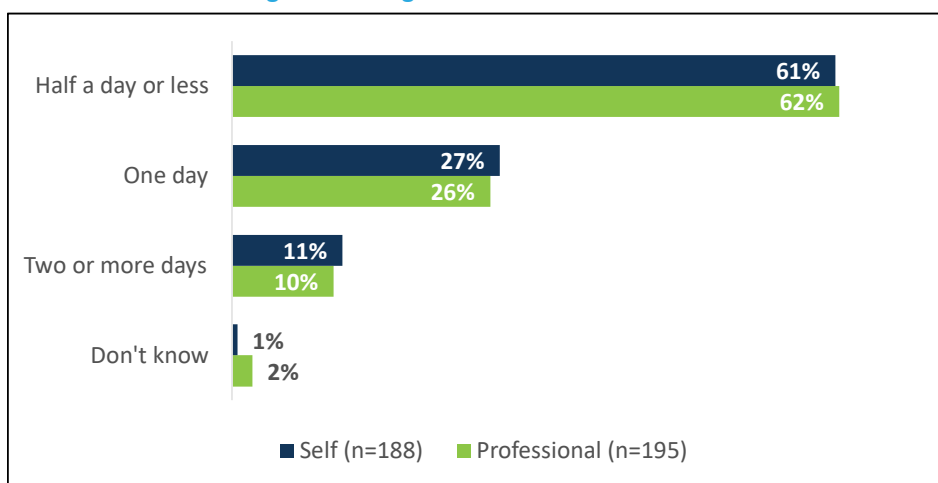
Figure 56: Who Installed HPWH (n=448)



Q43. Did you install the new water heater yourself, or did you hire an installer to do it?
 Q44. Did you install the new water heater yourself, did you hire an installer to do it separately from your home construction, or did the general contractor building your home manage the installation?

Figure 57 shows that most HPWHs were installed in half a day or less, including 61% of self-installed HPWHs and 62% of professionally installed HPWHs. Of note is that there was virtually no difference in installation times between self- and professionally installed HPWHs.

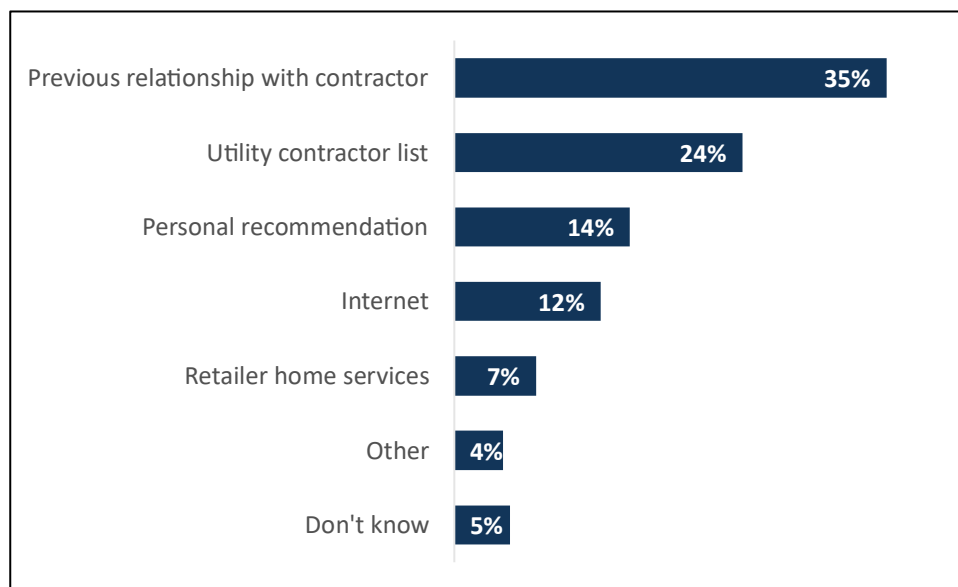
Figure 57: Length of Time to Install HPWH



Q50. About how long did it take to install the heat pump water heater?

Installation contractors. The most common way HPWH purchasers found a professional to install their HPWH was through a previous relationship with a contractor (35%), followed by a utility contractor list (24%), and a personal recommendation (14%, [Figure 58](#)). On average, respondents received 1.5 quotes or bids before selecting their installer and of those installers providing quotes, on average, 1.3 recommended HPWHs. Overall, purchasers reported that contractors recommended HPWHs in 80% of the quotes they provided. As this was a HPWH purchaser survey of mostly program participants, the contractor recommendation rate of HPWHs reported in the purchaser survey is higher than the average recommendation rate reported by installers (29% of the time in failed or near-failure replacement situations and 21% of the time for fully functioning water heaters).

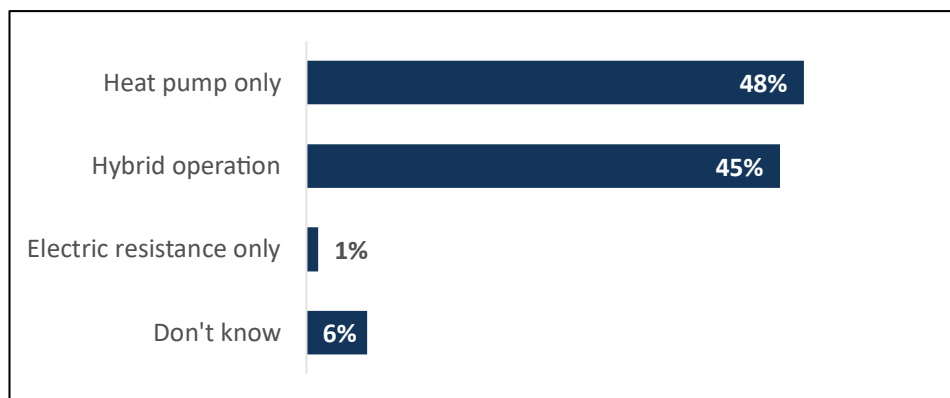
Figure 58: How Purchasers Found Installer (n=195)



Q47. How did you find the person or company that installed your new water heater?

Figure 59 displays the setting that HPWH purchasers say they primarily use. Almost one-half (48%) of purchasers use the heat pump only setting, while over two-fifths (45%) use the hybrid setting. Among purchasers who had their HPWH professionally installed, just over one-half (54%) said their installer told them which water heater settings to use. This is comparable to the 55% of purchasers who said their installer told them which settings to use in 2021 (MPER #6) and to the 57% of purchasers who said their installer told them which settings to use in 2018 (MPER #4).⁶⁴

Figure 59: Settings Used by Purchasers (n=449)



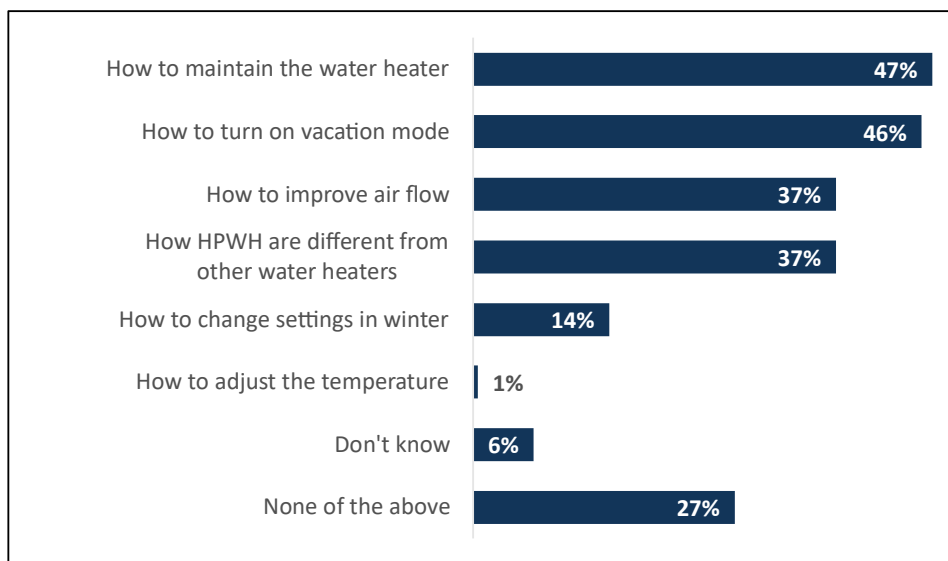
Q59. Which setting do you primarily use on your heat pump water heater?

The team compared satisfaction ratings by setting primarily used by respondents. There were no statistically significant differences in HPWH satisfaction overall between respondents who used their HPWH in heat pump only mode versus hybrid operation mode.

⁶⁴ Difference is statistically significant at the 90% confidence level.

HPWH Education. Many purchasers who hired an installer received adequate information on how to operate the HPWH.⁶⁵ Figure 60 shows that close to one-half (47%) of purchasers were told by their installers how to maintain their water heater. Forty-six percent were instructed on how to turn the water heater to vacation mode, 37% were told to avoid obstructing the air flow to the HPWH, and another 37% were instructed on the differences between HPWHs and other water heaters.

Figure 60: HPWH Information Provided by Installer (n=193)



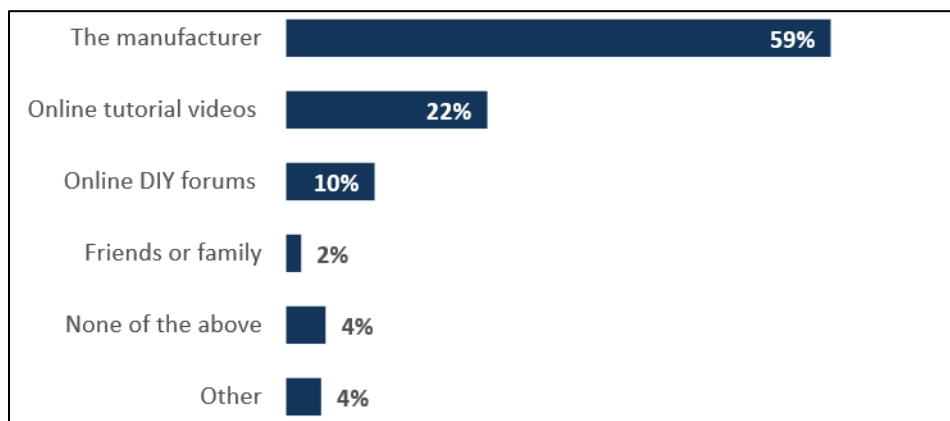
Multiple responses permitted.

Q60. Did your installer provide you with any of the following information after the installation?

⁶⁵ Programs might require that qualified contractors educate customers about the operation and maintenance of the HPWH. In that case, these results may be higher than non-participants might report, but lower than hoped for compliance if it was required by the program(s). For example, Tacoma Power’s HPWH program specifications require contractors to engage in customer education (<https://www.mytpu.org/wp-content/uploads/hpwh-program-specifications.pdf>).

For self-installers, the majority (59%, [Figure 61](#)) primarily got their information on how to operate the HPWH from the manufacturer. Over one-fifth (22%) of respondents got their information from online tutorial videos and another one-tenth (10%) got their information from online DIY forums.

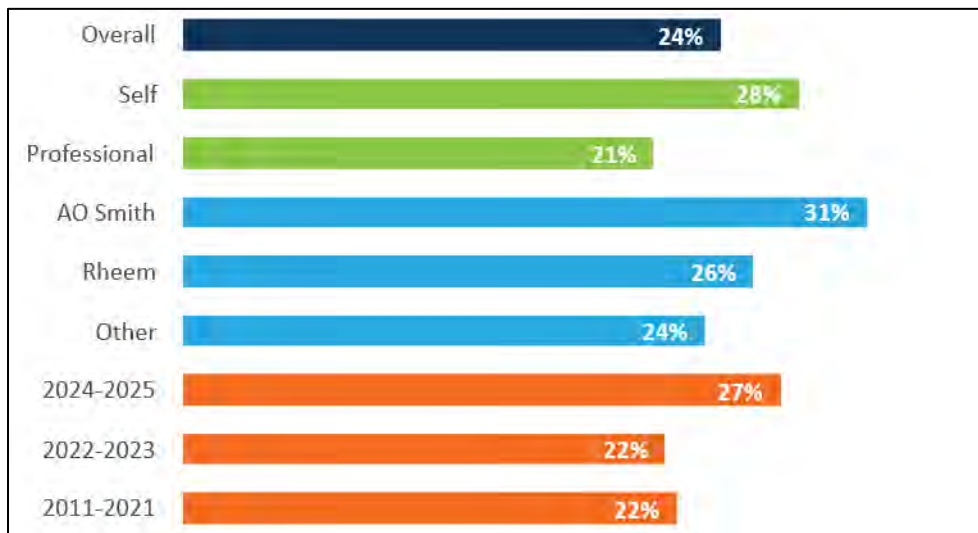
Figure 61: HPWH Information Sources for Self-Installers (n=188)



Q61. Where do you get information about how to operate and maintain your heat pump water heater?

Installation challenges. Overall, just under one-quarter (24%) of HPWH purchasers encountered challenges with the HPWH installation. [Figure 62](#) shows how installation challenges varied by the installer (self vs. professional), brand, and year HPWH was purchased. While individuals who installed HPWHs themselves were more likely to encounter challenges (28%) than those who hired professionals (21%), this difference is not statistically significant. Similarly, variations by brand and year purchased are also not statistically significant.

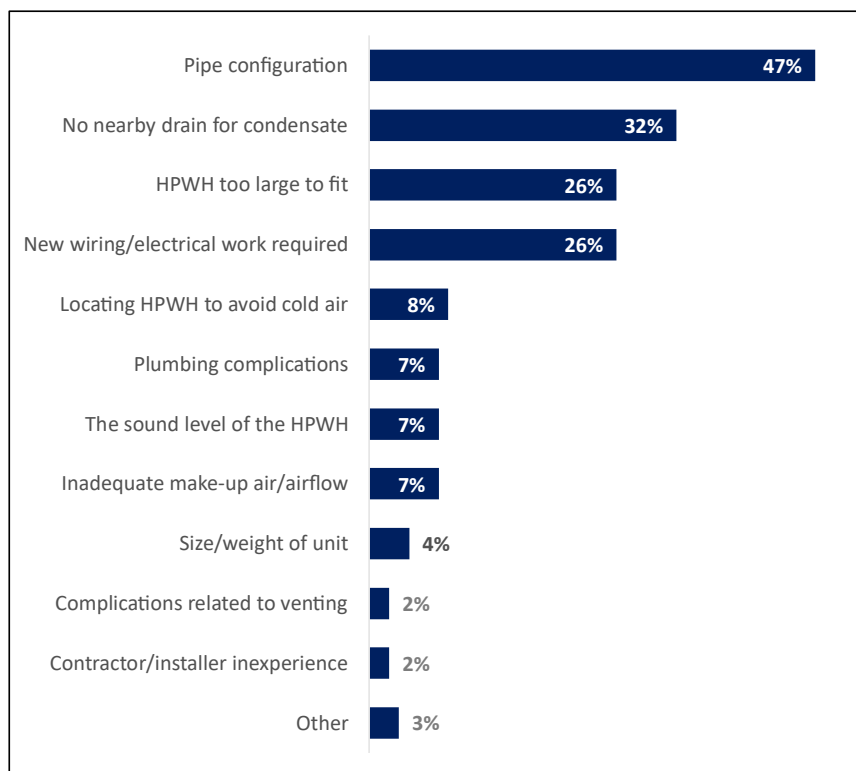
Figure 62: Encountered Installation Challenges (n=396)



Q51. Did "your contractor / installer" / "you" encounter any challenges with the heat pump water heater installation?

Figure 63 displays the types of installation challenges respondents encountered. The most common challenges purchasers encountered pertained to pipe configuration (47%) and lack of a nearby drain for condensate (32%). To resolve pipe configuration challenges, respondents typically added new pipe, replumbed, or rearranged the pipe configuration. To address condensate draining challenges, respondents typically installed a new drain or rerouted the drain tube outdoors or to a nearby drain. Over one-quarter of respondents who encountered challenges said the HPWH was too large to fit where the old water heater was located (26%) or that new wiring/electrical work was required (26%). The most common solution to size challenges was moving the HPWH to a new location. The types of installation challenges respondents encountered did not vary significantly by HPWH brand.

Figure 63: Types of Installation Challenges (n=96)



Multiple responses permitted.
Q52. What challenges?

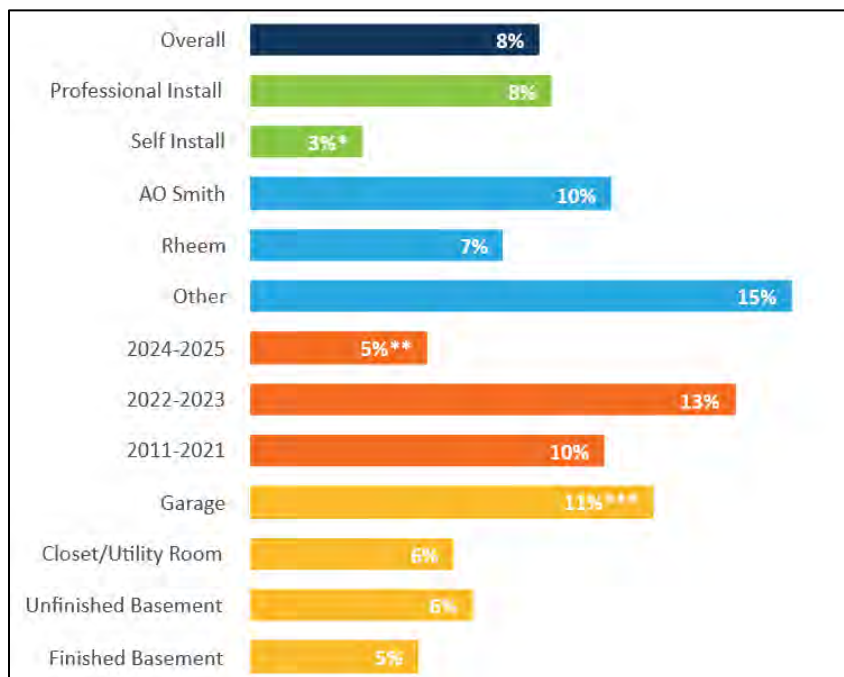
Over one-half (51%) of DIY respondents mentioned that the HPWH was not the first water heater they had installed. When asked to gauge the difficulty of installation compared to other types of water heaters, only 27% said it was harder to install. Common reasons respondents gave for this included complications related to the pipe configuration and condensate drain (58%), complications related to air and venting (42%), and the weight of the unit (25%).

SERVICE AND REPAIR

The survey defined **service** as *routine maintenance to keep the HPWH in optimal condition (annual tune-ups, cleaning, inspecting, etc.)* and **repair** as *fixing equipment that is malfunctioning or not working*. Overall, 12% of HPWH purchasers had contacted a professional to service and/or repair their HPWH since purchasing it, including 8% who had called for service (Figure 64) and 8% who had called for a repair (Figure 65). Around one-fifth (22%) of those who needed their HPWH serviced or repaired said it was challenging to find a technician who knew how to service or repair it, down from 26% in 2021.

HPWH Services. Most respondents who had HPWHs serviced only did so once (39%); 13% of purchasers had done so two or more times.⁶⁶ Figure 64 shows the likelihood of having the HPWH serviced varied by the installer, year it was purchased, and installation location. Individuals who used a professional installer were more likely to have had it serviced (8%) than DIY installers (3%). This difference is likely a combination of two factors: professional installers recommend regular service, and individuals who self-install may handle their own service. Not surprisingly, HPWHs purchased 2022–2023 were more likely to have been serviced (13%) than those purchased 2024–2025 (5%). Additionally, HPWHs in garages were more likely to have been serviced (11%) than those in finished basements (5%). This may be because garages can get too cold for HPWHs operating in heat pump mode. Over half (57%) of the 8% of purchasers who had HPWHs serviced had a warranty that covered all or part of the cost.

Figure 64: Had HPWH Serviced (n=449)



Q62 to Q65.

* Statistically different from professional Install at the 90% confidence level

** Statistically different from 2022-2023 at the 90% confidence level

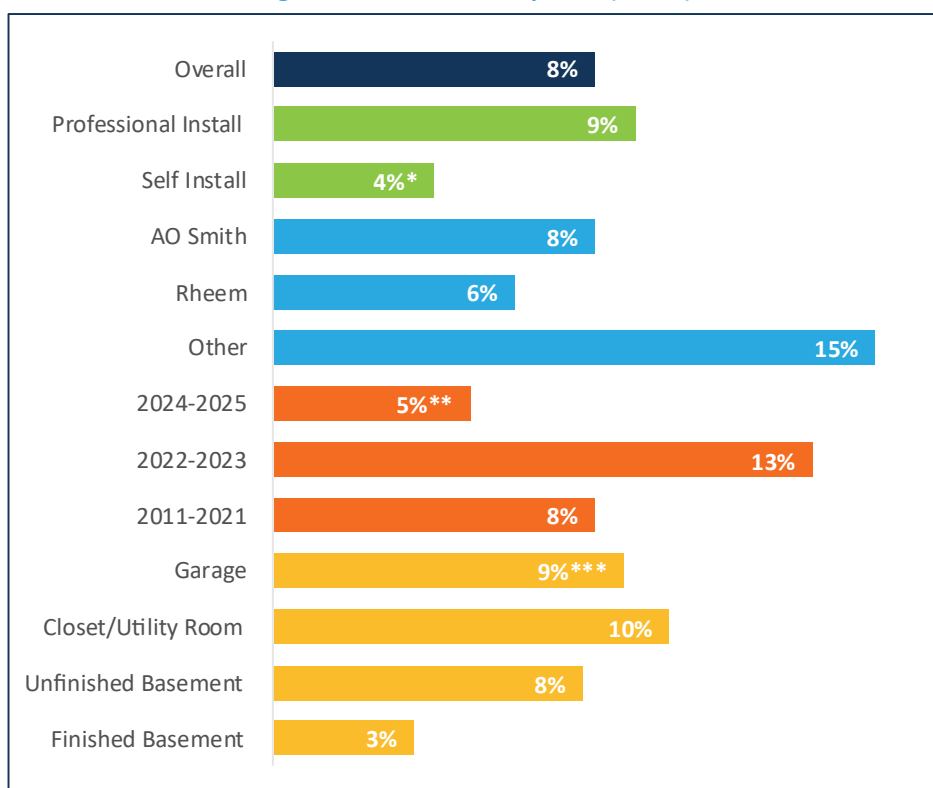
*** Statistically different from finished basement at the 90% confidence level

⁶⁶ All six were Rheem HPWHs that were purchased in 2016-2017 (3) or 2018-2019 (3).

HPWH Repairs. Overall, 8% of HPWH purchasers had contacted a professional to repair it. Most respondents who had their HPWH repaired had only done so once (43%); 13% had two or more repairs. The most common reason a repair was necessary was the control board or other electronic components malfunctioning (51%), followed by not getting enough hot water (19%), and sound/vibration (19%).

Figure 65 shows that individuals who hired a professional to install their HPWH were more likely to have had it repaired (9%) than those who self-installed (4%). Respondents who self-installed may also be capable of handling repairs on their own. Another plausible explanation may be that HPWH purchasers are taking advantage of a warranty or service contract offered by their installer or contractor. HPWHs purchased before 2022-2023 were more likely to have been repaired (13%) than those purchased 2024-2025 (5%). These repair trends could be due to the age of the HPWH or might reflect performance improvements in more recent HPWH models. HPWHs installed in garages were more likely to have been repaired than those installed in finished basements.

Figure 65: Had HPWH Repaired (n=449)



Q62 to Q65

* Statistically different from Professional Install at the 90% confidence level.

** Statistically different from 2022-2023 at the 90% confidence level.

*** Statistically different from finished basement at the 90% confidence level.

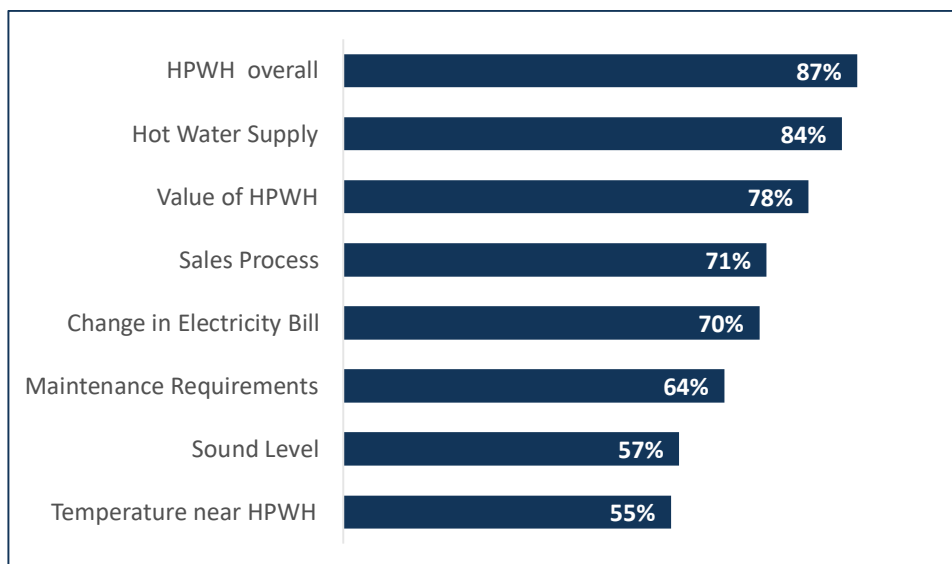
Nearly three-quarters (72%) of the 8% of purchasers who had their HPWHs repaired had a warranty that covered all or part of the cost. The most common timeframe for resolving the issue was 1 to 2 weeks (31%), followed by 3 to 7 days (22%). Fourteen percent of respondents said that the issue triggering the service or repair had not yet been resolved at the time of the survey.

SATISFACTION

Satisfaction with HPWH. Almost nine out of ten (87%) HPWH purchasers were satisfied with the HPWH overall (MPI 4a), as measured on a scale from 1 to 5, where 1 is “very dissatisfied” and 5 is “very satisfied.” Figure 66 shows the percentages of respondents who were “very satisfied” or “somewhat satisfied” with this and other aspects of their HPWH. Satisfaction with the value of the HPWH was higher among Rheem purchasers (85%) than those who purchased AO Smith (71%) water heaters.

Most respondents were satisfied with their hot water supply (84%), although satisfaction was lower among respondents who had a household size of 5 or more (73%) than those with household sizes of 1 to 2 (87%) and 3 to 4 (86%).⁶⁷ Between three- and four-fifths of respondents were satisfied with the value of the HPWH (78%), the sales process for buying their HPWH (71%), the change in their electricity bill after installing it (70%), and the maintenance requirements of the HPWH (64%). Aspects of the HPWH that respondents were least likely to be satisfied with were the sound level (57%) and temperature in the room where the HPWH was installed (55%).

Figure 66: Satisfaction with HPWH (n=449)

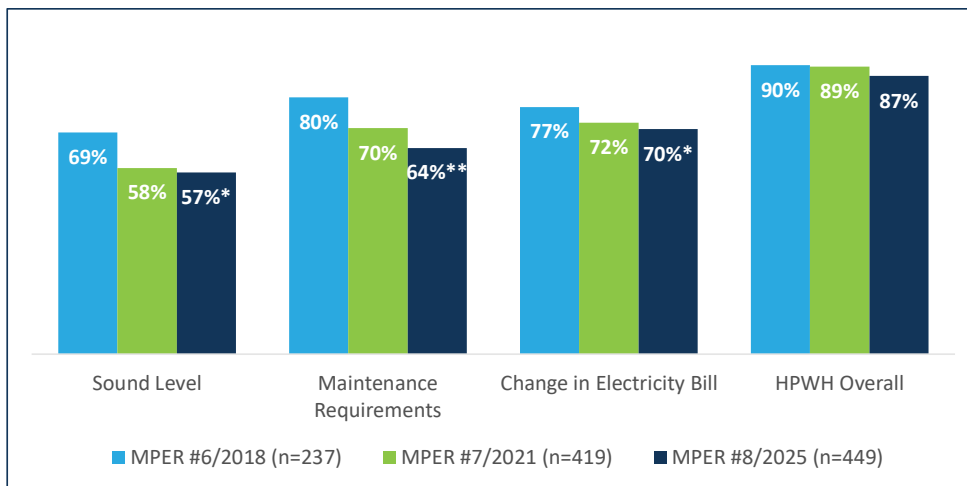


61. Since [IF_S_HPWH = 1 “purchasing”; S_HPWH = 2 “moving into the home with”] the heat pump water heater, how satisfied have you been with the following items on a 5-point scale, where 1 means “very dissatisfied” and 5 means “very satisfied.”

⁶⁷ Difference is statistically significant at the 90% confidence level.

Figure 67 displays aspects of HPWHs for which satisfaction has changed over time. While overall satisfaction has remained relatively steady, satisfaction with the sound level, maintenance requirements, and change in the electricity bill have declined slightly since past MPERs. While these changes are not dramatic, they are counterintuitive to the general expectation that manufacturers would improve their products over time. One possible explanation is that as HPWHs become more mainstream, purchasers have higher expectations for product performance.⁶⁸

Figure 67: Satisfaction with HPWH Over Time



Q61. Since purchasing or moving into the home with the heat pump water heater, how satisfied have you been with the following items on a 5-point scale, where 1 means “very dissatisfied” and 5 means “very satisfied.”

* Statistically different from 2018 at the 90% confidence level

** Statistically different from 2021 at the 90% confidence level

⁶⁸ MPER #6 assessed new technology adoption both for HPWH purchasers and homeowners with electric water heaters. However, past MPERs assessed new technology adoption only for the homeowner survey; therefore, assessing new technology adoption among HPWH purchasers over time is not possible.

Table 28 shows that satisfaction with most aspects of HPWHs varied by the year in which HPWHs were purchased.⁶⁹ Respondents who purchased HPWHs in 2024 or 2025 were more likely or just as likely to be satisfied with the sound level and hot water supply than those who purchased HPWHs before 2023. In contrast, respondents who purchased their HPWHs in 2024 or 2025 were less likely to be satisfied with the value of the HPWH, maintenance requirements, change in electricity bill, and temperature in the room where the HPWH was installed. This trend is a continuation of previous MPER findings. A possible explanation for these trends could be higher customer expectations as the HPWH technology becomes more mainstream.

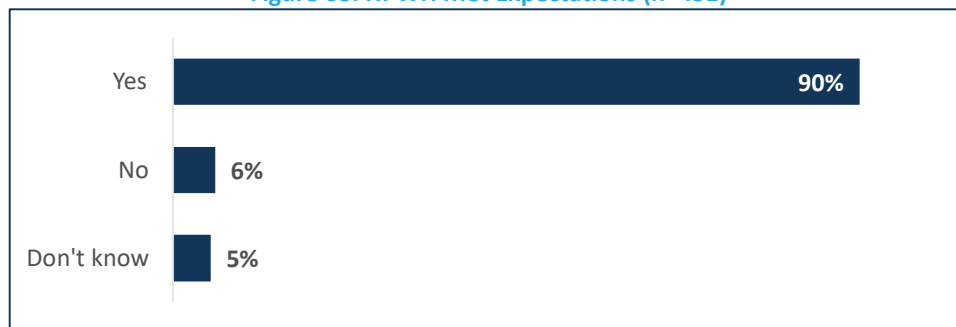
Table 28: Satisfaction with HPWH by Year Purchased

Satisfaction with Element of HPWH	2011-2021	2022-2023	2024-2025
<i>n</i>	51	149	225
The HPWH overall	94%	86%	85%
The hot water supply	84%	84%	84%
The value of the HPWH	88%	81%	74%
The sales process	69%	76%	68%
The change in your electricity bill	82%	76%	65%
Maintenance requirements	75%	69%	57%
Sound level	65%	52%	57%
Temperature near the HPWH	67%	56%	52%

Q61. Since purchasing or moving into the home with the heat pump water heater, how satisfied have you been with the following items on a 5-point scale, where 1 means “very dissatisfied” and 5 means “very satisfied.” How about ...?

Nine out of ten HPWH purchasers said the HPWH met their expectations (Figure 68), an equal proportion as in 2021 (MPER #6). Among the 6% who said the HPWH fell short of their expectations, the most common complaints were that the HPWH did not provide enough hot water (28%) and that it was too loud (24%).

Figure 68: HPWH Met Expectations (n=451)



Q78. Overall, has the heat pump water heater met your expectations?

⁶⁹ Differences between 2016-2017 and 2020-2021 for aspects listed in Table 28 statistically significant at 90% confidence level.

Would Recommend an HPWH. Figure 69 shows that most HPWH purchasers (60%) rated their likelihood to recommend a HPWH to a friend, colleague, or family member a 9 or 10 on a scale from 0 to 10, making them “promoters.” Only 14% rated their likelihood to recommend the HPWH a 6 or lower (“detractors”), for an overall net promoter score of 46% (MPI 4b).

Figure 69: Would Recommend HPWH (Net Promoter Score, n=451)

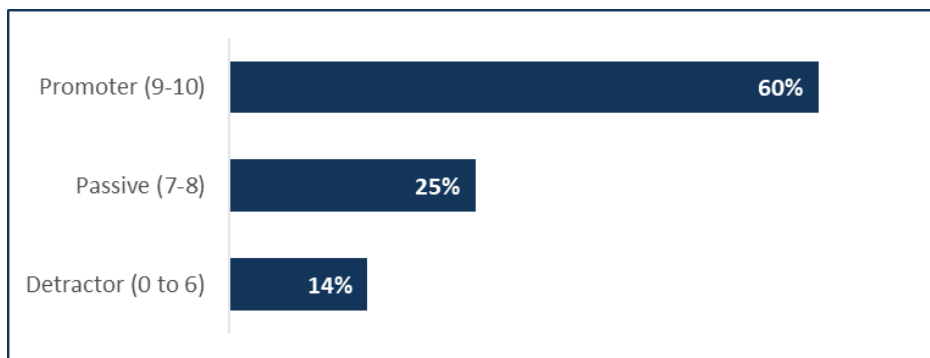


Figure does not sum to 100% due to rounding.

Q80. How likely are you to recommend heat pump water heaters to a friend or colleague?

Please use a score of 0 to 10 where 0 is “not at all likely” and 10 is “extremely likely.”

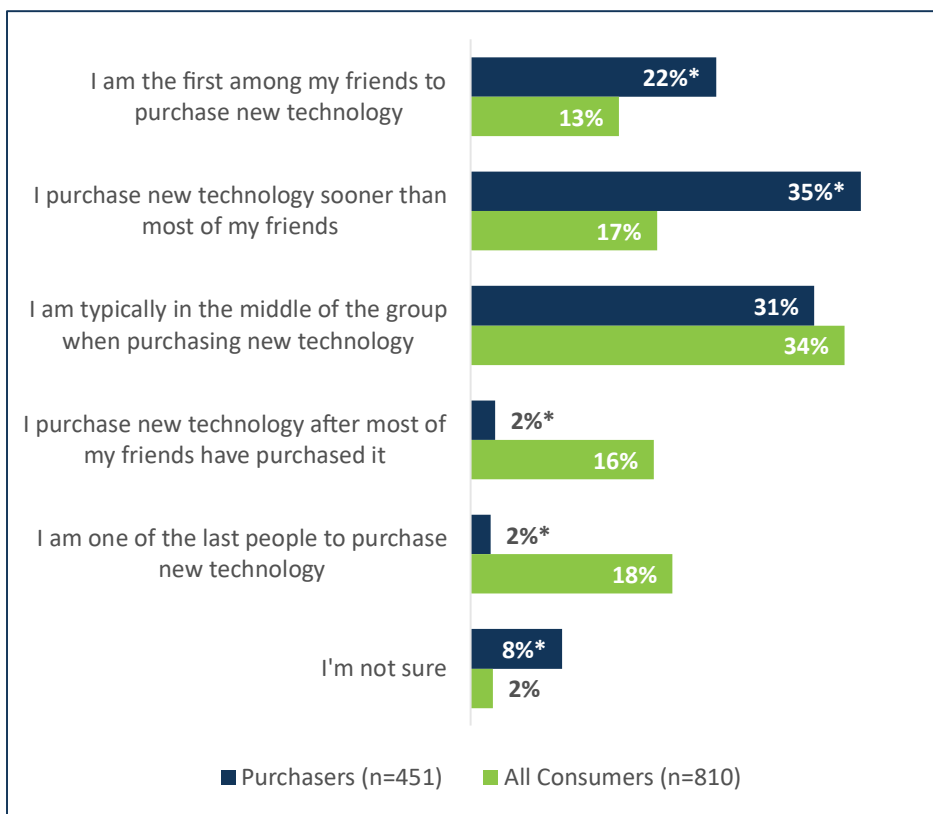
Impact on heating bills. Overall, over three-quarters (76%) of HPWH purchasers heated with electricity, 19% heated with gas or propane, and 3% heated with other fuels.⁷⁰ One-fifth (20%) of HPWH purchasers had noticed a change in their home heating costs since installing their HPWH, only 7% of whom said their heating bill had increased since installing the HPWH.

⁷⁰ Others include wood and fuel oil. Two percent of respondents did not know their heating fuel.

ATTITUDES ABOUT TECHNOLOGY AND THE ENVIRONMENT

Adopting new technology. The evaluation team gauged HPWH purchasers’ and the consumer survey respondents’ tendency to accept new technology by reading a series of five statements and asking respondents to pick the one that best described them. As Figure 70 shows, HPWH purchasers tend to be early adopters of new technology in general, and more so than the respondents to the consumer survey. Higher proportions of HPWH purchasers than respondents to the consumer survey said they were the first among their friends to purchase new technology (22%) or purchased new technology sooner than most of their friends (35%), compared to all consumers (13% and 17%, respectively).

Figure 70: New Technology Adoption with Comparison to All Consumers

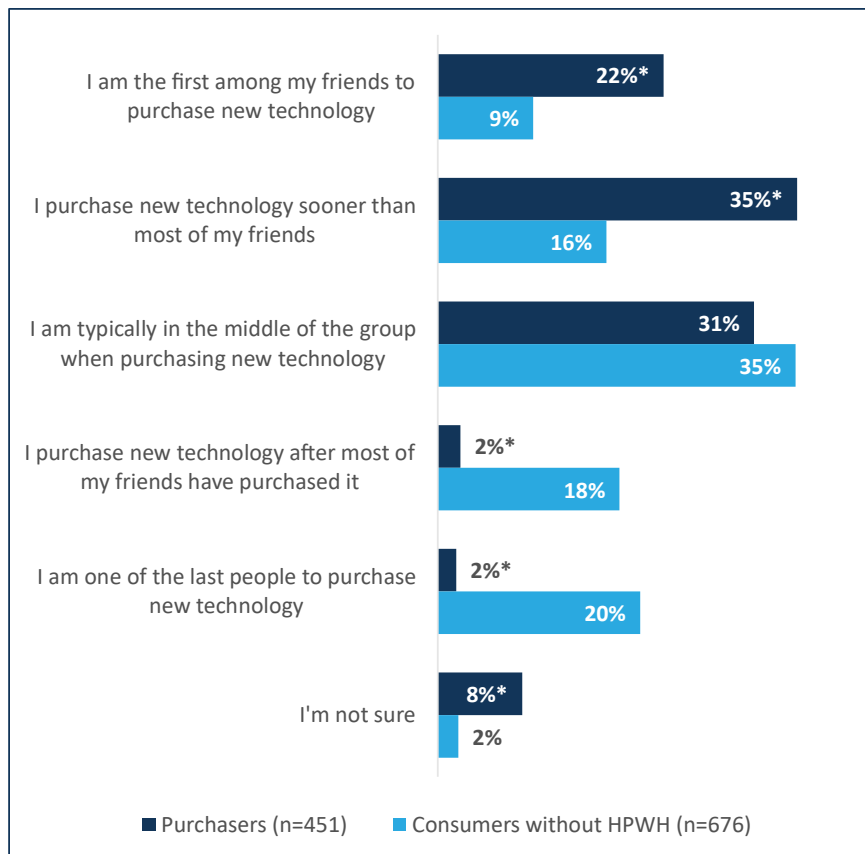


Q81. Which of the following statements best describes you?

* Statistically different from All Consumers at the 90% confidence level.

Thirteen percent of respondents in the 2025 consumer survey self-reported that they own a HPWH. [Figure 71](#) compares HPWH purchasers' tendency to accept new technology to the 2025 consumer survey respondents who did not claim to own a HPWH. After removing the consumer survey respondents who said they owned a HPWH, the percentage who said they were the first among their friends to purchase new technology declined from 13% to 9%, further underscoring the tendency of HPWH purchasers to be early adopters of new technology in general.

Figure 71: New Technology Adoption with Comparison to Consumers Who Do Not Own a HPWH

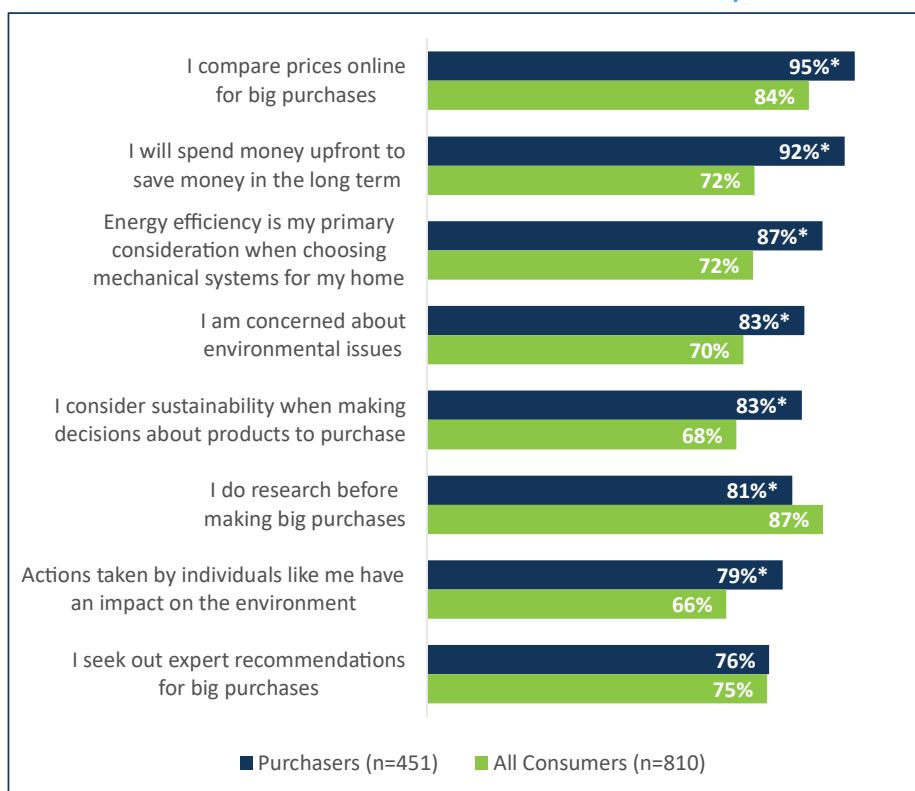


Q81. Which of the following statements best describes you?

* Statistically different from Consumers without HPWH at the 90% confidence level.

Attitudes about making major purchases and the environment. Figure 72 compares HPWH purchasers' attitudes (purchaser survey) about making major purchases and the environment to those of all consumers (consumer survey). Almost all HPWH purchasers said they compare prices online for big purchases (95%) and will spend money upfront to save money in the long term (92%). HPWH purchasers were more likely than homeowners with electric water heaters to agree with all of these statements, with the exception of seeking out expert recommendations for big purchases. Most notably, HPWH purchasers were more likely than the homeowners to spend money upfront to save over the long term (92% compared to 72%), prioritize energy efficiency when choosing mechanical systems for the home (87% compared to 72%), and consider sustainability when making purchase decisions (83% compared to 68%).

Figure 72: Purchase Process and Environmental Considerations with Comparison to All Consumers

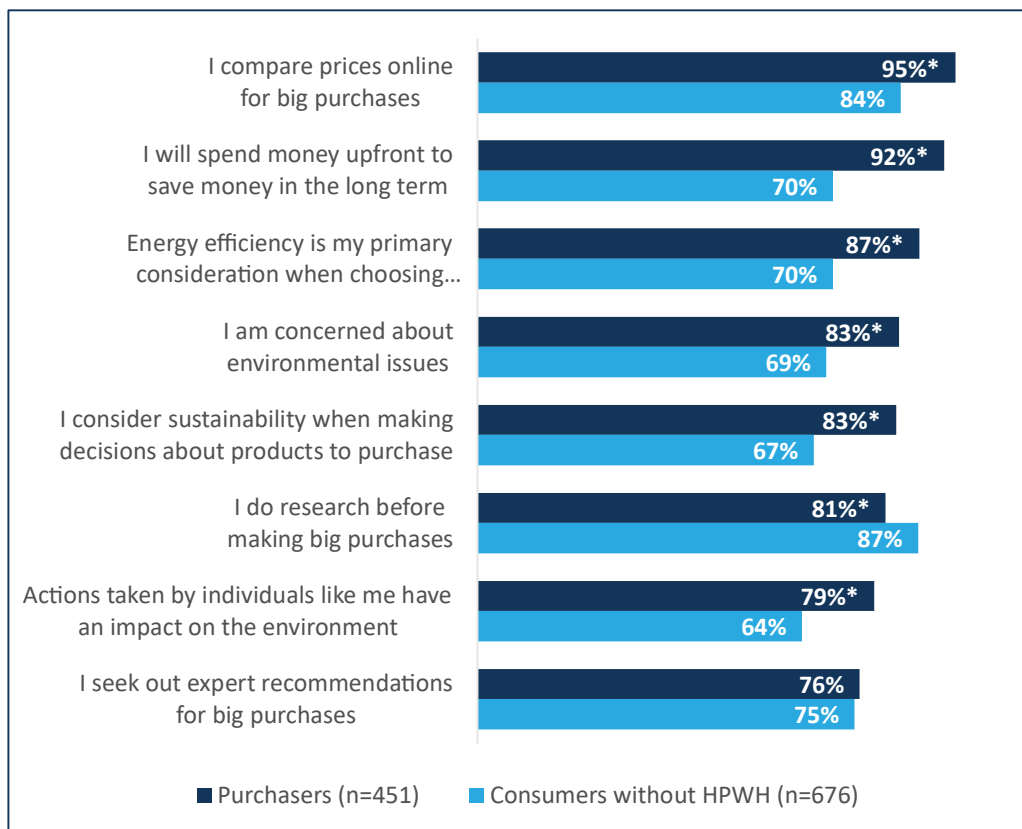


Q82. Please assess how much you agree or disagree with the following statements.

* Statistically different from All Consumers at the 90% confidence level.

Figure 73 compares HPWH purchasers' attitudes about making major purchases and the environment to the 2025 consumer survey respondents who did not claim to own a HPWH.

Figure 73: Purchase Process and Environmental Considerations with Comparison to Consumers Who Do Not Own a HPWH



Q82. Please assess how much you agree or disagree with the following statements.

* Statistically different Consumers without HPWH at the 90% confidence level.

DEMOGRAPHIC CHARACTERISTICS

This section presents demographic characteristics of the HPWH purchaser survey respondents. Most respondents were white (78%), non-Hispanic (88%), and homeowners (97%). Close to three-quarters (74%) of respondents had a college degree.

Table 29: Demographic Characteristics of Respondents

Characteristic	Total	Urban	Rural
<i>n</i>	451	419	32
White	78%	77%	91%*
Non-Hispanic	88%	88%	91%
Own Home	97%	97%	97%
College Graduate	74%	74%	63%

* Statistically different from Urban at the 90% confidence level

Over one-half (51%) of respondents lived in households of only one or two. The average household size among respondents was 2.8.

Table 30: Household Size

Household Size	Total	Urban	Rural
<i>N</i>	451	419	32
1 to 2	51%	51%	53%
3 to 4	29%	29%	25%
5 or more	11%	10%	19%
Don't know/Rather not say	9%	10%	3%
Average	2.8	2.8	3.0

Over one-half (62%) of respondents' household income was more than \$80,000. Respondents residing in urban areas were more likely to have household incomes less than \$40,000 per year and less likely to have incomes \$80,001 to \$120,000 per year than those residing in rural areas.

Table 31: Household Income

Household Income	Total	Urban	Rural
<i>n</i>	451	419	32
Less than \$40,000	5%	5%	0%*
\$40,001 to \$80,000	11%	11%	13%
\$80,001 to \$120,000	23%	22%	38%*
Over \$120,000	39%	40%	28%
Don't know/Rather not say	22%	22%	22%

* Statistically different from Urban at the 90% confidence level

The majority of respondents (92%) lived in single-family, detached homes.

Table 32: Type of Home

Type of Home	Total	Urban	Rural
<i>n</i>	451	419	32
Single-family detached	92%	91%	94%
Manufactured/mobile home	3%	3%	3%
Townhouse/rowhouse	3%	3%	0%*
Apartment in building with 2 to 4 units	1%	1%	0%*

* Statistically different from Urban at the 90% confidence level

Over two-fifths (59%) of respondents' homes were built during or after 1980. Close to one-quarter (23%) were built between 2000 and 2021. Rural respondents were slightly more likely to reside in homes built before 1960 (28%) than urban respondents (24%).

Table 33: Year Home Built

Year Home Built	Total	Urban	Rural
<i>n</i>	451	419	32
2010 to present	11%	11%	9%
2000 - 2009	12%	12%	13%
1990 - 1999	10%	10%	13%
1980 - 1989	11%	11%	19%
1970 - 1979	15%	15%	13%
1960 - 1969	6%	6%	0%*
Prior to 1960	24%	24%	28%
Don't know/Rather not say	11%	11%	6%

* Statistically different from Urban at the 90% confidence level

DETAILED RESULTS

See [Appendix H](#) for tables with detailed results.

Appendix D Consumer Survey

NMR conducted a survey of 810 residents in the Northwest to measure consumer awareness of HPWHs and gather information on the factors that affect water heater purchase decisions. This appendix describes the detailed methodology and findings from that effort.

Survey topics included the following:

- Awareness (MPI 9), interest, and perceptions of HPWHs, including customer satisfaction (MPI 4a and 4b)
- Common reasons for purchasing water heaters
- Attitudes about technology and the environment
- Household characteristics and demographics

METHODOLOGY

NMR conducted a consumer awareness survey in August and September 2025. The survey was fielded by Qualtrics to market research panelists of homeowners and renters of single- and multifamily homes in Washington, Oregon, Idaho, and Montana. Respondents with any type of water heater were eligible to complete the MPER #7 and MPER #8 surveys.⁷¹ The team classified counties as rural or urban based on the 2013 Rural-Urban Continuum Codes.⁷² In MPER #7, the team restricted the respondent pool to residents who live in ZIP codes targeted by the “Boring but Efficient” marketing campaign launched in September and October of 2022. The MPER #8 survey set quotas by state and region but did not restrict respondents to a particular geography within these areas, but this likely had limited impact, as the ZIP codes in MPER #7 covered the overwhelming majority of the Northwest.

⁷¹ MPER #1 and MPER #2 included homeowners and renters of single- and multi-family homes with electric storage water heaters. MPER #6 included only homeowners of single-family homes with electric storage water heaters, to narrow the respondent pool to those who are more likely to be in the position to purchase an electric or heat pump water heater.

⁷² U.S. Department of Agriculture Economic Research Service. *Rural-Urban Continuum Codes*. December 10, 2020. <https://www.ers.usda.gov/data-products/rural-urban-continuum-codes.aspx>.

To ensure survey respondents were located in the area (state and urban/rural designation) they reported on the survey, the team screened out any respondents whose IP address or self-reported zip code showed them located in the wrong state or region. [Table 34](#) shows target completes and survey results by region.

Table 34: Survey Disposition

State	Strata	Target	Responses Achieved
Washington	Urban	320	329
	Rural	60	59
Oregon	Urban	160	161
	Rural	60	61
Idaho	Urban	60	61
	Rural	60	60
Montana	Urban	20	19
	Rural	60	60
Total		800	810

[Table 35](#) show the weights applied to the survey results to represent the population of household types in urban and rural counties in each state. This approach is consistent with past consumer survey weighting schemes.⁷³

Table 35: Consumer Survey Weights

Household Type	Washington		Oregon		Idaho		Montana	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
<i>Owner-occupied</i>								
1 occupant, SF home ¹	1.855	0.809	0.910	0.955	3.046	0.525	0.815	
2 occupants, SF home	1.834	0.743	1.385	0.537	1.677	0.555	1.476	0.607
3+ occupants, SF home	0.623	0.648	0.925	0.767	0.569	0.420	0.561	0.461
Any size household, 2+ units	0.682		1.311		0.263		1.743	
<i>Renter-occupied</i>								
1-unit detached	1.780	0.738	1.713	0.558	1.362	0.648	1.743	
All other types	1.424	0.552	1.308	0.684	2.114	0.509	1.1971	

¹A "SF home" refers to a single family attached/detached home.

Source: Census data from 2023 ACS Survey 5-year estimates (Table B25124)

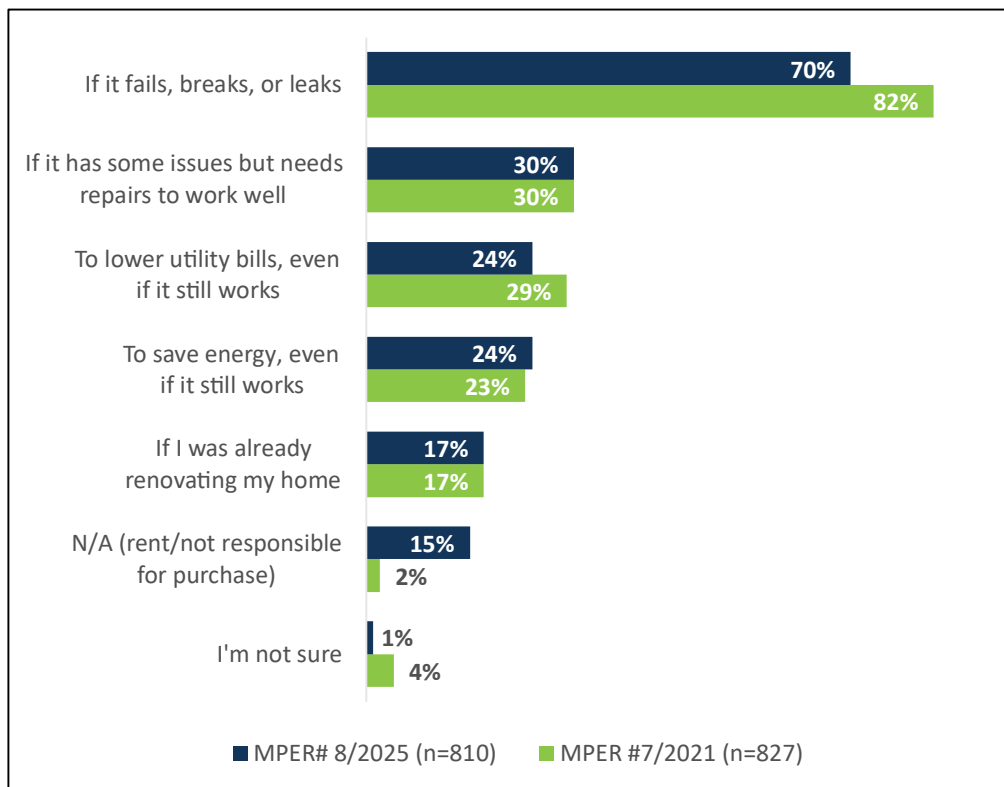
⁷³ The MPER #7 consumer survey was split into pre- and post-campaign surveys while the MPER #8 survey was fielded all at once. Due to the larger sample size, the team was also able to weight by household size for additional accuracy.

WATER HEATER PURCHASE FACTORS

Consumers replace water heaters when they fail, and one-fifth of water heaters are close to failure.

Figure 74 displays the reasons respondents selected for what would cause them to purchase a new water heater. The most common reason, cited by close to three-fourths (70%) of respondents, was if the current water heater failed, broke, or leaked. This is consistent with MPER #7 where over four-fifths (82%) of respondents selected that reason for why they would be induced to purchase a new water heater. Close to one-third (30%) of respondents reported that they would purchase a new water heater if their current water heater had some issues that needed repairs to work well. Around one-quarter of respondents indicated they would purchase a new water heater to lower utility bills (24%) or to save energy (24%), even if their current water heater still worked. Overall, these results are similar to MPER #7.

Figure 74: Why Respondents Would Purchase a New Water Heater

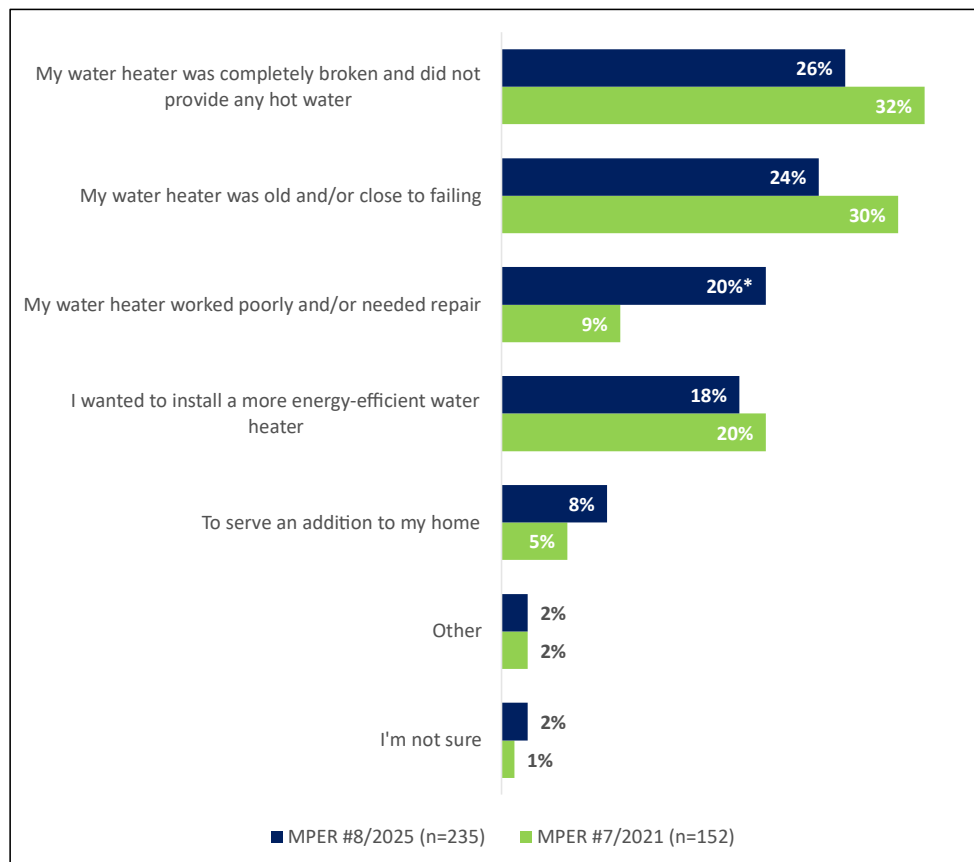


Multiple responses permitted.

A15. What would cause you to purchase a new water heater (of any type)?

One in four consumers is amenable to replacing a working water heater to save energy. Around one-quarter (24%) of respondents reported having purchased a new water heater in the past three years (n=810). Figure 75 displays the reasons respondents gave for purchasing a new water heater. The most common reason was because their water heater broke (26%), which coincides with the most common reason from MPER7 (32%). However, close to one-fifth (18%) of respondents said they wanted to install a more energy-efficient water heater, echoing the 24% of respondents in Figure 74 who said they would replace a working water heater to save money or energy. These results are mostly consistent with past MPERs, with MPER8 seeing an increase in water heaters working poorly and/or needing repair as a given reason for purchasing a new water heater (20% vs. 9%).

Figure 75: Reasons for Purchasing a New Water Heater



A15. What would cause you to purchase a new water heater (of any type)?

*Statistically different from MPER7 at the 90% confidence level

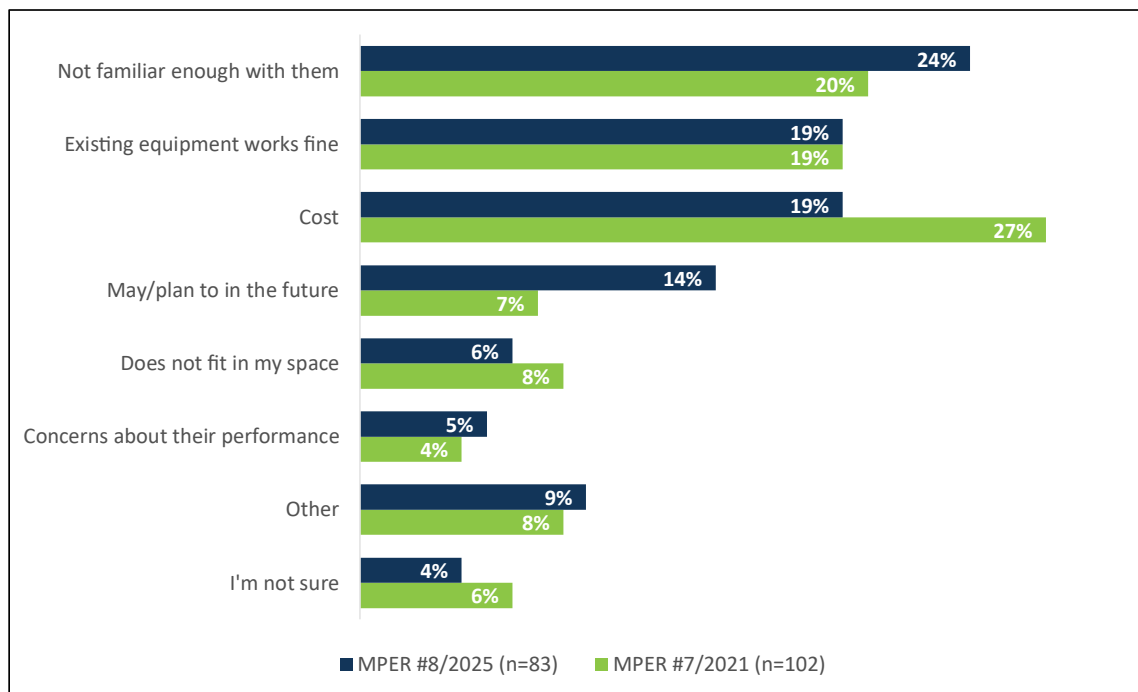
Inexperienced consumers who install their own water heaters want to save money and are confident in their ability to figure it out. Around two-fifths (42%) of respondents who purchased a water heater in the past three years said they (or a household member) installed it, compared to 57% who said they hired a professional to install it.⁷⁴ Three-fifths (60%) of respondents who installed their own water heater (n=98) claimed to have professional experience installing water heaters or other mechanical

⁷⁴ Percentages do not sum to 100% because one respondent did not know who installed their water heater.

equipment (e.g., plumber, contractor, or handyman). The two-fifths (40%) of respondents who did *not* have professional experience installing water heaters or other mechanical equipment gave the following reasons for installing their own water heater: to save money (42%), confidence in their ability to figure out how install it (40%), the perception that it would be easy to install (10%), and simply enjoying DIY projects (7%).⁷⁵

Lack of familiarity is the largest barrier to HPWH adoption. Over one-half (56%) of respondents who purchased a water heater in the past three years said they had considered installing a HPWH, and one-third (33%) of respondents who recently purchased a water heater purchased a HPWH. Those who had never considered installing a HPWH (including both those who had and had not recently purchased a water heater, n=83) provided the reasons in Figure 76. The top reasons for not considering a HPWH were lack of familiarity (24%), followed by the existing equipment working fine (19%), and cost (19%) – the former two being strong indications of consumers being comfortable with the types of systems to which they are accustomed. This ordering differs from the MPER7 results in which upfront cost was the largest barrier to adoption (27%) followed by lack of familiarity (20%); however, the differences between MPER #7 and MPER #8 reasons were not statistically significant.

Figure 76: Reasons for Not Considering a HPWH



A17. What is the primary reason you did/would not consider installing an electric hybrid heat pump water heater?

⁷⁵ Percentages do not sum to 100% because (1) multiple responses were permitted and (2) 14% of respondents did not know why they chose to self-install.

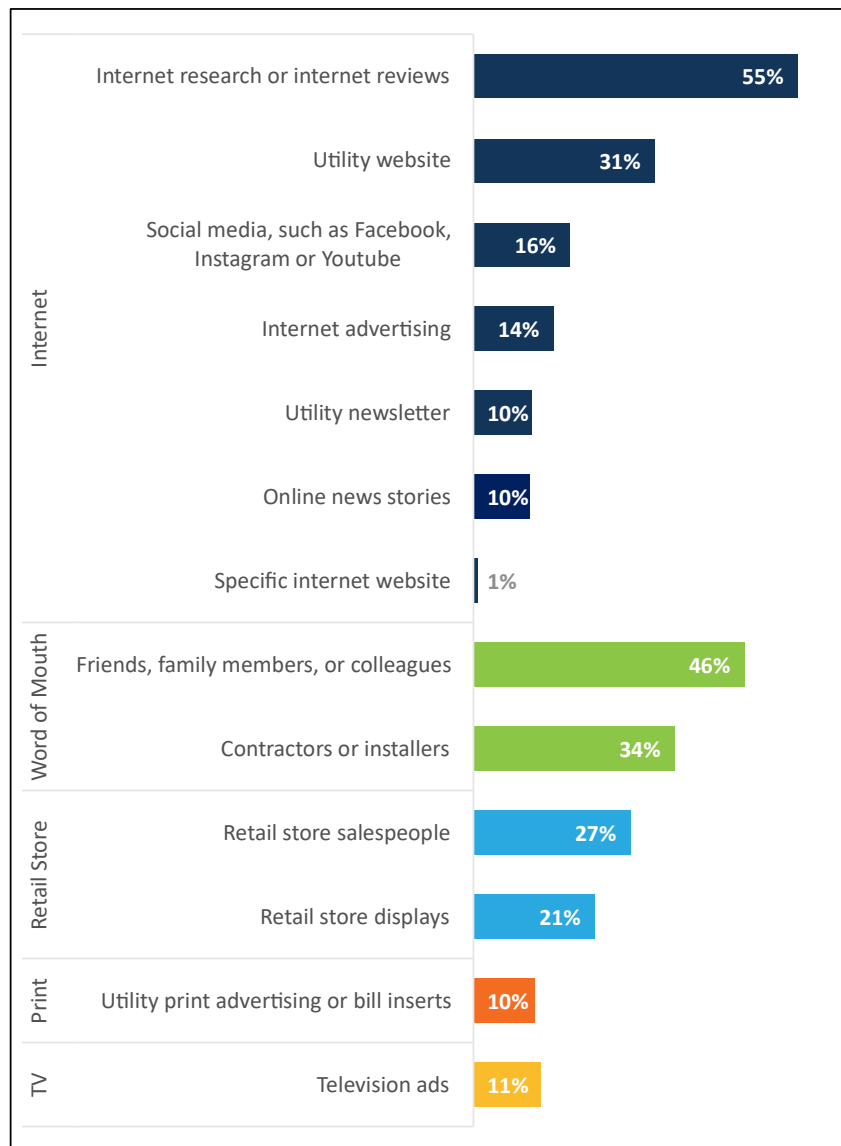
Contractors are recommending HPWHs to customers. Around one-quarter (24%) of respondents reported having purchased a new water heater in the past three years (n=810). The survey asked respondents who recently purchased a water heater and who were aware of HPWHs if their installer or contractor had recommended a HPWH to them. Over two-thirds of these respondents who had their recently purchased water heater professionally installed (n=100) said their installer or contractor had recommended a HPWH.⁷⁶ The HPWH recommendation rate is higher than observed in MPER #7, where 51% of recent water heater purchasers said their installer or contractor recommended a HPWH. DIY installers may not have consulted a contractor. Close to one-third of the respondents in the MPER #8 survey reported installing their water heater themselves.⁷⁷

Internet research and word of mouth are primary sources of information for major purchases. Figure 77 displays sources of information respondents consult when making decisions about purchasing mechanical equipment for the home, including water heaters. The top three sources were internet research or reviews (55%), friends, family members, or colleagues (46%), and contractors or installers (34%). Two-thirds (66%) of respondents who purchased a water heater in the past three years said their contractor recommended a HPWH (n=175).

⁷⁶ A statistically similar percentage of respondents who ultimately DIY-ed their installation (n=72, 66%) said their installer or contractor recommended a HPWH. It's not clear whether they received quotes and then later decided to DIY or answered this question in the affirmative without having spoken to a professional installer.

⁷⁷ The question about whether the recently purchased water heater was self-installed or installed by a professional contractor or installer was not asked in the MPER #6 consumer survey or the MPER #7 pre-campaign survey.

Figure 77: Sources of Information for Purchasing Mechanical Equipment (n=810)

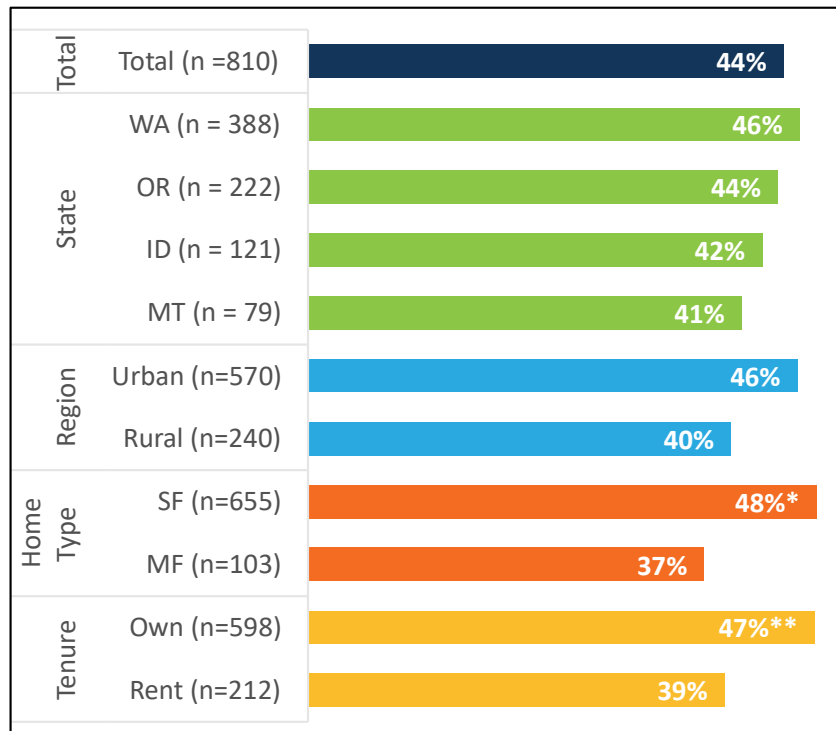


A10. When making a decision about purchasing mechanical equipment for your home, such as a furnace or water heater, what are your typical sources of information regarding which product to purchase? Please select all that apply. Specific internet websites included AI (e.g. Chat GPT), Home Depot, Lowes, Consumer Reports, Amazon, and Costco.

AWARENESS AND PERCEPTIONS OF HPWHs

Around two-fifths of respondents were aware of HPWHs. Forty-four percent of respondents were aware of HPWHs, up from 39% after the MPER #7 awareness campaign (a statistically significant difference). Awareness did not vary by state or region. However, single-family dwellers (48%) and homeowners (47%) were more likely to be aware of HPWHs than multifamily dwellers (37%) and renters (39%), respectively (Figure 78).

Figure 78: HPWH Awareness



*Statistically different from MF at the 90% confidence level

** Statistically different from Rent at the 90% confidence level

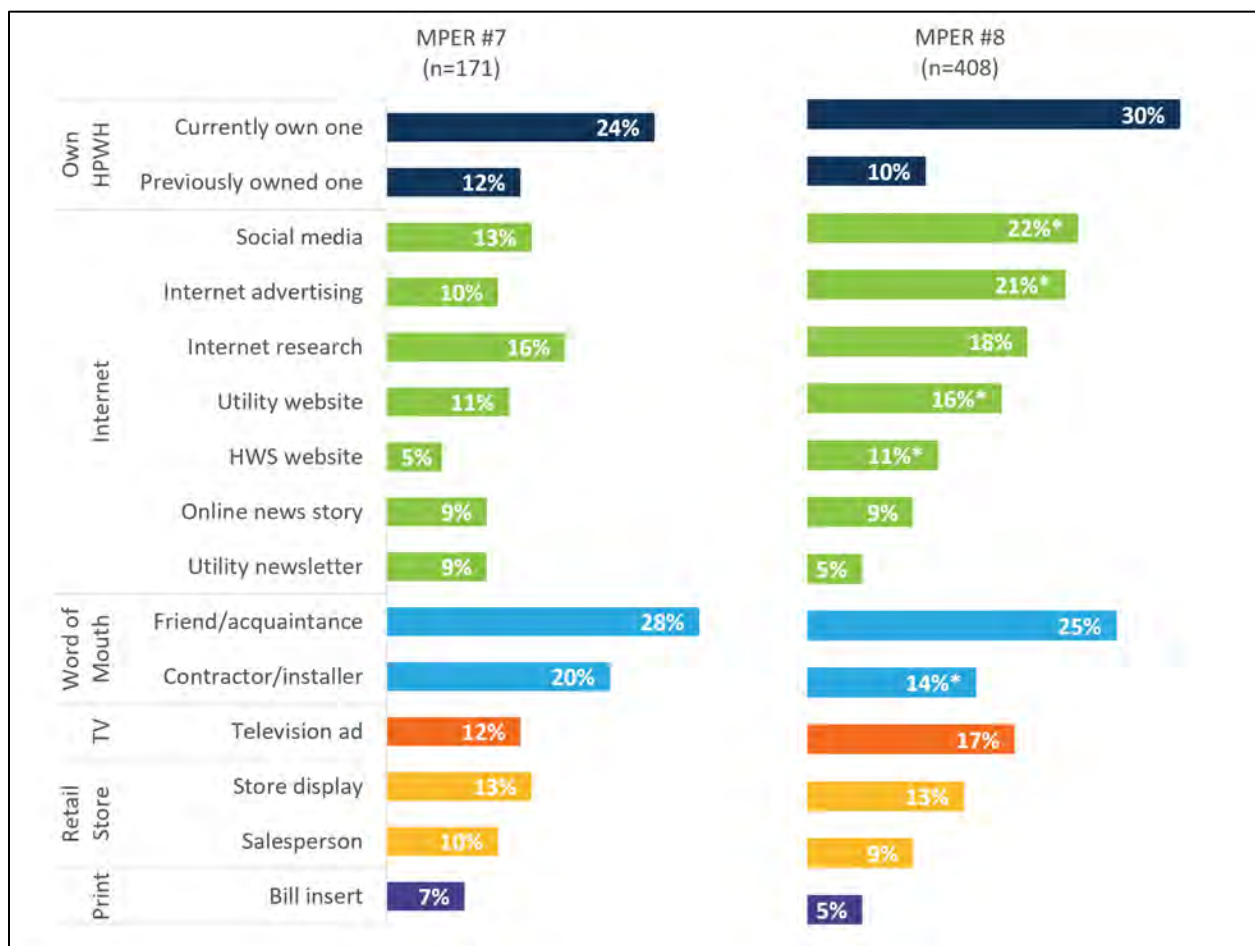
A2. [HPWH description shown] Based on this description, have you heard of “heat pump water heaters” or “electric hybrid water heaters”?

HPWH awareness among rural residents (40%) is statistically similar to urban residents (46%). In 2022, NEEA conducted an educational campaign (“Boring but Efficient”) on social media. MPER #7 measured awareness in targeted areas in a pre- and post-campaign survey and found that awareness in targeted zip codes in the rural region increased from 29% to 46%. The MPER #8 consumer survey indicates that HPWH awareness is not lagging in rural areas, but other barriers could explain the difference in HPWH adoption rates in urban and rural areas.

Word of mouth and online sources are primary drivers of HPWH awareness. Figure 79 shows that the top ways respondents heard of HPWHs were currently owning one, friends/acquaintances, and social media. This differs slightly from the MPER #7 results in which the top ways respondents heard of HPWHs were through friends/acquaintances, currently owning one, and internet research. Social media and internet advertising saw the greatest increase as sources of HPWH awareness (13% to 22% and 10% to 21%).

Overall, 13% of MPER #8 consumer survey respondents reported owning a HPWH (30% of respondents aware of HPWHs). As the 2022 RBSA estimates that 3% of homes have a HPWH, it is possible that even after weighting results, the survey oversampled HPWH owners. However, the team notes that survey respondents typically have difficulty correctly identifying the type of water heater they have, even with the guidance of instructions and photos in the survey. However, the team was unable to collect photo verification of the water heater type for the 810 consumer respondents, so these HPWH owners are referred to as “self-reported” throughout, compared to the “verified” purchasers from the HPWH purchaser survey who are known program participants that received a HPWH.

Figure 79: Sources of HPWH Awareness

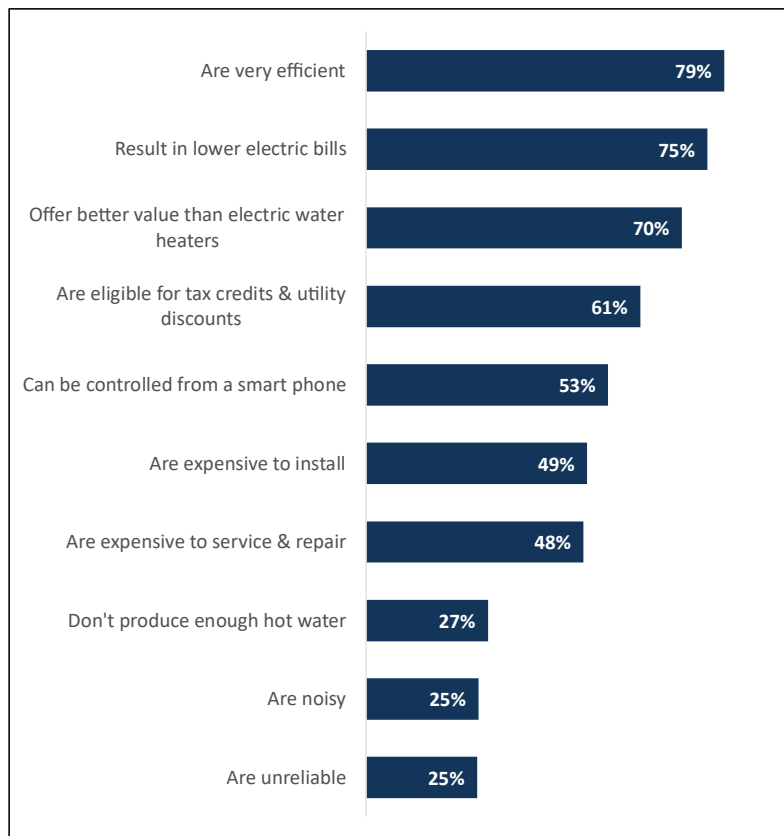


A10. Where or how have you heard about heat pump water heaters? Please select all that apply.

*Statistically different from MPER #7 at the 90% confidence level.

Consumers understand that HPWHs are efficient and result in lower electric bills. Figure 80 displays the percentage of respondents who agreed with various statements about HPWHs. Close to four-fifths of respondents (79%) agreed that HPWHs are very efficient, while three-quarters (75%) agreed that they result in lower electric bills. Only one-quarter (25%) of respondents agreed with the statements that HPWHs are noisy and unreliable.

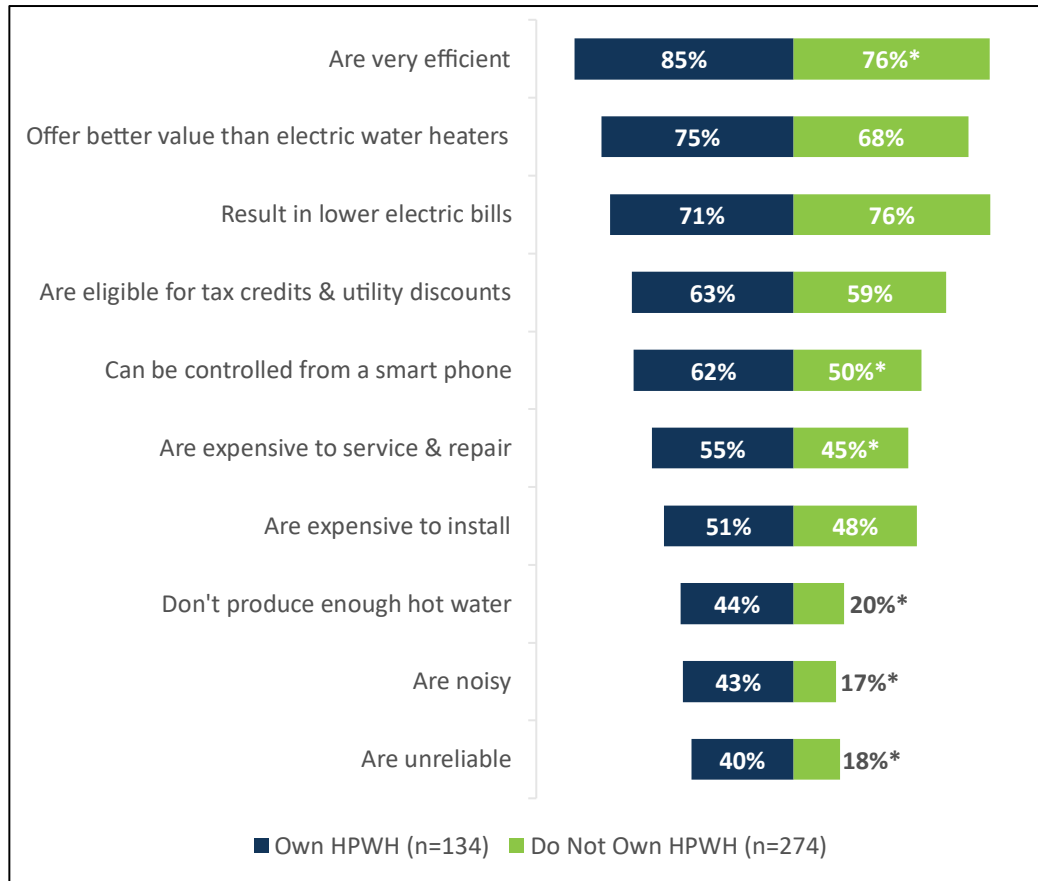
Figure 80: Perceptions of HPWHs (n=408)



Notes: Respondents who were aware of HPWH (A2) responded to this question. A9. Please assess how much you agree or disagree with the following statements.

HPWH owners have less favorable perceptions of HPWHs than consumers who are aware of, but do not currently own, a HPWH. Figure 81 shows that consumers who own HPWHs were more likely than non-owners to agree that HPWHs are expensive to service and repair (55% vs. 45%), don't produce enough water (44% vs. 20%), are noisy (43% vs. 17%), and are unreliable (40% vs. 18%). HPWH owners were also more likely to agree that HPWHs are very efficient (85% vs. 76%) and can be controlled from a smart phone (62% vs. 50%).

Figure 81: Perceptions by HPWH Ownership



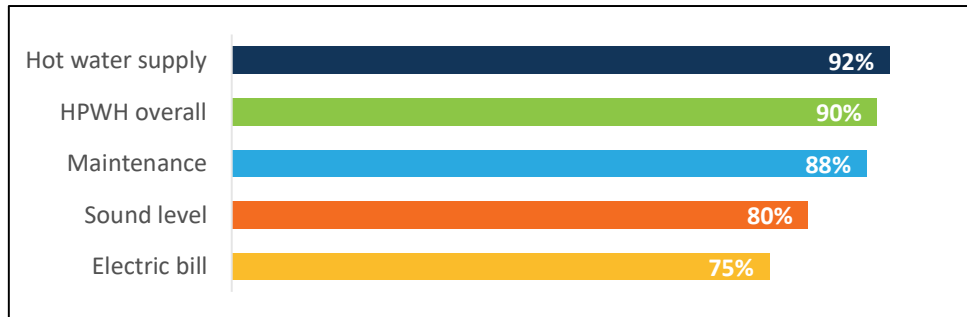
*Significantly different from HPWH Owners at the 90% confidence level.

Notes: Respondents who were aware of HPWH (A2) responded to this question.

A9. Please assess how much you agree or disagree with the following statements.

HPWH owners are highly satisfied. Nine out of ten (90%) respondents that owned an HPWH were satisfied with it overall (MPI 4a, [Figure 82](#)). Most HPWH owners were satisfied with their hot water supply (92%) and the HPWH maintenance requirements (88%). Four-fifths of HPWH owners were satisfied with the sound level of the HPWH (80%), and three-quarters with the change in their electric bill since installing the HPWH (75%). Over nine out of ten (95%) HPWH owners have or would recommend a HPWH to a friend, colleague, or family member (MPI 4b).

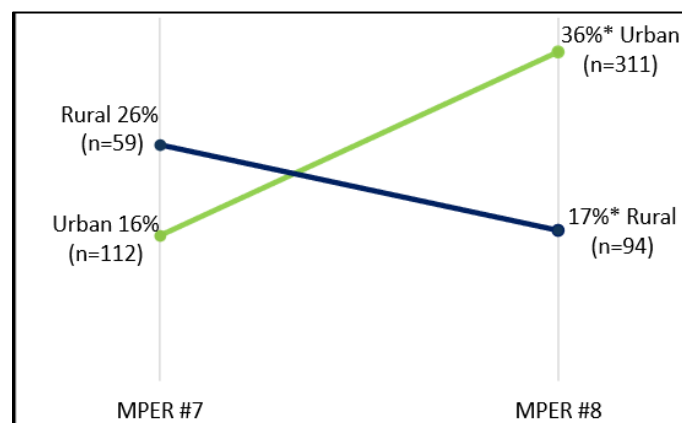
Figure 82: Satisfaction with HPWH (n=134)



Notes: Respondents who currently use or own a HPWH (A4) responded to this question. A6. Please rate your satisfaction with the following aspects of your heat pump water heater.

One-third of respondents were aware of the cooling effect of HPWHs. One-third (33%) of respondents were aware were aware that HPWHs cool the air around the water heater, up from one-fifth (19%) of respondents in MPER #7. ⁷⁸ As [Figure 83](#) shows, awareness of HPWH’s cooling effect rose among urban respondents (to 36%) but declined among rural respondents (to 17%). MPER #8 marked the first time consumers were asked if they had heard that HPWHs dehumidify the air around the water heater. Over one-quarter (29%) of respondents were aware of the dehumidification effect of HPWHs, including 32% of urban dwellers and 12% of rural dwellers.

Figure 83: Awareness of HPWH Cooling Effect



Q37. Have you heard anyone say that heat pump water heaters cool the air around the water heater?

⁷⁸ Difference is statistically significant at the 90% confidence level.

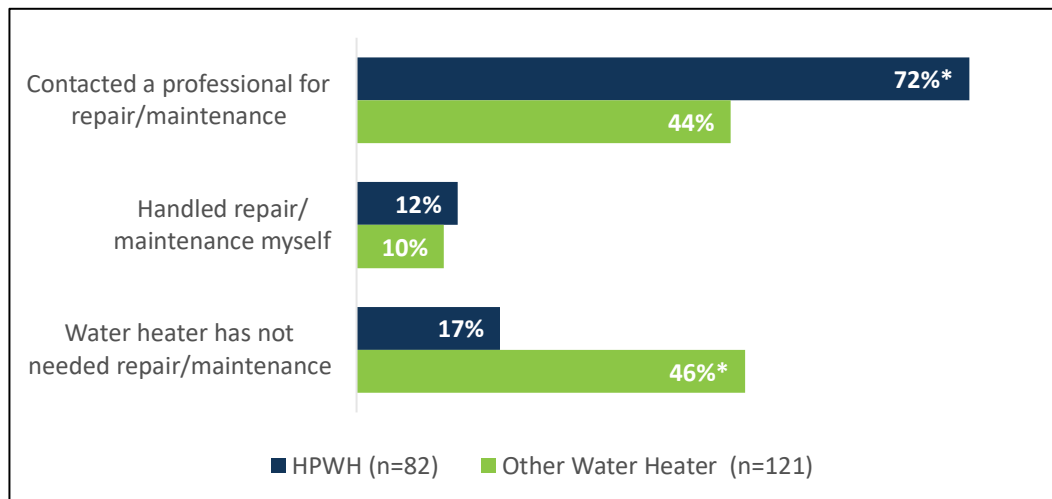
SERVICE AND REPAIR

HPWH Services. Overall, around two-fifths (38%) of single-family homeowners (n=596) had contacted a professional for repair or maintenance. Among the subset of single-family homeowners who purchased a water heater in the past three years (n=202), nearly one-half (54%) had contacted a professional for service or repair. On average, respondents had placed 1.7 calls for maintenance, 1.2 calls for repairs, and 1.3 calls for both maintenance and repair in the same visit. Almost half (47%) of all issues were resolved in one day or less, while most others (38%) were resolved in one to two days.

Respondents who purchased a HPWH were more likely to have contacted a professional for repair or maintenance (72%) than those who purchased other types of water heaters (44%, [Figure 84](#)).

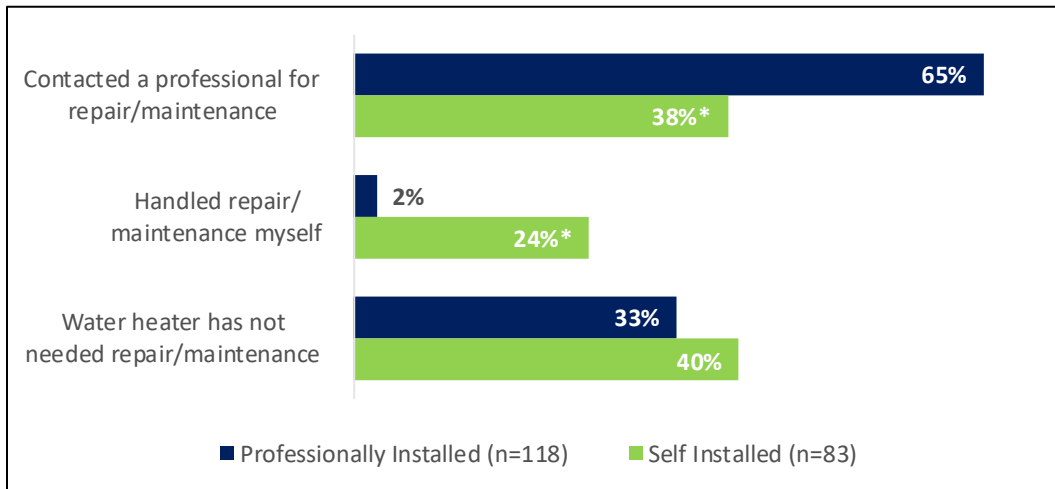
Respondents who installed their water heater by themselves were more likely to handle their own maintenance and repairs (24%) than those who had their water heaters installed by a professional (2%, [Figure 85](#)).

Figure 84: Repair or Maintenance by Water Heater Type



*Statistically different from Other Water Heaters at the 90% confidence level.

Figure 85: Repair or Maintenance by Installation Type



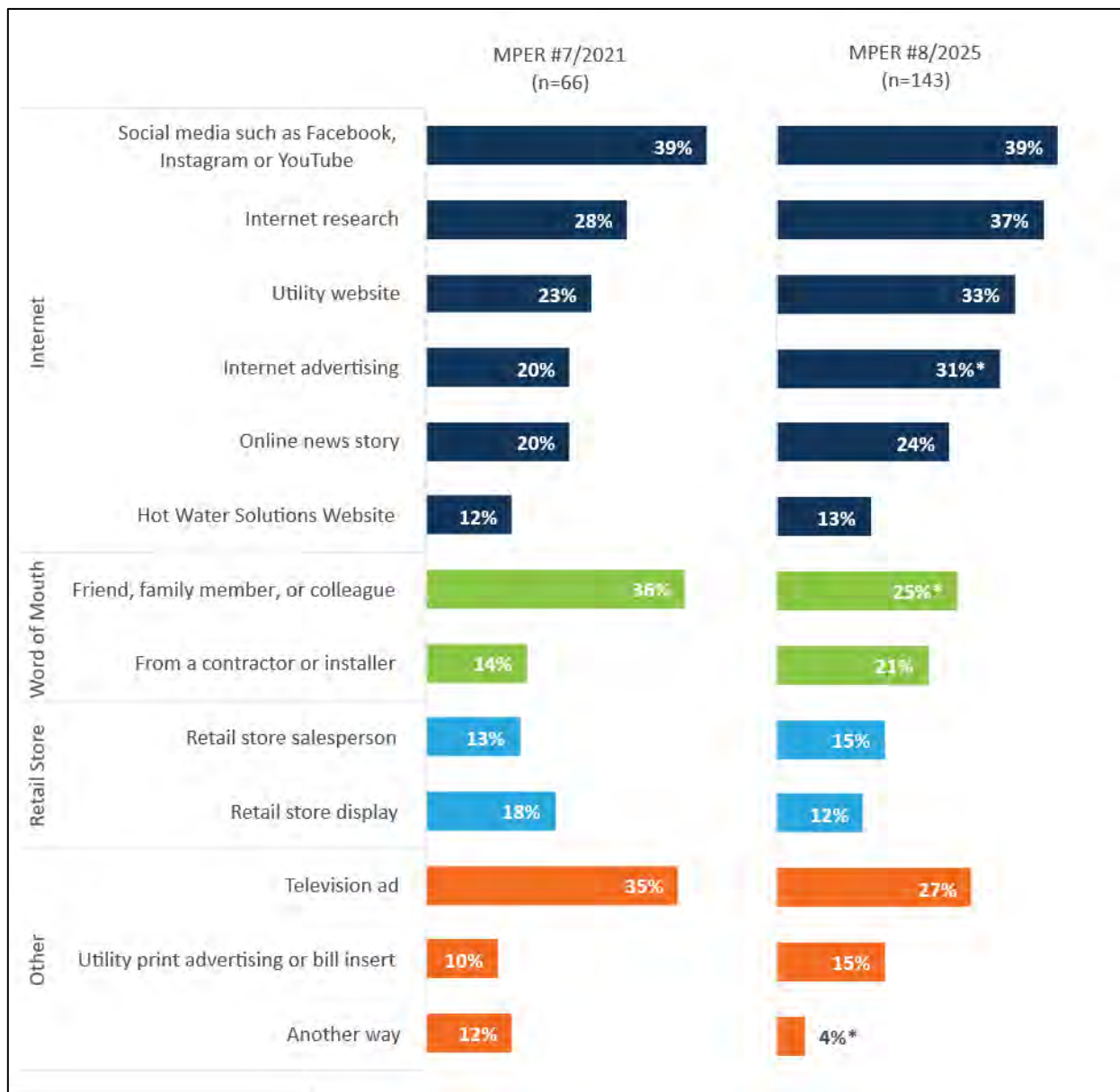
**Statistically different from Prof Install at the 90% confidence level.*

Among consumer survey respondents with an electric resistance storage water heater less than 5 years old that own their home (n=82), 14% said their water heater needed repair. One-half (52%) of respondents that needed service (n=23) had the issue resolved in one day or less.

HWS AWARENESS

Fourteen percent of consumers were aware of the Hot Water Solutions program. Over one in ten consumers (14%) were aware of the HWS program, compared to 19% in 2021.⁷⁹ Figure 86 shows that the top ways respondents heard of the HWS program were social media, internet research, utility websites, and internet advertising. More consumers had heard of HWS from internet advertising (31%) than in 2021 (20%).⁸⁰

Figure 86: Sources of HWS Awareness

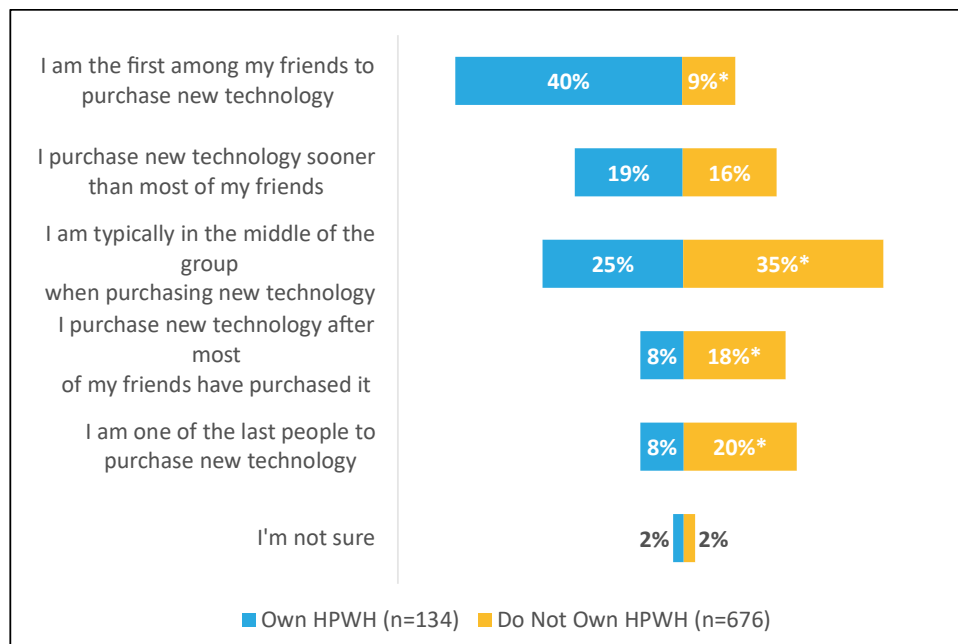


Q32. How did you first hear of the "Hot Water Solutions" program?

ATTITUDES ABOUT TECHNOLOGY AND THE ENVIRONMENT

HPWH owners are more likely to be early adopters of technology. Figure 87 displays respondents' tendency to accept new technology by whether they own a HPWH. HPWH owners were four times as likely to be early adopters of technology (40%) than those who did not own a HPWH (9%).

Figure 87: New Technology Adoption



Notes: Respondents who were aware of HPWH (A2) responded to this question.

* Denotes that findings are statistically different from respondents who currently own or use a HPWH (A4) at the 90% confidence level.

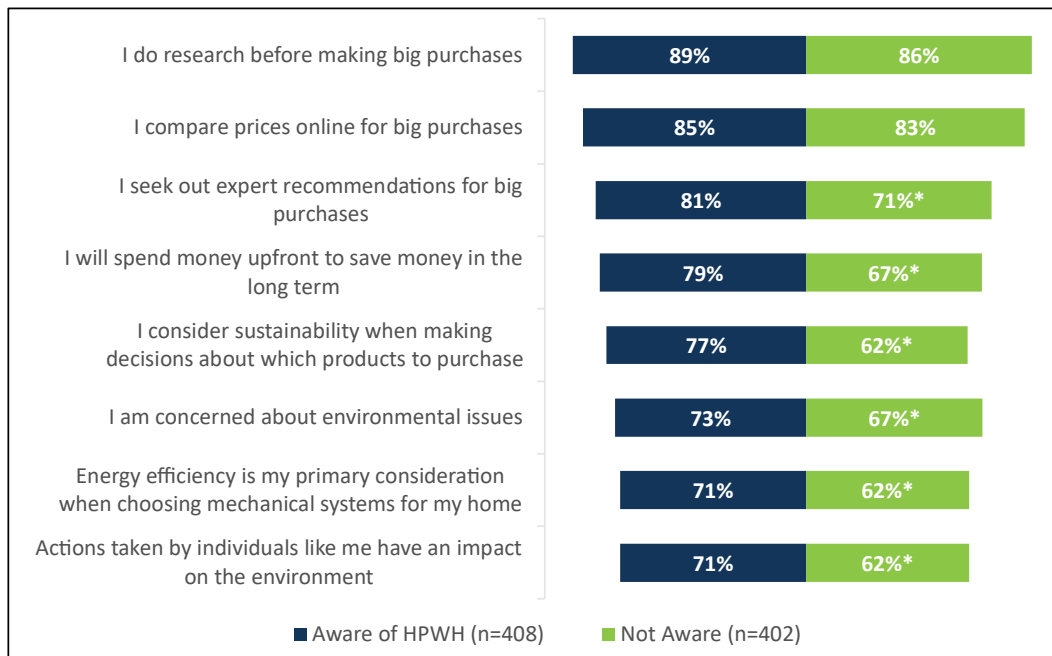
D1. Which of the following statements best describes you?

⁷⁹ Difference is statistically different at the 90% confidence level.

⁸⁰ Interestingly, 27% of respondents attributed their knowledge of HWS to television advertising, even though HWS does not run television ads.

Consumers aware of HPWHs are more likely to consider sustainability for major purchases. Figure 88 displays the percentage of respondents who agreed with various statements about the process of making big purchases by whether they were aware of HPWHs. Nearly all respondents reported doing research and comparing prices online before making big purchases. Respondents who were aware of HPWHs were more likely to agree with all of the remaining statements than those who were not aware of HPWHs. In particular, those who were aware of HPWHs were significantly more likely to spend money upfront to save money in the long term (79% compared to 67%, respectively) and consider sustainability when making decisions about which products to purchase (77% compared to 62%, respectively).

Figure 88: Purchase Process and Environmental Considerations



D1. Please rate your agreement with the following statements.

*Statistically different from Aware of HPWH at the 90% confidence level

DEMOGRAPHIC CHARACTERISTICS

This section presents demographic characteristics of the consumer survey respondents.

Nearly two-thirds of respondents reported owning their home (Table 36).

Table 36: Tenure

Tenure	Total	Urban	Rural
<i>n</i>	810	570	240
Own	65%	63%	73%*
Rent	35%	37%	27%*

* Statistically different from Urban at the 90% confidence level
S_OwnRent. Do you own or rent your home?

More than three-fifths of respondents lived in a free-standing, single-family home (Table 37).

Table 37: Home Type

Type of Home	Total	Urban	Rural
<i>n</i>	810	570	240
Free-standing, single-family	63%	62%	69%*
Apartment 5 or more units	18%	21%	7%*
Mobile home	7%	4%	17%*
Townhouse/rowhouse	6%	7%	3%*
Apartment 2 to 4 units	6%	6%	4%

* Statistically different from Urban at the 90% confidence level
S_HomeType. What type of home do you live in?

More rural respondents were aged 65 and older than urban respondents (Table 38).

Table 38: Age

Age	Total	Urban	Rural
<i>n</i>	810	570	240
18 to 24	2%	2%	1%
25 to 44	39%	40%	32%*
45 to 64	31%	31%	28%
65 and older	29%	26%	39%*

* Statistically different from Urban at the 90% confidence level
D4: Which of the following categories includes your age?

Over two-thirds of respondents had at least some college education (Table 39). Respondents in urban areas were more likely to have completed college than those in rural areas.

Table 39: Education

Education	Total	Urban	Rural
<i>n</i>	810	570	240
Some high school	2%	2%	4%
High school graduate or GED	19%	17%	23%*
Trade or technical school	8%	8%	7%
Some college	27%	26%	33%*
College graduate	21%	22%	17%*
Some graduate school	2%	2%	5%*
Graduate degree	20%	23%	11%*
I'd rather not say	<1%	<1%	1%

* Statistically different from Urban at the 90% confidence level

D6: Which of the following categories best describes the highest level of education you have completed?

Table 40 displays level of income. Respondents in rural areas were more likely to earn less than \$40,000 than those in urban areas.

Table 40: Income

Income	Total	Urban	Rural
<i>n</i>	810	570	240
Less than \$40,000	34%	31%	45%*
Between \$40,001 and \$60,000	19%	20%	14%*
Between \$60,001 and \$80,000	13%	12%	15%
Between \$80,001 and \$120,000	13%	13%	13%
Between \$120,001 and \$250,000	19%	22%	8%*
Over \$250,000	1%	1%	1%
I'd rather not say	1%	1%	4%*

* Statistically different from Urban at the 90% confidence level

D7: Which of the following categories best describes your approximate annual household income from all sources in 2021, before taxes?

Table 41 displays respondents' reported race. Rural respondents were more likely to identify as white, and less likely to identify as African American or Asian, than urban respondents.

Table 41: Race

Race	Total	Urban	Rural
<i>n</i>	810	570	240
White	89%	87%	94%*
Black or African American	5%	6%	1%*
American Indian or Alaska Native	3%	3%	4%
Asian	4%	4%	2%*
Other	2%	2%	2%
I'd rather not say	1%	1%	1%

* Statistically different from Urban at the 90% confidence level
D9: How would you describe yourself? Please select all that apply.

Table 42 displays respondents' self-reported gender. Over half of respondents identified as female. Rural respondents were more likely to identify as female than urban respondents.

Table 42: Gender

Race	Total	Urban	Rural
<i>n</i>	810	570	240
Female	53%	49%	65%*
Male	47%	50%	34%*
Non-binary	<1%	1%	0%
I'd rather not say	<1%	<1%	1%

* Statistically different from Urban at the 90% confidence level.
D10. How would you describe yourself?

Nearly all respondents primarily spoke English in their home (Table 43).⁸¹ Languages not selected by respondents are not shown in the table.

Table 43: Primary Language Spoken at Home

Race	Total	Urban	Rural
<i>N</i>	810	570	240
English	98%	98%	98%
Spanish	1%	1%	1%
Russian	1%	1%	0%
Punjabi	<1%	<1%	1%

* Statistically different from Urban at the 90% confidence level
D11: What language is primarily spoken in your home?

⁸¹ The web survey was fielded in English only.

DETAILED RESULTS

See [Appendix H](#) for tables with detailed results.

Appendix E Federal Rulemaking Process Review

In October 2022, NEEA joined manufacturers, energy efficiency organizations, and a consumer organization in recommending updated energy-efficiency levels for the Department of Energy's rulemaking process regarding the energy efficiency of residential water heaters. In May 2024, the DOE published a final rule mandating a shift for most residential, electric storage water heaters to efficiency levels that cannot currently be achieved without heat pump technology by 2029.⁸²

The MPER team reviewed public comments submitted as part of the federal rulemaking process and interviewed stakeholders who worked alongside NEEA to assess NEEA's impact on the new federal efficiency standard (MPI 12).

METHODOLOGY

The team reviewed the Notice of Proposed Rulemaking (NPR) comments submitted as part of DOE's rulemaking process, and the final rule to catalog how often NEEA was cited and whether the recommendations NEEA made were incorporated into the final rule.

The team also interviewed four stakeholders involved in the recommendation process: two NEEA staff and two consultants working with NEEA. Interview questions addressed the following:

- Role and tenure in their position,
- Involvement with the federal rulemaking process,
- NEEA's contributions to the rulemaking process,
- The process of forming the joint stakeholder group, and
- An assessment of NEEA's importance to achieving the federal standard.

⁸² Department of Energy. "Energy Conservation Programs: Energy Conservation Standards for Consumer Water Heaters". May 6, 2024. <https://www.federalregister.gov/documents/2024/05/06/2024-09209/energy-conservation-program-energy-conservation-standards-for-consumer-water-heaters>.

FINDINGS

The evidence provided by NEEA to support the recommendation was influential in the final rulemaking. NEEA's research was cited at least 23 times throughout the final rule. DOE cited evidence and commentary provided by NEEA at least 16 times when justifying aspects of the final rule. In two cases, DOE did not adopt NEEA's recommendation into the final rule (regarding lifecycle cost analysis and gas heat pump technology), but most of NEEA's recommendations or statements of support were adopted into the final rule.

The joint stakeholder group in which NEEA participated represented a diverse group of organizations that coalesced around a shared goal. The joint stakeholders were a coalition of public and private sector organizations including water heater manufacturers, energy efficiency organizations, environmental groups, and consumer organizations: the American Council for an Energy-Efficient Economy (ACEEE), the Appliance Standards Awareness Project (ASAP), Bradford White Corporation, Consumer Federation of America, the Natural Resources Defense Council (NRDC), NEEA, and Rheem Manufacturing.⁸³ The diversity of stakeholders represented in the coalition was a key factor in their success advocating for the standard.

The diversity of the organizations involved in the coalition are instrumental to the long-term viability of the federal standard. Interviewees noted that the manufacturers involved in the process continue to stand by and support the updated efficiency standard, strengthening it against possible challenges. The coalition was enduring; stakeholders indicated that most organizations that began discussions with the coalition saw the process through, and in fact the coalition gained additional members as the recommendation took shape. One stakeholder estimated that without NEEA's involvement, the efficiency standards that passed would not have been broad or effective and may have been vulnerable to rollback.

NEEA's involvement in the federal rulemaking process was a key factor in the passage of the updated efficiency standards. NEEA's work in building relationships with these groups prior to the rulemaking process was instrumental in bringing the coalition members together. As one stakeholder observed, NEEA's technical expertise, contributions of regional data, and long-term relationships with industry members that were essential. Multiple stakeholders estimated that there would not have been stakeholder agreement without NEEA.

⁸³ Energy Efficiency and Renewable Energy Office. "2022-10-21 Joint Stakeholder Recommendations for Amended Energy Conservation Standards for Consumer Water Heaters". October 24, 2022. <https://www.regulations.gov/comment/EERE-2017-BT-STD-0019-0049>.

Appendix F MPI Measurements

MPI MEASUREMENTS

The team measured one or more indicators for each of the outcomes slated for measurement in MPER #8, for a total of ten MPIs. [Table 44](#) shows the outcomes, MPIs, and current values. Detailed descriptions of each MPI can be found in the sections of the report noted for each MPI in the “Location” column.

Table 44: MPER #8 MPI Tracking

Outcomes and Related MPIs	Metric	MPER Data Source	Location of Detailed Results	Measurement 1	Measurement 2 (if applicable)	Measurement 3 (if applicable)
I. Installers increasingly recommend/sell/install HPWHs.						
1 a. Trained installers report higher confidence in and awareness of HPWHs	Rate of HWS-trained installer awareness of HPWHs, whether or not AWHs-qualified	Installer survey	Appendix B	Installer survey Q16 "Agree" or Strongly agree" to the following statements – all installers (n=100) My company's installation technicians can easily install heat pump water heaters correctly: all 83% Replacing an electric resistance water heater with a heat pump water heater will lower a customer's overall energy bill: all 71% HPWHs are reliable: all 50% HPWHs are good replacements for traditional electric resistance water heaters: all 53% My company is likely to get customer complaints or service requests soon after installing a heat pump water heater: all 25%	Installer survey Q11 Percentage of installers who had heard of "heat pump water heaters" or "hybrid water heaters:" all installers: 99%	Installer survey Q12 Percentage of installers who are very familiar with HPWHs: 36%
1 b. HWS trained installers' year-over-year installations of AWHs qualified products increase	Rate of HWS-trained installer confidence in HPWHs & related (e.g., ability to install correctly, probability of callbacks, etc.)					
1 c. Share of professional installers that have installed AWHs qualified products increases each year	Rate at which HWS-trained installers report installations of HPWHs, whether or not AWHs-qualified	Installer survey	Appendix B	Installer survey Q25 Percentage of electric storage water heater installations that were HPWHs: 21% (unit-weighted)		
1 d. Installers' recommendations of HPWHs in emergency and/or non-emergency scenarios increase year-over-year	Number of installers that have installed AWHs products	Installer survey	Appendix B	Installer survey Q13 Percentage of installers that install HPWHs: 70%		
1 e. Share of sales for emergency replacement increases each year	Rate of installer recommendations of HPWHs in emergency scenarios	Installer survey	Appendix B	Installer survey Q35 Percent of the time installers recommend HPWH to a customer when replacing a failed water heater: 29% (average), 15% (median)	Purchaser survey Q36 Percent of purchasers who purchased a new water heater because water heater was completely broken and did not provide any hot water: 10%	
	Rate of emergency replacement sales of HPWHs, whether or not AWHs-qualified	Installer survey Purchaser survey	Appendix B Appendix C	Installer survey Q27 Percent of total HPWH installations that were to customers replacing a failed water heater: 61% (unit-weighted)		

Outcomes and Related MPIs	Metric	MPER Data Source	Location of Detailed Results	Measurement 1	Measurement 2 (if applicable)	Measurement 3 (if applicable)
II. Retailers increasingly sell HPWHs.						
2. Year-over-year sales of AWHS qualified products increase through the retail channel	Retail sales of HPWHs, whether or not AWHS-qualified	Market sizing update	Appendix A	Percentage of residential HPWHs sold in the Northwest through retailers: 18%	Number of electric storage water heaters sold through retail that are HPWH: 6,327	
III. Distributors increasingly stock and sell HPWHs.						
3 a. Year-over-year sales of AWHS qualified products increase	Distributor sales of HPWHs, whether or not AWHS-qualified	Market sizing update	Appendix A	Market share of HPWH installations: 19%	Percentage of residential HPWHs sold in the Northwest through distributors in 2024: 82%	
IV. Purchasers are satisfied with AWHS-qualified products.						
4 a. At least 90% of purchasers are satisfied with qualified products	Percentage of purchasers satisfied with HPWH	Purchaser survey Consumer survey	Appendix C Appendix D	Purchaser survey Q61 Percentage satisfied with the HPWH overall: 87%	Consumer survey Q19 Percentage satisfied with the HPWH overall: 90%	
4 b. Percentage of purchasers who would recommend HPWHs does not decline year-over-year	Percentage of purchasers who would recommend HPWH	Purchaser survey Consumer survey	Appendix C Appendix D	Net promoter score among purchasers: +46%	Consumer survey Q20 Percentage who have or would recommend HPWH to a friend, colleague, or family member: 95%	
IX. Consumers are aware of HPWHs.						
9. Year-over-year increase in awareness and adoption of HPWHs among consumers in single-family homes	Percentage of consumers who are aware of HPWHs	Consumer survey	Appendix D	Consumer survey Q19 Percentage of consumers who had heard of “heat pump water heaters” or “hybrid water heaters:” all consumers: 44%; SF residents: 48%; MF residents: 37%; owners (all home types): 47%; renters (all home types): 39%; SF homeowners w/ electric storage water heater: 48%		
X. Federal Efficiency Standard <55 gallon is enacted.						
12. Federal Efficiency Standard <55 gallon is enacted	Passage of federal standard	Stakeholder interviews	Appendix E	NEEA’s recommendations incorporated into the final rule	Number of times NEEA cited in the final rule: 23	

OUTPUT TRACKING

As described in NEEA’s logic model, NEEA undertakes a variety of strategic interventions that could ultimately trigger market outcomes and broader transformation of the heat pump water heater market. Some of these interventions yield concrete materials (outcomes) whose existence could then lead to the outcomes described in the logic model. [Table 45](#) describes evidence of NEEA’s work to create those various outputs, based on materials provided to the MPER team by NEEA.

Table 45: Output Tracking and Program Activities to Date

Output	Relevant Outcome	Program Activities to create Output (2023 – 2024)	Evaluation
Marketing campaign(s) targeting supply chain and consumers	1, 2, 4, 11	<ul style="list-style-type: none"> • Convened Water Heater Installers Focus Groups and conducted one-on-one interviews to study the underlying reasons for resistance. Published final report and applied learnings to 2024 operations plan. • Published Challenging Installations Scenario study including brief report prepared by Optimized Thermal Systems, Inc., an independent research firm, which compares the study findings against the U.S. Department of Energy assumptions pertaining to the prevalence of challenging HPWHs in the residential stock. • Contracted with Liberman Research to better understand installer perception related to customer calls backs regarding their HPWHs. The key objectives are to understand if they receive callbacks, the frequency of callbacks, and the nature of the issues at hand, understand how installers resolve the problems and identify the types of training support installers may need to minimize these situations in the future. • Upgraded HWS consumer-facing website to include HPWHs. Attempted outreach with installation companies through newsletters, individual emails, and phone calls but achieved little in engagements. • Developed “Best Practices Heat Pump Water Heater Installation Locations by Climate in Single-Family” one pager based on confined space research and PNNL REC’s data. Solicited feedback from market actors. • Delivered seven newsletters to installers and distributors: Proper sizing HPWH, HPWH tiers explained, Using Yellow Energy Guide Labels as a sales tool, Recommended installation location by region, HPWH Myth Busters, and Case study for incorporating HPWH as a successful business model. • Recruited participants for Key Installers program. • Ran the “Level Up” consumer consideration campaign to increase consumer awareness of HPWHs. As part of this campaign, relaunched the HWS consumer-facing website with added information on HPWH technology, technical guides, details on regional rebates, and an installer/distributor locator. • Developed presentation material for regional webinar explaining standard final rule to funders and key stakeholders. 	<p>Strong Progress</p> <p>Diverse range of activities implementing marketing campaigns targeting actors throughout the supply chain and consumers.</p>

Output	Relevant Outcome	Program Activities to create Output (2023 – 2024)	Evaluation
<p>Socialize best practices:</p> <ul style="list-style-type: none"> • Number of trainings • Marketing tool kits available • Marketing interventions deployed • Number of installations • Utilities offering incentives • Stocking practices 	<p>1, 2, 3, 4</p>	<ul style="list-style-type: none"> • Upgraded website to include HPWHs. Attempted outreach with installation companies through newsletters, individual emails, and phone calls but achieved little in engagements. • Developed “Best Practices Heat Pump Water Heater Installation Locations by Climate in Single-Family” one pager based on confined space research and PNNL REC’s data. Solicited feedback from market actors. • Delivered seven newsletters to installers and distributors: Proper sizing HPWH, HPWH tiers explained, Using Yellow Energy Guide Labels as a sales tool, Recommended installation location by region, HPWH Myth Busters, and Case study for incorporating HPWH as a successful business model. • Recruited participants for Key Installers program. • Ran the “Level Up” consumer consideration campaign to increase consumer awareness of HPWHs. As part of this campaign, relaunched the HWS consumer-facing website with added information on HPWH technology, technical guides, details on regional rebates, and an installer/distributor locator. • Developed presentation material for regional webinar explaining standard final rule to funders and key stakeholders. • Held a train-the-trainer event with nine participants to expand the number of qualified trainers for in-person HPWH regional trainings. • Coordinated and delivered cold-climate installer trainings in partnership with NorthWestern Energy and distributors, Keller Supply and Gensco. • Ran a virtual HPWH Technology Overview & Customer Solutions virtual training in partnership with Energy Trust of Oregon (80 attendees). • Delivered 17 in-person, technical HPWH trainings to over 200 installers across all four states. Many trainings were delivered in collaboration with local utilities and others were delivered at contractors’ offices/shops and followed a more casual “shop talk” format. • Developed interview guide for interviews with Key Installers to better understand their experience with a straightforward HPWH installation. • Delivered two trainings to 80 plumbing and HVAC students at technical schools. • Collaborated with PGE and Energy Trust of Oregon on a pilot as part of the Smart Test Bed to work on multifamily new construction as part of the Smart Test Bed to work on multifamily new construction unitary HPWHs. 	<p>Strong Progress</p> <p>Completed in-person and virtual trainings with a range of audiences. Successfully developed marketing tool kits and deployed marketing interventions. Key Installer program offers incentives and promotes HPWH stocking.</p>

Output	Relevant Outcome	Program Activities to create Output (2023 – 2024)	Evaluation
<p>Share body of knowledge and expertise with utilities, OEMs, and distribution channel including incentives, campaigns, challenging install solutions, etc.</p>	<p>4, 11</p>	<ul style="list-style-type: none"> • Held a train-the-trainer event with nine participants to expand the number of qualified trainers for in-person HPWH regional trainings. • Coordinated and delivered cold-climate installer trainings in partnership with NorthWestern Energy and distributors, Keller Supply and Gensco. • Ran a virtual HPWH Technology Overview & Customer Solutions virtual training in partnership with Energy Trust of Oregon (80 attendees). • Delivered 17 in-person, technical HPWH trainings to over 200 installers across all four states. Many trainings were delivered in collaboration with local utilities and others were delivered at contractors' offices/shops and followed a more casual "shop talk" format. • Developed interview guide for interviews with Key Installers to better understand their experience with a straightforward HPWH installation. • Delivered two trainings to 80 plumbing and HVAC students at technical schools. • Finalized benefits for Key Installers Program, conducted outreach, and started the program. The three offerings as part of the Key Installer offering are: <ul style="list-style-type: none"> ○ Fully paid HPWH installation for a customer or employee for the purposes of training. ○ Stocking incentive to encourage installers to have on hand HPWHs for emergency replacements. ○ Call back fund to help reticent installers feel comfortable specifying a new product knowing that the program will support them in the unlikely event of a call back. • Supported the implementation of the Market Development Fund (MDF) designed to increase installer adoption of HPWHs. Directed marketing activities to home improvement magazines, tabling at plumber golf tournament to share HPWH resources, sponsoring food trucks at training events held at distributor warehouses. • Developed and distributed info sheets for target market actors (installers and distributor) to explain the final rule, the benefits to their business/line of work, and the impact to the Northwest. The info sheets have been distributed at training events and through Hot Water Solution's monthly newsletter. • Collaborated with PGE and Energy Trust of Oregon on a pilot as part of the Smart Test Bed to work on multifamily new construction unitary HPWHs. • Engaged two major manufacturers in discussions about publishing multifamily installation guides for their unitary products. • Began planning for phase two of the design charette. Phase two will focus on barrier and design solutions for existing multifamily applications. Key take aways from the charette will be shared with OEMs at a virtual report out to support development to their technical documents. 	<p>Strong Progress</p> <p>Shared knowledge through in-person and virtual trainings and events and print materials.</p>

Output	Relevant Outcome	Program Activities to create Output (2023 – 2024)	Evaluation
Participation in regional and national workgroups providing best practices and lessons learned	5, 11	<ul style="list-style-type: none"> • Visited manufacturer sound room to understand how sound energy testing is performed. This will inform AWS 9.0 to standardize sound energy testing to ensure repeatable and consistency in manufacture sound claims. • Hosted webinar for funders detailing the final rule for the water heater standards. Forty regional stakeholders participated. • Held initial conversation with large installation companies, Washington Energy Services and Fast Water Heating about how NEEA can support their adoption of HPWH. • Announced Hot Water Innovation Prize at Hot Water Forum in Atlanta. Networked with potential Hot Water Innovation Prize funders and manufacturer participants, including Rheem, AO Smith, and Bradford White • Published final rules and guidelines for Hot Water Innovation Prize, incorporating feedback from manufacturers on the draft rules. 	<p>Some Progress</p> <p>Strong engagement with regional workgroups but could increase national outreach.</p>
Demand response for HPWH included in AWHs* regional and national advocacy recommendations, presentations etc.	6, 8, 11	<ul style="list-style-type: none"> • Published “Advance Water Heating Specification Version 8.1” that now requires demand response capability for Tier 3 and higher products (optional for Tiers 1 and 2). Demand response can be demonstrated through a product being listed in the OpenADR Alliance’s EcoPort^{CM} Certified Product Database or being compliant with AHRI 1430. Alignment with EcoPort (the branded name for CTA-2045) focuses on supporting a single, national standard and certification. (There is not yet a database for ARHI 1430 compliant products.) 	<p>Strong Progress</p> <p>AWHS spec includes/supports a single, national standard among AWHs criteria; may be opportunity to highlight this in presentations and outreach activities.</p>
Continued participation and iteration on AWHs & OPL that supports all installations and products	7, 10	<ul style="list-style-type: none"> • Published “Advance Water Heating Specification Version 8.1.” Updated version incorporates industry feedback with significant changes on the commercial side including streamlined listing of commercial HPWHs (CHPWHs), alignment including Technical Forum (RTF) requests, and inclusion of a pathway for integrated CHPWHs. 	<p>Strong Progress</p> <p>Continues to iterate on AWHs, incorporating new information.</p>

Appendix G Survey Instruments

INSTALLER SURVEY GUIDE – PHONE VERSION

Recruitment Email

Subj: Water heater survey from NEEA--\$75 gift card to complete

Dear [First Name] [Last Name],

I am writing to ask for your help in a study of **water heaters in the Northwest**. Braun Research Interviewing (BR Interviewing) and NMR Group (NMR) are conducting this study on behalf of The Northwest Energy Efficiency Alliance (NEEA). Your feedback will help ensure that NEEA's work addresses the needs of water heater installers like you.

If you are eligible to take the survey, **NMR will send you a \$75 electronic gift card in appreciation of your time**. Your responses will be kept **confidential – we will not publicize, share, or sell your information**. Your responses will only be released in summaries in which no individual's answers can be identified.

We expect the survey to take about 20 minutes to complete. **To complete the survey online**, please follow this link [ADD HYPERLINK] or paste this web address into your browser: [LINK].

To complete the survey over the phone, please email [Braun contact name] of BR Interviewing at [email] or leave a message at [number]. Please provide your name and phone number and they will call you back.

If you have any other questions about the study, please contact [NMR contact name] of NMR at NEEAsurvey@nmrgroupinc.com.

We greatly appreciate your taking the time to provide thoughtful answers for this important study.

Sincerely,

[Braun study manager]

Intro

Hello, this is _____ calling from BR Interviewing. The Northwest Energy Efficiency Alliance (NEEA) has partnered with NMR Group and BR Interviewing to better understand the experience of water heater installers. Your feedback will help ensure that NEEA's work addresses the needs of water heater installers like you.

Upon completion of the survey, **NMR will send you a \$75 electronic gift card in appreciation of your time**. Your responses will be kept confidential – we will not publicize, share, or sell your information.

[DO NOT READ; PROVIDE IF RESPONDENT REQUESTS MORE INFORMATION: *If you have any other questions about the study, please contact [NMR contact] of NMR at NEEAsurvey@nmrgroupinc.com.*]

Screening and Background

1. Did your company install any **residential** water heating equipment in any of the following states in the past 12 months? Select all that apply. [ALLOW MULTIPLE RESPONSES]
 1. Oregon
 2. Washington
 3. Idaho
 4. Montana
 5. [DO NOT READ] None of the above [EXCLUSIVE RESPONSE; TERMINATE]

Termination message: We are sorry, but you do not qualify for this survey. Thank you for your time.

2. Which of the following activities represents your company's main line of work?
 1. Installing equipment in residential new construction (newly built homes that are not yet occupied)
 2. Replacing or servicing equipment in existing homes
 3. Installing, replacing, or servicing equipment in commercial or industrial facilities.
 4. Something else: [RECORD]

3. [IF Q2 = 3] You said that your company's main line of business is working in commercial or industrial facilities. For the rest of this survey, **please be sure to provide answers that relate to your work in residential settings only.**
 1. [DO NOT READ] *I will be sure to provide answers that relate to my work in residential settings only*
 2. [DO NOT READ] *My company does not do any work in residential settings* [TERMINATE]

Termination message: We are sorry, but you do not qualify for this survey. Thank you for your time.

[READ IF Q2 = 1 OR 2] For this survey, we are only asking about your work in **residential** settings. If you happen to also do work in commercial or industrial facilities, **please limit your responses to your work in residential settings.**

Company Structure

4. Besides installing water heating equipment, what other services does your company provide? Please select all that apply. [ALLOW MULTIPLE RESPONSES]
 1. [DO NOT READ] *HVAC installation and/or maintenance*
 2. [DO NOT READ] *Plumbing*
 3. [DO NOT READ] *Electrical*
 4. [DO NOT READ] *Construction or general contracting services*
 5. [DO NOT READ] *Other:* [RECORD]
 6. [DO NOT READ] *My company does not provide other services.*

5. Which of the following best describes your company?

1. A business with a single location
 2. A company with multiple locations
 3. [DO NOT READ] Other: [RECORD]
6. [IF Q5 ≠ 1] Where is your business headquartered? [Record City/Town, State]
7. Approximately how many people in total work for your company? IF Q5 ≠ 1 Think only about your locations in these four states, if applicable: Oregon, Washington, Idaho, and/or Montana. [RECORD NUMERIC RESPONSE]
[Do not read:]
98. Don't know
8. What is your role at the company? Please select all that apply from the following list. [ALLOW MULTIPLE RESPONSES]
1. I own the company
 2. I install or service water heaters
 3. I make recommendations about what customers should install
 4. I manage installation technicians
 5. I am in a sales position
 6. Another role: [RECORD]
 98. [DO NOT READ] I'm not sure
9. How many years of experience do you have in the water heating industry?
1. Less than 2 years
 2. 2 to 5 years
 3. 6 to 10 years
 4. 11 to 20 years
 5. More than 20 years

HPWH Awareness

10. Before today, had you heard the term “heat pump water heater” or “hybrid water heater”?
1. [DO NOT READ] Yes
 2. [DO NOT READ] No
 98. [DO NOT READ] I'm not sure
11. [IF Q10 = 1 “As you may already be aware, heat”; IF Q10 = 2 or 98 “Heat”] pump water heaters, also known as electric hybrid water heaters, use an electric heat pump to transfer heat from the air outside of the unit to the water in the tank. They work like a refrigerator, but in reverse. They are *not* the same as a tankless water heater. A heat pump water heater has a large cylinder-shaped water storage tank, like a standard water heater. A tankless water heater has a smaller metal box mounted on a wall, with no storage tank.

Based on that description, have you heard of “heat pump water heaters” or “hybrid water heaters”?

1. [DO NOT READ] *Yes*
2. [DO NOT READ] *No*
98. [DO NOT READ] *I’m not sure*

[READ] For the rest of this survey, we will use the term “heat pump water heater” to refer to this type of water heater.

12. [IF Q11 = 1] Before this survey, which of the following best describes your level of familiarity with heat pump water heaters?
 1. Not very familiar - heard of them but never worked with them
 2. Somewhat familiar - worked with them occasionally
 3. Very familiar - worked with them regularly
98. [DO NOT READ] *Don’t know*

Installation Practices

13. What types of water heaters does your company install in residential homes? Please select all that apply. [ALLOW MULTIPLE RESPONSES]
 1. Electric resistance storage
 2. Gas storage
 3. Gas on-demand/tankless
 4. Electric on-demand/tankless
 5. Heat pump water heater
 6. Another type: [RECORD]
 98. [DO NOT READ] *Don’t know*

14. [DISPLAY OPTIONS 1-5 SELECTED IN Q13] What is the most profitable type of water heater for your company to install in residential homes?
 1. Electric resistance storage
 2. Gas storage
 3. Gas on-demand/tankless
 4. Electric on-demand/tankless
 5. Heat pump water heater
 6. [PIPED TEXT ENTRY IF Q13 = 6]
 7. Another type: [RECORD]
 98. [DO NOT READ] *Don’t know*

15. [IF Q14 ≠ 98] Why is that? [RECORD]

Familiarity and Confidence

16. [IF Q11 = 1 “I am going to read you a list of statements. For each one,” IF Q11 ≠ 1 “For the following statement,”] please assess how much you agree or disagree, using the following scale: strongly disagree, somewhat disagree, neither agree nor disagree, somewhat agree, or strongly agree. [RANDOMIZE ORDER]

- a. I try to avoid newer water heater technologies.
- b. [IF Q11 = 1] Heat pump water heaters are reliable.
- c. [IF Q11 = 1] Heat pump water heaters are good replacements for traditional electric resistance water heaters.
- d. [IF Q11 = 1] My company's installation technicians can easily install heat pump water heaters correctly.
- e. [IF Q11 = 1] My company is likely to get customer complaints or service requests soon after installing a heat pump water heater.
- f. [IF Q11 = 1] My company regularly recommends heat pump water heaters to customers.
- g. [IF Q11 = 1] Heat pump water heaters remove heat from the room where they are located.
- h. [IF Q11 = 1] Replacing an electric resistance water heater with a heat pump water heater will lower a customer's overall energy bill.
- i. My company makes more money when we sell a larger number of low-cost water heaters than when we sell a smaller number of high-cost water heaters.
- j. [IF Q11 = 1] I can get heat pump water heaters quickly from local distributors.

- 1. Strongly disagree
- 2. Somewhat disagree
- 3. Neither agree nor disagree
- 4. Somewhat agree
- 5. Strongly agree
- 98. [DO NOT READ] *Don't know*

17. [IF Q16c = 1 OR 2] Why do you feel that heat pump water heaters are not good replacements for electric resistance water heaters? Select all that apply. [RANDOMIZE ORDER; ALLOW MULTIPLE RESPONSES]

- 1. Lack of product support at the manufacturer level
- 2. Lack of product support at the distributor level
- 3. Lack of consumer awareness
- 4. My company had a bad experience with a heat pump water heater installation in the past
- 5. The difficulty of installation
- 6. High upfront cost
- 7. Payback period is too long
- 8. Difficulty finding heat pump water heaters in stock
- 9. Other; please describe: [RECORD]
- 98. [DO NOT READ] I'm not sure

18. [IF Q17 = 5] Could you describe the installation difficulties you experience when installing heat pump water heaters? [RECORD]

19. [IF Q11 = 1] How frequently do installation technicians face challenges with the following aspects of a heat pump water heater installation? [RANDOMIZE ORDER]
- a. Pipe configuration
 - b. No nearby drain for condensate
 - c. New wiring/electrical work required
 - d. Inadequate make-up air/airflow
 - e. Heat pump water heater too large to fit where old water heater was
 - f. Complications related to floorplan and noise (noise from heat pump water heater would be a nuisance in desired installation location)
 - g. Complications related to floorplan and cold air (cold air generated by heat pump water heater would be a nuisance in desired installation location)
 - h. Installing ductwork
 - i. Other; please describe: [REQUIRE TEXT ENTRY]
1. Always
 2. Very frequently
 3. Occasionally
 4. Rarely
 5. Very rarely
 6. Never
98. [DO NOT READ] *Don't know*
20. [IF Q11 = 1] On average, how many person-hours does it take to install each of the following water heaters in a typical home: (To estimate person hours, multiply the time spent by the number of people working. For example, one person working two hours is 2 person-hours; two people working for one hour is also 2 person hours.)
1. Electric resistance storage tank: ___ hours [REQUIRE NUMERIC ENTRY; OPTION FOR DK/N/A]
 2. **Un-ducted** heat pump water heater: ___ hours [REQUIRE NUMERIC ENTRY; OPTION FOR DK/N/A]
 3. **Ducted** heat pump water heater: ___ hours [REQUIRE NUMERIC ENTRY; OPTION FOR DK/N/A]
 4. On-demand or tankless: ___ hours [REQUIRE NUMERIC ENTRY; OPTION FOR DK/N/A]
21. [IF Q11 = 1] Please estimate what percentage of heat pump water heater installations require ducting to be installed.
 ___ % [RECORD]
[Do not read:]
98. *Don't know*
22. [IF Q11 = 1] Heat pump water heaters can be set in different modes:
- heat pump only (most efficient),

- hybrid or mixed operation (primarily operates in heat pump mode but uses electric resistance as backup), or
- electric resistance only (least efficient).

When installing a heat pump water heater in a customer's home, what mode would you usually recommend to the customer?

1. Heat pump only
 2. Hybrid or mixed operation
 3. Electric resistance only
 4. It depends
98. [DO NOT READ] *I'm not sure*

23. [IF Q22 = 2, 3, OR 4] Why do you say that? [RECORD]

Sales and Revenues from HPWH

For the following questions, please think about what your company has done in the past 12 months (the past year).

24. [IF Q13 = 1 OR 4] How many *residential electric storage water heaters* did your company install in the past year? [IF Q13 = 4 "Please include installations of heat pump water heaters in your estimate."] Your best estimate is fine.

___ [REQUIRE NUMERIC RESPONSE]

25. [IF Q24 > 0] Of the approximately [PIPE NUMBER FROM Q24] *residential electric storage water heaters your company installed in the past year*, about what percent were heat pump water heaters? Your best estimate is fine.

___% [REQUIRE NUMERIC RESPONSE 0 to 100]

26. [IF Q25 > 0] Of the *heat pump water heaters your company installed in the past year*, about what percent of units were ...

- a. 55 gallons or greater? ___% [REQUIRE NUMERIC RESPONSE 0 to 100]
- b. Less than 55 gallons? ___% [REQUIRE NUMERIC RESPONSE 0 to 100]

Total: ___% [AUTOMATIC SUM: REQUIRE A + B = 100]

27. [IF Q25 > 0] Thinking about *all the heat pump water heaters your company installed in the past year*, about what percent of units were to customers who were...

- a. replacing a failed water heater? ___% [REQUIRE NUMERIC RESPONSE 0 to 100]
- b. replacing an old/near-failure water heater? ___% [REQUIRE NUMERIC RESPONSE 0 to 100]
- c. replacing a fully functioning water heater? ___% [REQUIRE NUMERIC RESPONSE 0 to 100]

d. installing a water heater in a newly constructed home? ___% [REQUIRE NUMERIC RESPONSE 0 to 100]

Total: ___% [AUTOMATIC SUM: REQUIRE A THROUGH + D = 100]

28. Thinking about your company's *overall business revenues* in the past 12 months, about what percent was from water heater sales and installations?

a. ___% [REQUIRE NUMERIC RESPONSE 0 to 100]

b. Comments: [TEXT ENTRY, OPTIONAL]

29. [IF Q25 > 0] Thinking about your company's *revenues just from sales and installations of water heaters* in the past 12 months, about what percentage was from heat pump water heaters?

a. ___% [REQUIRE NUMERIC RESPONSE 0 to 100]

b. Comments: [TEXT ENTRY, OPTIONAL]

30. When you replace a large capacity (≥ 55 gallons) electric resistance storage water heater for a residential customer, what is your typical replacement strategy?

1. Replace with a heat pump water heater
2. Replace with a single, smaller residential electric resistance storage water heater
3. Replace with two smaller residential electric resistance storage water heaters
4. Replace with a single commercial electric resistance storage water heater
5. Replace with an electric tankless water heater
6. Replace with a gas storage water heater
7. Replace with a gas tankless water heater
8. Other; please describe: [REQUIRE TEXT ENTRY]

31. [IF Q13 = 1] When installing smaller electric resistance storage tank water heaters (<55 gallons), how often do you install mixing valves, or a tank with an integrated mixing valve, in order to increase the amount of hot water produced by the smaller tank?

1. Never
2. Rarely
3. Sometimes
4. Always
5. Other; please describe: [REQUIRE TEXT ENTRY]
98. [DO NOT READ] I'm not sure

32. [IF Q31 = 3 OR 4] Do you [PIPE Q31 VALUE "sometimes" or "always"] install mixing valves on these smaller tanks to avoid installing a heat pump water heater?

1. Yes
2. No
3. Other; please specify: [REQUIRE TEXT ENTRY]

33. What types of water heating equipment does your company typically keep on hand for **emergency replacements**? Select all that apply. [RANDOMIZE ORDER OF 1-4; ALLOW MULTIPLE RESPONSES]
1. Electric resistance storage
 2. Gas storage
 3. On-demand/tankless
 4. Heat pump water heater
 5. Other; please specify: [REQUIRE TEXT ENTRY]
 6. [DO NOT READ] None of the above [EXCLUSIVE RESPONSE]
 98. Don't know [EXCLUSIVE RESPONSE]

HPWH Recommendations

34. [IF Q11 = 1] In what percent of the homes that you visit could you install a heat pump water heater without making more changes to the installation area than is typical for a standard storage water heater? Think only of existing homes, **not** newly built homes. Your best guess is fine.
- ___% [REQUIRE NUMERIC RESPONSE 0 to 100]
35. [IF Q11 = 1] In each of the following scenarios, what percent of the time would you recommend heat pump water heaters to a customer? [REQUIRE NUMERIC RESPONSE 0 to 100]
- a. To replace a fully functioning water heater ___ %
 - b. To replace an old/near-failure water heater ___ %
 - c. To replace a failed water heater ___ %
 - d. For new construction (new homes that are not yet occupied, where the customer is the builder/developer) ___ %
36. [IF Q35a > 0%] When you have recommended heat pump water heaters to a customer who is **replacing a fully functioning water heater**, what percentage of the time have they agreed to install one?
- a. ___% [REQUIRE NUMERIC RESPONSE 0 to 100]
 - b. I have never recommended a heat pump water heater to a customer replacing a fully functioning water heater
 - c. Comments: [OPTIONAL TEXT ENTRY]
37. [IF Q35b > 0%] When you have recommended heat pump water heaters to a customer who is **replacing an old water heater that still works but is near the point of failure**, what percentage of the time have they agreed to install one?
- a. ___% [REQUIRE NUMERIC RESPONSE 0 to 100]

- b. I have never recommended a heat pump water heater to a customer replacing a near-failure water heater
 - c. Comments: [OPTIONAL TEXT ENTRY]
38. [IF Q35c > 0%] When you have recommended a heat pump water heater to a customer who is **replacing a failed water heater**, what percentage of the time have they agreed to install one?
- a. ___% [REQUIRE NUMERIC RESPONSE 0 to 100]
 - b. I have never recommended a heat pump water heater to a customer replacing a failed water heater
 - c. Comments: [OPTIONAL TEXT ENTRY]
39. [If Q35c < 50%] You said you recommend heat pump water heaters to customers who need to replace a failed water heater about [PIPE Q35C PERCENTAGE]% of the time. Why don't you recommend heat pump water heaters more often in this situation? [REQUIRE TEXT RESPONSE]
40. [IF Q35d > 0%] When you have recommended a heat pump water heater to a builder/contractor **working on building a new home**, what percentage of the time have they agreed to install one?
- a. ___% [REQUIRE NUMERIC RESPONSE 0 to 100]
 - b. I have never recommended a heat pump water heater to a builder/contractor for a new home
 - c. Comments: [OPTIONAL TEXT ENTRY]
41. [IF Q11 = 1] In the next year or two, how often do you expect you will recommend heat pump water heaters to your customers?
- a. Much more often than you do now
 - b. Somewhat more often than you do now
 - c. At the same rate as you do now
 - d. Somewhat less often than you do now
 - e. Much less often than you do now
42. [IF Q11 = 1] Why do you say that you will recommend heat pump water heaters to your customers [PIPE Q41 RESPONSE]? [REQUIRE TEXT ENTRY]

Callbacks

43. [IF AWARE OF HPWH] In the past two years, how many times have you serviced or repaired a heat pump water heater? Your best estimate is fine. [REQUIRE NUMERIC ENTRY]
44. [IF Q43 > 0] In the approximately [PIPE IN Q43 VALUE] heat pump water heater service calls you have received in the past two years, how often did you encounter the following issues? Your best estimate is fine. If never, enter 0%. [ROTATE OPTIONS A THROUGH E]

1. Tank is too small (not enough hot water) __%
 2. Unit not functioning properly in cold weather __%
 3. Unit was incorrectly installed __%
 4. Unit was installed in an unsuitable location __%
 5. Dirty or clogged filters __%
 6. Faulty components (e.g. control board, compressor) __%
45. [IF Q43 > 0] Besides the reasons listed above, please describe any other issues you encounter during service calls for heat pump water heaters. [REQUIRE TEXT ENTRY]
46. [IF Q43 > 0] In what percentage of heat pump water heater service calls does the following happen...
1. More than one service call to resolve issue __%
 2. Technician needs to call the manufacturer __%
 3. Advise customer to change the mode from hybrid to electric to address hot water concerns __%
 4. Unit is replaced with a new heat pump water heater __%
 5. Unit is replaced with a different type of water heater __%
47. [IF INSTALLS HPWH] Do you keep spare parts or replacement units specifically for heat pump water heaters on hand?
1. Yes
 2. No
 98. [DO NOT READ] I'm not sure
48. [IF Q43 > 0] Have you ever serviced or repair heat pump water heaters that your company did not install?
1. Yes
 2. No
 98. [DO NOT READ] I'm not sure
49. [IF Q48 = 1] Thinking about the heat pump water heaters you service that you did not install, what percent were installed by the customer (DIY) versus professionally installed?
1. Installed by the customer (DIY) __%
 2. Installed by a professional (another plumber/installer) __%
50. [IF Q49a > 0%] Do you see issues with "DIY" installs that you do not see when a professional installs a heat pump water heater? Please describe: [REQUIRE TEXT ENTRY]

51. Compared to other types of water heaters, how often do you receive service requests or callbacks for heat pump water heaters? In your experience, do heat pump water heaters have...
1. Many more issues
 2. Somewhat more issues
 3. About the same number of issues
 4. Somewhat fewer issues
 5. Many fewer issues
52. In your experience, how long do heat pump water heaters last compared to other types of water heaters (the lifetime of the equipment)?
1. Much longer
 2. Somewhat longer
 3. About the same
 4. Somewhat shorter
 5. Much shorter
53. Do you have any other comments about your experience responding to service calls for heat pump water heaters to share? [OPTIONAL TEXT ENTRY]

Updated Standards and Access to Information

54. [IF Q1 = WASHINGTON] Have you heard of the new standard, ANSI/CTA-2045, which requires all new electric storage water heaters manufactured after January 1, 2023, to have a communications port?
1. Yes
 2. No
 98. [DO NOT READ] I'm not sure
55. [IF Q54 = 1] Do you think the new standard is a positive or negative development?
1. Positive
 2. Negative
 3. Neither positive or negative
 98. [DO NOT READ] I'm not sure
56. [IF Q55 = 2 OR 3] Why do you say that? [REQUIRE TEXT ENTRY]

Training

57. Have you, or has someone else at your company, ever participated in a Hot Water Solutions training about heat pump water heaters sponsored by local utilities or the Northwest Energy Efficiency Alliance? (Hot Water Solutions trainings have been offered in-person and via webinar, so you may have attended in person or online.)
1. Yes
 2. No
 98. [DO NOT READ] I'm not sure
58. Before today, have you heard of Hot Water Solutions? [<https://hotwatersolutionsnw.org>]
1. Yes
 2. No
 3. [DO NOT READ] I'm not sure

Closing

59. [IF Q11 = 1] In closing, how likely are you to recommend heat pump water heaters to a friend or colleague?
Please use a score of 0 to 10 where 0 is “not at all likely” and 10 is “extremely likely”.
60. Would you ever install a heat pump water heater in your own home?
1. Yes
 2. No
61. Please let us know if you have any additional thoughts about heat pump water heaters.
[OPTIONAL TEXT ENTRY]
62. Please enter the email address where you would like us to send your gift card.
1. [DO NOT READ] Email address: [restrict to email address]
 2. [DO NOT READ] I am not accepting an incentive for this survey.
63. Would you be willing to participate in future research opportunities?
3. Yes
 4. No

[FINISH SURVEY] Thank you for your feedback!

INSTALLER SURVEY GUIDE – WEB VERSION

Recruitment Email

Subj: Water heater survey from NEEA--\$75 gift card to complete

Dear [First Name] [Last Name],

I am writing to ask for your help in a study of **water heaters in the Northwest**. Braun Research Interviewing (BR Interviewing) and NMR Group (NMR) are conducting this study on behalf of The

Northwest Energy Efficiency Alliance (NEEA). Your feedback will help ensure that NEEA's work addresses the needs of water heater installers like you.

If you are eligible to take the survey, **NMR will send you a \$75 electronic gift card in appreciation of your time.** Your responses will be kept **confidential – we will not publicize, share, or sell your information.** Your responses will only be released in summaries in which no individual's answers can be identified.

We expect the survey to take about 20 minutes to complete. **To complete the survey online**, please follow this link [[ADD HYPERLINK](#)] or paste this web address into your browser: [[LINK](#)].

To complete the survey over the phone, please email [[BR contact name](#)] of BR Interviewing at [[email](#)] or leave a message at [[number](#)]. Please provide your name and phone number and they will call you back.

If you have any other questions about the study, please contact [[NMR contact name](#)] of NMR at NEEAsurvey@nmrgroupinc.com.

We greatly appreciate your taking the time to provide thoughtful answers for this important study.

Sincerely,

[[Braun study manager](#)]

Intro

The Northwest Energy Efficiency Alliance (NEEA) has partnered with NMR Group and BR Interviewing to better understand the experience of water heater installers. Your feedback will help ensure that NEEA's work addresses the needs of water heater installers like you.

If you are eligible and complete the survey, **NMR will send you a \$75 electronic gift card in appreciation of your time.** Your responses will be kept confidential – we will not publicize, share, or sell your information.

If you have technical problems with the survey, please contact [[BR contact name](#)] of BR Interviewing at [[email](#)] or leave a message at [[number](#)].

If you have any other questions about the study, please contact [[NMR contact name](#)] of NMR at NEEAsurvey@nmrgroupinc.com

Screening and Background

1. Did your company install any **residential** water heating equipment in any of the following states in the past 12 months? Select all that apply. [[ALLOW MULTIPLE RESPONSES](#)]

1. Oregon
2. Washington
3. Idaho
4. Montana
5. None of the above [EXCLUSIVE RESPONSE; TERMINATE]

Termination message: We are sorry, but you do not qualify for this survey. Thank you for your time.

2. Which of the following activities represents your company's main line of work?
 1. Installing equipment in residential new construction (newly built homes that are not yet occupied)
 2. Replacing or servicing equipment in existing homes
 3. Installing, replacing, or servicing equipment in commercial or industrial facilities.
 4. Other; please describe: [REQUIRE TEXT ENTRY]

3. [IF Q2 = 3] You said that your company's main line of business is working in commercial or industrial facilities. For the rest of this survey, **please be sure to provide answers that relate to your work in residential settings only.**
 1. I will be sure to provide answers that relate to my work in residential settings only
 2. My company does not do any work in residential settings [TERMINATE]

Termination message: We are sorry, but you do not qualify for this survey. Thank you for your time.

[DISPLAY IF Q2 = 1 OR 2] For this survey, we are only asking about your work in **residential** settings. If you happen to also do work in commercial or industrial facilities, **please limit your responses to your work in residential settings.**

Company Structure

4. Besides installing water heating equipment, what other services does your company provide? Please select all that apply. [ALLOW MULTIPLE RESPONSES]
 1. HVAC installation and/or maintenance
 2. Plumbing
 3. Electrical
 4. Construction or general contracting services
 5. Other, please specify: [REQUIRE TEXT ENTRY]
 6. My company does not provide other services. [MAKE ANSWER EXCLUSIVE]

5. Which of the following best describes your company?
 1. A business with a single location
 2. A company with multiple locations
 3. Other; please describe: [REQUIRE TEXT ENTRY]

6. [IF Q5 ≠ 1] Where is your business headquartered? [REQUIRE TEXT ENTRY: City/Town, State]

7. Approximately how many people in total work for your company? [IF Q5 ≠ 1 Think only about your locations in these four states, if applicable: Oregon, Washington, Idaho, and/or Montana]? [REQUIRE NUMERIC RESPONSE; PROVIDE OPTION FOR “DON’T KNOW”]

8. Please indicate your role(s) at the company. Select all that apply. [ALLOW MULTIPLE RESPONSES]
 1. I own the company
 2. I install or service water heaters
 3. I make recommendations about what customers should install
 4. I manage installation technicians
 5. I am in a sales position
 6. Other, please describe: [REQUIRE OPEN-END RESPONSE]

9. How many years of experience do you have in the water heating industry?
 - a. Less than 2 years
 - b. 2 to 5 years
 - c. 6 to 10 years
 - d. 11 to 20 years
 - e. More than 20 years

HPWH Awareness

10. Before today, had you heard the term “heat pump water heater” or “hybrid water heater”?
 1. Yes
 2. No
 98. I’m not sure

11. [IF Q10 = 1 “As you may already be aware, heat”; IF Q10 = 2 or 98 “Heat”] pump water heaters, also known as electric hybrid water heaters, use an electric heat pump to transfer heat from the air outside of the unit to the water in the tank. They work like a refrigerator, but in reverse. They are *not* the same as a tankless water heater. A heat pump water heater has a large cylinder-shaped water storage tank, like a standard water heater. A tankless water heater has a smaller metal box mounted on a wall, with no storage tank.

Based on that description, have you heard of “heat pump water heaters” or “hybrid water heaters”?

1. Yes
2. No

98. I'm not sure

[DISPLAY TEXT] For the rest of this survey, we will use the term “heat pump water heater” to refer to this type of water heater.

12. [IF Q11 = 1] Before this survey, which of the following best describes your level of familiarity with heat pump water heaters?
1. Not very familiar - heard of them but never worked with them
 2. Somewhat familiar - worked with them occasionally
 3. Very familiar - worked with them regularly

Installation Practices

13. What types of water heaters does your company install in residential homes? Please select all that apply. [RANDOMIZE 1 TO 5; ALLOW MULTIPLE RESPONSES]
1. Electric resistance storage
 2. Gas storage
 3. Gas on-demand/tankless
 4. Electric on-demand/tankless
 5. Heat pump water heater
 6. Other; please specify: [REQUIRE TEXT ENTRY]
 98. I'm not sure [EXCLUSIVE RESPONSE]

14. [IF AT LEAST TWO OPTIONS OF Q13 OPTIONS 1 THROUGH 5 SELECTED; DISPLAY OPTIONS 1-5 SELECTED IN Q13] What is the most profitable type of water heater for your company to install in residential homes? [RANDOMIZE OPTIONS 1 TO 5]
1. Electric resistance storage
 2. Gas storage
 3. Gas on-demand/tankless
 4. Electric on-demand/tankless
 5. Heat pump water heater
 6. [PIPED TEXT ENTRY IF Q13 = 5]
 7. Other; please specify: [REQUIRE TEXT ENTRY]
 98. I'm not sure [EXCLUSIVE RESPONSE]

15. [IF Q14 ≠ 98] Why is that type of water heater the most profitable to install? [REQUIRE TEXT ENTRY]

Familiarity and Confidence

16. Please assess how much you agree or disagree with the following statements. [RANDOMIZE ORDER]
- a. I try to avoid newer water heater technologies.
 - b. [IF Q11 = 1] Heat pump water heaters are reliable.
 - c. [IF Q11 = 1] Heat pump water heaters are good replacements for traditional electric resistance water heaters.

- d. [IF Q11 = 1] My company's installation technicians can easily install heat pump water heaters correctly.
- e. [IF Q11 = 1] My company is likely to get customer complaints or service requests soon after installing a heat pump water heater.
- f. [IF Q11 = 1] My company regularly recommends heat pump water heaters to customers.
- g. [IF Q11 = 1] Heat pump water heaters remove heat from the room where they are located.
- h. [IF Q11 = 1] Replacing an electric resistance water heater with a heat pump water heater will lower a customer's overall energy bill.
- i. My company makes more money when we sell a larger number of low-cost water heaters than when we sell a smaller number of high-cost water heaters.
- j. [IF Q11 = 1] I can get heat pump water heaters quickly from local distributors.

- 1. Strongly disagree
- 2. Somewhat disagree
- 3. Neither agree nor disagree
- 4. Somewhat agree
- 5. Strongly agree
- 98. Don't know

17. [IF Q16c = 1 OR 2] Why do you feel that heat pump water heaters are not good replacements for electric resistance water heaters? Select all that apply. [RANDOMIZE ORDER; ALLOW MULTIPLE RESPONSES]

- 1. Lack of product support at the manufacturer level
- 2. Lack of product support at the distributor level
- 3. Lack of consumer awareness
- 4. My company had a bad experience with a heat pump water heater installation in the past
- 5. The difficulty of installation
- 6. High upfront cost
- 7. Payback period is too long
- 8. Difficulty finding heat pump water heaters in stock
- 9. Other; please describe: [REQUIRE TEXT ENTRY]
- 98. I'm not sure [EXCLUSIVE RESPONSE]

18. [IF Q17 = 5] Could you describe the installation difficulties you experience when installing heat pump water heaters? [REQUIRE OPEN END]

19. [IF Q11 = 1] How frequently do installation technicians face challenges with the following aspects of a heat pump water heater installation? [RANDOMIZE ORDER]

- a. Pipe configuration
- b. No nearby drain for condensate
- c. New wiring/electrical work required

- d. Inadequate make-up air/airflow
- e. Heat pump water heater too large to fit where old water heater was
- f. Complications related to floorplan and noise (noise from heat pump water heater would be a nuisance in desired installation location)
- g. Complications related to floorplan and cold air (cold air generated by heat pump water heater would be a nuisance in desired installation location)
- h. Installing ductwork
- i. Other; please describe: [OPTIONAL TEXT ENTRY]
 1. Always
 2. Very frequently
 3. Occasionally
 4. Rarely
 5. Very rarely
 6. Never
 98. Don't know

20. [DISPLAY IF Q13 = 1, 3, 4, AND/OR 5] On average, how many person-hours does it take to install each of the following water heaters in a typical home: (To estimate person hours, multiply the time spent by the number of people working. For example, one person working two hours is 2 person-hours; two people working for one hour is also 2 person hours.)
- a. [DISPLAY IF Q13 = 1] Electric resistance storage tank: ___ hours [REQUIRE NUMERIC ENTRY; OPTION FOR DK/N/A]
 - b. [DISPLAY IF Q13 = 5] **Un-ducted** heat pump water heater: ___ hours [REQUIRE NUMERIC ENTRY; OPTION FOR DK/N/A]
 - c. [DISPLAY IF Q13 = 5] **Ducted** heat pump water heater: ___ hours [REQUIRE NUMERIC ENTRY; OPTION FOR DK/N/A]
 - d. [DISPLAY IF Q13 = 3 OR 4] On-demand or tankless: ___ hours [REQUIRE NUMERIC ENTRY; OPTION FOR DK/N/A]
21. [IF Q11 = 1] Please estimate what percentage of heat pump water heater installations require ducting to be installed.
 ___ % [REQUIRE NUMERIC ENTRY WITH OPTION FOR "I'M NOT SURE"]
22. [IF Q11 = 1] Heat pump water heaters can be set in different modes:
- heat pump only (most efficient),
 - hybrid or mixed operation (primarily operates in heat pump mode but uses electric resistance as backup), or
 - electric resistance only (least efficient).
- When installing a heat pump water heater in a customer's home, what mode would you usually recommend to the customer?
1. Heat pump only
 2. Hybrid or mixed operation

- 3. Electric resistance only
- 4. It depends
- 98. I'm not sure

23. [IF Q22 = 2, 3, OR 4] Why do you say that? [REQUIRE TEXT ENTRY]

Sales and Revenues from Heat Pump Water Heaters

For the following questions, please think about what your company has done in past 12 months (the past year).

24. [IF Q13 = 1 OR 4] How many *residential electric storage water heaters* did your company install in the past year? [IF Q13 = 4 "Please include installations of heat pump water heaters in your estimate."] Your best estimate is fine.

___ [REQUIRE NUMERIC RESPONSE]

25. [IF Q24 > 0] Of the approximately [PIPE NUMBER FROM Q24] *residential electric storage water heaters your company installed in the past year*, about what percent were heat pump water heaters? Your best estimate is fine.

___% [REQUIRE NUMERIC RESPONSE 0 to 100]

26. [IF Q25 > 0] Of the *heat pump water heaters your company installed in the past year*, about what percent of units were ...

a. 55 gallons or greater? ___% [REQUIRE NUMERIC RESPONSE 0 to 100]

b. Less than 55 gallons? ___% [REQUIRE NUMERIC RESPONSE 0 to 100]

Total: ___% [AUTOMATIC SUM: REQUIRE A + B = 100]

27. [IF Q25 > 0] Thinking about *all the heat pump water heaters your company installed in the past year*, about what percent of units were to customers who were...

a. replacing a failed water heater? ___% [REQUIRE NUMERIC RESPONSE 0 to 100]

b. replacing an old/near-failure water heater? ___% [REQUIRE NUMERIC RESPONSE 0 to 100]

c. replacing a fully functioning water heater? ___% [REQUIRE NUMERIC RESPONSE 0 to 100]

d. installing a water heater in a newly constructed home? ___% [REQUIRE NUMERIC RESPONSE 0 to 100]

Total: ___% [AUTOMATIC SUM: REQUIRE A THROUGH + D = 100]

28. Thinking about your company's *overall business revenues* in the past 12 months, about what percent was from water heater sales and installations?

a. ___% [REQUIRE NUMERIC RESPONSE 0 to 100]

- b. Comments: [TEXT ENTRY, OPTIONAL]
29. [IF Q25 > 0] Thinking about your company's revenues just from sales and installations of water heaters in the past 12 months, about what percentage was from heat pump water heaters?
- ___% [REQUIRE NUMERIC RESPONSE 0 to 100]
 - Comments: [TEXT ENTRY, OPTIONAL]
30. When you replace a large capacity (≥ 55 gallons) electric resistance storage water heater for a residential customer, what is your typical replacement strategy?
- Replace with a heat pump water heater
 - Replace with a single, smaller residential electric resistance storage water heater
 - Replace with two smaller residential electric resistance storage water heaters
 - Replace with a single commercial electric resistance storage water heater
 - Replace with an electric tankless water heater
 - Replace with a gas storage water heater
 - Replace with a gas tankless water heater
 - Other; please describe: [REQUIRE TEXT ENTRY]
31. [IF Q13 = 1] When installing smaller electric resistance storage tank water heaters (<55 gallons), how often do you install mixing valves, or a tank with an integrated mixing valve, in order to increase the amount of hot water produced by the smaller tank?
- Never
 - Rarely
 - Sometimes
 - Always
 - Other; please describe: [REQUIRE TEXT ENTRY]
 - I'm not sure
32. [IF Q31 = 3 OR 4] Do you [PIPE Q31 VALUE "sometimes" or "always"] install mixing valves on these smaller tanks to avoid installing a heat pump water heater?
- Yes
 - No
 - Other; please specify: [REQUIRE TEXT ENTRY]
33. What types of water heating equipment does your company typically keep on hand for **emergency replacements**? Select all that apply. [RANDOMIZE ORDER OF 1-4; ALLOW MULTIPLE RESPONSES]
- Electric resistance storage
 - Gas storage
 - On-demand/tankless

- 4. Heat pump water heater
- 5. Other; please specify: [REQUIRE TEXT ENTRY]
- 6. None of the above [EXCLUSIVE RESPONSE]
- 98. Don't know [EXCLUSIVE RESPONSE]

Heat Pump Water Heater Recommendations

34. [IF Q11 = 1] In what percent of the homes that you visit could you install a heat pump water heater without making more changes to the installation area than is typical for a standard storage water heater? Think only of existing homes, **not** newly built homes. Your best guess is fine.
- ___% [REQUIRE NUMERIC RESPONSE 0 to 100]
35. [IF Q11 = 1] In each of the following scenarios, what percent of the time would you recommend heat pump water heaters to a customer? [REQUIRE NUMERIC RESPONSE 0 to 100]
- a. To replace a fully functioning water heater ___ %
 - b. To replace an old/near-failure water heater ___ %
 - c. To replace a failed water heater ___ %
 - d. For new construction (new homes that are not yet occupied, where the customer is the builder/developer) ___ %
36. [IF Q35a > 0%] When you have recommended heat pump water heaters to a customer who is **replacing a fully functioning water heater**, what percentage of the time have they agreed to install one?
- a. ___% [REQUIRE NUMERIC RESPONSE 0 to 100]
 - b. I have never recommended a heat pump water heater to a customer replacing a fully functioning water heater
 - c. Comments: [OPTIONAL TEXT ENTRY]
37. [IF Q35b > 0%] When you have recommended heat pump water heaters to a customer who is **replacing an old water heater that still works but is near the point of failure**, what percentage of the time have they agreed to install one?
- a. ___% [REQUIRE NUMERIC RESPONSE 0 to 100]
 - b. I have never recommended a heat pump water heater to a customer replacing a near-failure water heater
 - c. Comments: [OPTIONAL TEXT ENTRY]
38. [IF Q35c > 0%] When you have recommended a heat pump water heater to a customer who is **replacing a failed water heater**, what percentage of the time have they agreed to install one?
- a. ___% [REQUIRE NUMERIC RESPONSE 0 to 100]
 - b. I have never recommended a heat pump water heater to a customer replacing a failed water heater

- c. Comments: [OPTIONAL TEXT ENTRY]
39. [IF Q35c < 50%] You said you recommend heat pump water heaters to customers who need to replace a failed water heater about [PIPE Q35C PERCENTAGE]% of the time. Why don't you recommend heat pump water heaters more often in this situation? [REQUIRE TEXT RESPONSE]
40. [IF Q35d > 0%] When you have recommended a heat pump water heater to a builder/contractor **working on building a new home**, what percentage of the time have they agreed to install one?
- ___% [REQUIRE NUMERIC RESPONSE 0 to 100]
 - I have never recommended a heat pump water heater to a builder/contractor for a new home
- c. Comments: [OPTIONAL TEXT ENTRY]
41. [IF Q11 = 1] In the next year or two, how often do you expect you will recommend heat pump water heaters to your customers?
- Much more often than you do now
 - Somewhat more often than you do now
 - At the same rate as you do now
 - Somewhat less often than you do now
 - Much less often than you do now
42. [IF Q11 = 1] Why do you say that you will recommend heat pump water heaters to your customers [PIPE Q41 RESPONSE]? [REQUIRE TEXT ENTRY]

Callbacks

43. [IF AWARE OF HPWH] In the past two years, how many times have you serviced or repaired a heat pump water heater? Your best estimate is fine. [REQUIRE NUMERIC ENTRY]
44. [IF Q43 > 0] In the approximately [PIPE IN Q43 VALUE] heat pump water heater service calls you have received in the past two years, how often did you encounter the following issues? Your best estimate is fine. If never, enter 0%. [ROTATE OPTIONS A THROUGH E]
- Tank is too small (not enough hot water) __%
 - Unit not functioning properly in cold weather __%
 - Unit was incorrectly installed __%
 - Unit was installed in an unsuitable location __%
 - Dirty or clogged filters __%
 - Faulty components (e.g. control board, compressor) __%
45. [IF Q43 > 0] Besides the reasons listed above, please describe any other issues you encounter during service calls for heat pump water heaters. [REQUIRE TEXT ENTRY]
46. [IF Q43 > 0] In what percentage of heat pump water heater service calls does the following happen...
- More than one service call to resolve issue __%

- b. Technician needs to call the manufacturer __%
 - c. Advise customer to change the mode from hybrid to electric to address hot water concerns __%
 - d. Unit is replaced with a new heat pump water heater __%
 - e. Unit is replaced with a different type of water heater __%
47. [IF Q13 = 5] Do you keep spare parts or replacement units specifically for heat pump water heaters on hand?
- 1. Yes
 - 2. No
 - 98. I'm not sure
48. [IF Q43 > 0] Have you ever serviced or repair heat pump water heaters that your company did not install?
- 1. Yes
 - 2. No
 - 98. I'm not sure
49. [IF Q48 = 1] Thinking about the heat pump water heaters you service that you did not install, what percent were installed by the customer (DIY) versus professionally installed?
- a. Installed by the customer (DIY) __%
 - b. Installed by a professional (another plumber/installer) __%
- Total: __% [AUTOMATIC SUM: REQUIRE A THROUGH + B = 100]
50. [IF Q49a > 0%] Do you see issues with "DIY" installs that you do not see when a professional installs a heat pump water heater? Please describe: [REQUIRE TEXT ENTRY]
51. [IF Q13 = 5] Compared to other types of water heaters, how often do you receive service requests or callbacks for heat pump water heaters? In your experience, do heat pump water heaters have...
- a. Many more issues
 - b. Somewhat more issues
 - c. About the same number of issues
 - d. Somewhat fewer issues
 - e. Many fewer issues
52. [IF Q13 = 5] In your experience, how long do heat pump water heaters last compared to other types of water heaters (the lifetime of the equipment)?
- a. Much longer
 - b. Somewhat longer
 - c. About the same
 - d. Somewhat shorter
 - e. Much shorter

53. [IF Q13 = 5] Do you have any other comments about your experience responding to service calls for heat pump water heaters to share? [OPTIONAL TEXT ENTRY]

Updated Standards and Access to Information

54. [IF Q1 = WASHINGTON] Have you heard of the new standard, ANSI/CTA-2045, which requires all new electric storage water heaters manufactured after January 1, 2023, to have a communications port?
1. Yes
 2. No
 98. I'm not sure
55. [IF Q54 = 1] Do you think the new standard is a positive or negative development?
1. Positive
 2. Negative
 3. Neither positive or negative
 98. I'm not sure
56. [IF Q55 = 2 OR 3] Why do you say that? [REQUIRE TEXT ENTRY]

Training

57. Have you, or has someone else at your company, ever participated in a Hot Water Solutions training about heat pump water heaters sponsored by local utilities or the Northwest Energy Efficiency Alliance? (Hot Water Solutions trainings have been offered in-person and via webinar, so you may have attended in person or online.)
1. Yes
 2. No
 98. I'm not sure
58. Before today, have you heard of Hot Water Solutions? [<https://hotwatersolutionsnw.org>]
1. Yes
 2. No
 3. I'm not sure

Closing

59. [IF Q11 = 1] In closing, how likely are you to recommend heat pump water heaters to a friend or colleague?
Please use a score of 0 to 10 where 0 is "not at all likely" and 10 is "extremely likely".
60. [IF Q11 = 1] Would you ever install a heat pump water heater in your own home?
1. Yes
 2. No

61. Please let us know if you have any additional thoughts about heat pump water heaters.
[OPTIONAL TEXT ENTRY]
62. Please enter the email address where you would like us to send your gift card.
 1. Email address: [restrict to email address]
 2. I am not accepting an incentive for this survey.
63. Would you be willing to participate in future research opportunities?
 1. Yes
 2. No

[FINISH SURVEY] Thank you for your feedback! Please allow up to 2 weeks to receive your gift card. If you have any questions, please email [NMR contact].

PURCHASER SURVEY GUIDE (WEB ONLY)

Intro

NMR Group, on behalf of the Northwest Energy Efficiency Alliance (NEEA), is conducting research on heat pump water heaters. Your responses will be kept completely confidential. This survey will take about 15 - 20 minutes. If you are eligible and complete the survey, we will send you a \$25 gift card to thank you for your time. If you have any questions or need help with completing the survey, please contact [NMR contact name] at NEEAsurvey@nmrgroupinc.com or 617-544-2008.

Whenever you see text with a box around it, like the one below, you can click on it for more information. [“CLICK ME” EXAMPLE POP-UP BOX]

Screener

[BASE: ALL]

1. When it comes to equipment purchases and home repairs, are you one of the decision-makers in your household?
 1. Yes
 2. No [TERMINATE; ASK TO FORWARD SURVEY TO DECISION-MAKER]
 98. I’m not sure [TERMINATE]

[BASE: ALL]

2. S_STATE. What state do you live in? (Please answer for your primary residence.) [DROPDOWN MENU]
 1. Oregon
 2. Washington
 3. Idaho
 4. Montana

5. Another state [TERMINATE]
3. COUNTY. Please select your county. [DROPDOWN MENU. ANSWER CHOICES REFLECT S_STATE RESPONSE AND INCLUDE “Don’t know”]
4. [ASK IF COUNTY = Don’t Know] S_ZIP. What is your zip code?
5. S_AWARE. Before today, had you heard the term “heat pump water heater” or “hybrid water heater”? Note that these are *not* the same as a tankless water heater.
 1. Yes
 2. No
 98. I’m not sure

[DISPLAY TEXT] [IF S_AWARE = 1 “As you may already be aware, heat”; IF S_AWARE = 2 or 98 “Heat”] pump water heaters, also known as electric hybrid water heaters, use an electric heat pump to transfer heat from the air outside of the unit to the water in the tank. They work like a refrigerator, but in reverse. They are *not* the same as a tankless water heater. A heat pump water heater has a large cylinder-shaped water storage tank, like a standard water heater. A tankless water heater has a smaller metal box mounted on a wall, with no storage tank.

6. [IF S_AWARE = 2, 98] Based on that description, have you heard of “heat pump water heaters” or “hybrid water heaters”?
 1. Yes
 2. No [TERMINATE]
 98. I’m not sure [TERMINATE]

[DISPLAY TEXT] For the rest of this survey, we will use the term “heat pump water heater” to refer to this type of water heater.

[BASE: ALL]

7. S_HPWH. Have you purchased a heat pump water heater, or moved into a home with a heat pump water heater already installed, in the past five years?
 1. Yes, purchased a heat pump water heater
 2. Yes, moved into a home with a heat pump water heater already installed
 3. No [TERMINATE]
 98. I’m not sure [TERMINATE]
8. S_INSTALL. Is that heat pump water heater still installed?
 1. Yes
 2. No
 98. I’m not sure [TERMINATE]

9. S_UNINSTALL. [IF S_INSTALL=2] Why did you uninstall the heat pump water heater?
1. The heat pump water heater was completely broken and did not provide any hot water
 2. The heat pump water heater worked poorly and/or needed repair
 3. I renovated my home
 4. I wanted a water heater with a specific feature (Please specify the feature:) [REQUIRE TEXT ENTRY]
 5. I was dissatisfied with the heat pump water heater (Please explain:) [REQUIRE TEXT ENTRY]
 6. Other; please specify: [REQUIRE TEXT ENTRY]
 98. I'm not sure

10. [IF S_INSTALL = 2] What type of water heater did you install to replace the heat pump water heater? As a reminder, whenever you see text with a box around it, like those in the answer choices below, you can click on it for more information. Please click on the larger box surrounding the text and image to select an answer choice. [SHOW EXAMPLE PHOTOS AND POP-UP DEFINITIONS FOR EACH]

1. Storage [Pop-up: "A storage water heater is typically located on the floor, and is typically a large cylinder shape."]
2. On Demand / tankless [Pop-up: "An on-demand water heater is a smaller metal box typically mounted on a wall."]
3. Indirect storage tank attached to boiler [Pop-up: "Indirect water heaters use the heat from your boiler to warm the water stored in the tank; they are usually connected to a boiler with pumps and pipes."]
4. Heat pump water heater [Pop-up: "Heat pump water heaters are also known as electric hybrid water heaters. They use an electric heat pump to transfer heat from the air outside of the unit to the water in the tank. It has a large cylinder-shaped water storage tank, like a standard water heater."]
98. I'm not sure

[IF S_INSTALL= 2, DISPLAY TEXT] For the remainder of the survey, please think about the heat pump water heater that was previously installed.

[BASE: ALL]

11. In which year did you [IF S_HPWH = 1 "purchase"; IF S_HPWH = 2 "move into the home with"] the heat pump water heater? [DROPDOWN 2010 or earlier, 2011 – 2024, AND "I'M NOT SURE" OPTIONS]
12. HPWH_NUM. Have you purchased more than one heat pump water heater?
 1. Yes
 2. No
 98. I'm not sure

13. HPWH_NUM2. [IF HPWH_NUM = 1 OR 98] How many heat pump water heaters are currently installed at your *primary residence* (where you live most of the year)?

1. One
2. Two or more
3. None, my heat pump water heater(s) are installed in my vacation home
4. None, my heat pump water heater(s) are installed in property I rent to others
5. Other; please specify: [REQUIRE TEXT ENTRY]
6. I'm not sure [TERMINATE]

[DISPLAY TEXT IF Q13 =1 OR 2] During the survey, please think about the heat pump water heater(s) installed in your primary residence."

14. [IF HPWH_NUM2 = 2] Could you describe why your primary residence has more than one heat pump water heater? [REQUIRE OPEN END TEXT ENTRY AND INCLUDE OPTION TO REFUSE]

15. [IF HPWH_NUM = 2] HPWH_HOME. Where was the heat pump water heater installed?

1. My primary residence
2. My vacation home
3. A property I rent to others
4. Other; please specify: [REQUIRE TEXT ENTRY]
98. I'm not sure [TERMINATE]

16. S_INCENTIVE1. Did you apply for or receive any of the following incentives or credits when you purchased your heat pump water heater? [ALLOW MULTIPLE RESPONSES FOR OPTIONS 1 TO 3]

1. Rebate or discount from your local utility
2. Federal or state tax credit
3. Other discount: [REQUIRE TEXT ENTRY]
4. None of the above
98. I'm not sure

17. PROJECT_TYPE2. Was the heat pump water heater installed in an existing home or was it part of a new home construction?

1. Existing home
2. New home construction
98. I'm not sure

18. INSTALL_CONFIRM. [IF INSTALL_LOC IS AVAILABLE] Our records indicate that your heat pump water heater is installed in [INSTALL_LOC]. Is that correct?

1. Yes
2. No

98. I'm not sure

19. [IF INSTALL_LOC IS NOT AVAILABLE OR INSTALL_CONFIRM = 2] Where is the heat pump water heater located? Is it in a...

1. Unfinished basement or crawl space
 2. Finished basement
 3. Garage
 4. Closet or utility room (not in a basement)
 5. Kitchen
98. Other, please specify: [REQUIRE TEXT ENTRY]
98. I'm not sure

20. Is the heat pump water heater located in a part of your home that is heated? By "heated", we mean a space that is served by a heating system and generally stays close to the temperature set by your thermostat.

1. Yes – heated
 2. No – unheated
 3. Other, please specify: [REQUIRE TEXT ENTRY]
98. I'm not sure

[BASE: ALL]

21. Is the heat pump water heater located in a part of your home that is insulated? By "insulated", we mean a room that has insulation in the exterior walls, floors, or ceilings, so that it is reasonably warm in the winter, though maybe not as warm as the rest of your home. These spaces may or may not be directly heated. Common examples include garages or basements with insulated walls

1. Yes – insulated
 2. No – not insulated
 3. Other, please specify: [REQUIRE TEXT ENTRY]
98. I'm not sure

[BASE: ALL]

22. RESPONSIBLE_BILL. Are you responsible for paying the electric bill at the property with the heat pump water heater?

1. Yes
 2. No
98. I'm not sure

23. [IF UTILITY NOT AVAILABLE] Who is your electric utility provider? [REQUIRE TEXT ENTRY]

Sources of Awareness

[BASE: ALL]

24. SOURCE_AWARE. Where or how have you heard about heat pump water heaters? [MULTIPLE RESPONSES; ROTATE OPTIONS 3 THROUGH 17]
1. I previously owned one
 2. From a friend, family member, or colleague
 3. Utility print advertising or bill insert
 4. Utility website
 5. "Hot Water Solutions" website
 6. Retail store display
 7. Retail store salesperson
 8. Online news story
 9. Television ad
 10. Radio ad
 11. Social media, such as Facebook, Instagram, or YouTube, please specify: [REQUIRE TEXT ENTRY]
 12. Contractor or installer
 13. While researching on the Internet
 14. Internet advertising
 15. Utility newsletter
 16. Professional experience
 97. Other, please specify: [REQUIRE TEXT ENTRY]
 98. I'm not sure

[BASE: ALL]

25. Please assess how much you agree or disagree with the following statements. [RANDOMIZE; COLOR ONLY FOR REVIEWERS' BENEFIT FOR POSITIVE AND NEGATIVE STATEMENTS]
- Strongly disagree
 - Somewhat disagree
 - Neither agree nor disagree
 - Somewhat agree
 - Strongly agree
- a. Heat pump water heaters are very efficient.
 - b. Heat pump water heaters result in lower electric bills than a typical electric water heater.
 - c. Heat pump water heaters are eligible for tax credits and/or discounts from utility companies.
 - d. Heat pump water heaters offer better value than typical electric water heaters.
 - e. Heat pump water heaters can be controlled from a smart phone.
 - f. Heat pump water heaters are noisy.
 - g. Heat pump water heaters are unreliable.
 - h. Heat pump water heaters are expensive to install.
 - i. Heat pump water heaters are expensive to service or repair.
 - j. Heat pump water heaters do not produce enough hot water.

Purchase Decision / Importance of Incentives

26. PREVIOUS_WH. [IF S_HPWH = 1] What type of water heater did you have before you purchased the heat pump water heater? Please click on the larger box surrounding the text and image to select an answer choice. [SHOW EXAMPLE PHOTOS AND POPUP DEFINITIONS FOR EACH]
1. Storage ["A storage water heater is typically shaped like a large cylinder and located on the floor."]
 2. On Demand / tankless ["An on-demand water heater is a smaller metal box typically mounted on a wall."]
 3. Indirect storage tank attached to boiler ["Indirect water heaters use the heat from your boiler to warm the water stored in a tank. They are usually connected to a boiler with pumps and pipes."]
 4. Heat pump water heater [Pop-up: "Heat pump water heaters are also known as electric hybrid water heaters. They use an electric heat pump to transfer heat from the air outside of the unit to the water in the tank. It has a large cylinder-shaped water storage tank, like a standard water heater."]
98. I'm not sure
27. [IF S_HPWH = 1 AND PREVIOUS_WH = 1, 2, 3, OR 4] You indicated that you installed a heat pump water heater to replace a [IF PREVIOUS_WH = 1 "storage"; IF PREVIOUS_WH = 2 "on-demand/tankless"; IF PREVIOUS_WH = 3 "indirect storage tank"; IF PREVIOUS_WH = 4 "heat pump"] water heater. What fuel did that water heater use? Please click on the text with a small box around it for more information, and click on the larger box surrounding the text to select an answer choice. [ADD POP-UP DEFINITIONS FOR EACH]
1. Electricity ["Electric water heaters only use electricity to heat water."]
 2. Natural Gas ["Natural gas comes to your home via underground pipes."]
 3. Propane ["Propane is delivered to your home and stored in a tank."]
 4. Fuel oil ["Fuel oil is delivered to your home and stored in a tank."]
 5. Another fuel type; please specify: [REQUIRE TEXT ENTRY]
98. I'm not sure
28. [IF PREVIOUS_WH = 1, 3, OR 4] What was the size of the water heater you replaced with the heat pump water heater?
1. Less than 55 gallons
 2. 55 gallons or more
98. I'm not sure
29. [IF TANK_VOLUME IS NOT AVAILABLE] How many gallons is your [IF S_INSTALL = 1 "current water heater tank"] [IF S_INSTALL = 2 "heat pump water heater"]?
1. Less than 55 gallons
 2. 55 gallons or more

98. I'm not sure

[BASE: PURCHASED A HEAT PUMP WATER HEATER]

30. [IF S_HPWH = 1 AND PROJECT_TYPE2 = EXISTING HOME] Why did you purchase a new water heater? [ROTATE RESPONSES 1 THROUGH 6]
1. My water heater was completely broken and did not provide any hot water
 2. My water heater worked poorly and/or needed repair
 3. My water heater was old and/or close to failing
 4. I wanted to install a more energy-efficient water heater
 5. To serve an addition to my home
 6. I wanted a water heater with a specific feature: [REQUIRE TEXT ENTRY]
 7. Other, please specify: [REQUIRE TEXT ENTRY]
98. I'm not sure

[BASE: PURCHASED A HEAT PUMP WATER HEATER]

31. WH_OPTIONS. [IF S_HPWH = 1] Besides heat pump water heaters, what other water heating options did you consider? Please select all options you considered. [ALLOW MULTIPLE RESPONSES]
1. Standard electric storage tank
 2. Electric tankless
 3. Natural gas tankless
 4. Natural gas storage tank, which would require natural gas service
 5. Propane storage tank
 6. Solar water heating
 7. I did not consider other types of water heaters
98. I'm not sure

32. [IF WH_OPTIONS = 1 THROUGH 6] Why did you decide to install a heat pump water heater instead of the other water heating options you considered? Please select all that apply. [ALLOW MULTIPLE RESPONSES]
1. Other options were more expensive to purchase
 2. Other options were more expensive to operate
 3. Other options were less efficient
 4. Other options required unacceptable renovation
 5. The availability of rebates/incentives from my utility
 6. To save energy
 7. [IF NEW CONSTRUCTION] Satisfied credits for the energy code when building my home
 8. Heat pump water heaters were recommended by a contractor or a salesperson
 9. Heat pump water heaters were recommended by someone else; please specify who: [REQUIRE TEXT ENTRY]
 10. Other, please specify: [REQUIRE TEXT ENTRY]
98. I'm not sure

33. [IF S_HPWH = 1] Where did you purchase your heat pump water heater?
1. Retail store (e.g. Home Depot, Lowe's, ACE Hardware, including online)
 2. Contractor or installer
 3. Utility marketplace (e.g. Enervee)
 4. Online / Internet / Website (e.g. Amazon.com) (Please specify: [REQUIRE TEXT ENTRY])
 5. Directly from my utility (this may include units that were provided at no cost)
 6. Other, please specify: [REQUIRE TEXT ENTRY]
 98. I'm not sure

[BASE: PURCHASED A HEAT PUMP WATER HEATER]

34. HPWH_FACTOR. [IF S_HPWH = 1] Which of the following were important factors in your decision to purchase a heat pump water heater? Please select all that apply.
1. The ENERGY STAR label
 2. [IF SOURCE_AWARE = 5 OR 6] The information on the Hot Water Solutions website
 3. Recommendation from your contractor, installer, and/or salesperson
 4. Rebate or incentive from your utility
 5. State or federal tax credit(s)
 6. Energy efficiency (saving energy)
 7. Going "green"/being good for the environment
 8. [IF NEW CONSTRUCTION] To satisfy energy code requirements

[BASE: PURCHASED A HEAT PUMP WATER HEATER]

35. [IF S_HPWH = 1] Were there any other factors that were important in your decision to install a heat pump water heater?
1. Yes, please specify: [REQUIRE TEXT ENTRY]
 2. No
 98. I'm not sure
36. Which statement most accurately describes your decision-making process?
1. I knew I wanted a heat pump water heater before I went shopping or spoke to a contractor
 2. I was undecided until my contractor, installer, or salesperson recommended a heat pump water heater
 3. Something else: [REQUIRE TEXT ENTRY]
37. [IF Q41 = 2] What did the installer or salesperson say to persuade you to choose a heat pump water heater? [REQUIRE TEXT ENTRY]

Installation

[DISPLAY TEXT] Now I would like to ask a few questions about the installation itself.

38. [PROJECT_TYPE2 = 1 AND S_HPWH = 1] HIRE_INSTALLER1. Did you install the new water heater yourself, or did you hire an installer to do it?

1. Installed it myself
 2. Hired an installer
 3. Other, please specify: [REQUIRE TEXT ENTRY]
 98. I'm not sure
39. [PROJECT_TYPE2 = 2 AND S_HPWH = 1] HIRE INSTALLER2. Did you install the new water heater yourself, did you hire an installer to do it separately from your home construction, or did the general contractor building your home manage the installation?
1. Installed it myself
 2. Hired an installer separate from home construction
 3. General contractor managed installation
 4. Other, please specify: [REQUIRE TEXT ENTRY]
 98. I'm not sure
40. [IF HIRE_INSTALLER1=1 OR HIRE_INSTALLER2=1] Do you, or someone in your household, have professional experience installing water heaters or other mechanical equipment (e.g., plumber, contractor, or handyman?)
1. Yes
 2. No
 3. Other: [REQUIRE TEXT ENTRY]
41. [IF Q40 = NO] Why did you decide to install the heat pump water heater yourself? [REQUIRE TEXT ENTRY]
- [BASE: HIRED AN INSTALLER OR HIRED AN INSTALLER SEPARATE FROM HOME CONSTRUCTION]
42. [IF HIRE_INSTALLER1 = 2 OR HIRE_INSTALLER2 = 2] How did you find the person or company that installed your new water heater?
1. Smart Water Heat website / Hot Water Solutions website / contractor finder
 2. Angie's List
 3. Craigslist
 4. Personal recommendation
 5. Retailer recommendation
 6. Retailer home services (e.g. Home Depot or Lowe's Home Services department)
 7. Manufacturer recommendation
 8. Previous relationship with contractor
 9. Utility contractor list
 10. Yelp
 11. Nextdoor
 12. Thumbtack
 13. TaskRabbit
 14. Other, please specify: [REQUIRE TEXT ENTRY]
 98. I'm not sure

43. [IF HIRE_INSTALLER1 = 2 OR HIRE_INSTALLER2 = 2] How many quotes or bids did you receive before selecting your installer? [ENTER NUMBER, WITH OPTION FOR I'M NOT SURE]
44. [IF Q43 > 0] How many of the [PIPE IN Q43] installers that provided you quotes recommended a heat pump water heater to you? [REQUIRE NUMERIC ENTRY WITH OPTION FOR I'M NOT SURE]
[BASE: SELF-INSTALLED, HIRED AN INSTALLER, OR HIRED AN INSTALLER SEPARATE FROM HOME BUILD]
45. [IF (HIRE_INSTALLER1 = 1 OR 2) OR (HIRE_INSTALLER2 = 1 OR 2)] About how long did it take to install the heat pump water heater?
1. Half a day or less
 2. One day
 3. Two days
 4. Three days
 5. Four days
 6. Five or more days
 98. I'm not sure
46. INSTALL_CHALLENGES [IF (HIRE_INSTALLER1 = 1, 2) OR (HIRE_INSTALLER2 = 1, 2, 3)] Did [IF HIRE_INSTALLER 1 = 2 OR (HIRE_INSTALLER2 = 2 OR 3) "your contractor / installer"] [IF HIRE_INSTALLER 1 = 1 OR HIRE_INSTALLER2 = 1 "you"] encounter any challenges with the heat pump water heater installation?
1. Yes
 2. No
 98. I'm not sure
47. CHALLENGES_ENCOUNTER [IF INSTALL_CHALLENGES = 1] What challenges did [IF HIRE_INSTALLER 1 = 2 OR (HIRE_INSTALLER2 = 2 OR 3) "your contractor / installer"] [IF HIRE_INSTALLER 1 = 1 OR HIRE_INSTALLER2 = 1 "you"] encounter? Please select all that apply. [RANDOM ORDER, ALLOW MULTIPLE RESPONSES]
1. Pipe configuration
 2. No nearby drain for condensate
 3. New wiring/electrical work required
 4. Inadequate make-up air/airflow
 5. Heat pump water heater too large to fit where old water heater was located
 6. Complications related to floorplan and noise (noise from heat pump water heater would be a nuisance in desired installation location)
 7. Complications related to floorplan and cold air (cold air generated by heat pump water heater would be a nuisance in desired installation location)
 8. Other, please specify: [REQUIRE TEXT ENTRY]
 98. I'm not sure
48. [IF CHALLENGES_ENCOUNTER = 1 THROUGH 8] For each challenge you encountered, how was the issue resolved? [SHOW FOR EACH RESPONSE SELECTED IN CHALLENGES_ENCOUNTER]
1. [REQUIRE TEXT ENTRY FOR EACH SELECTED CHALLENGES_ENCOUNTER 1-8]

98. I'm not sure
49. [IF Q40 = NO] Was the heat pump water heater the first water heater you ever installed?
1. Yes
 2. No
 3. Other: [REQUIRE TEXT ENTRY]
50. [IF Q49 = NO] Was the heat pump water heater easier or harder to install than other types of water heaters?
1. Easier to install
 2. Harder to install
 3. About the same level of difficulty
 4. I'm not sure
51. [IF Q50 = 1 OR 2] Why did you say it was [PIPE IN "EASIER" OR "HARDER"] to install the heat pump water heater compared to other water heaters? [REQUIRE TEXT ENTRY]

Education

[BASE: HIRED AN INSTALLER OR HIRED AN INSTALLER SEPARATE FROM HOME BUILD]

52. SETTINGS1 [IF HIRE_INSTALLER1 = 2 OR HIRE_INSTALLER2 = 2] Heat pump water heaters can be set in different modes:
- heat pump only (most efficient),
 - hybrid or mixed operation (primarily operates in heat pump mode but uses electric resistance as backup), or
 - electric resistance only (least efficient).
53. Did the installer/contractor tell you which water heater settings to use?
1. Yes
 2. No
 3. Other, please specify: [REQUIRE TEXT ENTRY]
98. I'm not sure
54. Which setting do you primarily use on your heat pump water heater?
1. Heat pump only (most efficient)
 2. Hybrid or mixed operation (primarily operates in heat pump mode but uses electric resistance as backup)
 3. Electric resistance only (least efficient)
98. I'm not sure
55. [IF HIRE_INSTALLER1 = 2 OR HIRE_INSTALLER2 = 2] Did your installer provide you with any of the following information after the installation? Please select all that apply. [ROTATE 1 THROUGH 5]
1. How a heat pump water heater is different from other water heaters
 2. Instructions for turning the water heater on "vacation mode"

3. Instructions to maintain the water heater, such as cleaning the filter and flushing the system
 4. Instructions to avoid placing items near the water heater to improve air flow
 5. [IF Q21 = 2] Instructions for changing the settings on the coldest days of winter
 6. Other information: [REQUIRE TEXT ENTRY]
 7. None of the above
 98. I'm not sure
56. [IF HIRE_INSTALLER1 = 1 OR HIRE_INSTALLER2 = 1] Where do you get information about how to operate and maintain your heat pump water heater? [ROTATE RESPONSES 1 THROUGH 6]
1. "Hot Water Solutions" website
 2. The manufacturer
 3. "Do-it-yourself" DIY forums online (e.g. Reddit)
 4. Online tutorials or videos (e.g., YouTube)
 5. Friends or family
 6. Trade publications
 7. Other information: [REQUIRE TEXT ENTRY]
 8. None of the above

Service and Repair

[BASE: ALL]

57. Since [IF S_HPWH = 1 "purchasing"; IF S_HPWH = 2 "moving into the home with"] the heat pump water heater, have you contacted a professional to service or repair the heat pump water heater?

A **service** is routine maintenance to keep the heat pump water heater in optimal working condition (annual tune-ups, cleaning, inspecting, etc.).

A **repair** fixes equipment that is malfunctioning or not working.

(If you both contacted a professional for some repairs or service while handling others yourself, please select both).

1. Yes, I contacted a professional
2. I handled the repair or service myself
3. No, my heat pump water heater has not needed repairs or maintenance [SKIP TO SATISFACTION MODULE]
98. I'm not sure [SKIP TO SATISFACTION MODULE]

[DISPLAY TEXT] How many times have you had a professional service and/or repair the heat pump water heater?

58. [IF Q57 = 1] NUM_SERVICE1. Number of service-only visits: [DROPDOWN 0-20, I'M NOT SURE]
59. [IF Q57 = 1] NUM_SERVICE2. Number of repair-only visits? [DROPDOWN 0-20, I'M NOT SURE]

60. [IF Q57 = 1] NUM_SERVICE3. Number of visits with service and repair in the same visit? [DROPDOWN 0-20, I'M NOT SURE]
61. [IF Q57 = 1 OR 2] What issues have you experienced with your heat pump water heater? Please select all that apply. [MULTIPLE RESPONSE, ROTATE 1 THROUGH 7]
1. Cools down room
 2. Not enough hot water
 3. Hot water slow to arrive at faucet
 4. Noise/humming/vibration
 5. Water leak
 6. High cost to operate
 7. Control board or other electronics malfunctioned
 8. Other, please specify: [REQUIRE TEXT ENTRY]
 9. No issues, just conducting periodic or annual tune-up [MAKE EXCLUSIVE]
 98. I'm not sure [MAKE EXCLUSIVE]
62. [IF NUM_SERVICE2 OR NUM_SERVICE3 > 0] How long did it take for the issue(s) to be resolved?
1. 1 day or less
 2. 1 to 2 days
 3. 3 to 7 days
 4. 1 to 2 weeks
 5. Other: [REQUIRE TEXT ENTRY]
 6. I'm not sure
63. [IF NUM_SERVICE1>0 OR NUM_SERVICE3 > 0] Thinking only for the service visit(s), not repairs, did you have a warranty that covered the service for the heat pump water heater?
1. Yes, warranty covered the cost of the entire service.
 2. Yes, warranty only partially covered the cost of the service.
 3. No
 98. I'm not sure
64. [IF NUM_SERVICE2>0 OR NUM_SERVICE3 > 0] Thinking only of repair visit(s), not service or maintenance, did you have a warranty that covered the repair of the heat pump water heater?
1. Yes, warranty covered the cost of the entire repair.
 2. Yes, warranty only partially covered the cost of the repair.
 3. No
 98. I'm not sure
65. [IF Q63 >1] Roughly, how much did the service visit(s) cost you, in total? This includes costs of labor and parts. If you had a warranty, consider only the cost you needed to pay to service

the heat pump water heater. For any visits that included a service that also triggered the need for an additional repair, please only provide the service portion of those costs. We will ask about any repair costs separately.

1. Cost (enter numerical value only): [REQUIRE NUMERIC TEXT ENTRY]
2. I'm not sure

66. [IF Q64 >1] Roughly, how much did the repairs cost you, in total? This includes costs of labor and parts. If you had a warranty, consider only the cost you needed to pay to repair the heat pump water heater.

1. Cost (enter numerical value only): [REQUIRE NUMERIC TEXT ENTRY]
2. I'm not sure

67. [IF Q57 = 1] Was it challenging to find a technician who knew how to service or repair the heat pump water heater?

1. Yes
2. No
98. I'm not sure

Satisfaction

[BASE: ALL]

68. SATISFACTION1. Since [IF S_HPWH = 1 "purchasing"; S_HPWH = 2 "moving into the home with"] the heat pump water heater, how satisfied have you been with the following items on a 5-point scale, where 1 means "very dissatisfied" and 5 means "very satisfied." How about ...? [RESPONSE MATRIX]

1. 1 - Very dissatisfied
2. 2 – Somewhat dissatisfied
3. 3 – Neither satisfied nor dissatisfied
4. 4 – Somewhat satisfied
5. 5 - Very satisfied
98. I'm not sure

Item	Rating
The sound level of the heat pump water heater	
[DISPLAY IF RESPONSIBLE_BILL = 1 & S_HPWH = 1] The change in your electricity bill after installing the heat pump water heater	
Your hot water supply	
The maintenance requirements of the heat pump water heater	

The temperature in the room where the heat pump water heater is installed?

[DISPLAY IF RESPONSIBLE_BILL = 1] The value of the heat pump water heater

[DISPLAY IF S_HPWH = 1] The sales process for buying a heat pump water heater

The heat pump water heater overall

69. [FOR EACH ITEM IN SATISFACTION1 WITH RATING < 3] Why are you dissatisfied with...?

[DISPLAY IF RATING < 3] Item

OPEN END
RESPONSE

The sound level of the heat pump water heater

The change in your electricity bill after installing the heat pump water heater

Your hot water supply

The maintenance requirements of the heat pump water heater

The temperature of the room where the heat pump water heater is installed

The value of the heat pump water heater

The sales process for buying a heat pump water heater

The heat pump water heater overall

[BASE: ALL]

70. PRIMARY_HEAT. What fuel do you primarily use to heat your home? Please click on the text with a small box around it for more information, and click on the larger box surrounding the text to select an answer choice.

1. Electricity ["Either electric resistance heating or with heat pumps."]
2. Natural Gas or Propane ["Natural gas comes to your home via underground pipes. Propane is delivered to your home and stored in a tank."]
3. Fuel oil ["Fuel oil is delivered to your home and stored in a tank."]
4. Another fuel type; please specify: [REQUIRE TEXT ENTRY]
98. I'm not sure

71. [(IF PRIMARY_HEAT = 1 AND RESPONSIBLE_BILL = 1) OR PRIMARY_HEAT = 2 - 4] HEAT_BILL_CHANGE Since installing the heat pump water heater, have you noticed any changes in how much it costs to heat your home?

1. Yes
2. No

98. I'm not sure

72. [IF HEAT_BILL_CHANGE = 1] Since installing the heat pump water heater, how have your heating bills changed? [RANDOMIZE SCALE FOR RESPONDENT FROM INCREASE TO DECREASE OR DECREASE TO INCREASE]

1. Increased a lot
 2. Increased a little
 3. Stayed about the same
 4. Decreased a little
 5. Decreased a lot
98. I'm not sure

[BASE: ALL]

73. MET_EXPECTATIONS. Overall, has the heat pump water heater met your expectations?

1. Yes
 2. No
98. I'm not sure

74. [IF MET_EXPECTATIONS = 2] Where did the heat pump water heater fall short of your expectations? [REQUIRE TEXT ENTRY WITH OPTION FOR "DON'T KNOW"]

[BASE: ALL]

75. How likely are you to recommend heat pump water heaters to a friend or colleague? Please use a score of 0 to 10 where 0 is "not at all likely" and 10 is "extremely likely".

Household Characteristics and Demographics

[DISPLAY TEXT] These final questions about you and your household are for classification purposes only. All your answers will be kept confidential.

76. Which of the following statements best describes you?

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
98. I'm not sure

77. Please assess how much you agree or disagree with the following statements: [ROTATE ORDER]

- Strongly disagree

- Somewhat disagree
 - Neither agree nor disagree
 - Somewhat agree
 - Strongly agree
- a. I do research before making big purchases.
 - b. I compare prices online for big purchases.
 - c. I seek out expert recommendations for big purchases.
 - d. I will spend money upfront to save money in the long term.
 - e. I am concerned about environmental issues.
 - f. I consider sustainability when making decisions about which products to purchase.
 - g. Actions taken by individuals like me have an impact on the environment.
 - h. Energy efficiency is my primary consideration when choosing mechanical systems for my home, like a furnace, air conditioner, or water heater.

78. Approximately what year was your home built?

1. YEAR: ____ [REQUIRE 4-DIGIT NUMBER > 1800 AND < 2022]
98. I'm not sure

79. What type of home [IF (HPWH_HOME = 1 OR 2) OR (HPWH_NUM2 = 1 OR 2) "do you live in?"; IF HPWH_HOME = 3 OR (HPWH_NUM2 = 3 or 4) "is the heat pump water heater installed in?"]

1. A free-standing, single-family home
2. A townhouse or rowhouse. [POP-UP: These share at least one side with another building, but have no other units above or below. There are no shared hallways, stairs, or basements.]
3. Manufactured or mobile home
4. Apartment or condominium in a building with 2 to 4 units.
5. Apartment or condominium in a building with 5 or more units.
6. Other, please specify: [REQUIRE TEXT ENTRY]
98. I'm not sure
99. I'd rather not say

[BASE: PRIMARY RESIDENCE OR VACATION HOME]

80. [IF (HPWH_HOME = 1 or 2) OR (HPWH_NUM2 = 1, 2, OR 3)] Do you own or rent your home?

1. Own
2. Rent
3. Other, please specify: [REQUIRE TEXT ENTRY]
99. I'd rather not say

[BASE: PRIMARY RESIDENCE OR VACATION HOME]

81. How many people living in your household are in each of the following age groups? Be sure to include yourself.
1. 5 years and under
 2. 6-17
 3. 18-24
 4. 25-34
 5. 35-44
 6. 45-54
 7. 55-64
 8. 65 and older
 99. I'd rather not say
82. Which of the following categories describes the highest level of education you have completed?
1. Some high school
 2. High school graduate or GED
 3. Trade or technical school
 4. Some college
 5. College graduate
 6. Some graduate school
 7. Graduate degree
 97. Other, please specify: [REQUIRE TEXT ENTRY]
 98. I'm not sure
 99. I'd rather not say
83. Do you consider yourself Hispanic or Latino?
1. Yes
 2. No
 99. I'd rather not say
84. How would you describe yourself? Please select all that apply. [ALLOW MULTIPLE RESPONSES]
1. White
 2. Black or African American
 3. American Indian or Alaska Native
 4. Asian
 5. Native Hawaiian or Other Pacific Islander
 6. Other, please specify: [REQUIRE TEXT ENTRY]
 99. I'd rather not say
85. Which of the following categories best describes your approximate annual household income from all sources in 2024, 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
98. I'm not sure
99. I'd rather not say

Model Number

86. HPWH_PICTURE [IF S_INSTALL=1 AND MODEL IS NOT AVAILABLE] Please go to your heat pump water heater and take a picture of the manufacturer's label that shows the brand, model number, and serial number. [SHOW EXAMPLE PHOTO] [FIRST PHOTO UPLOAD]

If your water heater has a digital display or interface with the current settings, please take a picture. Please upload a second photo of the display [SHOW EXAMPLE PHOTO]

1. I am unable to take or upload the picture

87. HPWH_MODEL. [IF S_INSTALL=1 AND HPWH_PICTURE IS EMPTY] Please type the model number you see on the manufacturer's label. In the example below, you would type "XXX-XX". [USE MODEL NUMBER FROM EXAMPLE PHOTO]

1. Model number: [REQUIRE TEXT ENTRY]
2. I cannot locate the model number

88. [IF S_INSTALL=1 AND HPWH_MODEL = 2 AND BRAND IS NOT AVAILABLE] What brand is your heat pump water heater?

1. Brand: [REQUIRE TEXT ENTRY]
98. I'm not sure

Closing

89. Those are all the questions that we have. Thank you for your help with this survey. Do you have any comments that you'd like to share about heat pump water heaters?

1. Yes [REQUIRE TEXT ENTRY]
2. No

90. GIFT_CARD In appreciation of your time, we are offering a \$25 gift card. Please enter the email address where you would like the \$25 gift card sent.

1. Yes, please send me a gift card. My email is: [REQUIRE EMAIL ADDRESS]
2. No thank you.

91. [DISPLAY TEXT IF GIFT_CARD = 1] Please allow up to seven (7) days for the gift card to be sent to the email address you have provided. If you have not received your gift card at that time, please contact Christine at NEEAsurvey@nrmgroupinc.com for assistance.

CONSUMER SURVEY GUIDE (WEB ONLY)

Intro

Welcome to NMR Group's water heater study. Your responses will provide valuable information about water heaters in the Northwest, and they will be kept completely confidential. This survey will take about 10 minutes. If you have any questions or need help with completing the survey, please reach out to NEEAsurvey@nmrgroupinc.com.

Whenever you see text with a box around it, like the one below, you can click on it for more information.

Screener

1. S_New. In the past three years, have you participated in a survey about water heaters?
 1. Yes [SKIP TO C1]
 2. No

2. S_StateCounty. What state and county do you live in? (Please answer for your primary residence.)[SHOW DROP DOWN MENU FOR STATE. STATE-SPECIFIC DROPDOWN MENU FOR COUNTY WILL APPEAR AFTER STATE IS SELECTED. COUNTY DROPDOWN MENU WILL INCLUDE "I'm not sure"]
 1. Oregon
 2. Washington
 3. Idaho
 4. Montana
 5. Another state [SKIP TO C1]

3. S_ZIP. What is your zip code?

4. S_OwnRent. Do you own or rent your home?
 1. Own
 2. Rent
 98. I'm not sure [SKIP TO C1]

5. S_Decisions. Are you involved in making decisions about major purchases for your home?
 1. Yes
 2. No [SKIP TO C1]

6. D4. Which of the following categories includes your age?
 1. Under 18 [SKIP TO C1]

2. 18 to 24
 3. 25 to 34
 4. 35 to 44
 5. 45 to 54
 6. 55 to 64
 7. 65 and older
 99. I'd rather not say
7. S_HomeType. What type of home do you live in? [INCLUDE PHOTO EXAMPLES]
1. A free-standing, single-family home
 2. A townhouse or rowhouse. These share at least one side with another building, but have no other units above or below. There are no shared hallways, stairs, or basements.
 3. Mobile home
 4. Apartment or condominium in a building with 2 to 4 units.
 5. Apartment or condominium in a building with 5 or more units.
 98. I'm not sure [SKIP TO C1]
8. How many years have you lived in your current home?
1. [NUMERIC ENTRY] years
 98. I'm not sure

Water Heater Characteristics

9. [IF S_HomeType = 4 or 5] S_WHOwn. Does your unit have its own water heater?
1. Yes
 2. No, my unit shares a water heater with one or more other units [SKIP TO A0]
 98. I'm not sure [SKIP TO A0]
10. S_WHType. What type of water heater do you have? [SHOW EXAMPLE PHOTOS AND POPUP DEFINITIONS FOR EACH]
1. Storage or tank water heater ["A storage water heater is typically located on the floor, and is typically a large cylinder shape."]
 2. On-demand / tankless ["An on-demand water heater is a smaller metal box typically mounted on a wall."]
 3. Indirect storage tank attached to boiler ["Indirect water heaters use the heat from your boiler to warm the water stored in the tank; they are usually connected to a boiler with pumps and pipes."]
 4. Something else, please specify: [REQUIRE TEXT ENTRY]
 98. I'm not sure
11. S_WHFuel. What fuel does your water heater use? [ADD POPUP DEFINITIONS FOR EACH]

1. Electricity ["Electric water heaters only use electricity to heat water."]
2. Natural Gas or Propane ["Natural gas comes to your home via underground pipes. Propane is delivered to your home and stored in a tank."]
3. Fuel oil ["Fuel oil is delivered to your home and stored in a tank."]
4. Another fuel type; please specify:
98. I'm not sure

Water Heater Fuel Help

12. S_WHFuelHelp1. [IF S_DHWfuel = 98] If you're not sure what fuel your water heater uses, we can walk you through it. Go to your water heater and look for a yellow "ENERGY GUIDE" label. It might say "KWH" for electric, "therms" for natural gas, "BTU" for propane, or "fuel oil" for oil systems. [SHOW PICTURE OF ENERGY GUIDE] Based on what you see, what fuel does your water heater use?
 1. Electricity ("KWH") [SKIP to next section]
 2. Natural gas ("therms")
 3. Propane ("BTU")
 4. Oil
 5. I don't see a label
 98. I'm not sure

13. S_WHFuelHelp2. [IF S_DHWfuelHelp1 = 5 or 98] Look for the manufacturer's label on the water heater that shows the brand, model number, and serial number. These usually specify the fuel. Electric water heaters usually indicate a "wattage" rating. [SHOW EXAMPLES]
 1. Electricity [SKIP TO NEXT SECTION]
 2. Natural Gas
 3. Propane
 4. Oil
 5. I don't see a label
 98. I'm not sure

14. S_WHFuelHelp3. [IF S_DHWfuelHelp2 = 4 OR 98] Does your water heater have an exhaust vent pipe at the top? It would be more than 2 inches wide, and could be made out of metal or white PVC. It would either be connected to a chimney or it would exhaust to the outside of your home. [SHOW EXAMPLE PHOTO]
 1. Yes
 2. No
 98. I'm not sure

15. S_WHFuelHelp4. [IF S_DHWfuelHelp3 = 2 OR 98] Your system sounds like it may be electric, since it doesn't have a vent pipe. Can you find an electrical plug or wiring connected to the tank? It might be coming out of the top of the tank, or out of the side. [SHOW EXAMPLE PHOTO]

1. Yes
2. No
98. I'm not sure

Water Heater Characteristics Continued

16. WH_Age. Approximately how old is your water heater? If you are able to access your water heater, the manufacturer's label that shows the brand, model number, and serial number usually provides the date of manufacture. [SHOW EXAMPLE PHOTO]

1. Less than 1 year old
2. 1 to 5 years old
3. 6 to 10 years old
4. More than 10 years old
98. I'm not sure

17. WH_Loc. Where is your water heater located? Is it in a...

1. Unfinished basement or crawl space
2. Finished basement
3. Garage
4. Closet or utility room (not in a basement)
5. Kitchen
6. [DISPLAY IF S_HomeType = 4 OR 5] Mechanical room in my building (not in my unit)
7. Other, please specify: [REQUIRE TEXT ENTRY]
98. I'm not sure

Awareness, Interest, and Perceptions

18. A0. Before today, had you heard the term "heat pump" related to any appliances?

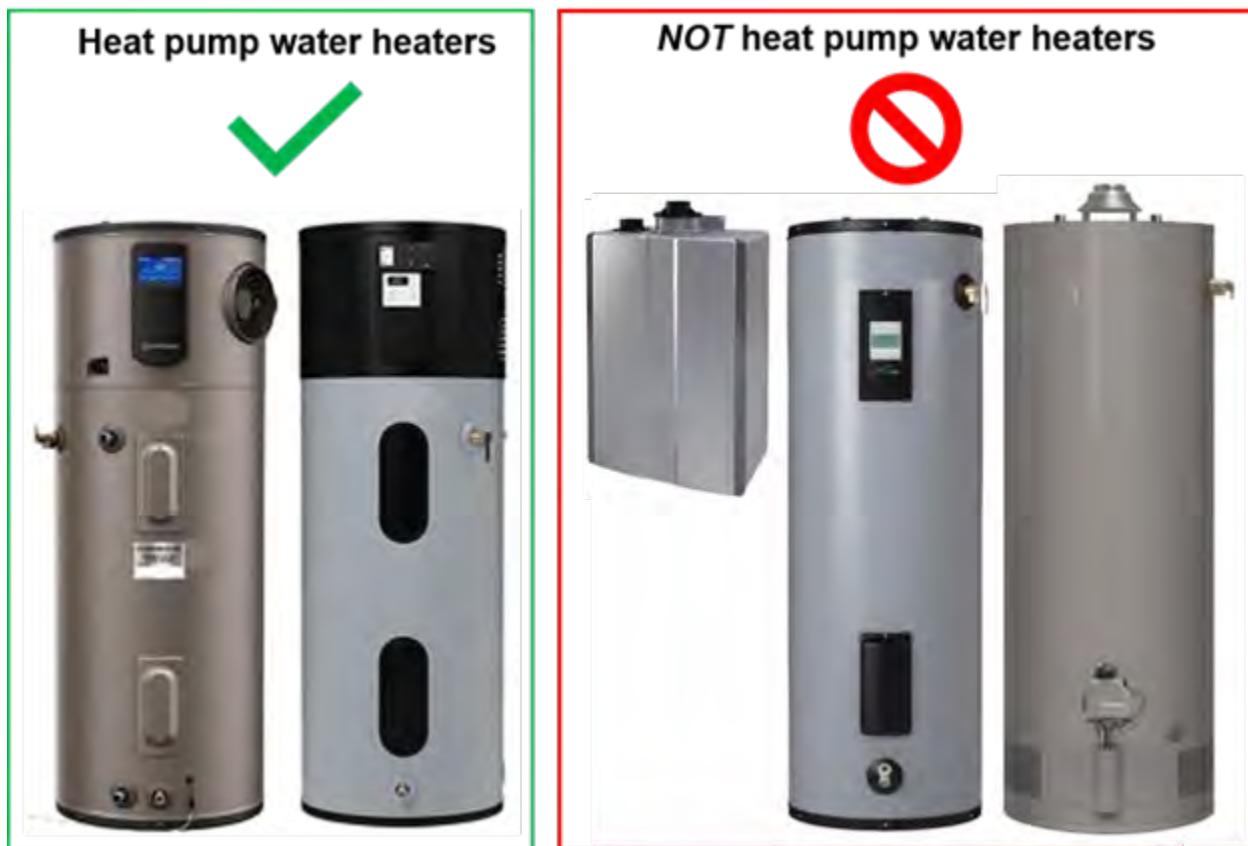
1. Yes
2. No
98. I'm not sure

19. A1. Before today, had you heard the terms "heat pump water heater" or "electric hybrid water heater"?

1. Yes
2. No
98. I'm not sure

20. A2. Heat pump water heaters, or electric hybrid 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. You may have also seen them advertised as "electric hybrid water heaters" or "electric hybrid heat pump water heaters". They work like a refrigerator, but in reverse. (This is *not* the

same as a tankless water heater. A tankless water heater is a small metal box mounted on a wall and it has no storage tank.) A heat pump water heater runs on electricity and has a large cylinder-shaped tank like a standard electric storage water heater, except it has vents at the top and behind them are fans that pull surrounding air into the unit. In some cases, a heat pump water heater may have ducts (large silver tubes that direct air into or away from the unit). In the photo below, the units on the left are heat pump water heaters; the units to the right are *not*. [SHOW EXAMPLE PHOTOS]



Based on this description, have you heard of “heat pump water heaters” or “electric hybrid water heaters”?

1. Yes
2. No
98. I’m not sure

[DISPLAY TEXT] For the rest of this survey, we will use the term “heat pump water heater” to refer to this type of water heater.

21. A4. [IF A2 = 1] Where or how have you heard about heat pump water heaters? Please select all that apply. [ROTATE OPTIONS 3 THROUGH 16]

1. I currently own or use one
 2. I previously owned or used one
 3. From a friend, family member, or colleague
 4. Utility print advertising or bill insert
 5. Utility website
 6. "Hot Water Solutions" website
 7. Retail store display
 8. Retail store salesperson
 9. Online news story
 10. Television ad
 11. Social media, such as Facebook, Instagram, or YouTube
 12. Contractor or installer
 13. While researching on the Internet
 14. Internet advertising
 15. Utility newsletter
 16. Professional experience
 97. Other, please specify: [REQUIRE OPEN END RESPONSE]
 98. I'm not sure
22. A6. [IF A4 = 1] Please rate your satisfaction with the following aspects of your heat pump water heater. [INCLUDE N/A OPTION]
- Very dissatisfied
 - Somewhat dissatisfied
 - Neither satisfied nor dissatisfied
 - Somewhat satisfied
 - Very satisfied
- a. The sound level of the heat pump water heater
 - b. The change in your electricity bill since installing the heat pump water heater
 - c. Your hot water supply
 - d. The maintenance requirements of the heat pump water heater
 - e. The heat pump water heater overall
23. A7. [IF A4 = 1] Have you, or would you, recommend a heat pump water heater to a friend, colleague, or family member?
1. Yes, I have
 2. Yes, I would
 3. No
 97. Other, please specify: [REQUIRE OPEN END RESPONSE]
 98. I'm not sure

24. A9. [IF A2 = 1] Please assess how much you agree or disagree with the following statements. [RANDOMIZE; COLOR ONLY FOR REVIEWERS' BENEFIT FOR POSITIVE AND NEGATIVE STATEMENTS]

- Strongly disagree
 - Somewhat disagree
 - Neither agree nor disagree
 - Somewhat agree
 - Strongly agree
- a. Heat pump water heaters are very efficient.
 - b. Heat pump water heaters result in lower electric bills than a typical electric water heater.
 - c. Heat pump water heaters are eligible for tax credits and/or discounts from utility companies.
 - d. Heat pump water heaters offer better value than typical electric water heaters.
 - e. Heat pump water heaters can be controlled from a smart phone.
 - f. Heat pump water heaters are noisy.
 - g. Heat pump water heaters are unreliable.
 - h. Heat pump water heaters are expensive to install.
 - i. Heat pump water heaters are expensive to service or repair.
 - j. Heat pump water heaters do not produce enough hot water.

25. A10. When making a decision about purchasing mechanical equipment for your home, such as a furnace or water heater, what are your typical sources of information regarding which product to purchase? Please select all that apply. [ROTATE RESPONSES 1 THROUGH 13; ALLOW MULTIPLE RESPONSES]

1. Friends, family members, or colleagues
2. Utility print advertising or bill inserts
3. Utility website
4. Retail store displays
5. Retail store salespeople
6. Online news stories
7. Television ads
8. Social media, such as Facebook, Instagram or YouTube
9. Contractors or installers
10. Internet research or Internet reviews
11. Internet advertising
12. Specific internet website, please specify: [REQUIRE OPEN END RESPONSE]
13. Utility newsletter
97. Other, please specify: [REQUIRE OPEN END RESPONSE]
98. I'm not sure

26. A11. Have you purchased a new water heater (of any type) in the past three years?

1. Yes

2. No
98. I'm not sure
27. A12. [IF A11 = 1] Why did you purchase a new water heater? [ROTATE RESPONSES 1 THROUGH 6]
1. My water heater was completely broken and did not provide any hot water
 2. My water heater worked poorly and/or needed repair
 3. My water heater was old and/or close to failing
 4. I wanted to install a more energy-efficient water heater
 5. To serve an addition to my home
 6. I wanted a water heater with a specific feature: (please specify the feature)
97. Other; please specify: [REQUIRE OPEN END RESPONSE]
98. I'm not sure
28. A13. [IF A2 = 1 AND A11 = 1] Did your installer or contractor recommend a heat pump water heater to you?
1. Yes
 2. No
98. I'm not sure
29. [IF A11 = 1] Did you install the new water heater yourself, or did you hire an installer to do it?
1. I installed it myself
 2. Another member of my household installed it
 3. Hired an installer
 4. Other, please specify: [REQUIRE TEXT ENTRY]
98. I'm not sure
30. [IF Q29 = 1 OR 2] Do you, or someone in your household, have professional experience installing water heaters or other mechanical equipment (e.g., plumber, contractor, or handyman?)
1. Yes
 2. No
 3. Other: [REQUIRE TEXT ENTRY]
98. I'm not sure
31. [IF Q30= 2] Why did you decide to install the water heater yourself? [REQUIRE TEXT ENTRY]
32. A15. What would cause you to purchase a new water heater (of any type)? Please select all that apply. [MULTIPLE RESPONSE]
1. If it fails, breaks, or leaks
 2. If it has some issues but needs repairs to work well
 3. To save energy, even if it still works

4. To lower utility bills, even if it still works
 5. If I was already renovating my home
 6. [DISPLAY IF S_OWNRENT = 2] N/A – I rent and do not need to purchase a water heater
 97. Other; please specify: [REQUIRE OPEN END RESPONSE]
 98. I'm not sure
33. A16. [IF A2 = 1 & A4 ≠ 1 & A15 ≠ 6] [IF A11 = 1 "Did you consider"] [IF A11 ≠ 1 "Have you ever considered"] installing a heat pump water heater?
1. Yes
 2. No
 98. I'm not sure
34. A17. [IF A4 ≠ 1 AND A2 = 1] AND A16 = 2] What is the primary reason you [IF A11 = 1 "did"] [IF A11 ≠ 1 "would"] not consider installing an electric hybrid heat pump water heater? [ROTATE RESPONSES 1 THROUGH 8]
1. Existing equipment works fine
 2. Prefer a different kind
 3. May/plan to in the future
 4. Cost of installation
 5. Cost of maintenance or repairs
 6. Not familiar enough with them
 7. Concerns about their performance
 8. Does not fit in my space
 9. [SHOW IF A11 = 1] The installer/contractor did not mention them
 10. [SHOW IF A11 = 1] The installer/contractor recommended against them
 11. [IF (S_WHFuel = 2, 3, OR 4) OR (S_WHFuelHelp2 = 2, 3, OR 4)] I do not want to switch water heating fuels
 12. Other, please specify
 98. I'm not sure

Service and Repair

35. [IF S_OwnRent = 1 AND (S_WHOwn = 1 OR S_HomeType = 1, 2, OR 3)] Thinking about the water heater that is currently installed in your home, have you contacted a professional to service or repair the water heater?
- A **service** is routine maintenance to keep the water heater in optimal working condition (annual tune-ups, cleaning, inspecting, etc.).
- A **repair** fixes equipment that is malfunctioning or not working.
- (If you both contacted a professional for some repairs or service while handling others yourself, please select both).
1. Yes, I contacted a professional

2. I (or another member of the household) handled the repair or service
3. No, my water heater has not needed repairs or maintenance [SKIP TO HWS AWARENESS MODULE]
98. I'm not sure [SKIP TO HWS AWARENESS MODULE]

[DISPLAY TEXT] How many times have you had a professional service and/or repair the water heater?

36. [IF Q35 = 1] NUM_SERVICE1. Number of service-only visits: [DROPDOWN 0-20, I'M NOT SURE]
37. [IF Q35 = 1] NUM_SERVICE2. Number of repair-only visits? [DROPDOWN 0-20, I'M NOT SURE]
38. [IF Q35 = 1] NUM_SERVICE3. Number of visits with service and repair in the same visit? [DROPDOWN 0-20, I'M NOT SURE]
39. [IF NUM_SERVICE2 OR NUM_SERVICE3 > 0] When repairing the water heater, how long did it take for the issue(s) to be resolved?
 1. 1 day or less
 2. 1 to 2 days
 3. 3 to 7 days
 4. 1 to 2 weeks
 5. Other: [REQUIRE TEXT ENTRY]
 98. I'm not sure

HWS Awareness

40. HWS_Aware. Before today, had you heard of the "Hot Water Solutions" program?
 1. Yes
 2. No
 98. I'm not sure
41. HWS_First. [IF HWS_Aware = 1] How did you first hear of the "Hot Water Solutions" program? [RANDOMIZE 1 to 13]
 1. Hot Water Solutions website [LINK TO WEBSITE]
 2. Friend, family member, or colleague
 3. Utility print advertising or bill insert
 4. Utility website
 5. Retail store display
 6. Retail store salesperson
 7. Online news story
 8. Television ad
 9. Social media, such as Facebook, Instagram or YouTube
 10. From a contractor or installer
 11. Internet research

12. Internet advertising
13. Boring But Efficient website [[LINK TO WEBSITE boringbutefficient.com](#)]
14. Another way: [REQUIRE TEXT ENTRY]
98. I'm not sure

Characteristics

42. D1. Which of the following statements best describes you?
 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
 98. I'm not sure

43. D2. Please rate your level of agreement with the following statements: [ROTATE ORDER]
 - Strongly disagree
 - Somewhat disagree
 - Neither agree nor disagree
 - Somewhat agree
 - Strongly agree
 - a. I do research before making big purchases.
 - b. I compare prices online for big purchases.
 - c. I seek out expert recommendations for big purchases.
 - d. I will spend money upfront to save money in the long term.
 - e. I am concerned about environmental issues.
 - f. I consider sustainability when making decisions about which products to purchase.
 - g. Actions taken by individuals like me have an impact on the environment.
 - h. Energy efficiency is my primary consideration when choosing mechanical systems for my home, like a furnace, air conditioner, or water heater.

Cooling Impacts

44. [IF A2 = 1] COOL_SPACE. Have you heard anyone say that heat pump water heaters cool the air around the water heater?
 1. Yes
 2. No
 98. I'm not sure

45. [IF COOL_SPACE = 1] Where did you hear that heat pump water heaters cool the air around the water heater? Please select all that apply. [ROTATE OPTIONS 1 THROUGH 5]
 1. Friend, family member, or colleague
 2. Personal experience

3. Social media
 4. Online research about water heaters
 5. A contractor or plumber
 6. Other; please specify: [REQUIRE OPEN END RESPONSE]
 98. I'm not sure
46. [IF A2 = 1] DEHUMIDIFY. Have you ever heard anyone say that heat pump water heaters dehumidify the air around your water heater?
1. Yes
 2. No
 98. I'm not sure
47. [IF DEHUMIDIFY = 1] Where did you hear that heat pump water heaters dehumidify the air around the water heater? Please select all that apply. [ROTATE OPTIONS 1 THROUGH 5]
1. Friend, family member, or colleague
 2. Personal experience
 3. Social media
 4. Online research about water heaters
 5. A contractor or plumber
 6. Other; please specify: [REQUIRE OPEN END RESPONSE]
 98. I'm not sure

Demographics

48. D6. Which of the following categories best describes the highest level of education you have completed?
1. Some high school
 2. High school graduate or GED
 3. Trade or technical school
 4. Some college
 5. College graduate
 6. Some graduate school
 7. Graduate degree
 97. Other, please specify: [REQUIRE OPEN END RESPONSE]
 98. I'm not sure
 99. I'd rather not say
49. D7. Which of the following categories best describes your approximate annual household income from all sources in 2024, 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
98. I'm not sure
99. I'd rather not say

50. D8. Do you consider yourself Hispanic or Latino?

1. Yes
2. No
98. I'd rather not say

51. D9. How would you describe yourself? Please select all that apply. [MULTIPLE RESPONSES]

1. White
2. Black or African American
3. American Indian or Alaska Native
4. Asian
5. Native Hawaiian or Other Pacific Islander
97. Other; please specify: [REQUIRE OPEN END RESPONSE]
98. I'd rather not say

52. D10. How would you describe yourself?

1. Male
2. Female
3. Prefer to self-identify, please specify:
4. I'd rather not say

53. D11. What language is primarily spoken in your home?

1. English
2. Spanish
3. French
4. Arabic
5. Portuguese
6. Mandarin
7. Cantonese
8. Russian
9. Ukrainian
10. Tagalog
11. Korean
12. Vietnamese
13. Japanese
14. Marshallese

-
- 15. Punjabi
 - 97. Other; please specify: [REQUIRE OPEN END RESPONSE]
 - 99. I'd rather not say
 - 54. D12. Including yourself, how many people live in your home? [NUMERIC TEXT ENTRY FOR EACH CATEGORY WITH A SUM FOR TOTAL PEOPLE; INCLUDE I'D RATHER NOT SAY OPTION]
 - a. Under 18:
 - b. 18 to 65:
 - c. 65 and older:

Closing

- 55. C1. Unfortunately, you do not qualify for this survey. Thank you very much for your time.
- 56. C3. Those are all the questions that we have. Thank you for your help with this survey. Do you have any comments that you'd like to share about heat pump water heaters?
 - 1. Yes [REQUIRE OPEN END RESPONSE]
 - 2. No

Appendix H Detailed Results for Installer, Purchaser, and Consumer Surveys

This appendix includes full results for all survey questions included in this MPER. It includes detailed results for the [Installer Survey](#), [Purchaser Survey](#), and [Consumer Survey](#).

INSTALLER SURVEY

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
1 (n=101) Did your company install any residential water heating equipment in any of the following states in the past twelve months?	Oregon	32	32%	32	100%	11	21%	1	4%	0	-	27	33%	5	25%
	Washington	52	51%	11	34%	52	100%	5	22%	0	-	47	58%	5	25%
	Idaho	23	23%	1	3%	5	10%	23	100%	0	-	18	22%	5	25%
	Montana	11	11%	0	-	0	-	0	-	11	100%	5	6%	6	30%
2 (n=101) Which of the following activities represents your company's main line of work?	Installing equipment in residential new construction	10	10%	3	9%	6	12%	0	-	1	9%	7	9%	3	15%
	Replacing or servicing equipment in existing homes	77	76%	23	72%	42	81%	18	78%	8	73%	64	79%	13	65%
	Installing, replacing, or servicing equipment in commercial or industrial facilities	4	4%	2	6%	1	2%	1	4%	1	9%	4	5%	0	-
	Other	10	10%	4	13%	3	6%	4	17%	1	9%	6	7%	4	20%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
4 (n=101) Besides installing water heating equipment, what other services does your company provide? Please select all that apply.	HVAC installation and/or maintenance	49	49%	17	53%	22	42%	15	65%	7	64%	39	48%	10	50%
	Plumbing	75	74%	24	75%	41	79%	17	74%	7	64%	60	74%	15	75%
	Electrical	22	22%	9	28%	14	27%	5	22%	1	9%	19	23%	3	15%
	Construction or general contracting services	17	17%	5	16%	8	15%	5	22%	2	18%	11	14%	6	30%
	Other	36	36%	11	34%	17	33%	10	43%	6	55%	25	31%	11	55%
	My company does not provide other services	0	-	0	-	0	-	0	-	0	-	0	-	0	-
5 (n=101) Which of the following best describes your company?	A business with a single location	89	88%	27	87%	40	85%	14	100%	8	89%	68	84%	18	90%
	A company with multiple locations	10	10%	3	10%	6	13%	0	-	1	11%	13	16%	2	10%
	Other:	2	2%	1	3%	1	2%	0	-	0	-	0	-	0	-
7 (n=101) Approximately how many people in total work for your company?	1 to 5	34	34%	9	28%	17	33%	9	39%	1	9%	25	31%	9	45%
	6 to 10	28	28%	10	31%	13	25%	4	17%	3	27%	21	26%	7	35%
	11 to 50	28	28%	11	34%	16	31%	5	22%	5	45%	25	31%	3	15%
	More than 50	11	11%	2	6%	6	12%	5	22%	2	18%	10	12%	1	5%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
8 (n=101) Please indicate your role(s) at the company. Select all that apply.	I own the company	62	61%	21	68%	26	55%	10	71%	5	56%	37	46%	9	45%
	I install or service water heaters	51	50%	17	55%	21	45%	10	71%	3	33%	48	59%	13	65%
	I make recommendations about what customers should install	70	69%	22	71%	29	62%	14	100%	5	56%	65	80%	19	95%
	I manage installation technicians	69	68%	22	71%	29	62%	11	79%	7	78%	61	75%	17	85%
	I am in a sales position	56	55%	17	55%	24	51%	12	86%	3	33%	56	69%	12	60%
	Other	18	18%	6	19%	7	15%	10	29%	1	11%	42	52%	12	60%
9 (n=101) How many years of experience do you have in the water heating industry?	Less than 2 years	5	5%	3	9%	3	6%	0	-	0	-	3	4%	2	10%
	2 to 5 years	8	8%	3	9%	5	10%	0	-	2	18%	5	6%	3	15%
	6 to 10 years	11	11%	5	16%	4	8%	3	13%	1	9%	10	12%	1	5%
	11 to 20 years	20	20%	5	16%	10	19%	6	26%	3	27%	17	21%	3	15%
	More than 20 years	57	56%	16	50%	30	58%	14	61%	5	45%	46	57%	11	55%
10 (n=101) Before today, had you heard the term "heat pump water heater" or "hybrid water heater"?	Yes	97	96%	31	97%	51	98%	22	96%	10	91%	80	99%	17	85%
	No	4	4%	1	3%	1	2%	1	4%	1	9%	1	1%	3	15%
	I'm not sure	0	-	0	-	0	-	0	-	0	-	0	-	0	-
11 (n=101) Based on that description, have you heard of "heat pump water heaters" or "hybrid water heaters"?	Yes	100	99%	32	1	52	100%	22	96%	11	1	80	99%	20	100%
	No	1	1%	0	0	0	-	1	4%	0	0	1	1%	0	-
	I'm not sure	0	-	0	0	0	-	0	-	0	0	0	-	0	-

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
12 (n=97) Before this survey, which of the following best describes your level of familiarity with heat pump water heaters?	Not very familiar - I've heard of them but never worked with them	16	16%	4	13%	4	8%	9	41%	2	18%	13	16%	3	15%
	Somewhat familiar - I've worked with them occasionally	48	48%	17	53%	23	44%	11	50%	5	45%	37	46%	11	55%
	Very familiar - I've worked with them regularly	36	36%	11	34%	25	48%	2	9%	4	36%	30	38%	6	30%
13 (n=101) What types of water heaters does your company install in residential homes? Please select all that apply.	Electric resistance storage	85	84%	26	81%	42	81%	22	96%	9	82%	69	85%	16	80%
	Gas storage	88	87%	29	91%	43	83%	22	96%	9	82%	71	88%	17	85%
	Gas on-demand tankless	95	94%	31	97%	48	92%	22	96%	11	100%	78	96%	17	85%
	Electric on-demand/tankless	57	56%	18	56%	33	63%	14	61%	5	45%	44	54%	13	65%
	Heat pump water heater	71	70%	25	78%	45	87%	9	39%	6	55%	60	74%	11	55%
	Other	19	19%	3	9%	8	15%	7	30%	3	27%	14	17%	5	25%
	I'm not sure	0	-	0	-	0	-	0	-	0	-	0	-	0	-

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
14 (n=94) What is the most profitable type of water heater for your company to install in residential homes?	Electric resistance storage	13	14%	5	16%	8	16%	2	10%	1	10%	9	12%	4	24%
	Gas storage	19	20%	7	23%	8	16%	7	35%	1	10%	18	23%	1	6%
	Gas on-demand/tankless	43	46%	13	42%	22	45%	9	45%	5	50%	36	47%	7	41%
	Electric on-demand/tankless	1	1%	1	3%	1	2%	0	-	0	-	1	1%	0	-
	Heat pump water heater	10	11%	3	10%	5	10%	0	-	2	20%	7	9%	3	18%
	Other	2	2%	1	3%	0	-	2	10%	0	-	0	-	2	12%
	I'm not sure	6	6%	1	3%	5	10%	0	-	1	10%	6	8%	0	-
16a (n=101) Please assess how much you agree or disagree with the following statements. I try to avoid newer water heater technologies	Strongly disagree	48	48%	11	34%	24	46%	11	48%	7	64%	41	51%	7	35%
	Somewhat disagree	27	27%	10	31%	15	29%	7	30%	3	27%	20	25%	7	35%
	Neither agree nor disagree	10	10%	5	16%	5	10%	2	9%	0	-	8	10%	2	10%
	Somewhat agree	11	11%	3	9%	7	13%	2	9%	1	9%	8	10%	3	15%
	Strongly agree	5	5%	3	9%	1	2%	1	4%	0	-	4	5%	1	5%
	Don't know	0	-	0	-	0	-	0	-	0	-	0	-	0	-
16b (n=100) Please assess how much you agree or disagree with the following statements. Heat pump water heaters are reliable.	Strongly disagree	7	7%	2	6%	4	8%	2	9%	0	-	6	8%	1	5%
	Somewhat disagree	11	11%	3	9%	4	8%	5	23%	1	9%	7	9%	4	20%
	Neither agree nor disagree	25	25%	9	28%	12	23%	4	18%	6	55%	21	26%	4	20%
	Somewhat agree	26	26%	8	25%	17	33%	4	18%	2	18%	21	26%	5	25%
	Strongly agree	24	24%	9	28%	13	25%	3	14%	2	18%	22	28%	2	10%
	Don't know	7	7%	1	3%	2	4%	4	18%	0	-	3	4%	4	20%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
16c (n=100) Please assess how much you agree or disagree with the following statements. Heat pump water heaters are good replacements for traditional electric resistance water heaters.	Strongly disagree	16	16%	4	13%	5	10%	5	23%	2	18%	12	15%	4	20%
	Somewhat disagree	16	16%	3	9%	12	23%	5	23%	1	9%	13	16%	3	15%
	Neither agree nor disagree	13	13%	5	16%	3	6%	3	14%	3	27%	11	14%	2	10%
	Somewhat agree	31	31%	11	34%	21	40%	6	27%	2	18%	26	33%	5	25%
	Strongly agree	22	22%	9	28%	11	21%	1	5%	3	27%	16	20%	6	30%
	Don't know	2	2%	0	-	0	-	2	9%	0	-	2	3%	0	-
16d (n=100) Please assess how much you agree or disagree with the following statements. My company's installation technicians can easily install heat pump water heaters correctly.	Strongly disagree	5	5%	2	6%	1	2%	2	9%	1	9%	3	4%	2	10%
	Somewhat disagree	3	3%	1	3%	3	6%	1	5%	0	-	2	3%	1	5%
	Neither agree nor disagree	7	7%	2	6%	1	2%	2	9%	3	27%	7	9%	0	-
	Somewhat agree	16	16%	6	19%	9	17%	5	23%	2	18%	12	15%	4	20%
	Strongly agree	67	67%	21	66%	38	73%	10	45%	5	45%	54	68%	13	65%
	Don't know	2	2%	0	-	0	-	2	9%	0	-	2	3%	0	-
16e (n=100) Please assess how much you agree or disagree with the following statements. My company is likely to get customer complaints or service requests soon after installing a heat pump water heater.	Strongly disagree	41	41%	14	44%	22	42%	8	36%	5	45%	36	45%	5	25%
	Somewhat disagree	14	14%	4	13%	9	17%	3	14%	1	9%	12	15%	2	10%
	Neither agree nor disagree	16	16%	7	22%	6	12%	3	14%	3	27%	12	15%	4	20%
	Somewhat agree	14	14%	3	9%	8	15%	2	9%	2	18%	10	13%	4	20%
	Strongly agree	11	11%	2	6%	5	10%	5	23%	0	-	7	9%	4	20%
	Don't know	4	4%	2	6%	2	4%	1	5%	0	-	3	4%	1	5%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
16f (n=100) Please assess how much you agree or disagree with the following statements. My company regularly recommends heat pump water heaters to customers.	Strongly disagree	35	35%	9	28%	14	27%	13	59%	3	27%	29	36%	6	30%
	Somewhat disagree	19	19%	5	16%	9	17%	6	27%	2	18%	11	14%	8	40%
	Neither agree nor disagree	16	16%	6	19%	9	17%	2	9%	3	27%	14	18%	2	10%
	Somewhat agree	19	19%	8	25%	13	25%	1	5%	1	9%	18	23%	1	5%
	Strongly agree	11	11%	4	13%	7	13%	0	-	2	18%	8	10%	3	15%
	Don't know	0	-	0	-	0	-	0	-	0	-	0	-	0	-
16g (n=100) Please assess how much you agree or disagree with the following statements: Heat pump water heaters remove heat from the room where they are located.	Strongly disagree	6	6%	3	9%	2	4%	2	9%	0	-	6	8%	0	-
	Somewhat disagree	13	13%	4	13%	7	13%	2	9%	1	9%	10	13%	3	15%
	Neither agree nor disagree	13	13%	6	19%	4	8%	4	18%	2	18%	11	14%	2	10%
	Somewhat agree	19	19%	4	13%	8	15%	7	32%	4	36%	13	16%	6	30%
	Strongly agree	45	45%	14	44%	28	54%	6	27%	4	36%	36	45%	9	45%
	Don't know	4	4%	1	3%	3	6%	1	5%	0	-	4	5%	0	-
16h (n=100) Please assess how much you agree or disagree with the following statements: Replacing an electric resistance water heater with a heat pump water heater will lower a customer's overall energy bill.	Strongly disagree	6	6%	2	6%	1	2%	2	9%	1	9%	4	5%	2	10%
	Somewhat disagree	10	10%	2	6%	4	8%	6	27%	0	-	8	10%	2	10%
	Neither agree nor disagree	8	8%	3	9%	3	6%	2	9%	2	18%	7	9%	1	5%
	Somewhat agree	26	26%	8	25%	19	37%	4	18%	2	18%	22	28%	4	20%
	Strongly agree	45	45%	14	44%	23	44%	7	32%	6	55%	34	43%	11	55%
	Don't know	5	5%	3	9%	2	4%	1	5%	0	-	5	6%	0	-

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
16i (n=101) Please assess how much you agree or disagree with the following statements: My company makes more money when we sell a larger number of low-cost water heaters than when we sell a smaller number of high-cost water heaters.	Strongly disagree	11	11%	4	13%	2	4%	2	9%	4	36%	7	9%	4	20%
	Somewhat disagree	16	16%	4	13%	11	21%	5	22%	0	-	13	16%	3	15%
	Neither agree nor disagree	27	27%	8	25%	14	27%	8	35%	3	27%	24	30%	3	15%
	Somewhat agree	14	14%	6	19%	8	15%	3	13%	1	9%	12	15%	2	10%
	Strongly agree	25	25%	6	19%	14	27%	3	13%	3	27%	18	22%	7	35%
	Don't know	8	8%	4	13%	3	6%	2	9%	0	-	7	9%	1	5%
16j (n=100) Please assess how much you agree or disagree with the following statements: I can get heat pump water heaters quickly from local distributors.	Strongly disagree	6	6%	2	6%	2	4%	2	9%	1	9%	4	5%	2	10%
	Somewhat disagree	7	7%	1	3%	2	4%	3	14%	2	18%	6	8%	1	5%
	Neither agree nor disagree	7	7%	4	13%	4	8%	2	9%	1	9%	6	8%	1	5%
	Somewhat agree	22	22%	10	31%	9	17%	4	18%	3	27%	16	20%	6	30%
	Strongly agree	53	53%	15	47%	32	62%	8	36%	4	36%	43	54%	10	50%
	Don't know	5	5%	0	-	3	6%	3	14%	0	-	5	6%	0	-

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
17. (n = 32) Why do you feel that heat pump water heaters are not good replacements for electric resistance water heaters? Select all that apply.	Lack of product support at the manufacturer level	5	16%	1	14%	3	18%	1	10%	1	33%	4	16%	1	14%
	Lack of product support at the distributor level	8	25%	2	29%	4	24%	2	20%	2	67%	7	28%	1	14%
	My company had a bad experience with a heat pump water heater installation in the past	21	66%	4	57%	11	65%	8	80%	2	67%	18	72%	3	43%
	The difficulty of installation	8	25%	3	43%	3	18%	2	20%	0	-	6	24%	2	29%
	High upfront cost	11	34%	4	57%	5	29%	3	30%	1	33%	9	36%	2	29%
	Payback period is too long	23	72%	5	71%	12	71%	8	80%	2	67%	18	72%	5	71%
	Difficulty finding heat pump water heaters in stock	17	53%	3	43%	10	59%	7	70%	0	-	12	48%	5	71%
	Other, please describe;	7	22%	2	29%	4	24%	1	10%	2	67%	5	20%	2	29%
	I'm not sure	21	66%	3	43%	9	53%	10	100%	2	67%	17	68%	4	57%
19a (n=100) How frequently do installation technicians face challenges with the following aspects of a heat pump water heater installation? Pipe configuration	Always	8	8%	4	13%	5	10%	1	5%	0	-	6	8%	2	10%
	Very frequently	14	14%	4	13%	5	10%	5	23%	1	9%	11	14%	3	15%
	Occasionally	26	26%	9	28%	12	23%	6	27%	3	27%	21	26%	5	25%
	Rarely	30	30%	9	28%	17	33%	7	32%	4	36%	23	29%	7	35%
	Very rarely	5	5%	1	3%	3	6%	0	-	1	9%	5	6%	0	-
	Never	15	15%	5	16%	9	17%	1	5%	2	18%	12	15%	3	15%
	Don't know	2	2%	0	-	1	2%	2	9%	0	-	2	3%	0	-

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
19b (n=100) How frequently do installation technicians face challenges with the following aspects of a heat pump water heater installation? No nearby drain for condensate	Always	4	4%	2	6%	3	6%	0	-	0	-	3	4%	1	5%
	Very frequently	29	29%	8	25%	14	27%	7	32%	3	27%	23	29%	6	30%
	Occasionally	39	39%	8	25%	23	44%	10	45%	4	36%	35	44%	4	20%
	Rarely	15	15%	6	19%	8	15%	4	18%	1	9%	9	11%	6	30%
	Very rarely	5	5%	3	9%	2	4%	1	5%	1	9%	4	5%	1	5%
	Never	8	8%	5	16%	2	4%	0	-	2	18%	6	8%	2	10%
	Don't know	0	-	0	-	0	-	0	-	0	-	0	-	0	-
19c (n=100) How frequently do installation technicians face challenges with the following aspects of a heat pump water heater installation? New wiring/electrical work required	Always	8	8%	2	6%	2	4%	3	14%	1	9%	2	3%	6	30%
	Very frequently	12	12%	4	13%	6	12%	3	14%	2	18%	12	15%	0	-
	Occasionally	40	40%	16	50%	18	35%	10	45%	4	36%	34	43%	6	30%
	Rarely	20	20%	5	16%	13	25%	5	23%	2	18%	14	18%	6	30%
	Very rarely	5	5%	1	3%	5	10%	0	-	0	-	5	6%	0	-
	Never	11	11%	3	9%	6	12%	0	-	2	18%	10	13%	1	5%
	Don't know	4	4%	1	3%	2	4%	1	5%	0	-	3	4%	1	5%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
19d (n=100) How frequently do installation technicians face challenges with the following aspects of a heat pump water heater installation? Inadequate make-up air/airflow	Always	3	3%	1	3%	1	2%	1	5%	0	-	2	3%	1	5%
	Very frequently	22	22%	4	13%	11	21%	7	32%	2	18%	16	20%	6	30%
	Occasionally	37	37%	10	31%	24	46%	8	36%	4	36%	34	43%	3	15%
	Rarely	20	20%	7	22%	10	19%	5	23%	2	18%	15	19%	5	25%
	Very rarely	4	4%	4	13%	0	-	1	5%	0	-	2	3%	2	10%
	Never	10	10%	4	13%	5	10%	0	-	2	18%	9	11%	1	5%
	Don't know	4	4%	2	6%	1	2%	0	-	1	9%	2	3%	2	10%
19e (n=100) How frequently do installation technicians face challenges with the following aspects of a heat pump water heater installation? Heat pump water heater too large to fit where old water heater was	Always	1	1%	0	-	1	2%	0	-	0	-	1	1%	0	-
	Very frequently	35	35%	8	25%	16	31%	9	41%	5	45%	26	33%	9	45%
	Occasionally	34	34%	11	34%	21	40%	5	23%	3	27%	30	38%	4	20%
	Rarely	13	13%	5	16%	7	13%	6	27%	1	9%	10	13%	3	15%
	Very rarely	8	8%	4	13%	4	8%	0	-	0	-	7	9%	1	5%
	Never	8	8%	4	13%	2	4%	1	5%	2	18%	5	6%	3	15%
	Don't know	1	1%	0	-	1	2%	1	5%	0	-	1	1%	0	-

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
19f (n=100) How frequently do installation technicians face challenges with the following aspects of a heat pump water heater installation? Complications related to floorplan and sound (sound from heat pump water heater would be a nuisance in desired installation location)	Always	3	3%	2	6%	0	-	1	5%	0	-	2	3%	1	5%
	Very frequently	8	8%	2	6%	4	8%	2	9%	1	9%	6	8%	2	10%
	Occasionally	46	46%	14	44%	28	54%	10	45%	4	36%	38	48%	8	40%
	Rarely	25	25%	7	22%	14	27%	6	27%	3	27%	20	25%	5	25%
	Very rarely	6	6%	3	9%	1	2%	1	5%	1	9%	5	6%	1	5%
	Never	11	11%	3	9%	5	10%	2	9%	2	18%	8	10%	3	15%
	Don't know	1	1%	1	3%	0	-	0	-	0	-	1	1%	0	-
19g (n=100) How frequently do installation technicians face challenges with the following aspects of a heat pump water heater installation? Complications related to floorplan and cold air (cold air generated by heat pump water heater would be a nuisance in desired installation location)	Always	4	4%	1	3%	0	-	3	14%	0	-	3	4%	1	5%
	Very frequently	22	22%	2	6%	16	31%	5	23%	2	18%	17	21%	5	25%
	Occasionally	35	35%	11	34%	18	35%	5	23%	6	55%	27	34%	8	40%
	Rarely	21	21%	8	25%	11	21%	7	32%	1	9%	19	24%	2	10%
	Very rarely	8	8%	5	16%	3	6%	2	9%	0	-	6	8%	2	10%
	Never	9	9%	4	13%	4	8%	0	-	2	18%	7	9%	2	10%
	Don't know	1	1%	1	3%	0	-	0	-	0	-	1	1%	0	-

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
19h (n=100) How frequently do installation technicians face challenges with the following aspects of a heat pump water heater installation? Installing ductwork	Always	9	9%	2	6%	7	13%	2	9%	0	-	8	10%	1	5%
	Very frequently	19	19%	3	9%	13	25%	4	18%	2	18%	14	18%	5	25%
	Occasionally	34	34%	11	34%	14	27%	8	36%	6	55%	26	33%	8	40%
	Rarely	14	14%	8	25%	9	17%	3	14%	0	-	13	16%	1	5%
	Very rarely	6	6%	2	6%	2	4%	1	5%	1	9%	3	4%	3	15%
	Never	13	13%	3	9%	6	12%	2	9%	2	18%	11	14%	2	10%
	Don't know	5	5%	3	9%	1	2%	2	9%	0	-	5	6%	0	-
20a (n=85) On average, how many hours does it take to install each of the following water heaters in a typical home: Electric resistance storage tank	One	3	4%	1	4%	2	5%	0	-	0	-	3	4%	0	-
	Two	31	36%	11	42%	15	36%	10	45%	1	11%	27	39%	4	25%
	Three	13	15%	7	27%	5	12%	4	18%	0	-	9	13%	4	25%
	Four or more	35	41%	7	27%	18	43%	7	32%	7	78%	27	39%	8	50%
	Don't know	3	4%	0	-	2	5%	1	5%	1	11%	3	4%	0	-
20b (n=71) On average, how many hours does it take to install each of the following water heaters in a typical home: Un-ducted heat pump water heater	One	2	3%	0	-	2	4%	0	-	0	-	2	3%	0	-
	Two	6	8%	4	16%	2	4%	1	11%	0	-	5	8%	1	9%
	Three	13	18%	5	20%	9	20%	2	22%	0	-	11	18%	2	18%
	Four	22	31%	11	44%	13	29%	0	-	2	33%	18	30%	4	36%
	Five	5	7%	0	-	3	7%	2	22%	1	17%	4	7%	1	9%
	Six or more	19	27%	5	20%	13	29%	3	33%	2	33%	16	27%	3	27%
	Don't know	4	6%	0	-	3	7%	1	11%	1	17%	4	7%	0	-

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
20c (n=71) On average, how many hours does it take to install each of the following water heaters in a typical home: ducted heat pump water heater	One to Three	5	7%	2	8%	4	9%	1	11%	0	-	4	7%	1	9%
	Four to Five	23	32%	12	48%	10	22%	2	22%	1	17%	20	33%	3	27%
	Six to Seven	13	18%	5	20%	12	27%	1	11%	1	17%	11	18%	2	18%
	Eight to Nine	15	21%	1	4%	11	24%	3	33%	3	50%	12	20%	3	27%
	Ten or more	9	13%	3	12%	6	13%	1	11%	0	-	7	12%	2	18%
	Don't know	6	8%	2	8%	2	4%	1	11%	1	17%	6	10%	0	-
20d (n=95) On average, how many hours does it take to install each of the following water heaters in a typical home: on-demand/tankless	One to Three	17	18%	8	26%	8	17%	5	23%	1	9%	13	17%	4	24%
	Four to Five	25	26%	8	26%	12	25%	7	32%	2	18%	22	28%	3	18%
	Six to Seven	19	20%	4	13%	11	23%	4	18%	3	27%	16	21%	3	18%
	Eight to Nine	21	22%	6	19%	12	25%	4	18%	1	9%	17	22%	4	24%
	Ten or more	12	13%	5	16%	5	10%	2	9%	3	27%	9	12%	3	18%
	Don't know	1	1%	0	-	0	-	0	-	1	9%	1	1%	0	-
21 (n=100) Please estimate what percentage of heat pump water heater installations require ducting to be installed.	Zero	6	6%	2	6%	2	4%	1	4%	1	9%	4	5%	2	10%
	1 to 25%	30	30%	10	31%	18	35%	5	22%	3	27%	26	32%	4	20%
	26 to 50%	22	22%	8	25%	9	17%	5	22%	2	18%	17	21%	5	25%
	51 to 75%	5	5%	2	6%	3	6%	1	4%	1	9%	5	6%	0	-
	76 to 100%	13	13%	2	6%	7	13%	6	26%	0	-	9	11%	4	20%
	Don't know	24	25%	8	26%	13	27%	4	18%	4	36%	19	24%	5	29%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
22 (n=100) When installing a heat pump water heater in a customer's home, what mode would you usually recommend to the customer?	Heat pump only	29	29%	11	34%	12	23%	8	36%	2	18%	22	28%	7	35%
	Hybrid or mixed operation	53	53%	14	44%	30	58%	11	50%	6	55%	43	54%	10	50%
	It depends	3	3%	1	3%	1	2%	0	-	1	9%	1	1%	2	10%
	I'm not sure	5	5%	1	3%	4	8%	1	5%	1	9%	5	6%	0	-
24 (n=97) How many residential electric storage water heaters did your company install in 2022? Your best estimate is fine.	1 to 25	39	40%	12	40%	18	35%	12	52%	3	30%	33	42%	6	33%
	26 to 50	20	21%	8	27%	11	22%	3	13%	1	10%	17	22%	3	17%
	51 to 100	18	19%	4	13%	11	22%	2	9%	3	30%	14	18%	4	22%
	101 to 200	11	11%	3	10%	5	10%	3	13%	2	20%	8	10%	3	17%
	201 to 500	4	4%	1	3%	3	6%	1	4%	0	-	4	5%	0	-
	501 to 1,000	2	2%	2	7%	2	4%	0	-	0	-	2	3%	0	-
25 (n=94) Of the approximately [PIPE NUMBER FROM Q24] residential electric storage water heaters your company installed in 2022, about what percent were heat pump water heaters? Your best estimate is fine.	Zero	28	30%	7	23%	9	18%	14	67%	3	33%	22	28%	6	38%
	1 to 25%	53	56%	20	67%	31	62%	6	29%	5	56%	46	59%	7	44%
	26 to 50%	9	10%	2	7%	7	14%	1	5%	1	11%	7	9%	2	13%
	51 to 75%	0	-	0	-	0	-	0	-	0	-	0	-	0	-
	76 to 100%	4	4%	1	3%	3	6%	0	-	0	-	3	4%	1	6%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
26a (n=67) Of the heat pump water heaters your company installed in 2022, about what percent of units were 55 gallons or greater?	Zero	20	30%	6	26%	11	27%	3	38%	2	33%	17	30%	3	30%
	1 to 25%	5	7%	2	9%	2	5%	1	13%	1	17%	4	7%	1	10%
	26 to 50%	7	10%	3	13%	6	15%	0	-	0	-	6	11%	1	10%
	51 to 75%	3	4%	3	13%	1	2%	0	-	0	-	2	4%	1	10%
	76 to 100%	32	48%	9	39%	21	51%	4	50%	3	50%	28	49%	4	40%
26b (n=67) Of the heat pump water heaters your company installed in 2022, about what percent of units were less than 55 gallons?	Zero	23	34%	7	30%	15	37%	2	25%	2	33%	20	35%	3	30%
	1 to 25%	10	15%	3	13%	6	15%	2	25%	1	17%	9	16%	1	10%
	26 to 50%	5	7%	3	13%	4	10%	0	-	0	-	4	7%	1	10%
	51 to 75%	4	6%	2	9%	3	7%	0	-	0	-	3	5%	1	10%
	76 to 100%	25	37%	8	35%	13	32%	4	50%	3	50%	21	37%	4	40%
27a (n=66) Thinking about all the heat pump water heaters your company installed in 2022, about what percent of units were to customers who were replacing a failed water heater?	Zero	11	17%	4	17%	5	12%	3	43%	1	17%	10	18%	1	10%
	1 to 25%	13	20%	6	26%	9	22%	0	-	0	-	11	20%	2	20%
	26 to 50%	12	18%	3	13%	9	22%	1	14%	1	17%	8	14%	4	40%
	51 to 75%	10	15%	4	17%	5	12%	1	14%	1	17%	10	18%	0	-
	76 to 100%	20	30%	6	26%	13	32%	2	29%	3	50%	17	30%	3	30%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
27b (n=66) Thinking about all the heat pump water heaters your company installed in 2022, about what percent of units were to customers who were replacing an old/near-failure water heater?	Zero	17	26%	3	13%	12	29%	2	29%	2	33%	16	29%	1	10%
	1 to 25%	31	47%	12	52%	20	49%	4	57%	2	33%	25	45%	6	60%
	26 to 50%	12	18%	4	17%	7	17%	0	-	2	33%	10	18%	2	20%
	51 to 75%	1	2%	0	-	1	2%	0	-	0	-	1	2%	0	-
	76 to 100%	5	8%	4	17%	1	2%	1	14%	0	-	4	7%	1	10%
27c (n=66) Thinking about all the heat pump water heaters your company installed in 2022, about what percent of units were to customers who were replacing a fully functioning water heater?	Zero	42	64%	14	61%	26	63%	4	57%	3	50%	37	66%	5	50%
	1 to 25%	21	32%	8	35%	12	29%	3	43%	3	50%	16	29%	5	50%
	26 to 50%	2	3%	0	-	2	5%	0	-	0	-	2	4%	0	-
	51 to 75%	1	2%	1	4%	1	2%	0	-	0	-	1	2%	0	-
	76 to 100%	0	-	0	-	0	-	0	-	0	-	0	-	0	-
27d (n=66) Thinking about all the heat pump water heaters your company installed in 2022, about what percent of units were to customers who were installing a water heater in a newly constructed home?	Zero	37	56%	14	61%	22	54%	3	43%	4	67%	33	59%	4	40%
	1 to 25%	14	21%	4	17%	10	24%	2	29%	1	17%	10	18%	4	40%
	26 to 50%	4	6%	3	13%	1	2%	0	-	0	-	2	4%	2	20%
	51 to 75%	1	2%	1	4%	0	-	0	-	0	-	1	2%	0	-
	76 to 100%	10	15%	1	4%	8	20%	2	29%	1	17%	10	18%	0	-

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
28 (n=101) Thinking about your company's overall business revenues in 2022, about what percent was from water heater sales and installations?	1 to 25%	4	4%	1	3%	1	2%	1	4%	1	9%	4	5%	0	-
	26 to 50%	79	78%	29	91%	39	75%	18	78%	7	64%	63	78%	16	80%
	51 to 75%	15	15%	2	6%	9	17%	4	17%	3	27%	11	14%	4	20%
	76 to 100%	3	3%	0	-	3	6%	0	-	0	-	3	4%	0	-
	Don't know	0	-	0	-	0	-	0	-	0	-	0	-	0	-
29 (n=66) Thinking about your company's revenues just from sales and installations of water heaters in 2022, about what percent was from heat pump water heaters?	Zero	3	5%	0	-	1	2%	1	14%	1	17%	3	5%	0	-
	1 to 25%	60	91%	22	96%	38	93%	5	71%	5	83%	50	89%	10	100%
	26 to 50%	2	3%	1	4%	1	2%	1	14%	0	-	2	4%	0	-
	51 to 75%	0	-	0	-	0	-	0	-	0	-	0	-	0	-
	76 to 100%	1	2%	0	-	1	2%	0	-	0	-	1	2%	0	-
Don't know	3	5%	0	-	1	2%	1	14%	1	17%	3	5%	0	-	
30 (n=101) When you replace a large capacity (≥55 gallons) electric resistance storage water heater for a residential customer, what is your typical replacement strategy?	Replace with a heat pump water heater	11	11%	6	19%	8	15%	0	-	0	-	9	11%	2	10%
	Replace with a single, smaller residential electric resistance storage water heater	13	13%	2	6%	9	17%	1	4%	3	27%	10	12%	3	15%
	Replace with two smaller residential electric resistance storage water heaters	4	4%	0	-	1	2%	2	9%	1	9%	3	4%	1	5%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	Replace with a single commercial electric resistance storage water heater	44	44%	14	44%	21	40%	13	57%	4	36%	36	44%	8	40%
	Replace with an electric tankless water heater	3	3%	2	6%	2	4%	0	-	0	-	2	2%	1	5%
	Replace with a gas storage water heater	7	7%	3	9%	0	-	5	22%	0	-	5	6%	2	10%
	Replace with a gas tankless water heater	14	14%	4	13%	9	17%	1	4%	2	18%	13	16%	1	5%
	Other	5	5%	1	3%	2	4%	1	4%	1	9%	3	4%	2	10%
31 (n=85) When installing smaller electric resistance storage tank water heaters (<55 gallons), how often do you install mixing valves in order to increase the amount of hot water produced by the smaller tank?	Never	16	19%	6	23%	6	14%	5	23%	0	-	14	20%	2	13%
	Rarely	31	36%	10	38%	10	24%	12	55%	2	22%	24	35%	7	44%
	Sometimes	32	38%	8	31%	23	55%	5	23%	5	56%	26	38%	6	38%
	Always	5	6%	1	4%	2	5%	0	-	2	22%	4	6%	1	6%
	Other	0	-	0	-	0	-	0	-	0	-	0	-	0	-
	I'm not sure	1	1%	1	4%	1	2%	0	-	0	-	1	1%	0	-
32 (n=37) Do you install mixing valves on these smaller tanks to avoid installing a heat pump water heater?	Yes	7	19%	1	11%	6	24%	1	20%	0	-	6	20%	1	14%
	No	29	78%	8	89%	18	72%	4	80%	7	100%	23	77%	6	86%
	Other	1	3%	0	-	1	4%	0	-	0	-	1	3%	0	-

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
33 (n=101) What types of water heating equipment does your company typically keep on hand for emergency replacements? Select all that apply.	Electric resistance storage	52	51%	16	50%	29	56%	11	48%	7	64%	41	51%	11	55%
	Gas storage	53	52%	15	47%	27	52%	14	61%	8	73%	43	53%	10	50%
	On-demand/tankless	24	24%	7	22%	16	31%	4	17%	4	36%	21	26%	3	15%
	Heat pump water heater	13	13%	5	16%	11	21%	2	9%	0	-	11	14%	2	10%
	Other	2	2%	1	3%	1	2%	1	4%	0	-	2	2%	0	-
	None of the above	38	38%	13	41%	16	31%	9	39%	3	27%	32	40%	6	30%
34 (n=100) In what percent of the homes that you visit could you install a heat pump water heater without making more changes to the installation area than is typical for a storage water heater? Think only of existing homes, not newly built homes. Your best guess is fine.	Zero	18	18%	5	16%	6	12%	7	32%	2	18%	12	15%	6	30%
	1 to 25%	41	41%	11	34%	23	44%	11	50%	4	36%	36	45%	5	25%
	26 to 50%	24	24%	11	34%	12	23%	3	14%	2	18%	18	23%	6	30%
	51 to 75%	9	9%	3	9%	5	10%	1	5%	2	18%	6	8%	3	15%
	76 to 100%	8	8%	2	6%	6	12%	0	-	1	9%	8	10%	0	-
35a (n=100) In each of the following scenarios, what percent of the time would you recommend heat pump water heaters to a customer? To replace a fully functioning water heater	Zero	45	45%	13	41%	23	44%	12	55%	4	36%	37	46%	8	40%
	1 to 25%	32	32%	12	38%	15	29%	7	32%	5	45%	24	30%	8	40%
	26 to 50%	7	7%	1	3%	5	10%	2	9%	0	-	7	9%	0	-
	51 to 75%	4	4%	1	3%	1	2%	0	-	2	18%	2	3%	2	10%
	76 to 100%	12	12%	5	16%	8	15%	1	5%	0	-	10	13%	2	10%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
35b (n=100) In each of the following scenarios, what percent of the time would you recommend heat pump water heaters to a customer? To replace an old/near-failure water heater	Zero	35	35%	10	31%	17	33%	10	45%	3	27%	27	34%	8	40%
	1 to 25%	25	25%	10	31%	12	23%	6	27%	3	27%	20	25%	5	25%
	26 to 50%	22	22%	5	16%	12	23%	6	27%	3	27%	19	24%	3	15%
	51 to 75%	4	4%	2	6%	1	2%	0	-	1	9%	1	1%	3	15%
	76 to 100%	14	14%	5	16%	10	19%	0	-	1	9%	13	16%	1	5%
35c (n=100) In each of the following scenarios, what percent of the time would you recommend heat pump water heaters to a customer? To replace a failed water heater	Zero	36	36%	10	31%	16	31%	11	50%	4	36%	28	35%	8	40%
	1 to 25%	26	26%	10	31%	12	23%	8	36%	2	18%	21	26%	5	25%
	26 to 50%	20	20%	4	13%	13	25%	3	14%	3	27%	17	21%	3	15%
	51 to 75%	4	4%	2	6%	1	2%	0	-	1	9%	1	1%	3	15%
	76 to 100%	14	14%	6	19%	10	19%	0	-	1	9%	13	16%	1	5%
35d (n=100) In each of the following scenarios, what percent of the time would you recommend heat pump water heaters to a customer? For new construction (new homes that are not yet occupied, where the customer is the builder/developer)	Zero	53	113%	19	146%	26	100%	12	120%	4	57%	44	122%	9	82%
	1 to 25%	8	8%	3	9%	3	6%	3	14%	2	18%	7	9%	1	5%
	26 to 50%	15	15%	5	16%	8	15%	4	18%	2	18%	11	14%	4	20%
	51 to 75%	5	5%	2	6%	3	6%	0	-	1	9%	4	5%	1	5%
	76 to 100%	19	19%	3	9%	12	23%	3	14%	2	18%	14	18%	5	25%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
36 (n=55) When you have recommended heat pump water heaters to a customer who is replacing a fully functioning water heater, what percentage of the time have they agreed to install one?	Zero	6	11%	2	11%	3	10%	1	10%	0	-	6	14%	0	-
	1 to 25%	24	44%	9	47%	13	45%	5	50%	2	29%	17	40%	7	58%
	26 to 50%	12	22%	2	11%	7	24%	1	10%	3	43%	10	23%	2	17%
	51 to 75%	2	4%	1	5%	1	3%	0	-	0	-	0	-	2	17%
	76 to 100%	8	15%	4	21%	4	14%	2	20%	1	14%	7	16%	1	8%
	I have never recommended a heat pump water heater to a customer replacing a fully functioning water heater	3	5%	1	5%	1	3%	1	10%	1	14%	3	7%	0	-
37 (n= 66) When you have recommended heat pump water heaters to a customer who is replacing an old water heater that still works but is near the point of failure, what percentage of the time have they agreed to install one?	Zero	7	11%	2	9%	2	6%	4	33%	0	-	7	13%	0	-
	1 to 25%	25	38%	8	36%	13	37%	4	33%	3	38%	18	34%	7	58%
	26 to 50%	17	26%	5	23%	11	31%	1	8%	4	50%	15	28%	2	17%
	51 to 75%	8	12%	4	18%	5	14%	1	8%	0	-	5	9%	3	25%
	76 to 100%	6	9%	1	5%	3	9%	2	17%	1	13%	6	11%	0	-
	I have never recommended a heat pump water heater to a customer replacing a near-failure water heater	2	3%	2	9%	1	3%	0	-	0	-	2	4%	0	-

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
38 (n=65) When you have recommended a heat pump water heater to a customer who is replacing a failed water heater, what percentage of the time have they agreed to install one?	Zero	8	13%	3	14%	3	8%	4	36%	0	-	8	15%	0	-
	1 to 25%	25	39%	7	32%	14	39%	5	45%	3	43%	20	38%	5	42%
	26 to 50%	13	20%	3	14%	8	22%	2	18%	3	43%	9	17%	4	33%
	51 to 75%	11	17%	4	18%	7	19%	0	-	1	14%	9	17%	2	17%
	76 to 100%	5	8%	4	18%	3	8%	0	-	0	-	4	8%	1	8%
	I have never recommended a heat pump water heater to a customer replacing a failed water heater	2	3%	1	5%	1	3%	0	-	0	-	2	4%	0	-
40 (n=47) When you have recommended a heat pump water heater to a builder/contractor working on building a new home, what percentage of the time have they agreed to install one?	Zero	8	17%	2	15%	4	15%	2	20%	2	29%	7	19%	1	9%
	1 to 25%	13	28%	6	46%	4	15%	3	30%	3	43%	8	22%	5	45%
	26 to 50%	7	15%	0	-	5	19%	2	20%	1	14%	6	17%	1	9%
	51 to 75%	6	13%	3	23%	4	15%	0	-	0	-	5	14%	1	9%
	76 to 100%	10	21%	1	8%	8	31%	1	10%	1	14%	8	22%	2	18%
	I have never recommended a heat pump water heater to a builder/contractor for a new home	3	6%	1	8%	1	4%	2	20%	0	-	2	6%	1	9%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
41 (n=100) In the next year or two, how often do you expect you will recommend heat pump water heaters to your customers?	Much more often than you do now	8	8%	2	6%	8	15%	0	-	0	-	8	10%	0	-
	Somewhat more often than you do now	15	15%	5	16%	9	17%	5	23%	1	9%	12	15%	3	15%
	At the same rate as you do now	70	70%	21	66%	34	65%	16	73%	8	73%	56	70%	14	70%
	Somewhat less often than you do now	1	1%	1	3%	0	-	0	-	0	-	0	-	1	5%
	Much less often than you do now	6	6%	3	9%	1	2%	1	5%	2	18%	4	5%	2	10%
43 (n=100) In the past two years, how many times have you serviced or repaired a heat pump water heater? Your best estimate is fine.	Zero	29	62%	9	69%	13	50%	9	90%	2	29%	23	64%	6	55%
	1 to 10	54	54%	16	50%	29	56%	8	36%	8	73%	42	53%	12	60%
	11 to 50	11	11%	6	19%	6	12%	2	9%	0	-	10	13%	1	5%
	51 to 100	2	2%	0	-	1	2%	1	5%	0	-	2	3%	0	-
	101 to 200	1	1%	0	-	1	2%	1	5%	0	-	1	1%	0	-
	More than 200	3	3%	1	3%	2	4%	1	5%	1	9%	2	3%	1	5%
44 (n = 71) In the approximately [PIPE IN Q43 VALUE] heat pump water heater service calls you have received in the past two years, how often did you encounter the following issues? Your best estimate is fine. If never, enter -. Tank is too small (not enough hot water)	Zero	50	70%	14	61%	24	62%	11	85%	6	67%	41	72%	9	64%
	1 to 25%	13	18%	5	22%	12	31%	2	15%	0	-	12	21%	1	7%
	26 to 50%	5	7%	2	9%	2	5%	0	-	2	22%	3	5%	2	14%
	51 to 75%	1	1%	1	4%	0	-	0	-	0	-	0	-	1	7%
	76 to 100%	2	3%	1	4%	1	3%	0	-	1	11%	1	2%	1	7%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
44 (n = 71) In the approximately [PIPE IN Q43 VALUE] heat pump water heater service calls you have received in the past two years, how often did you encounter the following issues? Your best estimate is fine. If never, enter -. Unit not functioning properly in cold weather	Zero	32	45%	10	43%	16	41%	3	23%	5	56%	25	44%	7	50%
	1 to 25%	20	28%	13	57%	12	31%	3	23%	1	11%	15	26%	5	36%
	26 to 50%	9	13%	0	-	5	13%	1	8%	3	33%	8	14%	1	7%
	51 to 75%	1	1%	0	-	1	3%	1	8%	0	-	1	2%	0	-
	76 to 100%	9	13%	0	-	5	13%	5	38%	0	-	8	14%	1	7%
44 (n=71) In the approximately [PIPE IN Q43 VALUE] heat pump water heater service calls you have received in the past two years, how often did you encounter the following issues? Your best estimate is fine. If never, enter -. Unit was incorrectly installed	Zero	42	59%	10	43%	23	59%	6	46%	7	78%	35	61%	7	50%
	1 to 25%	20	28%	11	48%	12	31%	3	23%	2	22%	15	26%	5	36%
	26 to 50%	7	10%	2	9%	4	10%	2	15%	0	-	6	11%	1	7%
	51 to 75%	0	-	0	-	0	-	0	-	0	-	0	-	0	-
	76 to 100%	2	3%	0	-	0	-	2	15%	0	-	1	2%	1	7%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
44 (n=71) In the approximately [PIPE IN Q43 VALUE] heat pump water heater service calls you have received in the past two years, how often did you encounter the following issues? Your best estimate is fine. If never, enter -. Unit was installed in an unsuitable location	Zero	41	58%	14	61%	20	51%	5	38%	6	67%	32	56%	9	64%
	1 to 25%	21	30%	8	35%	16	41%	4	31%	1	11%	17	30%	4	29%
	26 to 50%	8	11%	1	4%	3	8%	3	23%	2	22%	7	12%	1	7%
	51 to 75%	0	-	0	-	0	-	0	-	0	-	0	-	0	-
	76 to 100%	1	1%	0	-	0	-	1	8%	0	-	1	2%	0	-
44 (n=71) In the approximately [PIPE IN Q43 VALUE] heat pump water heater service calls you have received in the past two years, how often did you encounter the following issues? Your best estimate is fine. If never, enter -. Dirty or clogged filter	Zero	17	24%	6	26%	6	15%	4	31%	2	22%	14	25%	3	21%
	1 to 25%	34	48%	15	65%	23	59%	5	38%	1	11%	30	53%	4	29%
	26 to 50%	10	14%	0	-	8	21%	1	8%	2	22%	8	14%	2	14%
	51 to 75%	5	7%	2	9%	0	-	1	8%	3	33%	0	-	5	36%
	76 to 100%	5	7%	0	-	2	5%	2	15%	1	11%	5	9%	0	-

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
44 (n=71) In the approximately [PIPE IN Q43 VALUE] heat pump water heater service calls you have received in the past two years, how often did you encounter the following issues? Your best estimate is fine. If never, enter -. Faulty components (e.g. control board, compressor)	Zero	15	21%	4	17%	5	13%	5	38%	1	11%	13	23%	2	14%
	1 to 25%	23	32%	8	35%	17	44%	5	38%	2	22%	19	33%	4	29%
	26 to 50%	12	17%	5	22%	6	15%	1	8%	3	33%	8	14%	4	29%
	51 to 75%	6	8%	1	4%	4	10%	0	-	1	11%	5	9%	1	7%
	76 to 100%	15	21%	5	22%	7	18%	2	15%	2	22%	12	21%	3	21%
Q49 (n=71) In what percentage of heat pump water service calls does the following happen...More than one service call to resolve issue	Zero	20	28%	10	43%	9	23%	2	15%	2	22%	19	33%	1	7%
	1 to 25%	20	28%	7	30%	12	31%	6	46%	3	33%	15	26%	5	36%
	26 to 50%	14	20%	4	17%	9	23%	1	8%	2	22%	10	18%	4	29%
	51 to 75%	3	4%	1	4%	1	3%	0	-	1	11%	2	4%	1	7%
	76 to 100%	14	20%	1	4%	8	21%	4	31%	1	11%	11	19%	3	21%
Q49 (n=71) In what percentage of heat pump water service calls does the following happen...Technician needs to call the manufacturer	Zero	11	15%	6	26%	3	8%	1	8%	1	11%	10	18%	1	7%
	1 to 25%	20	28%	7	30%	9	23%	4	31%	5	56%	13	23%	7	50%
	26 to 50%	14	20%	5	22%	10	26%	2	15%	1	11%	13	23%	1	7%
	51 to 75%	5	7%	2	9%	3	8%	1	8%	1	11%	3	5%	2	14%
	76 to 100%	21	30%	3	13%	14	36%	5	38%	1	11%	18	32%	3	21%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
Q49 (n=71) In what percentage of heat pump water service calls does the following happen...Advise customer to change the mode from hybrid to electric to address hot water concerns	Zero	22	31%	10	43%	11	28%	3	23%	1	11%	18	32%	4	29%
	1 to 25%	18	25%	8	35%	10	26%	4	31%	2	22%	12	21%	6	43%
	26 to 50%	14	20%	3	13%	9	23%	2	15%	3	33%	13	23%	1	7%
	51 to 75%	5	7%	1	4%	3	8%	0	-	1	11%	4	7%	1	7%
	76 to 100%	12	17%	1	4%	6	15%	4	31%	2	22%	10	18%	2	14%
Q49 (n=71) In what percentage of heat pump water service calls does the following happen...Unit is replaced with a new heat pump water heater	Zero	38	54%	14	61%	18	46%	8	62%	5	56%	29	51%	9	64%
	1 to 25%	15	21%	7	30%	9	23%	3	23%	1	11%	11	19%	4	29%
	26 to 50%	11	15%	1	4%	8	21%	1	8%	1	11%	10	18%	1	7%
	51 to 75%	2	3%	0	-	1	3%	0	-	1	11%	2	4%	0	-
	76 to 100%	5	7%	1	4%	3	8%	1	8%	1	11%	5	9%	0	-
Q49 (n=71) In what percentage of heat pump water service calls does the following happen...Unit is replaced with a different type of water heater	Zero	37	52%	15	65%	18	46%	5	38%	5	56%	29	51%	8	57%
	1 to 25%	21	30%	5	22%	17	44%	5	38%	1	11%	18	32%	3	21%
	26 to 50%	10	14%	2	9%	3	8%	3	23%	2	22%	8	14%	2	14%
	51 to 75%	2	3%	1	4%	1	3%	0	-	0	-	1	2%	1	7%
	76 to 100%	1	1%	0	-	0	-	0	-	1	11%	1	2%	0	-
47 (n=71) Do you keep spare parts or replacement units specifically for heat pump water heaters on hand?	Yes	7	10%	2	8%	3	7%	3	33%	1	17%	2	3%	5	45%
	No	62	87%	22	88%	40	89%	6	67%	5	83%	56	93%	6	55%
	I'm not sure	2	3%	1	4%	2	4%	0	-	0	-	2	3%	0	-

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
48 (n=71) Have you ever serviced or repaired heat pump water heaters that your company did not install?	Yes	50	70%	17	74%	26	67%	11	85%	7	78%	41	72%	9	64%
	No	20	28%	5	22%	13	33%	2	15%	2	22%	15	26%	5	36%
	I'm not sure	1	1%	1	4%	0	-	0	-	0	-	1	2%	0	-
49 (n=50) Thinking about the heat pump water heater you service that you did not install, what percent were installed by the customer (DIY)?	Zero	25	50%	5	29%	14	54%	7	64%	3	43%	21	51%	4	44%
	1 to 25%	18	36%	8	47%	10	38%	3	27%	2	29%	15	37%	3	33%
	26 to 50%	4	8%	2	12%	1	4%	1	9%	1	14%	2	5%	2	22%
	51 to 75%	2	4%	1	6%	1	4%	0	-	1	14%	2	5%	0	-
	76 to 100%	1	2%	1	6%	0	-	0	-	0	-	1	2%	0	-
49 (n=50) Thinking about the heat pump water heater you service that you did not install, what percent were installed by a professional (another plumber/installer)?	Zero	1	2%	1	6%	0	-	0	-	0	-	1	2%	0	-
	1 to 25%	0	-	0	-	0	-	0	-	0	-	0	-	0	-
	26 to 50%	4	8%	2	12%	1	4%	0	-	2	29%	2	5%	2	22%
	51 to 75%	2	4%	1	6%	1	4%	1	9%	0	-	2	5%	0	-
	76 to 100%	43	86%	13	76%	24	92%	10	91%	5	71%	36	88%	7	78%
51 (n =71) Compared to other types of water heaters, how often do you receive service requests or callbacks for heat pump water heaters? In your experience, do heat pump water heaters have...	Many more issues	9	13%	3	12%	7	16%	1	11%	0	-	7	12%	2	18%
	Somewhat more issues	14	20%	2	8%	10	22%	1	11%	3	50%	13	22%	1	9%
	About the same number of issues	23	32%	11	44%	14	31%	2	22%	1	17%	19	32%	4	36%
	Somewhat fewer issues	14	20%	7	28%	6	13%	4	44%	1	17%	11	18%	3	27%
	Many fewer issues	11	15%	2	8%	8	18%	1	11%	1	17%	10	17%	1	9%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
52 (n =71) In your experience, how long do heat pump water heaters last compared to other types of water heaters (the lifetime of the equipment)?	Much longer	3	4%	0	-	2	4%	0	-	1	17%	2	3%	1	9%
	Somewhat longer	9	13%	3	12%	6	13%	2	22%	1	17%	8	13%	1	9%
	About the same	46	65%	18	72%	28	62%	5	56%	3	50%	38	63%	8	73%
	Somewhat shorter	9	13%	2	8%	6	13%	2	22%	1	17%	8	13%	1	9%
	Much shorter	4	6%	2	8%	3	7%	0	-	0	-	4	7%	0	-
54 (n=52) Have you heard of the new standard, ANSI/CTA-2045, which requires all new electric storage water heaters manufactured after January 1, 2023, to have a communications port?	Yes	32	62%	6	55%	32	62%	3	60%	0	-	31	66%	1	20%
	No	19	37%	4	36%	19	37%	2	40%	0	-	15	32%	4	80%
	I'm not sure	1	2%	1	9%	1	2%	0	-	0	-	1	2%	0	-
55 (n=32) Do you think the new standard is a positive or negative development?	Positive	9	28%	3	27%	9	17%	1	20%	0	-	9	19%	0	-
	Negative	19	59%	3	27%	19	37%	2	40%	0	-	18	38%	1	20%
	Neither positive or negative	3	9%	0	-	3	6%	0	-	0	-	3	6%	0	-
	I'm not sure	1	3%	0	-	1	2%	0	-	0	-	1	2%	0	-

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
57 (n=101) Have you, or has someone else at your company, ever participated in a Hot Water Solutions training or orientation session about heat pump water heaters sponsored by the Northwest Energy Efficiency Alliance? (Hot Water Solutions trainings have been offered in-person and via webinar, so you may have attended in person or online).	Yes	24	24%	11	34%	11	21%	2	9%	5	45%	20	25%	4	20%
	No	73	72%	20	63%	38	73%	20	87%	6	55%	59	73%	14	70%
	I'm not sure	4	4%	1	3%	3	6%	1	4%	0	-	2	2%	2	10%
58 (n=77) Before today, have you heard of Hot Water Solutions?	Yes	13	17%	4	19%	6	15%	6	29%	1	17%	8	13%	5	31%
	No	62	81%	17	81%	33	80%	15	71%	5	83%	51	84%	11	69%
	I'm not sure	2	3%	0	-	2	5%	0	-	0	-	2	3%	0	-

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
60 (n=24) On a scale of 1 to 5, where 1 is “not at all satisfied” and 5 is “very satisfied,” how satisfied were you with how the Hot Water Solutions trainings covered the following topics? How heat pump water heaters work	1 - Not at all satisfied	0	-	0	-	0	-	0	-	0	-	0	-	0	-
	2	1	4%	1	9%	0	-	0	-	0	-	1	5%	0	-
	3	2	8%	1	9%	2	18%	0	-	0	-	2	10%	0	-
	4	4	17%	1	9%	3	27%	0	-	0	-	4	20%	0	-
	5 – Very satisfied	14	58%	6	55%	5	45%	1	50%	5	100%	10	50%	4	100%
	I’m not sure	1	4%	1	9%	0	-	0	-	0	-	1	5%	0	-
	N/A – Not relevant for training I attended	2	8%	1	9%	1	9%	1	50%	0	-	2	10%	0	-
60 (n=24) On a scale of 1 to 5, where 1 is “not at all satisfied” and 5 is “very satisfied,” how satisfied were you with how the Hot Water Solutions trainings covered the following topics? How to install heat pump water heaters	1 - Not at all satisfied	0	-	0	-	0	-	0	-	0	-	0	-	0	-
	2	0	-	0	-	0	-	0	-	0	-	0	-	0	-
	3	6	25%	3	27%	2	18%	1	50%	1	20%	5	25%	1	25%
	4	3	13%	1	9%	0	-	0	-	2	40%	2	10%	1	25%
	5 – Very satisfied	11	46%	5	45%	8	73%	0	-	1	20%	9	45%	2	50%
	I’m not sure	1	4%	1	9%	0	-	0	-	0	-	1	5%	0	-
	N/A – Not relevant for training I attended	3	13%	1	9%	1	9%	1	50%	1	20%	3	15%	0	-

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
60 (n=24) On a scale of 1 to 5, where 1 is “not at all satisfied” and 5 is “very satisfied,” how satisfied were you with how the Hot Water Solutions trainings covered the following topics? How to size heat pump water heaters	1 - Not at all satisfied	0	-	0	-	0	-	0	-	0	-	0	-	0	-
	2	1	4%	1	9%	0	-	0	-	0	-	1	5%	0	-
	3	2	8%	1	9%	1	9%	0	-	1	20%	1	5%	1	25%
	4	6	25%	2	18%	1	9%	1	50%	2	40%	5	25%	1	25%
	5 – Very satisfied	12	50%	5	45%	8	73%	0	-	2	40%	10	50%	2	50%
	I’m not sure	1	4%	1	9%	0	-	0	-	0	-	1	5%	0	-
	N/A – Not relevant for training I attended	2	8%	1	9%	1	9%	1	50%	0	-	2	10%	0	-
60 (n=24) How satisfied were you with how the Hot Water Solutions trainings covered: Energy savings from heat pump water heaters	1 - Not at all satisfied	2	8%	0	-	1	9%	1	50%	0	-	2	10%	0	-
	2	1	4%	1	9%	0	-	0	-	0	-	1	5%	0	-
	3	2	8%	2	18%	1	9%	0	-	0	-	2	10%	0	-
	4	6	25%	2	18%	2	18%	0	-	2	40%	4	20%	2	50%
	5 – Very satisfied	10	42%	4	36%	6	55%	0	-	3	60%	8	40%	2	50%
	I’m not sure	1	4%	1	9%	0	-	0	-	0	-	1	5%	0	-
	N/A – Not relevant for training I attended	2	8%	1	9%	1	9%	1	50%	0	-	2	10%	0	-

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
60 (n=24) On a scale of 1 to 5, where 1 is “not at all satisfied” and 5 is “very satisfied,” how satisfied were you with how the Hot Water Solutions trainings covered the following topics? How to overcome customer concerns and/or lack of awareness about heat pump water heaters	1 - Not at all satisfied	1	4%	0	-	0	-	1	50%	0	-	1	5%	0	-
	2	2	8%	1	9%	0	-	0	-	1	20%	1	5%	1	25%
	3	5	21%	3	27%	3	27%	0	-	0	-	4	20%	1	25%
	4	7	29%	3	27%	3	27%	0	-	2	40%	6	30%	1	25%
	5 – Very satisfied	6	25%	2	18%	4	36%	0	-	2	40%	5	25%	1	25%
	I’m not sure	1	4%	1	9%	0	-	0	-	0	-	1	5%	0	-
	N/A – Not relevant for training I attended	2	8%	1	9%	1	9%	1	50%	0	-	2	10%	0	-
62 (n=100) In closing, how likely are you to recommend heat pump water heaters to a friend or colleague? Please use a score of 0 to 10 where 0 is not at all likely and 10 is extremely likely.	0 - Not at All Likely	25	25%	6	19%	12	23%	7	32%	2	18%	21	26%	4	20%
	1	6	6%	2	6%	2	4%	3	14%	0	-	4	5%	2	10%
	2	5	5%	2	6%	1	2%	2	9%	1	9%	2	3%	3	15%
	3	4	4%	0	-	2	4%	3	14%	0	-	2	3%	2	10%
	4	9	9%	4	13%	6	12%	2	9%	1	9%	8	10%	1	5%
	5	16	16%	7	22%	10	19%	1	5%	1	9%	15	19%	1	5%
	6	4	4%	1	3%	3	6%	0	-	1	9%	3	4%	1	5%
	7	9	9%	4	13%	3	6%	1	5%	2	18%	7	9%	2	10%
	8	10	10%	3	9%	8	15%	1	5%	1	9%	8	10%	2	10%
	9	2	2%	1	3%	0	-	1	5%	0	-	2	3%	0	-
10 - Extremely Likely	10	10%	2	6%	5	10%	1	5%	2	18%	8	10%	2	10%	

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
63 (n = 100) Would you ever install a heat pump water heater in your own home?	Yes	48	48%	15	47%	26	50%	8	36%	6	55%	37	46%	11	55%
	No	52	52%	17	53%	26	50%	14	64%	5	45%	43	54%	9	45%

PURCHASER SURVEY

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
7 (n=451) Have you purchased a heat pump water heater, or moved into a home with a heat pump water heater already installed, in the past five years?	Yes, purchased a heat pump water heater	413	92%	52	98%	286	89%	63	98%	12	100%	382	91%	31	97%
	Yes, moved into a home with a heat pump water heater already installed	38	8%	1	2%	36	11%	1	2%	0	--	37	9%	1	3%
8 (n=451) Is the heat pump water heater still installed?	Yes	446	99%	52	98%	319	99%	63	98%	12	100%	414	99%	32	100%
	No	5	1%	1	2%	3	1%	1	2%	0	--	5	1%	0	--
9 (n=5) Why did you uninstall it?	The heat pump water heater worked poorly and/or needed repair	2	40%	0	--	2	70%	0	--	0	--	2	40%	0	--
	I was dissatisfied with the heat pump water heater	1	20%	0	--	0	--	1	100%	0	--	1	20%	0	--
	Never installed	2	40%	1	100%	1	30%	0	0%	0	--	2	40%	0	--
10 (n=5) What type of water heater did you install to replace the heat pump water heater?	Storage	2	40%	1	100%	0	--	1	100%	0	--	2	40%	0	--
	On-demand / tankless	1	20%	0	--	1	33%	0	--	0	--	1	20%	0	--
	Heat Pump Water Heater	1	20%	0	--	1	33%	0	--	0	--	1	20%	0	--
	I'm not sure	1	20%	0	--	1	33%	0	--	0	--	1	20%	0	--

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
11 (n=451) In which year did you “purchase” “move into the home with” the heat pump water heater?	2011	2	0%	2	4%	0	--	0	--	0	--	2	0%	0	--
	2012	1	0%	0	--	1	0%	0	--	0	--	1	0%	0	--
	2013	2	0%	0	--	2	1%	0	--	0	--	2	0%	0	--
	2015	2	0%	0	--	0	--	1	2%	1	8%	1	0%	1	3%
	2016	2	0%	0	--	0	--	2	3%	0	--	1	0%	1	3%
	2017	1	0%	1	2%	0	--	0	--	0	--	1	0%	0	--
	2018	5	1%	1	2%	3	1%	1	2%	0	--	5	1%	0	--
	2019	14	3%	3	6%	3	1%	8	13%	0	--	11	3%	3	9%
	2020	9	2%	2	4%	2	1%	5	8%	0	--	5	1%	4	13%
	2021	13	3%	1	2%	6	2%	6	9%	0	--	11	3%	2	6%
	2022	44	10%	2	4%	32	10%	10	16%	0	--	40	10%	4	13%
	2023	105	23%	10	19%	76	24%	17	27%	2	17%	94	22%	11	34%
	2024	166	37%	13	25%	138	43%	10	16%	5	42%	162	39%	4	13%
	2025	61	14%	6	11%	51	16%	0	--	4	33%	60	14%	1	3%
I'm not sure	13	3%	1	2%	8	2%	4	6%	0	--	12	3%	1	3%	
99	11	2%	11	21%	0	--	0	--	0	--	11	3%	0	--	
12 (n=451) Have you purchased more than one heat pump water heater?	Yes	45	10%	4	8%	34	11%	7	11%	0	--	40	10%	5	16%
	No	406	90%	49	92%	288	89%	57	89%	12	100%	379	90%	27	84%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
13 (n=45) How many heat pump water heaters are currently installed at your primary residence (where you live most of the year)?	One	36	80%	4	100%	27	79%	5	71%	0	-	32	80%	4	80%
	Two or more	8	18%	0	--	6	18%	2	29%	0	-	7	20%	1	2%
	None, my HPWH(s) are in my vacation home	1	2%	0	--	1	3%	0	--	0	-	1	0%	0	--
15 (n=449) Where was the heat pump water heater installed?	My primary residence	434	97%	49	94%	312	97%	61	95%	12	100%	403	97%	31	97%
	My vacation home	10	2%	1	2%	7	2%	2	3%	0	--	9	2%	1	3%
	A property I rent to others	4	1%	2	4%	1	0%	1	2%	0	--	4	1%	0	--
	Detached dwelling unit	1	0%	0	--	1	0%	0	--	0	--	1	0%	0	--
16 (n=386) Did you apply for or receive any of the following incentives or credits when you purchased your heat pump water heater?	Rebate or discount from your local utility	331	86%	31	78%	236	87%	55	87%	9	75%	305	86%	26	84%
	Federal or state tax credit	175	45%	20	50%	123	45%	26	41%	6	50%	163	46%	12	39%
	None of the above	17	4%	1	3%	13	5%	3	5%	0	--	14	4%	3	10%
	Don't know	12	3%	1	3%	6	2%	3	5%	2	17%	11	3%	1	3%
22 (n=451) Was the heat pump water heater installed in an existing home or was it part of a new home construction?	Existing home	401	89%	51	96%	276	86%	62	97%	12	100%	370	88%	31	97%
	New home construction	49	11%	2	4%	45	14%	2	3%	0	--	48	11%	1	3%
	I'm not sure	1	0%	0	--	1	0%	0	--	0	--	1	0%	0	--

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
24 (n=438) Where is the heat pump water heater located?	Unfinished basement or crawl space	65	14%	4	8%	51	16%	10	16%	0	--	60	15%	5	17%
	Finished basement	86	19%	1	2%	60	19%	25	39%	0	--	74	18%	12	40%
	Garage	206	46%	28	55%	164	51%	14	22%	0	--	200	49%	6	20%
	Closet or utility room (not in a basement)	71	16%	15	29%	42	13%	13	20%	1	100%	64	16%	7	23%
	Other, please specify:	3	1%	2	4%	1	0%	0	--	0	--	3	1%	0	--
	Outdoors	3	1%	0	--	3	1%	0	--	0	--	3	1%	0	--
	Attic	1	0%	0	--	0	--	1	2%	0	--	1	0%	0	--
	I'm not sure	3	1%	1	2%	1	0%	1	2%	0	--	3	1%	0	--
26 (n=449) Is the heat pump water heater located in a part of your home that is heated?	Yes - heated	156	35%	19	37%	89	28%	39	61%	9	75%	137	33%	19	59%
	No - unheated	291	65%	33	63%	230	72%	25	39%	3	25%	278	67%	13	41%
	I'm not sure	2	0%	0	--	2	1%	0	--	0	--	2	1%	0	--
27 (n=449) Is the heat pump water heater located in a part of your home that is insulated?	Yes - insulated	334	74%	42	81%	228	71%	54	84%	10	83%	309	74%	25	78%
	No - not insulated	102	23%	7	14%	83	26%	10	16%	2	17%	96	23%	6	19%
	Partially insulated	7	2%	2	4%	5	2%	0	--	0	--	7	2%	0	--
	I'm not sure	6	1%	1	2%	5	2%	0	--	0	--	5	1%	1	3%
28 (n=451) Are you responsible for paying the electric bill at the property with the heat pump water heater?	Yes	448	99%	53	100%	320	99%	63	98%	12	100%	416	99%	32	100%
	No	2	1%	0	--	1	0%	1	2%	0	--	2	1%	0	--
	I'm not sure	1	0%	0	--	1	0%	0	--	0	--	1	0%	0	--
29 (n=451)	Chelan PUD	26	6%	0	--	26	8%	0	--	0	--	26	6%	0	--

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
Who is your electric utility provider? [Coded Open-Ended Response]	Clark PUD	32	7%	1	2%	31	10%	0	--	0	--	32	8%	0	--
	EPUD	12	3%	12	23%	0	--	0	--	0	--	12	3%	0	--
	Idaho Power	64	14%	1	2%	0	--	63	98%	0	--	39	9%	25	78%
	NorthWestern Energy	11	2%	0	--	0	--	0	--	11	92%	9	2%	2	6%
	PSE	146	32%	0	--	146	45%	0	--	0	--	145	35%	1	3%
	SCL	73	16%	0	--	73	23%	0	--	0	--	73	17%	0	--
	Tacoma	40	9%	0	--	40	12%	0	--	0	--	40	10%	0	--
	General Pacific	33	7%	30	57%	3	1%	0	--	0	--	32	8%	1	3%
	Benton REA	1	0%	0	--	1	0%	0	--	0	--	1	0%	0	--
	Central Electric Cooperative	1	0%	1	2%	0	--	0	--	0	--	1	0%	0	--
	Central Lincoln PUD	1	0%	1	2%	0	--	0	--	0	--	0	--	1	3%
	EWEB	1	0%	1	2%	0	--	0	--	0	--	1	0%	0	--
	Fall River Rural Electric Cooperative	1	0%	0	--	0	--	1	2%	0	--	0	--	1	3%
	Fergus Electric Cooperative	1	0%	0	--	0	--	0	--	1	8%	0	--	1	3%
	Jefferson County PUD	1	0%	0	--	1	0%	0	--	0	--	1	0%	0	--
	McMinnville Water & Light	1	0%	1	2%	0	--	0	--	0	--	1	0%	0	--
	Pacific Gas & Electric Company	3	1%	3	6%	0	--	0	--	0	--	3	1%	0	--
Pacific Power	3	1%	2	4%	1	0%	0	--	0	--	3	1%	0	--	

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
30 (n=451) Where or how have you heard about heat pump water heaters?	I previously owned one	38	8%	6	11%	27	8%	5	8%	0	--	35	8%	3	9%
	From a friend or acquaintance	73	16%	6	11%	49	15%	14	22%	4	33%	66	16%	7	22%
	Utility print advertising or bill insert	57	13%	5	9%	47	15%	5	8%	0	--	55	13%	2	6%
	Utility website	111	25%	15	28%	91	28%	4	6%	1	--	109	26%	2	6%
	Hot Water Solutions website	6	1%	1	2%	4	1%	0	--	1	8%	5	1%	1	3%
	Retail store display	50	11%	5	9%	38	12%	7	11%	0	--	46	11%	4	13%
	Retail store salesperson	7	2%	1	2%	3	1%	3	5%	0	--	6	1%	1	3%
	Online news story	29	6%	0	--	27	8%	1	2%	1	8%	28	7%	1	3%
	Television ad	5	1%	0	--	5	2%	0	--	0	--	5	1%	0	--
	Radio ad	1	0%	0	--	1	0%	0	--	0	--	1	0%	0	--
	Social media, such as Facebook, Instagram, or YouTube	10	2%	1	2%	9	3%	0	--	0	--	10	2%	0	--
	Contractor or installer	67	15%	11	21%	47	15%	5	8%	4	33%	64	15%	3	9%
	While researching on the internet	189	42%	12	23%	136	42%	37	58%	4	33%	173	41%	16	50%
	Internet advertising	21	5%	2	4%	18	6%	1	2%	0	--	21	5%	0	--
	Utility newsletter	86	19%	12	23%	69	21%	5	8%	0	--	83	20%	3	9%
Professional experience	47	10%	6	11%	29	9%	11	17%	1	8%	39	9%	8	25%	
Programs, events, or groups	5	1%	0	--	4	1%	1	2%	0	--	4	1%	1	3%	

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	Permitting office	2	0%	0	--	2	1%	0	--	0	--	2	1%	0	--
	Television show	2	0%	1	2%	0	--	1	2%	0	--	1	0%	1	3%
	Don't know	12	3%	2	4%	7	2%	3	5%	0	--	12	3%	0	--
31a (n=451) Please assess how much you agree or disagree with the following statements. - Heat pump water heaters are very efficient.	Strongly disagree	5	1%	1	2%	3	1%	1	2%	0	--	4	1%	1	3%
	Somewhat disagree	7	2%	0	--	6	2%	1	2%	0	--	7	2%	0	--
	Neither agree nor disagree	59	13%	13	25%	39	12%	5	8%	2	17%	57	14%	2	6%
	Somewhat agree	134	30%	11	21%	102	32%	17	27%	4	33%	127	30%	7	22%
	Strongly agree	246	55%	28	53%	172	53%	40	63%	6	50%	224	54%	22	69%
31b (n=451) Please assess how much you agree or disagree with the following statements. - Heat pump water heaters are eligible for tax credits and/or discounts from utility companies.	Strongly disagree	16	4%	4	8%	12	4%	0	--	0	--	16	4%	0	--
	Somewhat disagree	3	1%	0	--	2	1%	1	2%	0	--	2	1%	1	3%
	Neither agree nor disagree	60	13%	8	15%	44	14%	6	9%	2	17%	56	13%	4	13%
	Somewhat agree	108	24%	11	21%	79	25%	13	20%	5	42%	107	26%	1	3%
	Strongly agree	264	59%	30	57%	185	58%	44	69%	5	42%	238	57%	26	81%
31c (n=451) Please assess how much you agree or disagree with the following statements. - Heat pump water heaters can be controlled from a smart phone.	Strongly disagree	18	4%	6	11%	8	3%	3	5%	1	8%	16	4%	2	6%
	Somewhat disagree	17	4%	1	2%	15	5%	1	2%	0	--	16	4%	1	3%
	Neither agree nor disagree	129	28%	22	42%	88	27%	15	23%	4	33%	122	29%	7	22%
	Somewhat agree	90	20%	7	13%	65	20%	14	22%	4	33%	84	20%	6	29%
	Strongly agree	197	44%	17	32%	146	45%	31	48%	3	25%	181	43%	16	50%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
31d (n=451) Please assess how much you agree or disagree with the following statements. - Heat pump water heaters are unreliable.	Strongly disagree	224	50%	32	60%	145	45%	42	66%	5	42%	199	48%	25	78%
	Somewhat disagree	93	21%	6	11%	71	22%	13	20%	3	25%	90	22%	3	9%
	Neither agree nor disagree	103	22%	12	23%	80	25%	8	13%	3	25%	100	24%	3	9%
	Somewhat agree	22	5%	2	4%	19	6%	1	2%	0	--	22	5%	0	--
	Strongly agree	9	2%	1	2%	7	2%	0	--	1	8%	8	2%	1	3%
31e (n=451) Please assess how much you agree or disagree with the following statements. - Heat pump water heaters are expensive to service or repair.	Strongly disagree	31	7%	3	6%	15	5%	11	17%	2	17%	25	6%	6	19%
	Somewhat disagree	29	6%	2	4%	19	6%	8	13%	0	--	24	6%	5	16%
	Neither agree nor disagree	309	69%	40	76%	228	71%	32	50%	9	75%	294	70%	15	47%
	Somewhat agree	63	14%	5	9%	45	14%	12	19%	1	8%	58	14%	5	16%
	Strongly agree	19	4%	3	6%	15	5%	1	2%	0	--	18	4%	1	3%
31f (n=451) Please assess how much you agree or disagree with the following statements. - Heat pump water heaters result in lower electric bills than a typical water heater.	Strongly disagree	10	2%	1	2%	8	3%	1	2%	0	--	9	2%	1	3%
	Somewhat disagree	17	4%	0	--	16	5%	1	2%	0	--	16	4%	1	3%
	Neither agree nor disagree	64	14%	14	26%	44	14%	4	6%	2	17%	63	15%	1	3%
	Somewhat agree	130	29%	15	28%	91	28%	18	28%	6	50%	124	30%	6	19%
	Strongly agree	230	51%	23	43%	163	51%	40	63%	4	33%	207	49%	23	72%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
31g (n=451) Please assess how much you agree or disagree with the following statements. - Heat pump water heaters offer better value than typical electric water heaters.	Strongly disagree	12	3%	2	4%	9	3%	1	2%	0	0%	11	3%	1	3%
	Somewhat disagree	19	4%	1	2%	16	5%	2	3%	0	0%	17	4%	2	6%
	Neither agree nor disagree	72	16%	9	17%	51	16%	8	13%	4	33%	69	17%	3	9%
	Somewhat agree	141	31%	20	38%	105	33%	12	19%	4	33%	138	33%	3	9%
	Strongly agree	207	46%	21	40%	141	44%	41	64%	4	33%	184	44%	23	72%
31h (n=451) Please assess how much you agree or disagree with the following statements. - Heat pump water heaters are noisy.	Strongly disagree	91	20%	14	26%	62	19%	12	19%	3	25%	84	20%	7	22%
	Somewhat disagree	99	22%	7	13%	74	23%	17	27%	1	8%	88	21%	11	34%
	Neither agree nor disagree	74	16%	8	15%	53	17%	10	16%	3	25%	68	16%	6	19%
	Somewhat agree	162	36%	22	42%	116	36%	20	31%	4	33%	157	38%	5	16%
	Strongly agree	25	6%	2	4%	17	5%	5	8%	1	8%	22	5%	3	9%
31i (n=451) Please assess how much you agree or disagree with the following statements. - Heat pump water heaters are expensive to install.	Strongly disagree	77	17%	15	28%	43	13%	19	30%	0	--	65	16%	12	38%
	Somewhat disagree	77	17%	14	26%	51	16%	11	17%	1	8%	72	17%	5	16%
	Neither agree nor disagree	129	29%	10	19%	96	30%	19	30%	4	33%	121	29%	8	25%
	Somewhat agree	125	28%	11	21%	97	30%	11	17%	6	50%	120	29%	5	16%
	Strongly agree	43	10%	3	6%	35	11%	4	6%	1	8%	41	10%	2	6%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
31j (n=451) Please assess how much you agree or disagree with the following statements. - Heat pump water heaters do not produce enough hot water.	Strongly disagree	247	55%	33	62%	172	53%	38	59%	4	33%	230	55%	17	53%
	Somewhat disagree	90	20%	9	17%	64	20%	14	22%	3	25%	82	20%	8	25%
	Neither agree nor disagree	62	14%	5	9%	49	15%	5	8%	3	25%	59	14%	3	9%
	Somewhat agree	37	8%	6	11%	26	8%	3	5%	2	17%	35	8%	2	6%
	Strongly agree	15	3%	0	--	11	3%	4	6%	0	--	13	3%	2	6%
32 (n=413) What type of water heater did you have before you purchased the heat pump water heater?	Storage	363	81%	44	85%	251	88%	56	89%	12	100%	334	87%	29	94%
	On-demand	10	2%	0	--	10	3%	0	--	0	--	10	3%	0	--
	Indirect storage tank attached to boiler	6	1%	0	--	4	1%	2	3%	0	--	6	2%	0	--
	Heat Pump Water Heater	26	6%	5	10%	17	6%	4	6%	0	--	24	6%	2	6%
	I'm not sure	8	2%	3	6%	4	1%	1	2%	0	--	8	2%	0	--
33 (n=405) What fuel did that water heater use?	Electricity	312	77%	45	92%	199	71%	57	92%	11	92%	282	75%	30	97%
	Natural gas	72	18%	3	6%	65	23%	4	6%	0	--	71	19%	1	3%
	Propane	7	2%	0	--	7	2%	0	--	0	--	7	2%	0	--
	Fuel Oil	2	1%	0	--	1	0%	1	2%	0	--	2	1%	0	--
	I'm not sure	12	3%	1	2%	10	4%	0	--	1	8%	12	3%	0	--

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
32 & 33 combined (n=413)	Electric storage	287	70%	40	77%	184	64%	52	83%	11	92%	259	68%	28	90%
	Gas/Propane storage	66	16%	3	6%	59	21%	4	6%	0	--	65	17%	1	3%
	Electric indirect	3	1%	0	--	2	1%	1	2%	0	--	3	1%	0	--
	HPWH	26	6%	5	10%	17	6%	4	6%	0	--	24	6%	2	6%
	Gas/propane/oil indirect	3	1%	0	--	2	10%	1	2%	0	--	3	1%	0	--
	Gas/propane/oil tankless	10	2%	0	--	10	3%	0	--	0	--	10	3%	0	--
	Don't know	18	4%	4	8%	12	4%	1	2%	1	8%	18	5%	0	--
34 (n=394) What was the size of the water heater you replaced with the heat pump water heater?	Less than 55 gallons	217	55%	31	65%	141	52%	37	60%	8	67%	199	55%	18	58%
	55 gallons or more	148	38%	15	31%	111	41%	20	32%	2	17%	136	38%	12	39%
	I'm not sure	29	7%	2	4%	20	7%	5	8%	2	17%	28	8%	1	3%
35 (n=451) How many gallons is your current water heater?	Less than 55 gallons	189	42%	34	64%	117	36%	35	55%	3	25%	172	41%	17	53%
	55 gallons or more	226	50%	17	32%	178	55%	25	39%	6	50%	212	51%	14	44%
	I'm not sure	36	8%	2	4%	27	8%	4	6%	3	25%	35	8%	1	3%
36 (n=396) Why did you purchase a new water heater?	My water heater was completely broken and did not provide any hot water	41	10%	4	8%	30	11%	5	8%	2	17%	38	10%	3	10%
	My water heater worked poorly and/or needed repair	37	9%	5	10%	23	8%	9	15%	0	--	34	9%	3	10%
	My water heater was old and/or close to failing	175	44%	20	39%	127	47%	25	41%	3	25%	165	45%	10	33%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	I wanted to install a more energy-efficient water heater	125	32%	21	41%	76	28%	21	34%	7	58%	111	30%	14	47%
	To serve an addition to my home	4	1%	0	--	4	1%	0	--	0	--	4	1%	0	--
	I wanted a water heater with a specific feature	3	1%	0	--	3	1%	0	--	0	--	3	1%	0	--
	I received a rebate/it was free	4	1%	1	2%	3	1%	0	--	0	--	4	1%	0	--
	I needed more capacity	1	0%	0	--	1	0%	0	--	0	--	1	0%	0	--
	Installed as part of a remodel	4	1%	0	--	3	1%	1	2%	0	--	4	1%	0	--
	I'm not sure	2	1%	0	--	2	1%	0	--	0	--	2	1%	0	--
37 (n=413) Besides heat pump water heaters, what other water heating options did you consider?	Standard electric storage tank	179	43%	20	39%	122	43%	32	51%	5	42%	165	43%	14	45%
	Electric tankless	144	35%	13	25%	108	38%	22	35%	1	8%	134	35%	10	32%
	Natural gas tankless	39	9%	2	4%	29	10%	6	10%	2	17%	35	9%	4	13%
	Natural gas storage tank, which would require natural gas service	23	6%	2	4%	15	5%	6	10%	0	--	22	6%	1	3%
	Propane storage water tank	12	3%	2	4%	7	2%	3	5%	0	--	11	3%	1	3%
	Solar water heating	20	5%	6	12%	9	3%	5	8%	0	--	18	5%	2	7%
	I did not consider other types of water heaters	130	32%	22	42%	90	32%	14	22%	4	33%	119	31%	11	36%
	Don't know	12	3%	0	--	7	2%	3	5%	2	17%	11	3%	1	3%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
38 (n=270) Why did you decide to install a heat pump water heater instead of the other water heating options you considered?	Other options were more expensive to purchase	42	16%	3	10%	28	15%	9	20%	2	33%	37	15%	5	26%
	Other options were more expensive to operate	69	26%	8	28%	44	23%	16	35%	1	17%	62	25%	7	37%
	Other options were less efficient	140	52%	13	45%	100	53%	23	50%	4	67%	131	52%	9	47%
	Other options required unacceptable renovation	28	10%	1	3%	19	10%	7	15%	1	17%	23	9%	5	26%
	The availability of rebates/incentives from my utility	156	58%	21	72%	111	59%	21	46%	3	50%	149	59%	7	37%
	To save energy	161	60%	17	59%	112	59%	30	65%	2	33%	149	59%	12	63%
	Satisfied credits for the energy code when building my home	2	1%	0	--	2	1%	0	--	0	--	2	1%	0	--
	Heat pump water heaters were recommended by a contractor or a salesperson	24	9%	6	21%	15	8%	1	2%	2	33%	23	9%	1	5%
	Heat pump water heaters were recommended by friends, family members, or colleagues	7	3%	3	10%	4	2%	0	--	0	--	7	3%	0	--
	Heat pump water heaters were recommended by utility company	4	2%	2	7%	1	1%	1	2%	0	--	4	2%	0	--
To electrify home	2	1%	0	--	1	1%	1	2%	0	--	2	1%	0	--	

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	To reduce carbon footprint	4	2%	0	--	4	2%	0	--	0	--	4	2%	0	--
	The availability of state/federal tax credits	3	1%	1	4%	1	1%	1	2%	0	--	3	1%	0	--
	Heat pump water heaters help with cooling in the summer	2	1%	0	--	2	1%	0	--	0	--	2	1%	0	--
	Other	5	2%	0	--	4	2%	1	2%	0	--	5	2%	0	--
	Don't know	1	0%	0	--	1	1%	0	--	0	--	1	0%	0	--
39 (n=413) Where did you purchase your heat pump water heater?	Retail store (e.g., Home Depot, Lowe's, ACE Hardware, including online)	248	60%	9	17%	186	65%	53	84%	0	--	225	59%	23	74%
	Contractor or installer	96	23%	4	8%	77	27%	7	11%	8	67%	92	24%	4	13%
	Utility marketplace (e.g., Enervee)	11	3%	10	19%	1	0%	0	--	0	--	11	3%	0	--
	Online / Internet / Website (e.g., Amazon.com)	5	1%	0	--	3	1%	2	3%	0	--	4	1%	1	3%
	Directly from my utility (this may include units that were provided at no cost)	39	9%	23	44%	16	6%	0	--	0	--	38	10%	1	3%
	HVAC Distributor/Supplier	4	1%	3	6%	0	--	1	2%	0	--	3	1%	1	3%
	Solar Company	1	0%	0	--	0	--	0	--	1	8%	1	0%	0	--
	I'm not sure	9	2%	3	6%	3	1%	0	--	3	25%	8	2%	1	3%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
40 (n=410) Which of the following were important factors in your decision to purchase a heat pump water heater? Please select all that apply.	The ENERGY STAR label	160	39%	15	29%	104	37%	35	56%	6	50%	141	37%	19	61%
	The information on the Hot Water Solutions website	4	1%	0	--	4	2%	0	--	0	--	4	1%	0	--
	Recommendation from your contractor, installer, and/or salesperson	69	17%	10	19%	48	17%	3	5%	8	67%	66	17%	3	10%
	Rebate or incentive from your utility	311	76%	43	83%	213	75%	46	73%	9	75%	287	76%	24	77%
	State or federal tax credit(s)	188	46%	23	44%	129	46%	31	49%	5	42%	176	46%	12	39%
	Energy efficiency (saving energy)	324	79%	44	85%	219	77%	52	83%	9	75%	298	79%	26	84%
	Going green/being good for the environment	206	50%	26	50%	148	52%	27	43%	5	42%	194	51%	12	39%
	To satisfy energy code requirements	7	2%	0	--	7	3%	0	--	0	--	7	2%	0	--

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
42 (n=413) Were there any other factors that were important in your decision to install a heat pump water heater? [Coded Open-Ended Response]	To cool/dehumidify space	10	19%	1	25%	7	19%	2	20%	0	--	10	22%	0	--
	To save money	7	13%	1	25%	6	17%	0	--	0	--	7	15%	0	--
	Ease of installation/ability to self install	5	9%	0	--	3	8%	2	20%	0	--	5	11%	0	--
	Finding a suitable installation location	4	7%	1	25%	3	8%	0	--	0	--	4	9%	0	--
	Greater capacity than other options	4	7%	0	--	3	8%	1	10%	0	--	4	9%	0	--
	Presence of smart features, such as remote access via Wi-Fi	5	9%	0	--	3	8%	2	20%	0	--	2	4%	1	20%
	Quieter than other options	3	6%	1	25%	1	3%	1	10%	0	--	2	4%	1	20%
	To take advantage of solar panels	3	6%	0	--	2	6%	1	10%	0	--	2	4%	1	20%
	Wanted heat pump technology	3	6%	0	--	2	6%	1	10%	0	--	2	4%	1	20%
	Reliability of HPWH	2	4%	0	--	1	3%	0	--	1	100%	1	2%	1	20%
	To eliminate use of natural gas	2	4%	0	--	2	6%	0	--	0	--	2	4%	0	--
	Availability of extended warranty	1	2%	0	--	1	3%	0	--	0	--	1	2%	0	--
	Did not have other options	1	2%	0	--	1	3%	0	--	0	--	1	2%	0	--
	Did not like other options	1	2%	0	--	1	3%	0	--	0	--	1	2%	0	--
	Having a split unit	1	2%	0	--	1	3%	0	--	0	--	1	2%	0	--
	To take advantage of time of use electricity rates	1	2%	1	25%	0	--	0	--	0	--	1	2%	0	--
Increase home value	1	2%	0	--	1	3%	0	--	0	--	1	2%	0	--	

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
41 (n=412) Which statement most accurately describes your decision-making process?	I knew I wanted a heat pump water heater I wanted before I went shopping or spoke to a contractor	350	85%	40	77%	247	87%	58	92%	5	42%	323	85%	27	87%
	I was undecided until my contractor, installer, or salesperson recommended a heat pump water heater	62	15%	12	23%	38	13%	5	8%	7	58%	58	15%	4	13%
42 (n=392) What did the installer or salesperson say to persuade you to choose a heat pump water heater? [Coded Open-Ended Response]	Higher energy-efficiency and/or long-term cost savings	35	49%	9	75%	19	54%	2	40%	5	72%	33	60%	2	50%
	Rebates/free	13	18%	3	25%	6	17%	1	20%	3	43%	13	24%	0	--
	Quality/reliability	3	4%	1	8%	2	6%	0	--	0	--	2	4%	1	25%
	Code requirements	2	3%	0	--	2	6%	0	--	0	--	2	4%	0	--
	Good deal	2	3%	0	--	2	6%	0	--	0	--	2	4%	0	--
	Less expensive than tankless	2	3%	1	8%	0	--	1	20%	0	--	1	2%	1	25%
	Only option available	2	3%	0	--	2	6%	0	--	0	--	2	4%	0	--
	Personal endorsement	2	3%	1	8%	0	--	0	--	1	14%	2	4%	0	--
	Switch from gas to electricity	2	3%	0	--	2	6%	0	--	0	--	2	4%	0	--
	Ease of installation	1	1%	0	--	1	3%	0	--	0	--	1	2%	0	--
	Increase home value	1	1%	0	--	1	3%	0	--	0	--	1	2%	0	--
	Multiple heating modes	1	1%	0	--	1	3%	0	--	0	--	1	2%	0	--
	Don't know	5	7%	0	--	3	9%	1	20%	1	14%	4	7%	1	25%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
43 (n=448) Did you install the new water heater yourself, did you hire an installer to do it separately from your home construction, or did the general contractor building your home manage the installation?	Professional install	216	48%	24	46%	164	51%	17	27%	11	92%	202	49%	14	44%
	Self-install	192	43%	27	52%	118	37%	46	72%	1	8%	175	42%	17	53%
	Don't know	40	9%	1	2%	38	12%	1	2%	0	--	39	9%	1	3%
45 (n=188) Do you, or someone in your household, have professional experience installing water heaters or other mechanical equipment (e.g., plumber, contractor, or handyman?)	Yes	96	51%	17	63%	48	42%	30	65%	1	100%	84	49%	12	71%
	No	92	49%	10	37%	66	58%	16	35%	0	--	87	51%	5	29%
46 (n=92) Why did you decide to install the heat pump water heater yourself? [Coded Open-Ended Response]	To save money	48	37%	3	30%	36	55%	9	56%	-	-	47	54%	1	20%
	Confidence in own ability	37	29%	5	50%	23	35%	9	56%	-	-	32	37%	5	100%
	Ease of installation	29	22%	3	30%	20	30%	6	38%	-	-	28	32%	1	20%
	Enjoy DIY	6	5%	1	10%	4	6%	1	6%	-	-	6	7%	0	--
	Other	10	8%	1	10%	8	12%	1	6%	-	-	10	12%	0	--

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
47 (n=195) How did you find the person or company that installed your new water heater?	Smart Water Heat website / Hot Water Solutions website / contractor finder	6	3%	0	--	4	3%	2	14%	0	--	4	2%	2	15%
	Angie's List	2	1%	0	--	2	1%	0	--	0	--	2	1%	0	--
	Craigslist	1	1%	0	--	1	1%	0	--	0	--	1	1%	0	--
	Personal recommendation	28	14%	2	9%	20	13%	5	36%	1	10%	25	14%	3	23%
	Retailer recommendation	3	2%	0	--	3	2%	0	--	0	--	3	2%	0	--
	Retailer home services (e.g. Home Depot or Lowe's Home Services department)	13	7%	0	--	13	9%	0	--	0	--	12	7%	1	8%
	Manufacturer recommendation	1	1%	0	--	1	1%	0	--	0	--	1	1%	0	--
	Previous relationship with contractor	69	35%	11	50%	50	34%	5	36%	3	30%	66	36%	3	23%
	Utility contractor list	46	24%	8	36%	35	24%	0	--	3	30%	44	24%	2	15%
	Yelp	3	2%	0	--	3	2%	0	--	0	--	3	2%	0	--
	Thumbtack	1	1%	0	--	1	1%	0	--	0	--	1	1%	0	--
	Google search/reviews	9	5%	1	5%	5	3%	1	7%	2	20%	8	4%	1	8%
	Facebook	2	1%	0	--	2	1%	0	--	0	--	2	1%	0	--
	Local housing organization	1	1%	0	--	1	1%	0	--	0	--	1	1%	0	--
	Yellow Pages	1	1%	0	--	1	1%	0	--	0	--	1	1%	0	--
I'm not sure	9	5%	0	--	7	5%	1	7%	1	10%	8	4%	1	8%	

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
48 (n=175) How many quotes or bids did you receive before selecting your installer?	0	24	14%	6	27%	16	12%	2	17%	0	--	22	13%	2	18%
	1	82	47%	13	59%	56	42%	8	67%	5	56%	75	46%	7	64%
	2	37	21%	3	14%	29	22%	2	17%	3	33%	35	21%	2	18%
	3	26	15%	0	--	25	19%	0	--	1	11%	26	16%	0	--
	4	2	1%	0	--	2	2%	0	--	0	--	2	1%	0	--
	5	1	1%	0	--	1	1%	0	--	0	--	1	1%	0	--
	6	3	2%	0	--	3	2%	0	--	0	--	3	2%	0	--
49 (n=151) How many of the installers that provided you quotes recommended a heat pump water heater to you?	0	21	14%	3	19%	17	15%	1	10%	0	--	21	15%	0	--
	1	81	54%	11	69%	57	49%	8	80%	5	56%	73	51%	8	89%
	2	31	21%	2	13%	25	22%	1	10%	3	33%	30	21%	1	11%
	3	14	9%	0	--	13	11%	0	--	1	11%	14	10%	0	--
	4	3	2%	0	--	3	3%	0	--	0	--	3	2%	0	--
	6	1	1%	0	--	1	1%	0	--	0	--	1	1%	0	--
48 & 49 combined (n=151) Recommendation rate	0%	21	14%	3	19%	17	15%	1	10%	0	--	21	15%	0	--
	33%	4	3%	0	--	4	3%	0	--	0	--	4	3%	0	--
	40%	1	1%	0	--	1	1%	0	--	0	--	1	1%	0	--
	50%	6	4%	1	6%	4	3%	1	10%	0	--	5	4%	1	11%
	67%	7	5%	0	--	7	6%	0	--	0	--	7	5%	0	--
	100%	112	74%	12	75%	83	72%	8	80%	9	100%	104	73%	8	89%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
50 (n=383) About how long did it take to install the heat pump water heater?	Half a day or less	235	61%	33	67%	148	56%	48	80%	6	55%	210	60%	25	83%
	One day	102	27%	15	31%	76	29%	8	13%	3	27%	97	28%	5	17%
	Two days	29	8%	1	2%	26	10%	2	3%	0	--	29	8%	0	--
	Three days	6	2%	0	--	6	2%	0	--	0	--	6	2%	0	--
	Four days	1	0%	0	--	0	--	0	--	1	9%	1	0%	0	--
	Five or more days	5	1%	0	--	4	2%	1	2%	0	--	5	1%	0	--
	I'm not sure	5	1%	0	--	3	1%	1	2%	1	9%	5	1%	0	--
51 (n=396) Did "your contractor/installer" or "you" run into any challenges with the heat pump water heater installation?	Yes	96	24%	9	18%	76	28%	10	16%	1	9%	94	26%	2	7%
	No	279	71%	39	78%	180	66%	50	81%	10	91%	251	69%	28	90%
	I'm not sure	21	5%	2	4%	17	6%	2	3%	0	--	20	6%	1	3%
52 (n=96) What challenges did "your contractor / installer" or "you" encounter?	Pipe configuration	45	27%	5	56%	37	49%	2	20%	1	100%	44	47%	1	50%
	No nearby drain for condensate	31	19%	2	22%	21	28%	7	70%	1	100%	30	32%	1	50%
	New wiring/electrical work required	25	15%	2	22%	21	28%	2	20%	0	--	25	27%	0	--
	Inadequate make-up air/airflow	7	4%	0	--	6	8%	1	10%	0	--	7	7%	0	--
	Heat pump water heater too large to fit where old water heater was located	25	15%	3	33%	19	25%	3	30%	0	--	25	27%	0	--

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
	Complications related to floorplan and noise (noise from heat pump water heater would be a nuisance in desired installation location)	7	4%	0	--	6	8%	0	--	1	100%	7	7%	0	--
	Complications related to floorplan and cold air (cold air generated by heat pump water heater would be a nuisance in desired installation location)	8	5%	0	--	5	7%	2	20%	1	100%	8	9%	0	--
	Contractor/installer inexperience	2	1%	0	--	2	3%	0	--	0	--	2	2%	0	--
	Complications related to plumbing	7	4%	0	--	6	8%	1	10%	0	--	7	7%	0	--
	Complications related to venting	2	1%	0	--	2	3%	0	--	0	--	2	2%	0	--
	Size and weight of unit	4	2%	0	--	3	4%	1	10%	0	--	4	4%	0	--
	Wet leak detector user error	2	1%	0	--	2	3%	0	--	0	--	2	2%	0	--
	Alarm issue	1	1%	0	--	1	1%	0	--	0	--	1	1%	0	--
	Don't know	1	1%	1	11%	0	--	0	--	0	--	1	1%	0	--

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
54 (n=92) Was the heat pump water heater the first water heater you ever installed?	Yes	45	49%	4	40%	32	49%	9	56%	-	-	45	52%	0	--
	No	47	51%	6	60%	34	51%	7	44%	-	-	42	48%	5	100%
55 (n=45) Was the heat pump water heater easier or harder to install than other types of water heaters?	Easier to install	1	2%	0	--	1	3%	0	--	-	-	1	2%	0	--
	Harder to install	12	27%	2	40%	10	30%	0	--	-	-	12	30%	0	--
	About the same level of difficulty	32	71%	3	60%	22	67%	7	100%	-	-	27	68%	5	100%
58 (n=195) Did the installer/contractor tell you which water heater settings to use?	Yes	105	54%	8	36%	82	55%	8	57%	7	70%	99	54%	6	46%
	No	73	37%	8	36%	58	39%	5	36%	2	20%	66	36%	7	54%
	I'm not sure	17	9%	6	27%	9	6%	1	7%	1	10%	17	9%	0	--
59 (n=449) Which setting do you primarily use on your heat pump water heater?	Heat pump only (most efficient)	214	48%	27	52%	144	45%	39	61%	4	33%	197	47%	17	53%
	Hybrid or mixed operation (primarily operates in heat pump mode but uses electric resistance as backup)	204	45%	20	39%	155	48%	24	38%	5	42%	191	46%	13	41%
	Electric resistance only (least efficient)	5	1%	0	--	4	1%	1	2%	0	--	4	1%	1	3%
	I'm not sure	26	6%	5	10%	18	6%	0	--	3	25%	25	6%	1	3%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
60 (n=193) Did your installer provide you with any of the following information after the installation?	How a heat pump water heater is different from other water heaters	72	37%	9	41%	56	38%	2	14%	5	50%	71	39%	1	8%
	Instructions for turning the water heater on vacation mode	89	46%	9	41%	66	45%	7	50%	7	70%	83	46%	6	46%
	Instructions to maintain the water heater, such as cleaning the filter and flushing the system	91	47%	8	36%	71	48%	6	43%	6	60%	88	49%	3	23%
	Instructions to avoid placing items near the water heater to improve air flow	72	37%	10	46%	52	35%	4	29%	6	60%	68	38%	4	31%
	Instructions for changing the settings on the coldest days of winter	27	14%	3	14%	21	14%	2	14%	1	10%	25	14%	2	15%
	Adjusting the temperature via the mix valve	1	1%	0	--	1	1%	0	--	0	--	1	1%	0	--
	None of the above	52	27%	4	18%	44	30%	4	29%	0	--	49	27%	3	23%
	Don't know	12	6%	3	14%	6	4%	0	--	3	30%	10	6%	2	15%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
61 (n=188) Where do you get information about how to operate and maintain your heat pump water heater?	The manufacturer	111	59%	19	70%	65	57%	26	57%	1	100%	103	60%	8	47%
	“Do-it-yourself” DIY forums online (e.g. Reddit)	18	10%	1	4%	14	12%	3	7%	0	--	17	10%	1	6%
	Online tutorials or videos (e.g., YouTube)	41	22%	5	19%	24	21%	12	26%	0	--	36	21%	5	29%
	Friends or family	3	2%	0	--	3	3%	0	--	0	--	3	2%	0	--
	Trade publications	2	1%	0	--	0	--	2	4%	0	--	1	1%	1	6%
	None of the above	8	4%	2	7%	4	4%	2	4%	0	--	6	4%	2	12%
	AI (e.g. ChatGPT)	2	1%	0	--	1	1%	1	2%	0	--	2	1%	0	--
	Professional experience	2	1%	0	--	2	2%	0	--	0	--	2	1%	0	--
	Internet research	1	1%	0	--	1	1%	0	--	0	--	1	1%	0	--
62 (n=449) Since “purchasing” “moving into the home with” the heat pump water heater, have you contacted a professional to service or repair the heat pump water heater?	Yes, I contacted a professional	54	12%	2	4%	44	14%	6	9%	2	17%	50	12%	4	13%
	I handled the repair or service myself	53	12%	5	10%	36	11%	12	19%	0	--	46	11%	7	22%
	No, my heat pump water heater has not needed repairs or maintenance	341	76%	45	87%	240	75%	46	72%	10	83%	320	77%	21	66%
	Don’t know	4	1%	1	2%	3	1%	0	--	0	--	4	1%	0	--

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
66 (n=80) What issues have you experienced with your heat pump water heater?	Cools down room	11	14%	0	--	5	8%	6	46%	0	--	8	11%	3	38%
	Not enough hot water	15	19%	0	--	9	15%	5	39%	1	50%	12	17%	3	38%
	Hot water slow to arrive at faucet	4	5%	0	--	3	5%	0	--	1	50%	4	6%	0	--
	Noise/humming/vibration	15	19%	1	20%	10	17%	3	23%	1	50%	13	18%	2	25%
	Water leak	3	4%	0	--	3	5%	0	--	0	--	3	4%	0	--
	High cost to operate	2	3%	0	--	1	2%	1	8%	0	--	2	3%	0	--
	Control board or other electronics malfunctioned	41	51%	2	40%	32	53%	7	54%	0	--	38	53%	3	38%
	Other	21	26%	2	40%	17	28%	1	8%	1	50%	19	26%	2	25%
	Don't know	3	4%	0	--	3	5%	0	--	0	--	3	4%	0	--
67 (n=36) How long did it take for the issue(s) to be resolved?	1 day or less	6	17%	0	--	6	21%	0	--	0	--	6	18%	0	--
	1 to 2 days	5	14%	0	--	4	14%	0	--	1	50%	5	15%	0	--
	3 to 7 days	8	22%	2	67%	5	17%	1	50%	0	--	8	24%	0	--
	1 to 2 weeks	11	31%	0	--	9	31%	1	50%	1	50%	9	27%	2	100%
	Issue not resolved	5	14%	1	33%	4	14%	0	--	0	--	5	15%	0	--
	I'm not sure	1	3%	0	--	1	3%	0	--	0	--	1	3%	0	--

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
68 (n=37) Thinking only for the service visit(s), not repairs, did you have a warranty that covered the service for the heat pump water heater?	Yes, warranty covered the cost of the entire service	16	43%	0	--	11	38%	3	60%	2	100%	13	39%	3	75%
	Yes, warranty only partially covered the cost of the service.	5	14%	0	--	5	17%	0	--	0	--	5	15%	0	--
	No	14	38%	1	100%	11	38%	2	40%	0	--	13	39%	1	25%
	I'm not sure	2	5%	0	--	2	7%	0	--	0	--	2	6%	0	--
69 (n=36) Thinking only of repair visit(s), not service or maintenance, did you have a warranty that covered the repair of the heat pump water heater?	Yes, warranty covered the cost of the entire service	22	61%	1	33%	19	66%	1	50%	1	50%	21	62%	1	50%
	Yes, warranty only partially covered the cost of the service.	4	11%	1	33%	3	10%	0	--	0	--	4	12%	0	--
	No	9	25%	1	33%	6	21%	1	50%	1	50%	8	24%	1	50%
	I'm not sure	1	3%	0	--	1	3%	0	--	0	--	1	3%	0	--
70 (n=16) Roughly, how much did the service visit(s) cost you, in total? [Coded Open-Ended Response]	Less than \$100	3	19%	-	-	3	21%	0	--	-	-	3	20%	0	--
	Between \$100 and \$200	4	25%	-	-	3	21%	1	50%	-	-	4	27%	0	--
	More than \$200	5	31%	-	-	5	36%	0	--	-	-	5	33%	0	--
	Don't know	4	25%	-	-	3	21%	1	50%	-	-	3	20%	1	100%
71 (n=14) Roughly, how much did the repairs cost you, in total? [Coded Open-Ended Response]	Between \$100 and \$200	4	29%	1	50%	1	10%	1	100%	1	100%	3	23%	1	100%
	More than \$200	7	50%	1	50%	6	60%	0	--	0	--	7	54%	0	--
	Don't know	3	21%	0	--	3	30%	0	--	0	--	3	23%	0	--

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
72 (n=55) Was it challenging to find a technician who knew how to service or repair the heat pump water heater?	Yes	12	22%	1	33%	9	20%	2	33%	-	-	11	22%	1	25%
	No	42	76%	2	67%	35	80%	3	50%	-	-	39	77%	3	75%
	I'm not sure	1	2%	0	--	0	--	1	17%	-	-	1	2%	0	--
73a (n=449) Since "purchasing" "moving into the home with" the heat pump water heater, how satisfied have you been with the following items? - The sound level of the heat pump water heater	Very dissatisfied	19	4%	1	2%	13	4%	4	6%	1	8%	17	4%	2	6%
	Somewhat dissatisfied	65	15%	5	10%	53	17%	5	8%	2	17%	63	15%	2	6%
	Neither satisfied nor dissatisfied	107	24%	10	19%	76	24%	16	25%	5	42%	98	24%	9	28%
	Somewhat satisfied	101	23%	14	27%	71	22%	13	20%	3	25%	96	23%	5	16%
	Very satisfied	153	34%	22	42%	104	32%	26	41%	1	8%	139	33%	14	44%
	I'm not sure	4	1%	0	--	4	1%	0	--	0	--	4	1%	0	--
73b (n=449) Since "purchasing" "moving into the home with" the heat pump water heater, how satisfied have you been with the following items? - Your hot water supply	Very dissatisfied	7	2%	0	--	4	1%	3	5%	0	--	5	1%	2	6%
	Somewhat dissatisfied	29	7%	0	--	25	8%	2	3%	2	17%	27	7%	2	6%
	Neither satisfied nor dissatisfied	32	7%	2	4%	24	8%	4	6%	2	17%	30	7%	2	6%
	Somewhat satisfied	79	18%	7	14%	60	19%	10	16%	2	17%	75	18%	4	13%
	Very satisfied	298	66%	42	81%	205	64%	45	70%	6	50%	276	66%	22	69%
	I'm not sure	4	1%	1	2%	3	1%	0	--	0	--	4	1%	0	--

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
73c (n=449) Since “purchasing” “moving into the home with” the heat pump water heater, how satisfied have you been with the following items? - The temperature in the room where the heat pump water heater is installed	Very dissatisfied	14	3%	1	2%	10	3%	3	5%	0	--	12	3%	2	6%
	Somewhat dissatisfied	39	9%	1	2%	31	10%	5	8%	2	17%	36	9%	3	9%
	Neither satisfied nor dissatisfied	140	31%	16	31%	106	33%	12	19%	6	50%	129	31%	11	34%
	Somewhat satisfied	77	17%	8	15%	54	17%	12	19%	3	25%	72	17%	5	16%
	Very satisfied	171	38%	25	48%	113	35%	32	50%	1	8%	160	38%	11	34%
	I’m not sure	8	2%	1	2%	7	2%	0	--	0	--	8	2%	0	--
73d (n=411) Since “purchasing” “moving into the home with” the heat pump water heater, how satisfied have you been with the following items? - The sales process for buying a heat pump water heater	Very dissatisfied	6	1%	0	--	5	2%	1	2%	0	--	5	1%	1	3%
	Somewhat dissatisfied	18	4%	0	--	17	6%	0	--	1	8%	18	5%	0	--
	Neither satisfied nor dissatisfied	86	19%	4	8%	64	23%	13	21%	5	42%	81	21%	5	16%
	Somewhat satisfied	79	18%	9	18%	60	21%	7	11%	3	25%	77	20%	2	7%
	Very satisfied	214	48%	38	75%	132	46%	41	65%	3	25%	192	51%	22	71%
	I’m not sure	8	2%	0	--	7	3%	1	2%	0	--	7	2%	1	3%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
73e (n=408) Since “purchasing” “moving into the home with” the heat pump water heater, how satisfied have you been with the following items? - The change in your electricity bill after installing the heat pump water heater	Very dissatisfied	11	3%	1	2%	8	3%	2	3%	0	--	10	3%	1	3%
	Somewhat dissatisfied	11	3%	3	6%	8	3%	0	--	0	--	11	3%	0	--
	Neither satisfied nor dissatisfied	67	16%	8	16%	49	17%	7	11%	3	25%	64	17%	3	10%
	Somewhat satisfied	101	25%	20	39%	65	23%	13	21%	3	25%	96	26%	5	16%
	Very satisfied	185	45%	17	33%	125	44%	38	61%	5	42%	165	44%	20	65%
	I’m not sure	33	8%	2	4%	28	10%	2	3%	1	8%	31	8%	2	7%
73f (n=449) Since “purchasing” “moving into the home with” the heat pump water heater, how satisfied have you been with the following items? - The maintenance requirements of the heat pump water heater	Very dissatisfied	7	2%	0	--	7	2%	0	--	0	--	7	2%	0	--
	Somewhat dissatisfied	11	2%	2	4%	8	3%	1	2%	0	--	10	2%	1	3%
	Neither satisfied nor dissatisfied	110	25%	4	8%	87	27%	10	16%	9	75%	103	25%	7	22%
	Somewhat satisfied	73	16%	10	19%	51	16%	11	17%	1	8%	70	17%	3	9%
	Very satisfied	215	48%	33	64%	140	44%	40	63%	2	17%	195	47%	20	63%
	I’m not sure	33	7%	3	6%	28	9%	2	3%	0	--	32	8%	1	3%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
73g (n=446) Since “purchasing” “moving into the home with” the heat pump water heater, how satisfied have you been with the following items? - The value of the heat pump water heater	Very dissatisfied	6	1%	0	--	5	2%	1	2%	0	--	5	1%	1	3%
	Somewhat dissatisfied	11	2%	1	2%	10	3%	0	--	0	--	11	3%	0	--
	Neither satisfied nor dissatisfied	69	15%	4	8%	55	17%	7	11%	3	25%	65	16%	4	13%
	Somewhat satisfied	88	20%	7	14%	70	22%	8	13%	3	25%	86	21%	2	6%
	Very satisfied	262	59%	38	73%	174	55%	45	71%	5	42%	239	58%	23	72%
	I’m not sure	10	2%	2	4%	5	2%	2	3%	1	8%	8	2%	2	6%
73h (n=449) Since “purchasing” “moving into the home with” the heat pump water heater, how satisfied have you been with the following items? - The heat pump water heater overall	Very dissatisfied	7	2%	0	--	5	2%	2	3%	0	--	6	1%	1	3%
	Somewhat dissatisfied	9	2%	0	--	8	3%	0	--	1	8%	9	2%	0	--
	Neither satisfied nor dissatisfied	37	8%	3	6%	31	10%	2	3%	1	8%	35	8%	2	6%
	Somewhat satisfied	90	20%	6	12%	66	21%	13	20%	5	42%	84	20%	6	19%
	Very satisfied	299	67%	42	81%	206	64%	46	72%	5	42%	276	66%	23	72%
	I’m not sure	7	2%	1	2%	5	2%	1	2%	0	--	7	2%	0	--

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
74a (n=84) Why are you dissatisfied with the sound level of the heat pump water heater? [Coded Open-Ended Response]	It is loud/noisy	80	95%	6	100%	63	96%	8	89%	3	100%	77	96%	3	75%
	Don't know	4	5%	0	--	3	5%	1	11%	0	--	3	4%	1	25%
74b (n=21) Why are you dissatisfied with the change in your electricity bill? [Coded Open-Ended Response]	Little/no reduction in bill	15	71%	4	100%	10	67%	1	50%	-	-	15	75%	0	--
	Bill increased	2	10%	0	--	2	13%	0	--	-	-	2	10%	0	--
	Don't know	4	19%	0	--	3	20%	1	50%	-	-	3	15%	1	100%
74c (n=35) Why are you dissatisfied with your hot water supply? [Coded Open-Ended Response]	Not enough hot water	18	51%	-	-	14	50%	3	60%	1	50%	16	52%	2	50%
	Takes time to heat up	10	29%	-	-	8	29%	1	20%	1	50%	8	26%	2	50%
	Water not warm enough	5	14%	-	-	3	11%	2	40%	0	--	4	13%	1	25%
	Don't know	4	11%	-	-	4	14%	0	--	0	--	4	13%	0	--

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
74d (n=18) Why are you dissatisfied with the maintenance requirements of the heat pump water heater? [Coded Open-Ended Response]	Does not work properly	1	6%	0	--	1	7%	0	--	-	-	1	6%	0	--
	Needed repair	7	39%	2	100%	5	33%	0	--	-	-	7	41%	0	--
	Needed to be replaced	1	6%	0	--	1	7%	0	--	-	-	1	6%	0	--
	Emptying overflow is a hassle	1	6%	0	--	1	7%	0	--	-	-	1	6%	0	--
	Frequently displays error codes	1	6%	0	--	1	7%	0	--	-	-	1	6%	0	--
	Difficult to find qualified contractors	1	6%	0	--	1	7%	0	--	-	-	1	6%	0	--
	Maintenance/repair costs	1	6%	0	--	1	7%	0	--	-	-	1	6%	0	--
	Buildup in the condensate line	1	6%	0	--	0	--	1	100%	-	-	0	--	1	100%
	Don't know	4	22%	0	--	4	27%	0	--	-	-	4	24%	0	--
74e (n=54) Why are you dissatisfied with the temperature of the room where the heat pump water heater is installed? [Coded Open-Ended Response]	Made space cold	45	83%	2	100%	34	81%	7	87%	2	100%	41	84%	4	80%
	Good in summer, bad in winter	4	7%	0	--	4	10%	0	--	0	--	4	8%	0	--
	Don't know	5	9%	0	--	4	10%	1	13%	0	--	4	8%	1	20%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
74f (n=17) Why are you dissatisfied with the value of the heat pump water heater? [Coded Open-Ended Response]	Too expensive	8	47%	0	--	8	53%	0	--	-	-	8	50%	0	--
	Not enough bill savings	2	12%	1	100%	1	7%	0	--	-	-	2	13%	0	--
	Did not meet expectations	2	12%	0	--	2	13%	0	--	-	-	2	13%	0	--
	Rebate not high enough	2	12%	0	--	2	13%	0	--	-	-	2	13%	0	--
	Don't know	3	18%	0	--	2	13%	1	100%	-	-	2	13%	1	100%
74g (n=25) Why are you dissatisfied with the sales process for buying a heat pump water heater? [Coded Open-Ended Response]	Sales rep did not provide sufficient/correct information	2	8%	-	-	2	9%	0	--	0	--	2	8%	0	--
	Contractor not knowledgeable	7	28%	-	-	6	26%	0	--	1	100%	7	29%	0	--
	Difficult to get the rebate	1	4%	-	-	1	4%	0	--	0	--	1	4%	0	--
	Bought a broken unit	1	4%	-	-	1	4%	0	--	0	--	1	4%	0	--
	Complications with delivery	2	8%	-	-	2	9%	0	--	0	--	2	8%	0	--
	Complications with exchange	1	4%	-	-	1	4%	0	--	0	--	1	4%	0	--
	It was too expensive	4	16%	-	-	4	17%	0	--	0	--	4	17%	0	--
	Rebate not available at all Home Depot locations	2	8%	-	-	2	9%	0	--	0	--	2	8%	0	--
	Don't know	5	20%	-	-	4	17%	1	100%	0	--	4	17%	1	100%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
74h (n=16) Why are you dissatisfied with the heat pump water heater overall? [Coded Open-Ended Response]	Not enough hot water	3	19%	-	-	3	23%	0	--	0	--	3	20%	0	--
	Does not work properly	4	25%	-	-	4	31%	0	--	0	--	4	27%	0	--
	Unhappy with it overall	4	25%	-	-	3	23%	0	--	1	100%	4	27%	0	--
	Don't know	5	31%	-	-	3	23%	2	100%	0	--	4	27%	1	100%
75 (n=451) What fuel do you primarily use to heat your home?	Electricity	77	77%	46	87%	254	79%	39	61%	6	50%	322	77%	23	72%
	Natural gas or propane	19	19%	4	8%	53	17%	22	34%	5	42%	77	18%	7	22%
	Fuel oil	1	1%	0	--	4	1%	1	2%	0	--	4	1%	1	3%
	Wood	9	2%	2	4%	5	2%	2	3%	0	--	9	2%	0	--
	I'm not sure	8	2%	1	2%	6	2%	0	--	1	8%	7	2%	1	3%
76 (n=444) Since installing the heat pump water heater, have you noticed any changes in how much it costs to heat your home?	Yes	88	20%	7	14%	64	20%	15	23%	2	17%	80	19%	8	25%
	No	265	60%	35	67%	181	57%	41	64%	8	67%	245	60%	20	63%
	I'm not sure	91	21%	10	19%	71	23%	8	13%	2	17%	87	21%	4	13%
77 (n=88) Since installing the heat pump water heater, how have your heating bills changed?	Increased a lot	1	1%	0	--	1	2%	0	--	0	--	1	1%	0	--
	Increased a little	5	6%	0	--	3	5%	2	13%	0	--	5	6%	0	--
	Stayed about the same	2	2%	0	--	1	2%	1	7%	0	--	2	3%	0	--
	Decreased a little	50	57%	6	86%	35	55%	7	47%	2	100%	47	59%	3	37%
	Decreased a lot	29	33%	1	14%	23	36%	5	33%	0	--	24	30%	5	63%
	I'm not sure	1	1%	0	--	1	2%	0	--	0	--	1	1%	0	--

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
78 (n=451) Overall, has the heat pump water heater met your expectations?	Yes	404	90%	46	87%	286	89%	61	95%	11	92%	373	89%	31	97%
	No	25	6%	4	8%	17	5%	3	5%	1	8%	24	6%	1	3%
	I'm not sure	22	5%	3	6%	19	6%	0	--	0	--	22	5%	0	--
79 (n=25) Where did the heat pump water heater fall short of your expectations? [Coded Open-Ended Response]	Not enough bill savings	2	8%	2	50%	0	--	0	--	0	--	2	8%	0	--
	Not enough hot water	7	28%	0	--	4	24%	2	67%	1	100%	7	29%	0	--
	Does not work properly	2	8%	0	--	2	12%	0	--	0	--	2	8%	0	--
	Too loud/noisy	6	24%	1	25%	5	29%	0	--	0	--	6	25%	0	--
	Made space cold	1	4%	0	--	1	6%	0	--	0	--	1	4%	0	--
	Takes too long to get hot water	4	16%	0	--	3	18%	0	--	1	100%	4	17%	0	--
	Not cost-effective	4	16%	0	--	4	24%	0	--	0	--	4	17%	0	--
	It broke	4	16%	1	25%	3	18%	0	--	0	--	4	17%	0	--
	Too expensive	1	4%	0	--	1	6%	0	--	0	--	1	4%	0	--
	Runs constantly	1	4%	0	--	1	6%	0	--	0	--	1	4%	0	--
	Doubts about winter performance	1	4%	0	--	0	--	1	33%	0	--	0	--	1	100%
	Warranty not honored	1	4%	0	--	1	6%	0	--	0	--	1	4%	0	--
	Water too hot/cold	1	4%	0	--	1	6%	0	--	0	--	1	4%	0	--
Couldn't install it	2	8%	1	25%	1	6%	0	--	0	--	2	8%	0	--	

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
81 (n=372) What brand is your heat pump water heater?	Rheem	248	67%	85	81%	161	61%	1	50%	1	100%	215	67%	33	62%
	General Electric	52	14%	13	12%	38	14%	1	50%	0	0%	44	14%	8	15%
	AO Smith	44	12%	2	2%	42	16%	0	0%	0	0%	37	12%	7	13%
	Ruud	12	3%	0	0%	12	5%	0	0%	0	0%	10	3%	2	4%
	Reliance	5	1%	3	3%	2	1%	0	0%	0	0%	5	2%	0	0%
	Bradford White	4	1%	1	1%	3	1%	0	0%	0	0%	3	1%	1	2%
	Stiebel Eltron	2	1%	0	0%	2	1%	0	0%	0	0%	1	0%	1	2%
	AirTap	1	0%	1	1%	0	0%	0	0%	0	0%	1	0%	0	0%
	Electrolux	1	0%	0	0%	1	0%	0	0%	0	0%	1	0%	0	0%
	Kenmore	1	0%	0	0%	1	0%	0	0%	0	0%	1	0%	0	0%
	Sanden	1	0%	0	0%	1	0%	0	0%	0	0%	1	0%	0	0%
	State	1	0%	0	0%	1	0%	0	0%	0	0%	0	0%	1	2%
80 (n=451) How likely are you to recommend heat pump water heaters to a friend or colleague? (Please use a score of 0 to 10 where 0 is “not at all likely” and 10 is “extremely likely”)	0	4	1%	1	2%	3	1%	0	--	0	--	4	1%	0	--
	1	6	1%	1	2%	3	1%	1	2%	1	8%	6	1%	0	--
	2	2	0%	0	--	2	1%	0	--	0	--	2	1%	0	--
	3	3	1%	0	--	3	1%	0	--	0	--	3	1%	0	--
	4	3	1%	1	2%	2	1%	0	--	0	--	3	1%	0	--
	5	27	6%	2	4%	24	8%	1	2%	0	--	27	7%	0	--
	6	19	4%	2	4%	13	4%	4	6%	0	--	17	4%	2	6%
	7	39	9%	3	6%	26	8%	6	9%	4	33%	35	8%	4	13%
	8	75	17%	8	15%	56	17%	9	14%	2	17%	75	18%	0	--
	9	83	18%	6	11%	66	21%	9	14%	2	17%	78	19%	5	16%
	10	189	42%	29	55%	123	38%	34	53%	3	25%	168	40%	21	66%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
81 (n=451) Which of the following statements best describes you?	I am the first among my friends to purchase new technology	99	22%	12	23%	75	23%	9	14%	3	25%	94	22%	5	16%
	I purchase new technology sooner than most of my friends	158	35%	16	30%	112	35%	27	42%	3	25%	148	35%	10	31%
	I am typically in the middle of the group when purchasing new technology	139	31%	17	32%	100	31%	20	31%	2	17%	127	30%	12	38%
	I purchase new technology after most of my friends have purchased it	10	2%	0	--	7	2%	2	3%	1	8%	8	2%	2	6%
	I am one of the last people to purchase new technology	8	2%	3	6%	4	1%	1	2%	0	--	8	2%	0	--
	I'm not sure	35	8%	4	8%	24	8%	5	8%	2	17%	33	8%	2	6%
	I'd rather not say	2	0%	1	2%	0	--	0	--	1	8%	1	0%	1	3%
82a (n=451) Which of the following statements best describes you? - I do research before making big purchases.	Strongly disagree	6	1%	0	--	5	2%	1	2%	0	--	6	1%	0	--
	Neither agree nor disagree	13	3%	1	2%	11	3%	1	2%	0	--	13	3%	0	--
	Somewhat agree	68	15%	11	21%	43	13%	12	19%	2	17%	63	15%	5	16%
	Strongly agree	359	80%	40	76%	260	81%	50	78%	9	75%	333	80%	26	81%
	I'd rather not say	5	1%	1	2%	3	1%	0	--	1	8%	4	1%	1	3%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
82b (n=451) Which of the following statements best describes you? - I compare prices online for big purchases.	Strongly disagree	5	1%	0	--	4	1%	1	2%	0	--	5	1%	0	--
	Somewhat disagree	2	0%	0	--	2	1%	0	--	0	--	2	1%	0	--
	Neither agree nor disagree	13	3%	0	--	9	3%	4	6%	0	--	12	3%	1	3%
	Somewhat agree	91	20%	9	17%	66	21%	13	20%	3	25%	85	20%	6	19%
	Strongly agree	335	74%	43	81%	238	74%	46	72%	8	67%	311	74%	24	75%
	I'd rather not say	5	1%	1	2%	3	1%	0	--	1	8%	4	1%	1	3%
82c (n=451) Which of the following statements best describes you? - I seek out expert recommendations for big purchases.	Strongly disagree	6	1%	0	--	5	2%	1	2%	0	--	5	1%	1	3%
	Somewhat disagree	29	6%	3	6%	21	7%	5	8%	0	--	27	6%	2	6%
	Neither agree nor disagree	70	16%	8	15%	49	15%	12	19%	1	8%	66	16%	4	13%
	Somewhat agree	164	36%	18	34%	118	37%	25	39%	3	25%	156	37%	8	25%
	Strongly agree	177	39%	23	43%	126	39%	21	33%	7	58%	161	38%	16	50%
	I'd rather not say	5	1%	1	2%	3	1%	0	--	1	8%	4	1%	1	3%
82d (n=451) Which of the following statements best describes you? - I will spend money upfront to save money in the long term.	Strongly disagree	5	1%	0	--	5	2%	0	--	0	--	5	1%	0	--
	Somewhat disagree	3	1%	0	--	1	0%	1	2%	1	8%	3	1%	0	--
	Neither agree nor disagree	22	5%	1	2%	18	6%	3	5%	0	--	21	5%	1	3%
	Somewhat agree	160	36%	18	34%	117	36%	21	33%	4	33%	155	37%	5	16%
	Strongly agree	256	57%	33	62%	178	55%	39	61%	6	50%	231	55%	25	78%
	I'd rather not say	5	1%	1	2%	3	1%	0	--	1	8%	4	1%	1	3%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
82e (n=451) Which of the following statements best describes you? - I am concerned about environmental issues.	Strongly disagree	12	3%	2	4%	7	2%	3	5%	0	--	9	2%	3	9%
	Somewhat disagree	10	2%	0	--	6	2%	4	6%	0	--	10	2%	0	--
	Neither agree nor disagree	48	11%	8	15%	25	8%	15	23%	0	--	40	10%	8	25%
	Somewhat agree	110	24%	13	25%	82	26%	13	20%	2	17%	106	25%	4	13%
	Strongly agree	266	59%	29	55%	199	62%	29	45%	9	75%	250	60%	16	50%
	I'd rather not say	5	1%	1	2%	3	1%	0	--	1	8%	4	1%	1	3%
82f (n=451) Which of the following statements best describes you? - I consider sustainability when making decisions about which products to purchase.	Strongly disagree	8	2%	1	2%	5	2%	2	3%	0	--	6	1%	2	6%
	Somewhat disagree	16	4%	0	--	13	4%	3	5%	0	--	15	4%	1	3%
	Neither agree nor disagree	49	11%	8	15%	31	10%	10	16%	0	--	46	11%	3	9%
	Somewhat agree	145	32%	11	21%	109	34%	21	33%	4	33%	137	33%	8	25%
	Strongly agree	228	51%	32	60%	161	50%	28	44%	7	58%	211	50%	17	53%
	I'd rather not say	5	1%	1	2%	3	1%	0	--	1	8%	4	1%	1	3%
82g (n=451) Which of the following statements best describes you? - Actions taken by individuals like me have an impact on the environment.	Strongly disagree	15	3%	1	2%	11	3%	3	5%	0	--	14	3%	1	3%
	Somewhat disagree	15	3%	1	2%	11	3%	3	5%	0	--	13	3%	2	6%
	Neither agree nor disagree	62	14%	8	15%	40	12%	13	20%	1	8%	58	14%	4	13%
	Somewhat agree	159	35%	16	30%	119	37%	20	31%	4	33%	150	36%	9	28%
	Strongly agree	195	43%	26	49%	138	43%	25	39%	6	50%	180	43%	15	47%
	I'd rather not say	5	1%	1	2%	3	1%	0	--	1	8%	4	1%	1	3%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
82h (n=451) Which of the following statements best describes you? - Energy efficiency is my primary consideration when choosing mechanical systems for my home, like a furnace, air conditioner, or water heater.	Strongly disagree	4	1%	0	--	4	1%	0	--	0	--	4	1%	0	--
	Somewhat disagree	13	3%	0	--	11	3%	1	2%	1	8%	13	3%	0	--
	Neither agree nor disagree	35	8%	2	4%	29	9%	3	5%	1	8%	34	8%	1	3%
	Somewhat agree	178	40%	24	45%	125	39%	24	38%	5	42%	169	40%	9	28%
	Strongly agree	216	48%	26	49%	150	47%	36	56%	4	33%	195	47%	21	66%
	I'd rather not say	5	1%	1	2%	3	1%	0	--	1	8%	4	1%	1	3%
83 (n=451) Approximately what year was your home built?	2010 to present	49	11%	8	15%	34	11%	6	9%	1	8%	46	11%	3	9%
	2000 - 2009	55	12%	7	13%	43	13%	3	5%	2	17%	51	12%	4	13%
	1990 - 1999	45	10%	3	6%	29	9%	13	20%	0	--	41	10%	4	13%
	1980 - 1989	50	11%	8	15%	33	10%	9	14%	0	--	44	11%	6	19%
	1970 - 1979	66	15%	11	21%	44	14%	11	17%	0	--	62	15%	4	13%
	1960 - 1969	27	6%	6	11%	18	6%	3	5%	0	--	27	6%	0	--
	Prior to 1960	110	24%	8	15%	82	26%	15	23%	5	42%	101	24%	9	28%
	Don't know	38	8%	1	2%	31	10%	3	5%	3	25%	37	9%	1	3%
	I'd rather not say	11	2%	1	2%	8	3%	1	2%	1	8%	10	2%	1	3%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
84 (n=451) What type of home “do you live in?”/“is the heat pump water heater installed in?”	A free-standing, single-family home	413	92%	44	83%	298	93%	61	95%	10	83%	383	91%	30	94%
	A townhouse or rowhouse.	12	3%	8	6%	0	--	1	--	12	8%	12	3%	0	--
	Apartment or condominium in a building with 2 to 4 units.	6	1%	1	2%	5	2%	0	--	0	--	6	1%	0	--
	Manufactured or mobile home	13	3%	4	8%	6	2%	3	5%	0	--	12	3%	1	3%
	I’m not sure	1	0%	0	--	1	0%	0	--	0	--	1	0%	0	--
	I’d rather not say	6	1%	1	2%	4	1%	0	--	1	8%	5	1%	1	3%
85 (n=451) Do you own or rent your home?	Own	437	97%	49	93%	314	98%	63	98%	11	92%	406	97%	31	97%
	Rent	1	0%	0	--	1	0%	0	--	0	--	1	0%	0	--
	I’d rather not say	13	3%	4	8%	7	2%	1	2%	1	8%	12	3%	1	3%
86 (n=410) How many people live in your household, including yourself?	1	51	12%	11	24%	28	10%	9	16%	3	27%	45	12%	6	19%
	2	180	44%	19	41%	135	46%	21	36%	5	46%	169	45%	11	36%
	3	60	14%	5	11%	46	16%	7	12%	2	18%	55	15%	5	16%
	4	71	17%	7	15%	54	18%	9	16%	1	9%	68	18%	3	10%
	5	32	8%	4	9%	24	8%	4	7%	0	--	29	8%	3	10%
	6	11	3%	0	--	5	2%	6	10%	0	--	9	2%	2	7%
	7	3	1%	0	--	2	1%	1	2%	0	--	3	1%	0	--
	10	1	0%	0	--	1	0%	0	--	0	--	1	0%	0	--
	11	1	0%	0	--	0	--	1	2%	0	--	0	--	1	3%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
87 (n=451) Which of the following categories describes the highest level of education you have completed?	Some high school	2	0%	0	--	2	1%	0	--	0	--	2	1%	0	--
	High school graduate or GED	16	4%	3	6%	10	3%	2	3%	1	8%	16	4%	0	--
	Trade or technical school	19	4%	3	6%	11	3%	5	8%	0	--	14	3%	5	16%
	Some college	55	12%	7	13%	39	12%	9	14%	0	--	50	12%	5	16%
	College graduate	154	34%	20	38%	114	35%	14	22%	6	50%	148	35%	6	19%
	Some graduate school	19	4%	0	--	17	5%	1	2%	1	8%	19	5%	0	--
	Graduate degree	159	35%	17	32%	109	34%	30	47%	3	25%	145	35%	14	44%
	I'm not sure	1	0%	0	--	1	0%	0	--	0	--	1	0%	0	--
	I'd rather not say	26	6%	3	6%	19	6%	3	5%	1	8%	24	6%	2	6%
88 (n=451) Do you consider yourself Hispanic or Latino?	Yes	8	2%	0	--	6	2%	2	3%	0	--	7	2%	1	3%
	No	397	88%	48	91%	282	88%	57	89%	10	83%	368	88%	29	91%
	I'd rather not say	46	10%	5	9%	34	11%	5	8%	2	17%	44	11%	2	6%
89 (n=451) How would you describe yourself? Please select all that apply.	White	352	77%	47	89%	242	75%	53	83%	10	83%	323	77%	29	91%
	Black or African American	2	0%	0	--	2	1%	0	--	0	--	2	1%	0	--
	American Indian or Native American	7	2%	1	2%	4	1%	2	3%	0	--	7	2%	0	--
	Asian	33	7%	0	--	32	10%	1	2%	0	--	33	8%	0	--
	I'd rather not say	66	14%	6	11%	47	15%	11	17%	2	17%	63	15%	3	9%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
90 (n=451) Which of the following categories best describes your approximate annual household income from all sources in 2020, before taxes?	Less than \$40,000	22	5%	4	8%	18	6%	0	--	0	--	22	5%	0	--
	Between \$40,001 and \$60,000	23	5%	3	6%	12	4%	7	11%	1	8%	20	5%	3	9%
	Between \$60,001 and \$80,000	27	6%	5	9%	18	6%	4	6%	0	--	26	6%	1	3%
	Between \$80,001 and \$120,000	103	23%	16	30%	62	19%	20	31%	5	42%	91	22%	12	38%
	Between \$120,001 and \$250,000	130	29%	9	17%	98	30%	21	33%	2	17%	122	29%	8	25%
	Over \$250,000	48	11%	3	6%	40	12%	4	6%	1	8%	47	11%	1	3%
	I'd rather not say	98	22%	13	25%	74	23%	8	13%	3	25%	91	22%	7	22%

CONSUMER SURVEY

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
4. (n=810) Do you own or rent your home?	Own	598	65%	154	64%	285	63%	95	71%	64	71%	421	63%	177	73%
	Rent	212	35%	68	36%	103	37%	26	29%	79	29%	149	27%	63	35%
6. (n=810) Which of the following categories includes your age?	18 to 24	17	2%	4	2%	9	3%	3	1%	1	1%	13	2%	4	2%
	25 to 34	87	11%	21	9%	45	12%	14	12%	7	10%	61	11%	26	11%
	35 to 44	264	27%	57	26%	154	29%	36	31%	17	19%	213	29%	51	27%
	45 to 54	120	15%	26	13%	60	16%	25	17%	9	11%	87	15%	33	15%
	55 to 64	108	16%	38	18%	49	16%	13	14%	8	12%	76	16%	32	16%
	65 and older	214	29%	76	32%	71	24%	30	25%	37	47%	120	26%	94	29%
7. (n=810) What type of home do you live in?	Single-family home	568	63%	149	59%	270	64%	88	76%	61	59%	387	62%	181	69%
	Townhouse/rowhouse	49	6%	16	8%	23	5%	7	4%	3	5%	42	7%	7	3%
	Mobile home	52	7%	17	9%	15	4%	11	4%	9	22%	25	4%	27	17%
	Apartment/condo (2-4 units)	38	6%	10	5%	24	8%	4	3%	-	-	28	6%	10	4%
	Apartment/condo (5+ units)	103	18%	30	18%	56	20%	11	12%	6	14%	88	21%	15	7%
8. (n=810) How many years have you lived in your current home?	Less than 5 years	187	27%	58	29%	78	24%	33	31%	18	27%	133	27%	54	24%
	5 to 9 years	217	26%	59	27%	105	27%	30	24%	23	26%	141	25%	76	29%
	10 to 19 years	202	22%	52	21%	102	23%	31	21%	17	22%	146	22%	56	22%
	20 Years or more	193	24%	51	22%	98	26%	23	22%	21	28%	144	24%	49	22%
	Don't know	11	1%	2	1%	5	0%	4	2%	-	-	6	0%	5	2%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
9. (n=141) Does your unit have its own water heater?	Yes	105	71%	29	70%	62	74%	12	79%	2	30%	86	71%	19	68%
	No, my unit shares a water heater with one or more units	28	22%	8	23%	13	18%	3	21%	4	70%	23	22%	5	26%
	I'm not sure	8	7%	3	7%	5	8%	-	-	-	-	7	7%	1	5%
10. (n=774) What type of water heater do you have?	Storage or tank water heater	588	79%	177	83%	272	78%	77	72%	62	79%	399	79%	189	81%
	On-demand / tankless	82	9%	14	7%	48	10%	17	10%	3	5%	67	10%	15	6%
	Indirect storage tank attached to boiler	86	10%	17	8%	44	10%	16	11%	9	13%	65	10%	21	9%
	None	3	0%	-	-	1	0%	2	1%	-	-	1	0%	2	0%
	I'm not sure	15	2%	3	2%	5	2%	6	5%	1	3%	8	2%	7	3%
11. (n=774) What fuel does your water heater use?	Electricity	509	66%	148	70%	262	70%	69	56%	30	41%	351	65%	158	69%
	Natural gas or propane	208	27%	49	23%	80	22%	39	39%	40	53%	146	27%	62	27%
	Fuel Oil	8	1%	4	2%	3	1%	1	-	-	-	7	1%	1	1%
	None	2	0%	-	-	1	-	1	-	-	-	1	0%	1	-
	Don't know	47	6%	10	5%	24	7%	8	6%	5	6%	35	7%	12	4%
16. (n=742) Approximately how old is your water heater?	Less than 1 year old	50	7%	9	5%	25	7%	9	11%	7	9%	34	7%	16	7%
	1 to 5 years old	300	39%	76	38%	151	40%	48	38%	25	34%	222	43%	78	34%
	6 to 10 years old	216	29%	57	29%	111	30%	26	21%	22	28%	151	29%	65	29%
	More than 10 years old	134	18%	41	21%	53	15%	23	23%	17	25%	77	15%	57	25%
	I'm not sure	42	7%	12	7%	22	8%	6	8%	2	5%	30	6%	12	5%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
17. (n=774) Where is your water heater located?	Unfinished basement or crawl space	91	10%	20	9%	33	9%	11	13%	15	22%	54	10%	37	16%
	Finished basement	124	15%	23	10%	68	18%	13	15%	10	15%	97	18%	27	12%
	Garage	169	22%	54	24%	80	21%	21	24%	9	13%	129	24%	40	17%
	Closet or utility room (not in a basement)	305	43%	109	48%	152	41%	35	40%	31	46%	198	37%	107	46%
	Kitchen	53	6%	9	4%	28	8%	4	5%	2	3%	44	8%	9	4%
	Mechanical room in my building (not in my unit)	2	0%	-	-	2	1%	-	-	-	-	2	0%	-	-
	Outside	12	2%	5	2%	5	1%	1	1%	1	2%	6	1%	6	3%
	Bathroom	8	1%	3	1%	2	1%	1	1%	-	-	5	1%	3	1%
	I'm not sure	10	1%	4	2%	5	1%	1	1%	-	-	5	1%	5	2%
18. (n=810) Before today, had you heard the term "heat pump" related to any appliances?	Yes	582	70%	174	78%	284	73%	85	70%	39	49%	454	70%	111	67%
	No	171	23%	32	14%	80	21%	28	23%	31	39%	144	22%	43	26%
	I'm not sure	57	8%	16	7%	24	6%	8	7%	9	11%	50	8%	12	7%
19. (n=810) Before today, had you heard the terms "heat pump water heater" or "electric hybrid water heater"?"	Yes	371	41%	83	36%	198	44%	57	36%	33	45%	280	41%	91	38%
	No	361	49%	114	52%	151	45%	56	56%	40	49%	238	48%	123	51%
	I'm not sure	78	11%	25	12%	39	12%	8	8%	6	6%	52	11%	26	11%
20. (n=810) Based on this description, have you heard of "heat pump water heaters" or "electric hybrid water heaters"?	Yes	408	101	44%	213	46%	62	42%	32	41%	314	46%	94	39%	101
	No	359	110	50%	155	48%	52	53%	42	51%	229	48%	130	54%	110
	I'm not sure	43	11	6%	20	7%	7	5%	5	8%	27	6%	16	7%	11

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
21. (n=408) Where or how have you heard about heat pump water heaters?	I currently own or use one	134	30%	26	22%	76	34%	24	36%	8	22%	108	31%	26	26%
	I previously owned or use one	36	10%	10	12%	14	7%	6	12%	6	23%	31	11%	5	5%
	From a friend or acquaintance	103	25%	25	25%	57	26%	11	16%	10	30%	82	26%	21	21%
	Utility print advertising or bill insert	21	5%	4	5%	13	5%	3	6%	1	4%	20	6%	1	1%
	Utility website	72	16%	19	19%	41	16%	8	10%	4	14%	59	16%	13	15%
	Hot Water Solutions website	50	11%	12	11%	32	13%	5	7%	1	4%	46	12%	4	4%
	Retail store display	63	13%	14	15%	35	13%	10	15%	4	11%	52	13%	11	13%
	Retail store salesperson	38	9%	10	9%	23	10%	2	5%	3	5%	33	10%	5	5%
	Professional experience	34	7%	6	6%	13	5%	11	17%	4	14%	24	7%	10	10%
	Online news story	47	9%	4	5%	29	11%	12	15%	2	6%	45	11%	2	3%
	Television ad	72	17%	17	16%	40	18%	11	13%	4	18%	64	19%	8	9%
	Social media, such as Facebook, Instagram, or YouTube	103	22%	22	21%	61	25%	16	22%	4	11%	93	25%	10	11%
	Contractor or installer	65	14%	17	17%	31	12%	13	19%	4	12%	45	13%	20	20%
	While researching on the Internet	78	18%	19	18%	41	25%	13	17%	5	10%	61	17%	17	18%
	Internet advertising	93	21%	17	18%	59	25%	13	17%	4	10%	86	24%	7	7%
	Utility newsletter	21	5%	7	6%	11	5%	2	2%	1	3%	18	5%	3	3%
	Home improvement show	4	1%	3	3%	-	-	-	-	1	4%	2	1%	2	4%
	This survey	4	1%	1	1%	1	1%	1	1%	1	2%	2	1%	2	2%
I'm not sure	11	3%	5	4%	4	3%	1	1%	1	4%	6	3%	5	5%	

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
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22a. (n=408) Please rate your satisfaction with the following aspects of your heat pump water heater. - The sound level of the heat pump water heater.	Very dissatisfied	3	2%	-	-	2	2%	-	-	-	-	1	1%	1	6%
	Somewhat dissatisfied	4	4%	-	-	2	2%	-	-	-	-	2	1%	-	-
	Neither satisfied nor dissatisfied	17	14%	1	4%	7	12%	-	-	-	-	7	8%	1	6%
	Somewhat satisfied	37	30%	8	32%	17	20%	11	57%	4	43%	31	28%	9	28%
	Very satisfied	72	51%	17	64%	48	66%	13	43%	4	57%	67	62%	15	61%
22b. (n=128) Please rate your satisfaction with the following aspects of your heat pump water heater. - The change in your electricity bill since installing the heat pump water heater.	Very dissatisfied	2	1%	-	-	2	2%	-	-	-	-	1	1%	1	6%
	Somewhat dissatisfied	6	5%	2	9%	4	7%	-	-	-	-	5	6%	1	6%
	Neither satisfied nor dissatisfied	18	17%	5	22%	8	15%	3	23%	2	14%	13	17%	5	19%
	Somewhat satisfied	59	42%	8	30%	33	42%	14	46%	4	57%	49	41%	10	38%
	Very satisfied	43	35%	10	39%	25	34%	6	31%	2	29%	36	35%	7	31%
22c. (n=134) Please rate your satisfaction with the following aspects of your heat pump water heater. - Your hot water supply.	Very dissatisfied	4	2%	-	-	3	3%	-	-	1	-	2	1%	2	6%
	Somewhat dissatisfied	2	1%	-	-	2	2%	-	-	-	-	2	1%	-	-
	Neither satisfied nor dissatisfied	5	6%	2	4%	2	5%	-	-	1	17%	4	6%	1	6%
	Somewhat satisfied	53	38%	10	44%	27	32%	14	64%	2	33%	41	38%	12	41%
	Very satisfied	70	53%	14	52%	42	58%	10	36%	4	50%	59	54%	11	47%
22d. (n=132) Please rate your satisfaction with the following aspects of your heat pump water heater. - The maintenance requirements of the heat pump water heater.	Very dissatisfied	3	2%	-	-	2	2%	-	-	1	-	2	1%	1	-
	Somewhat dissatisfied	1	1%	-	-	1	2%	-	-	-	-	1	1%	-	-
	Neither satisfied nor dissatisfied	11	10%	1	4%	6	12%	4	29%	-	-	8	10%	3	7%
	Somewhat satisfied	51	35%	9	33%	29	33%	9	29%	4	83%	44	35%	7	40%
	Very satisfied	66	52%	16	63%	36	52%	11	43%	3	17%	52	52%	14	53%

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22e. (n=134) Please rate your satisfaction with the following aspects of your heat pump water heater. - The heat pump water heater overall.	Very dissatisfied	2	1%	-	-	2	2%	-	-	-	-	1	1%	1	6%
	Somewhat dissatisfied	2	1%	-	-	2	2%	-	-	-	-	2	1%	-	-
	Neither satisfied nor dissatisfied	8	7%	1	4%	7	12%	-	-	-	-	7	8%	1	6%
	Somewhat satisfied	40	28%	8	32%	17	20%	11	57%	4	43%	31	28%	9	28%
	Very satisfied	82	62%	17	64%	48	66%	13	43%	4	57%	67	62%	15	61%
23. (n=134) Have you, or would you, recommend a heat pump water heater to a friend, colleague, or family member?	Yes, I have	77	51%	13	50%	44	51%	15	50%	5	67%	67	54%	10	35%
	Yes, I would	51	44%	11	42%	29	44%	9	50%	2	33%	38	42%	13	53%
	No	2	2%	-	-	2	3%	-	-	-	-	2	2%	-	-
	I'm not sure	4	3%	2	8%	1	2%	-	-	1	-	1	1%	3	12%
24a. (n=408) Please assess how much you agree or disagree with the following statements. - Heat pump water heaters are very efficient.	Strongly disagree	3	1%	-	1%	2	2%	-	-	1	-	3	1%	-	-
	Somewhat disagree	18	5%	4	8%	14	6%	-	3%	-	-	16	6%	2	2%
	Neither agree nor disagree	56	15%	17	19%	21	13%	13	24%	5	31%	31	13%	25	26%
	Somewhat agree	180	44%	48	44%	86	47%	28	45%	18	47%	132	42%	48	52%
	Strongly agree	151	35%	32	29%	90	32%	21	27%	8	22%	132	39%	19	20%
24b. (n=408) Please assess how much you agree or disagree with the following statements. - Heat pump water heaters result in lower electric bills than a typical water heater.	Strongly disagree	5	1%	1	1%	4	2%	-	-	-	-	5	2%	-	2%
	Somewhat disagree	22	7%	8	9%	12	7%	2	5%	-	-	17	7%	5	7%
	Neither agree nor disagree	72	17%	19	15%	28	11%	15	36%	10	33%	44	14%	28	17%
	Somewhat agree	187	47%	44	46%	100	50%	28	39%	15	47%	145	48%	42	48%
	Strongly agree	122	28%	29	30%	69	29%	17	21%	7	20%	103	30%	19	28%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
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24c. (n=408) Please assess how much you agree or disagree with the following statements. - Heat pump water heaters are eligible for tax credits and/or discounts from utility companies.	Strongly disagree	8	1%	1	1%	4	2%	2	3%	1	-	3	1%	5	3%
	Somewhat disagree	16	4%	5	4%	10	4%	1	8%	-	-	13	4%	3	3%
	Neither agree nor disagree	125	34%	35	36%	55	30%	24	46%	11	35%	87	33%	38	39%
	Somewhat agree	155	35%	38	36%	84	36%	21	26%	12	41%	122	35%	33	39%
	Strongly agree	104	25%	22	23%	60	28%	14	18%	8	24%	89	27%	15	15%
24d. (n=408) Please assess how much you agree or disagree with the following statements. - Heat pump water heaters offer better value than typical electric water heaters.	Strongly disagree	4	1%	-	-	3	2%	1	3%	-	1%	3	1%	1	1%
	Somewhat disagree	18	5%	6	7%	9	5%	2	3%	1	5%	11	4%	7	5%
	Neither agree nor disagree	89	24%	28	26%	32	19%	18	40%	11	25%	56	22%	33	25%
	Somewhat agree	173	42%	39	38%	102	47%	22	33%	10	42%	141	43%	32	42%
	Strongly agree	124	28%	28	29%	67	28%	19	23%	10	28%	103	29%	21	28%
24e. (n=408) Please assess how much you agree or disagree with the following statements. - Heat pump water heaters can be controlled from a smart phone.	Strongly disagree	5	1%	2	2%	-	-	1	-	2	7%	2	1%	3	3%
	Somewhat disagree	23	7%	7	8%	12	7%	3	5%	1	-	18	8%	5	5%
	Neither agree nor disagree	138	38%	49	50%	53	31%	23	50%	13	35%	95	37%	43	44%
	Somewhat agree	157	35%	23	22%	101	43%	21	26%	12	45%	125	34%	32	38%
	Strongly agree	85	19%	20	19%	47	20%	14	18%	4	14%	74	21%	11	11%
24f. (n=408) Please assess how much you agree or disagree with the following statements. - Heat pump water heaters are noisy.	Strongly disagree	85	17%	17	18%	31	17%	10	13%	9	20%	47	18%	20	17%
	Somewhat disagree	96	26%	26	24%	47	25%	14	24%	11	40%	77	26%	21	37%
	Neither agree nor disagree	105	32%	41	43%	52	26%	18	37%	9	27%	82	31%	38	40%
	Somewhat agree	67	16%	10	9%	52	21%	13	18%	1	7%	67	17%	9	11%
	Strongly agree	55	9%	7	6%	31	11%	7	8%	2	7%	41	10%	6	6%

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24h. (n=408) Please assess how much you agree or disagree with the following statements. - Heat pump water heaters are unreliable.	Strongly disagree	67	23%	22	22%	45	24%	7	10%	11	30%	64	23%	21	20%
	Somewhat disagree	98	25%	30	32%	45	22%	13	23%	8	27%	76	26%	20	23%
	Neither agree nor disagree	120	28%	29	27%	47	25%	19	41%	10	33%	67	24%	38	43%
	Somewhat agree	76	14%	11	10%	38	15%	15	18%	3	10%	61	16%	6	6%
	Strongly agree	47	11%	9	8%	38	14%	8	8%	-	-	46	11%	9	8%
24i. (n=408) Please assess how much you agree or disagree with the following statements. - Heat pump water heaters are expensive to install.	Strongly disagree	18	4%	5	5%	7	4%	3	3%	3	7%	12	4%	6	6%
	Somewhat disagree	57	15%	18	18%	30	16%	5	8%	4	10%	46	16%	11	12%
	Neither agree nor disagree	110	32%	32	33%	50	28%	16	41%	12	42%	74	30%	36	41%
	Somewhat agree	147	34%	30	31%	83	36%	22	30%	12	39%	114	34%	33	33%
	Strongly agree	76	15%	16	14%	43	17%	16	20%	1	3%	68	17%	8	8%
24j. (n=408) Please assess how much you agree or disagree with the following statements. - Heat pump water heaters are expensive to service or repair.	Strongly disagree	18	5%	3	4%	11	6%	1	3%	3	7%	16	5%	2	3%
	Somewhat disagree	53	14%	16	16%	26	15%	8	13%	3	7%	41	15%	12	12%
	Neither agree nor disagree	125	33%	40	40%	59	29%	16	31%	10	37%	84	31%	41	42%
	Somewhat agree	141	34%	30	30%	78	37%	22	33%	11	33%	115	36%	26	27%
	Strongly agree	71	14%	12	11%	39	14%	15	21%	5	17%	58	14%	13	15%
24k. (n=408) Please assess how much you agree or disagree with the following statements. - Heat pump water heaters do not produce enough hot water.	Strongly disagree	72	19%	24	25%	35	18%	7	11%	6	17%	58	20%	14	14%
	Somewhat disagree	100	26%	27	29%	52	26%	13	24%	8	23%	84	28%	16	19%
	Neither agree nor disagree	108	28%	32	30%	48	25%	20	34%	8	30%	64	24%	44	47%
	Somewhat agree	82	18%	11	10%	50	22%	13	18%	8	23%	65	18%	17	17%
	Strongly agree	46	9%	7	7%	28	10%	9	13%	2	7%	43	10%	3	3%

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25.(n=810) When making a decision about purchasing mechanical equipment for your home, such as a furnace or water heater, what are your typical sources of information regarding which product to purchase?	Friends, family members, or colleagues	384	46%	224	99%	364	89%	116	101%	64	71%	270	46%	144	46%
	Utility print advertising or bill inserts	88	10%	21	9%	46	11%	13	10%	8	9%	74	12%	14	5%
	Utility website	254	31%	76	34%	136	32%	27	22%	15	21%	197	32%	57	24%
	Retail store displays	182	21%	37	16%	100	23%	29	23%	16	20%	128	20%	54	22%
	Retail store salespeople	214	27%	59	26%	103	26%	26	22%	26	36%	148	26%	66	30%
	Online news stories	94	10%	19	9%	56	11%	15	9%	4	4%	82	11%	12	4%
	Television ads	105	11%	23	11%	61	14%	15	7%	6	7%	85	12%	20	8%
	Social media, such as Facebook, Instagram or Youtube	159	16%	32	13%	99	21%	21	14%	7	6%	137	18%	22	9%
	Contractors or installers	282	34%	74	32%	130	34%	40	38%	38	39%	181	33%	101	40%
	Internet research or internet reviews	436	55%	126	57%	219	55%	49	45%	42	57%	308	55%	128	55%
	Internet advertising	126	14%	31	14%	70	15%	18	12%	7	8%	110	15%	16	7%
	Specific internet website	8	1%	1	1%	2	1%	3	2%	2	2%	4	1%	4	1%
	Utility newsletter	89	10%	22	9%	52	12%	8	4%	7	9%	64	10%	25	9%
	Personal/professional experience	3	0%	2	1%	-	-	1	0%	-	-	3	1%	-	-
	Distributor	1	0%	1	1%	-	-	-	-	-	-	1	0%	-	-
	Manufacturer website	1	0%	-	-	-	-	-	-	1	1%	-	-	1	0%
	Retailer app	1	0%	-	-	1	0%	-	-	-	-	-	-	1	0%
N/A (not responsible for decision)	11	2%	1	1%	8	3%	1	2%	1	3%	10	3%	1	0%	
I'm not sure	26	4%	10	5%	10	3%	5	4%	1	1%	15	3%	11	4%	

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
26. (n=810) Have you purchased a new water heater in the past three years?	Yes	235	25%	49	21%	135	28%	34	21%	17	18%	187	33%	48	20%
	No	567	75%	171	78%	247	70%	87	79%	62	82%	376	66%	191	80%
	I'm not sure	8	1%	2	0%	6	2%	-	-	-	-	7	1%	1	0%
27. (n=235) Why did you purchase a new water heater?	My water heater was completely broken and did not provide any hot water	65	27%	17	33%	31	23%	9	25%	8	31%	46	25%	19	40%
	My water heater worked poorly and/or needed repair	43	21%	6	14%	28	24%	6	20%	3	23%	38	20%	5	10%
	My water heater was old and/or close to failing	55	24%	13	26%	31	24%	8	20%	3	31%	42	23%	13	27%
	I wanted to install a more energy-efficient water heater	45	18%	9	18%	28	19%	7	20%	1	8%	40	21%	5	10%
	To serve an addition to my home	20	8%	3	8%	13	8%	3	10%	1	8%	18	10%	2	4%
	For a new home	5	2%	1	2%	2	1%	1	5%	1	-	2	1%	3	6%
	I'm not sure	2	1%	-	-	2	2%	-	-	-	-	1	1%	1	2%
28. (n=175) Did your installer or contractor recommend a heat pump water heater to you?.	Yes	121	66%	21	55%	77	68%	20	71%	3	33%	108	68%	13	50%
	No	49	30%	9	31%	26	27%	8	29%	6	68%	38	28%	11	44%
	I'm not sure	5	4%	1	3%	4	5%	-	-	-	-	4	3%	1	6%
29. (n=235) Did you install the new water heater yourself, or did you hire an installer to do it?	I installed it myself	76	30%	7	14%	51	37%	14	37%	4	21%	62	33%	14	29%
	Another member of my household installed it	25	13%	8	17%	10	11%	4	11%	3	21%	15	8%	10	21%
	Hired an installer	133	57%	34	69%	73	52%	16	53%	10	57%	110	59%	23	48%
	I'm not sure	1	0%	-	-	1	1%	-	-	-	-	-	-	1	2%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
30. (n=235) Do you, or someone in your household, have professional experience installing water heaters or other mechanical equipment (e.g., plumber, contractor, or handyman)?	Yes	62	60%	4	25%	40	68%	14	75%	4	80%	51	68%	11	48%
	No	32	35%	8	56%	18	31%	3	13%	3	20%	22	29%	10	44%
	I'm not sure	4	6%	2	19%	1	2%	1	13%	-	-	2	3%	2	9%
31.(n=33) Why did you decide to install the water heater yourself?	To save money	12	42%	4	38%	7	49%	-	-	-	-	8	42%	4	42%
	Confidence in own ability	13	40%	4	52%	5	27%	2	62%	-	-	8	38%	5	47%
	Ease of installation	5	10%	-	-	2	8%	1	44%	-	-	2	5%	3	30%
	Enjoy DIY	3	7%	-	-	3	12%	-	-	-	-	3	8%	-	-
	Don't know	4	14%	1	-	2	16%	1	39%	-	-	4	17%	-	-
32. (n=810) What would cause you to purchase a new water heater (of any type)?	If it fails, breaks, or leaks	572	70%	171	74%	254	66%	80	70%	67	78%	377	66%	195	81%
	If it has some issues but needs repairs to work well	255	30%	67	30%	138	33%	31	23%	19	20%	194	34%	61	25%
	To save energy, even if it still works	227	24%	49	21%	124	25%	41	28%	13	17%	185	33%	42	18%
	To lower utility bills, even if it still works	213	24%	61	27%	108	23%	32	25%	12	15%	158	28%	55	23%
	If I was already renovating my home	151	17%	36	17%	76	15%	27	26%	12	12%	109	19%	42	18%
	Other	2	0%	-	-	1	0%	1	1%	-	-	2	0%	-	-
	Don't know	8	1%	2	1%	5	1%	1	1%	-	-	5	1%	3	-
	N/A - I rent and do not need to purchase a water heater	87	15%	27	16%	41	15%	12	11%	7	15%	62	11%	25	15%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
33. (n=250) Have you ever considered installing a heat pump water heater?	Yes	56%	15%	40	60%	86	59%	15	39%	8	38%	122	59%	27	45%
	No	35%	10%	19	29%	38	34%	17	44%	9	44%	57	34%	26	21%
	I'm not sure	9%	3%	7	11%	7	7%	2	19%	2	19%	12	8%	6	14%
34. (n=83) What is the primary reason you consider installing an electric hybrid heat pump water heater?	Existing equipment works fine	15	19%	3	15%	10	25%	2	17%	-	-	11	20%	4	19%
	Prefer a different kind	1	0%	-	-	-	-	1	-	-	-	-	-	1	-
	May/plan to in the future	10	14%	5	25%	3	5%	1	25%	1	13%	7	15%	3	14%
	Cost of installation	15	18%	4	20%	6	15%	3	17%	2	25%	11	18%	4	18%
	Not familiar enough with them	23	26%	2	10%	10	33%	5	17%	5	38%	14	25%	8	24%
	Concerns about their performance	3	5%	1	5%	2	8%	-	-	-	-	2	5%	1	5%
	Does not fit in my space	7	7%	2	10%	1	3%	2	8%	1	25%	3	3%	3	6%
	Other, please specify:	4	3%	-	-	2	5%	2	8%	-	-	3	5%	1	5%
	I'm not sure	3	4%	-	-	2	5%	1	8%	-	-	2	3%	1	4%
	I do not want to switch water heating fuels	2	4%	2	15%	-	-	-	-	-	-	2	5%	-	4%
	Cost of maintenance or repairs	2	2%	-	-	2	3%	-	-	-	-	2	2%	-	1%
35.(n=596) Thinking about the water heater that is currently installed in your home, have you contacted a professional to service or repair the water heater?	Yes, I contacted a professional	247	38%	52	34%	136	48%	42	44%	17	27%	206	49%	41	21%
	I (or a member of the household) handled the repair or service myself	58	9%	9	6%	29	10%	10	11%	10	16%	32	8%	26	18%
	No, my heat pump water heater has not needed repairs or maintenance	294	53%	91	60%	119	42%	45	48%	39	61%	182	43%	112	63%
	Don't know	4	1%	2	1%	2	1%	-	-	-	-	3	1%	1	1%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
37 (n=247) How many times have you had a professional service and/or repair the water heater? Service-only visits	0	30	16%	8	17%	9	12%	7	16%	6	46%	19	14%	11	29%
	1	94	38%	21	40%	55	37%	12	43%	6	31%	78	38%	16	37%
	2	68	27%	17	30%	37	27%	11	22%	3	14%	60	27%	8	22%
	3	27	9%	2	4%	20	13%	5	7%	2	9%	25	10%	2	3%
	4	15	5%	2	4%	7	5%	4	7%	0	-	13	5%	2	4%
	5	5	2%	1	3%	3	3%	1	1%	0	-	5	3%	0	-
	6	3	1%	1	2%	1	1%	1	2%	0	-	3	1%	0	-
	7 or more	4	1%	0	-	4	2%	0	-	0	-	3	1%	1	3%
	I'm not sure	1	0%	0	-	0	-	1	2%	0	-	0	-	1	2%
38 (n=247) How many times have you had a professional service and/or repair the water heater? Repair-only visits	0	74	34%	20	38%	30	29%	14	35%	10	64%	55	32%	19	47%
	1	96	40%	20	39%	61	44%	11	34%	4	25%	81	40%	15	40%
	2	41	14%	7	13%	24	15%	8	13%	2	7%	35	14%	6	12%
	3	15	5%	1	2%	11	6%	2	4%	1	4%	15	6%	0	-
	4	10	4%	3	6%	5	3%	2	4%	0	-	10	4%	0	-
	5	7	2%	1	2%	4	2%	2	4%	0	-	7	3%	0	-
	6	1	0%	0	-	0	-	1	2%	0	-	1	0%	0	-
	7 or more	2	0%	0	-	1	1%	1	1%	0	-	2	1%	0	-
	I'm not sure	1	0%	0	-	0	-	1	2%	0	-	0	-	1	2%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
39 (n=247) How many times have you had a professional service and/or repair the water heater? Visits with service and repair in the same visit	0	71	33%	22	-	-	-	11	26%	7	43%	-	-	-	-
	1	94	40%	19	-	-	-	12	40%	6	32%	-	-	-	-
	2	45	16%	8	-	-	-	9	16%	4	25%	-	-	-	-
	3	14	4%	1	-	-	-	2	3%	0	-	-	-	-	-
	4	7	2%	1	-	-	-	2	4%	0	-	-	-	-	-
	5	5	2%	1	-	-	-	2	3%	0	-	-	-	-	-
	6	2	1%	-	-	-	-	0	-	0	-	-	-	-	-
	7 or more	8	2%	-	-	-	-	3	7%	0	-	-	-	-	-
	I'm not sure	1	0%	-	-	-	-	1	2%	0	-	-	-	-	-
39 (n=202) When repairing the water heater, how long did it take for the issue(s) to be resolved?	1 day or less	92	47%	18	46%	51	47%	14	33%	9	88%	73	42%	19	70%
	1 to 2 days	73	38%	16	41%	44	37%	11	48%	2	13%	66	38%	7	26%
	3 to 7 days	27	10%	2	5%	17	12%	8	19%	-	-	26	15%	1	4%
	1 to 2 weeks	8	3%	1	3%	7	4%	-	-	-	-	8	5%	-	-
	I'm not sure	2	1%	2	5%	-	-	-	-	-	-	2	1%	-	-
37 (n=810) Before today, had you heard of the "Hot Water Solutions" program?	Yes	143	14%	21	9%	96	18%	19	14%	7	8%	130	16%	13	5%
	No	628	81%	192	87%	270	76%	97	83%	69	89%	410	79%	218	91%
	I'm not sure	39	5%	9	4%	22	6%	5	3%	3	4%	30	5%	9	4%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural		
		n	%	n	%	n	%	n	%	n	%	n	%	n	%	
38 (n=143) How did you first hear of the “Hot Water Solutions” program?	Hot Water Solutions Website	21	13%	2	12%	15	13%	3	9%	1	22%	20	14%	1	5%	
	Friend, family member, or colleague	38	25%	7	35%	26	25%	4	15%	1	8%	33	24%	5	37%	
	Utility print advertising or bill insert	23	15%	5	25%	11	11%	5	16%	2	18%	21	15%	2	11%	
	Utility website	52	33%	5	23%	36	33%	8	47%	3	38%	46	32%	6	44%	
	Retail store display	22	12%	1	4%	17	15%	3	8%	1	8%	21	12%	1	6%	
	Retail store salesperson	23	15%	4	19%	13	13%	4	14%	2	30%	21	15%	2	11%	
	Online news story	41	24%	2	9%	28	28%	8	27%	3	38%	34	23%	7	48%	
	Television ad	42	28%	6	27%	29	30%	5	18%	2	17%	38	28%	4	24%	
	Social media such as Facebook, Instagram or YouTube	60	39%	9	46%	41	41%	9	35%	1	8%	56	40%	4	27%	
	From a contractor or installer	31	21%	3	14%	23	23%	4	26%	1	8%	27	21%	4	25%	
	Internet research	56	37%	9	43%	41	41%	6	20%	-	-	51	37%	5	37%	
	Internet advertising	49	31%	7	34%	33	32%	6	19%	3	38%	45	32%	4	21%	
	Boring but Efficient website	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Another way	8	4%	-	-	6	5%	2	6%	-	-	8	4%	-	-	
	I'm not sure	1	1%	-	-	-	-	-	-	1	22%	-	-	1	15%	

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
39 (n=810) Which of the following statements best describes you?	I am the first among my friends to purchase new technology	143	13%	22	9%	93	17%	22	12%	6	6%	129	15%	14	5%
	I purchase new technology sooner than most of my friends	143	17%	34	15%	78	18%	22	18%	9	13%	115	18%	28	11%
	I am typically in the middle of the group when purchasing new technology	262	34%	85	39%	109	29%	40	38%	28	32%	180	34%	82	32%
	I purchase new technology after most of my friends have purchased it	119	16%	45	20%	50	16%	11	10%	13	15%	71	15%	48	21%
	I am one of the last people to purchase new technology	127	18%	32	14%	51	17%	22	19%	22	34%	69	16%	58	26%
	I'm not sure	16	2%	4	2%	7	2%	4	2%	1	2%	6	1%	10	5%
40 (n=810) Please rate your level of agreement with the following statements: I do research before making big purchases.	Strongly disagree	14	2%	5	3%	6	1%	1	1%	2	3%	11	2%	3	2%
	Somewhat disagree	15	2%	2	1%	7	2%	3	1%	3	3%	8	2%	7	2%
	Neither agree nor disagree	68	9%	19	9%	27	7%	14	12%	8	12%	38	8%	30	14%
	Somewhat agree	263	31%	64	26%	130	33%	41	33%	28	35%	189	31%	74	31%
	Strongly agree	450	56%	132	61%	218	56%	62	53%	38	47%	324	58%	126	51%
40 (n=810) Please rate your level of agreement with the following statements: I compare prices online for big purchases.	Strongly disagree	15	2%	8	5%	6	2%	-	-	1	1%	13	3%	2	1%
	Somewhat disagree	23	2%	5	1%	8	2%	8	7%	2	2%	10	2%	13	4%
	Neither agree nor disagree	81	11%	21	10%	39	11%	11	11%	10	13%	50	10%	31	15%
	Somewhat agree	272	32%	63	27%	148	37%	37	29%	24	31%	201	33%	71	30%
	Strongly agree	419	52%	125	58%	187	48%	65	53%	42	53%	296	52%	123	50%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
40 (n=810) Please rate your level of agreement with the following statements: I seek out expert recommendations for big purchases	Strongly disagree	19	3%	9	5%	4	1%	5	6%	1	1%	16	3%	3	1%
	Somewhat disagree	40	5%	8	3%	20	6%	5	3%	7	10%	23	5%	17	8%
	Neither agree nor disagree	127	17%	38	16%	49	15%	29	28%	11	15%	78	16%	49	21%
	Somewhat agree	377	46%	102	46%	187	47%	50	36%	38	49%	265	46%	112	46%
	Strongly agree	247	29%	65	30%	128	30%	32	27%	22	25%	188	31%	59	25%
40 (n=810) Please rate your level of agreement with the following statements: I will spend money upfront to save money in the long term.	Strongly disagree	15	2%	7	2%	4	1%	2	2%	2	5%	10	2%	5	2%
	Somewhat disagree	40	5%	13	6%	16	5%	5	2%	6	7%	27	5%	13	6%
	Neither agree nor disagree	152	20%	46	21%	66	19%	25	24%	15	19%	104	20%	48	21%
	Somewhat agree	379	46%	103	45%	179	46%	62	50%	35	46%	260	45%	119	50%
	Strongly agree	224	26%	53	25%	123	29%	27	22%	21	23%	169	27%	55	22%
40 (n=810) Please rate your level of agreement with the following statements: I consider sustainability when making decisions about which products to purchase.	Strongly disagree	31	4%	13	6%	9	3%	6	5%	3	5%	21	4%	10	4%
	Somewhat disagree	44	6%	11	4%	16	5%	12	13%	5	5%	32	6%	12	4%
	Neither agree nor disagree	156	20%	40	18%	72	20%	30	25%	14	20%	99	19%	57	26%
	Somewhat agree	334	41%	78	35%	170	44%	49	42%	37	44%	238	42%	96	38%
	Strongly agree	245	29%	80	37%	121	28%	24	16%	20	25%	180	29%	65	29%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
40 (n=810) Please rate your level of agreement with the following statements: I consider sustainability when making decisions about which products to purchase.	Strongly disagree	24	3%	10	5%	11	3%	3	3%	-	-	17	4%	7	2%
	Somewhat disagree	45	6%	14	6%	13	4%	12	13%	6	8%	31	6%	14	6%
	Neither agree nor disagree	171	22%	42	19%	81	24%	22	16%	26	35%	105	21%	66	28%
	Somewhat agree	348	44%	92	42%	175	45%	52	47%	29	38%	254	45%	94	40%
	Strongly agree	222	25%	64	28%	108	24%	32	21%	18	19%	163	25%	59	23%
42 (n=810) Please rate your level of agreement with the following statements: Actions taken by individuals like me have an impact on the environment.	Strongly disagree	21	3%	10	5%	4	1%	5	4%	2	3%	14	2%	7	3%
	Somewhat disagree	37	4%	11	5%	12	3%	9	7%	5	5%	22	4%	15	6%
	Neither agree nor disagree	200	27%	52	23%	95	29%	34	30%	19	24%	135	27%	65	27%
	Somewhat agree	322	40%	83	36%	161	41%	43	38%	35	47%	224	39%	98	42%
	Strongly agree	230	26%	66	31%	116	26%	30	21%	18	20%	175	27%	55	23%
43 (n=810) Please rate your level of agreement with the following statements: Energy efficiency is my primary consideration when choosing mechanical systems for my home, like a furnace, air conditioner, or water heater.	Strongly disagree	16	2%	7	2%	6	2%	1	1%	2	3%	10	2%	6	2%
	Somewhat disagree	40	6%	12	6%	15	5%	9	8%	4	6%	29	6%	11	5%
	Neither agree nor disagree	150	20%	35	16%	71	21%	26	24%	18	24%	91	19%	59	26%
	Somewhat agree	362	44%	101	46%	179	45%	45	37%	37	42%	256	45%	106	43%
	Strongly agree	242	28%	67	29%	117	27%	40	31%	18	25%	184	29%	58	25%
44 (n=402) Have you heard anyone say that heat pump water heaters cool the air around the water heater?	Yes	155	33%	28	26%	99	40%	22	27%	6	18%	136	36%	19	17%
	No	212	57%	58	59%	94	52%	36	65%	24	76%	153	56%	59	65%
	I'm not sure	41	10%	15	15%	20	8%	4	8%	2	6%	25	8%	16	18%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
45 (n=408) Where did you hear that heat pump water heaters cool the air around the water heater? Please select all that apply.	Friend, family member, or colleague	60	12%	12	43%	37	36%	9	41%	2	30%	54	40%	6	32%
	Personal experience	52	10%	5	16%	36	37%	11	48%	-	-	44	32%	8	42%
	Social media	75	14%	15	52%	50	45%	9	37%	1	8%	72	53%	3	16%
	Online research about water heaters	72	13%	11	39%	49	44%	11	48%	1	8%	67	49%	5	26%
	A contractor or plumber	55	12%	12	40%	34	34%	5	27%	4	70%	48	35%	7	37%
	Power company rep	1	0%	1	5%	-	-	-	-	-	-	1	1%	-	-
	I'm not sure	1	0%	-	-	1	1%	-	-	-	-	-	-	1	5%
46 (n=405) Have you ever heard anyone say that heat pump water heaters dehumidify the air around your water heater?	Yes	138	29%	25	23%	91	36%	18	21%	4	10%	124	32%	14	12%
	No	221	60%	60	63%	100	54%	37	68%	24	79%	157	58%	64	71%
	I'm not sure	46	11%	13	14%	23	10%	7	11%	3	10%	30	10%	16	17%
47 (n=138) Where did you hear that heat pump water heaters dehumidify the air around the water heater? Please select all that apply.	Friend, family member, or colleague	58	43%	8	31%	39	45%	8	44%	3	65%	51	42%	7	47%
	Personal experience	38	24%	3	12%	28	27%	7	36%	-	-	33	23%	5	29%
	Social media	66	44%	10	41%	44	45%	11	58%	1	13%	63	47%	3	15%
	Online research about water heaters	59	37%	8	33%	39	36%	12	67%	-	-	53	37%	6	37%
	A contractor or plumber	54	41%	14	55%	33	37%	5	31%	2	49%	49	41%	5	41%
	Other; please specify:	0	-	0	-	0	-	0	-	0	-	0	-	0	-
	I'm not sure	1	0%	-	-	-	-	1	6%	-	-	-	-	1	6%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
48 (n=810) Which of the following categories best describes the highest level of education you have completed?	Some high school	16	3%	7	4%	5	1%	-	-	4	9%	9	2%	7	4%
	High school graduate or GED	141	19%	41	19%	62	19%	28	19%	10	14%	86	17%	5	23%
	Trade or technical school	57	8%	15	7%	23	7%	14	13%	5	8%	38	8%	19	7%
	Some college	193	27%	71	33%	74	24%	25	23%	23	35%	122	26%	71	33%
	College graduate	167	21%	43	18%	90	25%	13	13%	21	22%	122	22%	45	17%
	Some graduate school	19	2%	9	4%	3	1%	3	1%	4	4%	9	8%	10	5%
	Graduate degree	215	20%	36	15%	129	24%	38	30%	12	11%	183	23%	32	11%
	I'd rather not say	2	0%	-	-	2	1%	-	-	-	-	1	0%	1	1%
49 (n=810) Which of the following categories best describes your approximate annual household income from all sources in 2024, before taxes?	Less than \$40,000	243	34%	76	35%	103	33%	38	29%	26	41%	142	31%	101	45%
	Between \$40,001 and \$60,000	136	19%	53	27%	44	13%	26	23%	13	18%	97	20%	39	14%
	Between \$60,001 and \$80,000	103	13%	31	13%	43	12%	17	14%	12	16%	69	12%	34	15%
	Between \$80,001 and \$120,000	115	13%	28	12%	54	13%	19	20%	14	12%	83	13%	32	13%
	Between \$120,001 and \$250,000	194	19%	32	13%	134	26%	19	13%	9	7%	171	22%	23	8%
	Over \$250,000	9	1%	1	1%	6	2%	1	-	1	-	5	1%	4	1%
	I'd rather not say	10	1%	1	0%	4	1%	1	1%	4	6%	3	1%	7	4%
50 (n=810) Do you consider yourself Hispanic or Latino?	Yes	103	11%	20	9%	66	13%	14	9%	3	4%	89	12%	14	5%
	No	702	89%	201	91%	319	86%	107	91%	75	95%	479	88%	223	94%
	I'd rather not say	5	1%	1	0%	3	1%	-	-	1	1%	2	1%	3	1%

Survey Question	Response Options	Total		OR		WA		ID		MT		Urban		Rural	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%
51 (n=810) How would you describe yourself? Please select all that apply.	White	732	89%	205	93%	338	85%	115	90%	74	95%	506	89%	226	94%
	Black or African American	35	5%	7	4%	26	8%	2	2%	-	-	32	6%	3	1%
	American Indian or Alaska Native	22	3%	7	3%	11	3%	1	2%	3	3%	13	2%	9	4%
	Asian	24	4%	5	2%	15	5%	2	5%	2	3%	20	4%	4	2%
	Other	13	2%	2	1%	7	2%	3	4%	1	1%	9	2%	4	2%
	I'd rather not say	4	1%	-	-	3	1%	-	-	1	1%	2	0%	2	1%
52 (n=810) How would you describe yourself?	Male	398	48%	98	44%	206	49%	67	48%	27	41%	316	50%	82	34%
	Female	407	53%	124	56%	178	50%	54	52%	51	57%	251	50%	156	65%
	Non-binary	2	0%	-	-	2	1%	-	-	-	-	2	1%	-	-
	I'd rather not say	3	0%	-	-	2	1%	-	-	1	1%	1	1%	2	1%
53 (n=810) What language is primarily spoken in your home?	English	795	98%	219	98%	377	97%	120	100%	79	100%	558	98%	237	98%
	Spanish	11	1%	2	1%	8	2%	1	-	-	-	9	1%	2	1%
	Russian	2	1%	-	-	2	1%	-	-	-	-	2	1%	-	1%
	Punjabi	2	-	1	-	1	0%	-	-	-	-	1	0%	1	0%
54 (n=810) Including yourself, how many people live in your home?	1 to 2	397	60%	133	62%	163	58%	56	60%	45	65%	245	59%	152	66%
	3 to 4	266	27%	65	29%	134	26%	45	28%	22	22%	206	28%	60	24%
	5 or more	135	12%	21	8%	88	15%	15	8%	11	12%	113	13%	22	8%
	I'd rather not say	12	1%	3	1%	3	1%	5	4%	1	1%	6	1%	6	2%



Appendix I Installer Callbacks Report

Heat Pump Water Heater Installer Callbacks Qual Research

Final Report



November 18, 2024

 **Lieberman**



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Business Objectives

To ensure the successful adoption of the new standard for energy-efficient products, NEEA aims to understand Installers' experience with HPWH installations and service callbacks. The goal is to explore the barriers Installers need to overcome in order to recommend HPWHs to their customers.



Key Primary Research Objectives:

1

Identify the nature of callbacks / issues reported (e.g., technical or customer interaction related, running out of hot water, etc.) and the number of units for which installers received a callback

2

Learn more about the problem-solving measures that installers use:

- Length of time to resolution
- Whether the situation was successfully resolved
- Perceived customer satisfaction

3

Discern, if and how, the callback experience alters installer perceptions or decisions to install HPWHs in the future

- Identify what, if any, support installers may need to overcome their hesitancy to install HPWHs

Methodology



What



Total N = 18

45-minute web enabled TDIs



Where



Location:

ID, OR, MT or WA

**most were located in WA*

When



Between:

September 23rd to
October 15th, 2024

Who: Screening Criteria

- **N=18 Installers of HPWHs**
 - Plumbers (15)
 - Water Heater Installers (2)
 - Builders (1)
- Installed at least 2* HPWHs within the past 24 months
- Have at least 1 callback regarding a HPWH within the past 6 months
- Mix of age, urbanicity (rural, urban, suburban), and years of experience
 - Mix of retrofit and new construction
 - Mix of smaller and larger companies

Type of Installs	# of Installers
Retrofit Installations	8
New Construction	10

**Target # of installations was >10 installations within the past 24 months; however, respondents ranged from 2 – 500 installs, with an average of 60 installs within the past 24 months*

Spectrum of HPWH Installers

18 Installers of HPWHs

Total Years in the Field

>10 years (9)

<10 years (9)

Ranges from 3 – 25 years

HPWH Focus

New (10)

Retrofit (8)

Maintenance (8)

Communities HPWHs are Installed

Suburban (16)

Rural (10)

Urban (7)

Single vs. Multi-family

Single (9)

Multi (3)

Both (6)

Openness to New Tech

Open (13)

Less open (5)

Water heaters Installers have in their own homes:

- **Most have either gas or standard electric units**
 - Standard electric in closet
 - Gas in garage

- **Some have HPWHs**
 - Installed to qualify for energy credits
 - Chosen because of energy efficiency
 - House already had one when purchased

Discussion Flow



**About You & Perceptions
of Current HPWHs**

**Understanding Callbacks
& HPWH Issues**

**Perceptions of Heat Pump
Technology**





Executive Summary

Key Insights: HPWH Installation Landscape

Water Heater Systems

- **Standard electric and gas water heaters** are the **most commonly installed systems** due to their perceived **simplicity** (ease of installing and servicing) and **efficiency** (quick hot water recovery)
- **HPWHs have become more widely installed**, as per Washington state energy / building codes, which require the installation of HPWHs in new homes
 - Most HPWHs are installed in garages, bedroom closets, and basements
 - Optimal locations are noted as those with surrounding space for adequate airflow and regulated temperature

HPWH Perceptions

- Installers generally find **HPWH installations straightforward**, but the unit's **size, airflow requirements, and condensate lines can complicate seamless integration and add time to the installation process**
- HPWHs are appreciated for their **energy efficiency** and **cost savings** to the customer, but issues such as size, weight, high initial cost, and frequent callbacks are common concerns among Installers
- Installers are **somewhat likely to recommend HPWHs**, with **reluctance higher among those who frequently handle callbacks**
- While installers initially perceive **high customer satisfaction upon installation**, **satisfaction decreases** for customers who encounter **performance issues, especially if it's a lack of hot water**

Key Insights: HPWH Callbacks

Nature of HPWH Callbacks

- HPWH callbacks are the result of **unit malfunctions, inappropriate use cases, and user experience**
 - **Unit malfunctions:** Compressor failures, faulty control boards, and worn out / broken parts
 - **Inappropriate use cases:** Lack of hot water and leaks from incorrect installation
 - **User experience:** Lack of customer troubleshooting/maintenance, loud fan noises, vibrations, and odor
- **HPWHs installed in colder areas with inadequate airflow (e.g., garages and closets) have higher callback rates**
 - Current home designs lack space and temperature requirements, leading to HPWH operation issues
 - Certain brands are noted as having slightly more issues

Challenges of HPWHs

- HPWH servicing requires **manufacturer involvement which limits Installers' autonomy, leading to more than one visit before the issue is successfully resolved and resulting in increased costs for customers**
 - Must submit a claim with the manufacturer while on-site in order for the warranty to be covered
 - The complex unit build demands specialized parts and knowledge, requiring Installers to rely on manufacturers for parts shipment
 - Certain components (e.g., compressor) can not be repaired or replaced, and require full unit replacements

Overcoming HPWH Hesitancy

- **Installers who experience frequent callbacks view HPWHs less favorably, but some remain optimistic about future improvements**
- **Installers want increased reliability, independence in repairs, and more comprehensive training / education for themselves and their customers**
 - Many have undergone plumbing technology training (online and in person) and express interest in HPWH-specific education
 - Customer-based educational materials are viewed as valuable, particularly for helping Installers teach customers maintenance best practices to avoid potential issues (e.g., switching to electric mode in colder climates, allowing adequate space for airflow, and cleaning the filters)
- Installers **stay informed** on industry advancements **via suppliers, manufacturers, and personal research**

Recommendations and Next Step Suggestions



- To improve perceptions of HPWHs and increase Installers' likelihood to recommend, provide training and education to Installers / builders / customers, encourage manufacturers to allow Installers more autonomy when addressing issues, and consider optimizing HPWH unit performance

- **Enhanced Training and Educational Resources**

- Provide Installers with:
 - Training that covers HPWH service / repair operations to enhance their confidence in resolving issues during callbacks
 - Education on the appropriate HPWH tank capacity based on home size (i.e., number of bathrooms and residents)
- Raise awareness among home builders, HVAC specialists, and plumbers about HPWH-specific requirements to ensure adequate placement conditions within the home
- Develop educational materials for customers to enhance product knowledge and proper maintenance practices

- **Enhanced Autonomy**

- Enable Installers with the tools and resources they need to resolve issues independently, without reliance on the manufacturer
 - Full unit knowledge on servicing / repairs without needing to defer to the manufacturer for troubleshooting
 - Access to HPWH parts "kits" to address issues faster without having to wait for the manufacturer to ship parts

- **Optimized Unit Performance**

- Consider designing HPWHs that better align with existing home designs, including compact models or those with adjustable airflow options for varied placement
- Consider advancing HPWH technology by integrating automatic electric mode adjustments based on ambient temperature



Perceptions of Current HPWHs

The push for energy efficiency in Washington State requires the installment of HPWHs newly constructed homes, which some installers support while others express concerns.



- **Installers in Washington state mention there is a new energy efficiency mandate that requires new homes to have HPWHs**
 - Newly constructed homes are being built with the intention of HPWH installation as per the building code
 - Some homeowners in existing houses with all-electric or gas water heaters are offered rebates and monthly energy bill savings as incentives to replace their existing units with HPWHs
- The focus on energy conservation has led most Installers to believe **HPWHs will be the new water heating standard in the future**
- **But some are more resistant to the mandate**
 - Mention current home design is not accommodating of HPWHs and their unique build compared to more common water heating systems (e.g., standard electric and gas)



“They’re relatively new for us within the last three years. The Washington State Energy Code was enacted around 2020 ish. And it really pushed home builders, specifically new home builders, away from the use of gas. Which then pushed us away from the use of gas tankless water heaters, which we had used almost exclusively previously for quite some time. It was the time of the code change that shifted us from gas tankless units to the high-efficiency heat pump tank units that we use today.”
– Builder, New Construction

*“We have to explain to customers that [HPWHs] are awesome, they’re great. **They’re probably the future**, so be ready because right now we’re asking you to be **more energy conscious** and to maybe implement these things into your life.”* – Plumber, New Construction

“Every plumber just installs them. We follow the code. Just do what you’ve got to do. We don’t have a choice in Washington.” – Plumber, Construction

Most HPWHs are installed in single-family, residential homes, with tank capacities ranging from 50 to 80g.



Home-type

- Slightly more Installers complete **new construction** vs. retrofit installations
- Most HPWH installs are in **new single-family homes**
- Multi-family homes or commercial buildings are more likely to have standard electric or gas water heaters, which are perceived as more efficient with hot water recovery



Size of HPWH Unit

- Size of the unit depends on the **number of bathrooms and people** who live in the home
 - 1-2.5 bathrooms: 40-50g
 - 3+ bathrooms: 60-80g
- Single-family residential homes typically have **50 or 80g** tanks
- Some recognize the need for larger units in houses with more residents
 - Recommend bigger tanks to meet the higher hot water demand, but customers are not always willing to pay the higher costs



*"I did have one application where there was a **three-unit home with a heat pump water heater. I'm going to try to go as big as possible.** This particular customer wanted the 50 instead of the 80. So, at the end of the day, he's the one paying the bill. But we definitely suggested the larger size, capacity." – Plumber, Retrofit Installations*

*"On these hybrid systems where you've got the heat pump system, **it's still only 50 gallons, so you're going to have to wait for it to heat up again and the recovery time on those is not immediate.**" – Plumber, New Construction*

HPWH Brands Installed

Most
Mentioned



Least
Mentioned

A.O. Smith
Rheem
Bradford White

Ruud
Rinnai
Sandon
Brunei
American Standard
GE
Nyle
Mitsubishi
Kolmac
Eco2 Systems

- Brands installed **largely depend on company contracts with manufacturers or certifications**, with some **installers required to install / service certain brands**
- A few from smaller companies will install **brands purchased by the customer from local hardware stores**

Most HPWHs are installed in the garage, which provides enough space for HPWHs to work properly and is Installer's preferred location.

- HPWHs are most commonly installed in garages, bedroom closets, and basements / mechanical rooms
 - **Garages:** Perceived as an optimal location because of the surrounding space for airflow and ease of installation / repair, but colder temperatures can hinder unit performance
 - **Bedroom closets:** Suitable for temperature control but often lack surrounding space and can be challenging when running condensate lines / venting
 - **Basements / mechanical rooms:** Surrounding space allows for airflow, but installations / replacements can be difficult when transferring units up and down stairs

Attribute	Garage	Bedroom Closet	Basement / mechanical room
Accessible space for installs & maintenance	Meets Need	Does not meet need	Neutral
Enough space for airflow	Meets Need	Does not meet need	Meets Need
Easy to run condensate lines / venting	Meets Need	Does not meet need	Neutral
Suitable temperature during winter months to run efficiently	Does not meet need	Meets Need	Meets Need
Safe location for leaks / limited damage to house	Meets Need	Does not meet need	Neutral
Blocks out noise from the unit	Meets Need	Does not meet need	Neutral
Insulation is not required	Does not meet need	Neutral	Meets Need

Installers perceive HPWHs are not always placed in the most suitable location for efficient operation

- HPWH placement is **determined by the builder and rarely relocated after installation**, even if the Installer believes the unit would operate better in another location
 - Changing locations is expensive and may require structural changes to the home, which most customers do not prefer
- For **retrofit installations, HPWHs are placed in the same location as the previous unit** (e.g., gas or electric) as there is no other area in the home for it
 - These spaces were not designed to accommodate the requirements of HPWHs (e.g., function and ease of install/repair)



*"We install ours **almost exclusively in the garage**... It's the **least intrusive** in terms of the amount of square footage that it takes up... And for some **venting purposes**, it keeps the garage very **cold in the summertime**. So, it doesn't negatively impact the living space of the home." – Homebuilder, New Construction*

Installers generally find the HPWH installation process straightforward, but for some, the unique build (size, airflow, condensate line) poses a challenge for seamless integration.

- Most describe the installation of HPWHs as **straightforward** and **quickly feel confident in the installation process** shortly after installing their first HPWH
 - Perceive the installation process similarly to that of a standard electric water heater, with the addition of a condensate line
- **Typically takes 1 to 3 hours on average and involves following guidelines by the manufacturer and/or company protocol:**
 - Shutting off the power and water supply to the old unit and removing the old tank
 - **Ensure the new unit fits properly with adequate clearance for airflow and maintenance**
 - Secure the unit to the wall (for earthquake protection)
 - **Connect / add a condensate line and attach hot and cold water supply lines**
 - Fill up the tank, turn on the water supply, and power
 - Set the desired temperature and verify the unit is working properly

- Some Installers note the **unique build of HPWHs can be incompatible with current home designs**, making the installation **more challenging and adding 30 minutes to 4 hours to the job**
 - HPWHs are **large and heavy**
 - Difficult to maneuver through homes and fit into tighter spaces
 - **Preexisting homes are not built for HPWH integration and require structural changes**, such as:
 - Running new lines through drywall, ceilings, or concrete
 - Installing drains in basements or connecting condensate lines to a furnace
 - Adding ventilation for airflow or connecting to an HVAC unit*



*“The install itself is **fairly straightforward**. Maybe just a little bit more consideration than a standard electric... It’s consideration of where you’re putting it. **Is the room big enough? What about the airflow?...** But the install itself is pretty smooth. The only difference between an electric water heater and a heat pump is you have to do something with the condensate.” – Plumber, Retrofit Installations*

* See notes section for more detail

Installers perceive the advantages of HPWHs as more customer-focused, while the disadvantages impact both them and their customers.

Advantages

- ✓ **Energy efficiency** and conservation
 - Positive environmental impact by reducing gas and electric usage
- ✓ **Saves customers money on electric bills**
- ✓ Provides added benefit of **reducing heat and cooling**
- ✓ Helps to **meet WA state code requirements** on new construction

Disadvantages

- × **Large and heavy**, requires more effort and space, which reduces maneuverability during installation and repair
 - Especially when installed in less ideal locations (e.g., garage vs. internal, in-home)
- × **Expensive**, with a higher upfront cost compared to standard electric water heaters
 - Convincing customers of the value is challenging due to high initial costs
 - Some installers believe cost savings are minimal and not worth the high upfront cost for the unit
- × Perceived **poor performance in colder climates**
 - Need to manually set and reset to electric mode
- × **Mechanical issues** (e.g., compressor failures)
- × **Inability to keep up with hot water demand**
 - Especially when tank capacity is too small for the home size



*"If you can capture the cold, it's good... I have one, so I have seen my **electrical bill a little bit cheaper**... I ended up putting it in my attic [and] **it's cooling it down**." – Plumber, New Construction*

*"In my house, I have [the HPWH] in high demand, and we're still **running out of hot water**... But the big thing is **the size and the weight**. Sometimes, it goes from a one-man install to needing two guys there. It elevates the cost quite a bit." – Plumber/Contractor, New Construction*

Installers are satisfied with HPWH installations, but customer satisfaction varies based on whether issues arise.



Installer

HPWH Installation Satisfaction

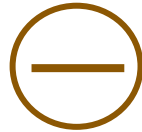


- Most Installers are **highly satisfied** with the installation of HPWHs, viewing it as **simple and straightforward**
- Some believe the installation would be **easier if units were smaller / lighter and if the design of new homes accounted for the additional space, airflow required, and condensate lines**



Customer

HPWH Overall Satisfaction



- Installers report **customers are initially satisfied with HPWHs**, drawn to the benefits of lower electric bills, tax incentives/rebates, and positive environmental implications
- Though, **satisfaction drops significantly when customers experience technical issues**, especially when they do not have hot water
- **New homeowners** required to have HPWHs **often become frustrated when facing service repairs or replacement expenses** shortly after purchasing their home
 - Even when parts or replacements are covered under warranty, some customers must still pay labor costs



*“You expect to do this water heater that needed this much room [small amount]. Well, now these heat pumps are in that **same amount of room**, where it’s just got **more parts and pieces that the access to it [is difficult]** ... I think in the future it’s going to be better because people know we **need more room** for these.” – Plumber, New Construction*

*“If they [Customers] don’t bother me, then they’re very satisfied. **It works great until it doesn’t. As long as it’s pumping out hot water.**” – Water Heater Installer, New Construction*



Satisfied



Neutral

Though most Installers are satisfied with HPWH installations, the frequency of callbacks leaves some hesitant to recommend.

- On average, Installers are somewhat likely to recommend HPWHs to their customers
 - Slightly more fall neutrally or negatively, highlighting the requirement for HPWHs in their state and being left without an option

Average Likelihood of Recommending HPWHs



Reasons for **Not Recommending**

- Installers who **experience frequent HPWH callbacks are less satisfied** with the units and **less likely to recommend them**
 - Install them because of company / state requirements or in competitive bid situations, rather than their professional recommendation
- **For some, recommendations depend on the customer's home type** (e.g., gas or electric) and **the current water heater location**
 - Some are less likely to recommend HPWHs if significant structural changes are required, as it increases costs for the customer

Reasons for **Recommending**

- Installers who **value HPWHs for their energy-saving components and find them efficient are likely to recommend them**
 - Believe HPWHs are the future of energy conservation
 - Others who don't have a choice to install them mention they're the best option to meet building codes / energy credits
- Most **give customers options, allowing them to decide based on budget and performance**
 - HPWHs are recommended for customers open to energy efficiency



"The installation process isn't difficult. It's not really the install. It's more of the operation of the unit that we run into issues with." – Plumber, New Construction

"If I come across a customer who wants to be super energy efficient, I'll open it up to them, but I'll explain the pros and cons and let them decide. I usually give them multiple options to think about." – Plumber, Retrofit Installations

"The callback issues are terrible, but we don't have a choice in Washington." – Plumber, New Construction



Understanding Callbacks & HPWH Issues

Most HPWH callbacks involve unit malfunctions like compressor failures and inappropriate use cases, such as undersized tanks and sub-optimal tank placement.

- The likelihood of receiving callbacks **depends on the installer's role**, with those handling **maintenance, repairs, and replacements** experiencing more callbacks than those focused on new construction



The timeframe of receiving callbacks after installation **varies from a few months to years, with most happening within the first year and often peaking during colder months**

Reasons for Callbacks

Unit Malfunctions

Compressor failure

- Stops working in cold temperature
- Lower-quality parts
- Damage from condensation / moisture

Faulty control boards

- Error codes
- Unresponsive screens

Worn out / broken parts

- T&P valve, anode rod, or other fittings
- Thermistor malfunction
- Cracked condensate pipe
- Burnt out electrical components
- Damaged copper or aluminum piping

Inappropriate Use Cases

Lack of hot water / inconsistent hot water

- Tank capacity is too small for demand
- Located in areas unsuited for climate
- Lower-quality brands
- Loss of refrigerant

Leaks

- **Incorrect installation** of condensate line or clogging due to lack of maintenance
- **Frozen parts** due to cold temperatures



"As soon as wintertime comes around, it seems like they all start acting up. I don't know if it's something with the cold air and people not switching them over to electric mode... During the summer months, it's fine." – Plumber, Retrofit Installations

User Experience

Lack of troubleshooting / maintenance

- Not manually switching to electric mode in colder temperatures
- Dirty or blocked air filter
 - Inadequate airflow in surrounding space
 - Cooking in garage leading to grease build up

Loud fan noises

Vibration

Sulfur odor / smell

Installers report more callbacks for HPWH units installed in colder areas with inadequate airflow or air temp and those of certain brands.



HPWH Location (in Home and State Region)

- Slightly more Installers in **northern regions of WA with colder climates mention issues with lack of hot water**
 - Common perception that HPWHs cannot operate in colder environments and attribute hot water demand issues to suboptimal locations such as unconditioned garages
- Some note **callbacks happen more in garages and closets** because customers stack items too close to the unit and don't leave enough surrounding space
- **Optimal unit function** requires spacious locations, allowing adequate airflow, and constant temperatures above 42 degrees Fahrenheit
- **Optimal usage experience** includes locations where customers don't mind cold air and noise produced by the unit

Brands of HPWH Installed

- Most Installers report **no significant differences in functionality issues across brands**
- But some experience **more issues with certain brands due to company contracts**, leading to more frequent installations of those brands
 - Some note **specific brands have more issues with control boards, compressors, and thermistors**
- Installers working with customer-purchased systems from hardware stores note that the units are built differently, have lower quality, and the warranties are worse compared to warehouse brands
 - Some believe more expensive units use higher-quality parts and are worth the investment
- Overall, Installers' perceptions of / satisfaction with brands depends on the customer service they receive from the manufacturer reps and techs



"I wish heat pump water heaters were not available to customers in home centers, like a Home Depot or Lowe's. Because I've had so many where people buy them, it's a completely wrong application, and they're very unhappy." – Plumber, Retrofit Installations

"We were getting A.O. Smith's a lot. The callbacks were the ECC code, which our rep used to nickname the 'death code.' So, it's essentially the compressor shutting down because the system's not working properly." – Plumber, Retrofit Installations

Installers have a typical process they follow when managing HPWH callbacks.

1 Receiving a Callback

- Customers contact the company to report their issue
- Customer service assesses whether they can troubleshoot over the phone or if a service visit is necessary, in which case they schedule an appointment with the Installer
 - Installers who have maintenance contracts with certain brands are likely to be directed to callbacks for that brand
 - For some, efforts are made to send the same Installer on service calls to maintain customer–installer relationships

2 Approaching Conversations with Customers

- Upon arrival, the Installer examines the issue and asks the customer to explain their experience, when it started, and how long it's been occurring
 - Some take time to explain the HPWHs functionality to help customers better understand the unit / the issue they're experiencing

3 Problem-solving Measures

- If the issue stems from improper installation, the Installer will address it
 - Most issues are attributed to the unit itself, though occasionally, Installers must correct issues left by others, such as improperly connected condensate lines
- If the issue is unit-related, they are required to contact the manufacturer for troubleshooting and support for the warranty to be honored
 - Installers explain the issue and error codes on the control board
 - If replacement parts are needed, the manufacturer will ship the parts, or the Installer will pick them up from a supply store (if they're available)

Callback Resolutions

- **Worn out / broken parts, Faulty Control Boards, Leaks**
 - Repair the units with the parts provided by the manufacturer or from a supply store
 - In rare cases, Installers may have parts on hand or can pick them up locally for same-day repairs
- **Hot water demand issues**
 - Installers advise customers to switch the unit to electric mode if related to colder temperatures
 - Addition of a mixing valve to help stretch the capacity of hot water if the tank is too small
- **Compressor failures or recurring part replacements**
 - HPWH may be swapped with a new unit or, in rarer cases, replaced with a different heating system (if the warranty has expired and the customer requests it), negating the energy efficiency benefits
- **Clean filters or flush condensate lines**



*"The customer calls and we get the technician that installed it back out there. Then **we call the manufacturer, run through their diagnosis, and then we order parts because parts typically aren't readily available.** So, now the customer is out of water or hot water for a day or two." – Plumber, Retrofit Installations*

Though HPWH-related issues are eventually resolved, they can take more than one visit, which prolongs job completion and increases costs for the customer.

- Issues with HPWHs are **generally resolved successfully**, though the **resolution timeframe varies** depending on whether they **must wait for parts or a new unit to be shipped** from the manufacturer
 - **Most cases require more than one service call**, as Installers do not have spare parts available
 - Additional service visits result in increased labor costs for the customer, which are not covered by the warranty
 - If the customer opts out of paying for expedited shipping, parts or replacement units **may take a few days to arrive, which extends job completion time**
 - A few mention they will **pre-order commonly needed parts** from supply stores in advance (if available) in hopes of same-day resolution / saving them a trip to the store
- Some Installers **believe issues will reoccur** with units not installed in optimal locations (adequate space and temperature) or if the tank size is insufficient to meet hot water demand, **viewing issue resolution as only temporary**



Customer Involvement

- Most Installers **do not encounter customers attempting to fix issues** with their HPWHs, especially when the unit is under warranty
 - During installations / service calls, Installers emphasize that tampering with the unit will void warranty coverage
- Some mention their customers **will research error codes and attempt to reset the unit** before contacting the company or manufacturer
 - Those who call the manufacturer directly are either given troubleshooting tips over the phone or are told to wait for a service member, depending on the issue



*“At this point, we kind of know what to expect. We prepare for that. **We carry several repair replacement parts** now, so we can start the claim, and have the manufacturer send us the repair parts. But we can go **address the client right away**, and then just replenish our stocks of the repair parts.”* – Plumber, New Construction

*“If it’s the compressor not working, then it’s a two visit [service call]. Sometimes it takes 10-12 days for the [control] board to show up. So, **within two weeks**. If all goes perfect...one week.”* – Plumber, Retrofit Installations

The unique nature of HPWHs presents challenges for Installers who must invest more time into troubleshooting with manufacturers, navigating complex applications, and waiting for specialized parts to arrive.

Challenges of Callbacks

Manufacturer Involvement

- Installers have **less autonomy due to warranties and specialized parts**, often needing to troubleshoot with manufacturer techs
 - **Adds more time and frustration** compared to callbacks for standard water heaters (e.g., gas and electric)
 - If parts are not on hand, must get them from supply stores or wait for new parts / unit delivery
 - **Causes delays in job completion and may require more than one visit to resolve the issue**, leading to additional labor costs for the customer

Location installed within the home

- HPWHs are **not always compatible with the design of preexisting homes**
 - Designers of new homes **may not be aware of the additional space and location requirements**
 - **Makes navigating tight spaces difficult** during installation / repair
 - Leads to **poor application of the units** that impact their operability (e.g., inadequate airflow and cold temperatures)

Unique build of HPWHs

- More components compared to traditional water heaters; perceived **increase for unit-related errors** and creates more time and work for the Installers
 - Contains **HVAC-related parts which some are not familiar with**
 - If lines are tied into other systems (i.e., air conditioning), **may need to bring in an HVAC specialist**
 - Unlike standard water heaters, **full units need to be replaced** if internal components can not be repaired

Pressure / resistance from customers

- **Keeping customers happy to maintain business is at the forefront**, especially for Installers who work at smaller companies or have a leadership / sales role
 - Customers can **be resistant to alternative location suggestions** due to potential structural changes and high expenses, even if it would improve efficiency

- **Most Installers are unable to anticipate HPWH callbacks, attributing issues to undetectable unit malfunctions**
 - However, a few expect to receive callbacks when servicing or replacing units in locations without adequate airflow or tempered air



Perceptions of Heat Pump Technology

While some callbacks taint Installers' perceptions of HPWHs, others are hopeful their experience with HPWHs will improve in time.



Impact on Installers

- Installers with frequent callbacks tend to have a less favorable view of HPWHs and express negative impacts
 - Small companies / owners note callbacks interfere with opportunities for more revenue-generating work
 - Some worry their customers perceive them as unprofessional because they have to defer to the manufacturer for troubleshooting
 - Those required to install HPWHs become frustrated with what they perceive as 'unavoidable' callbacks
- However, some Installers remain optimistic, believing HPWH performance will improve over time as the units evolve



Impact on Customers

- Customers are often unhappy when Installers show up during callbacks, especially if they are left without hot water while waiting for parts / a new unit or when services require additional costs
 - A few upset customers may demand a complete unit swap if they don't want to wait and/or if their unit is past warranty

Factors Considered as a Result of Callbacks



Installation

- Aim to ensure the unit is installed correctly to avoid installation-related issues (e.g., loose fittings that may lead to leaks)
 - Follow installation directions from the manufacturer, as it can vary by brand



Callbacks

- Prepare by bringing replacement parts to service calls to address the issue in one visit and avoid delays waiting for parts



"It's hard because when we go there, we have to tell the customer, 'I don't know how to fix this. I have to call the person who makes it.' And sometimes that makes me feel a little unprofessional." – Plumber, New Construction

Installers want to feel more confident in HPWHs with more reliable units, more independence, and more training.

Unit-based

- **Unit compatibility** within existing home designs for better integration when switching from traditional water heaters
- **High-quality components** (e.g., compressors) for enhanced durability
- **Improved awareness of appropriate placement** in colder environments
- **Larger capacity** and **quicker hot water recovery time**
- **Auto switch to electric mode** when temperatures drop below 42
- Option to **manually adjust the fan direction for better airflow** and avoid repositioning the unit during installation



Installers' Unmet Needs and Desires with HPWHs



Education-based

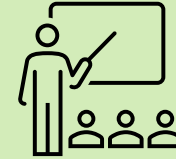
- **Improved training on proper system maintenance**, as well as clear guidance for customers on upkeep
 - **Collaboration** among HVAC specialists, electricians, builders, and plumbers to ensure proper application and performance of the units
 - **Customer education** on differences between HPWHs and traditional water heaters, emphasizing their need for hands-on involvement (e.g., cleaning filters, manually changing modes, flushing condensate lines)

Manufacturer-based

- **Greater autonomy** for installers to fix units independently rather than having to troubleshoot with the manufacturer
 - Especially if they have the parts on hand / they're available at a nearby supply store
- **Streamlined troubleshooting process** with the manufacturer to avoid long call times and expedite repairs
- **Additional parts 'kits' available** for repairs, similar to supplies installers have on hand for other standard water heaters
- **Extended labor warranties** beyond one year to alleviate customer frustration with repair costs

Most Installers have received training on technology within the plumbing industry and are interested in HPWH education opportunities.

- **Most Installers are open to attending HPWH workshop opportunities (in-person and/or online) to better understand unit operation**
 - Believe it will provide increased confidence and peace of mind during callbacks
 - Value the ability to ask questions to individuals who know the ins and outs of the unit
- **Training Areas of Interest:**
 - Unit build and internal components
 - Effectively addressing common issues
 - Explanation of error codes
 - Similarities and differences compared to other water heaters
 - Maintenance requirement differences
 - Proper installation techniques
- **Some Installers with negative perceptions of HPWHs due to frequent callbacks have less confidence in training, claiming unit-specific issues are beyond their control**



About half of Installers (more from larger companies and/or over 10 years of industry experience) have received non-HPWH training from supply houses, manufacturer reps, or through their company

- Supply houses provide refreshers on installation, service repairs, and information on new products / brands
- Some have traveled to manufacturer locations to receive formal training, while others have reps visit their company for “lunch and learns”



*“I would love to **learn more about taking apart the heat pump and have a more in-depth understanding of how to build it...** Having the hands-on training is something that would make it easier than having to research it when [callbacks] do happen.” – Plumber, Retrofit Installations*

Educational materials are perceived as highly valuable, especially for Installers who communicate HPWH maintenance best practices to their customers to avoid potential issues.

- Installers believe customers would benefit from education on HPWH operation and maintenance
 - Value information as a supplement to what Installers share during installations / service calls

Beneficial HPWH Information

- **General education**
 - How the unit works
 - How the unit is different from their previous water heater
- **Maintenance practices**
 - Avoiding placing items too close to the unit to ensure proper airflow
 - Cleaning the filter and flushing the system
 - Turning on “vacation mode” before going away to save energy
- **Troubleshooting tips**
 - Switching the unit to electric mode during colder months
 - Using a space heater in the colder months for garage units

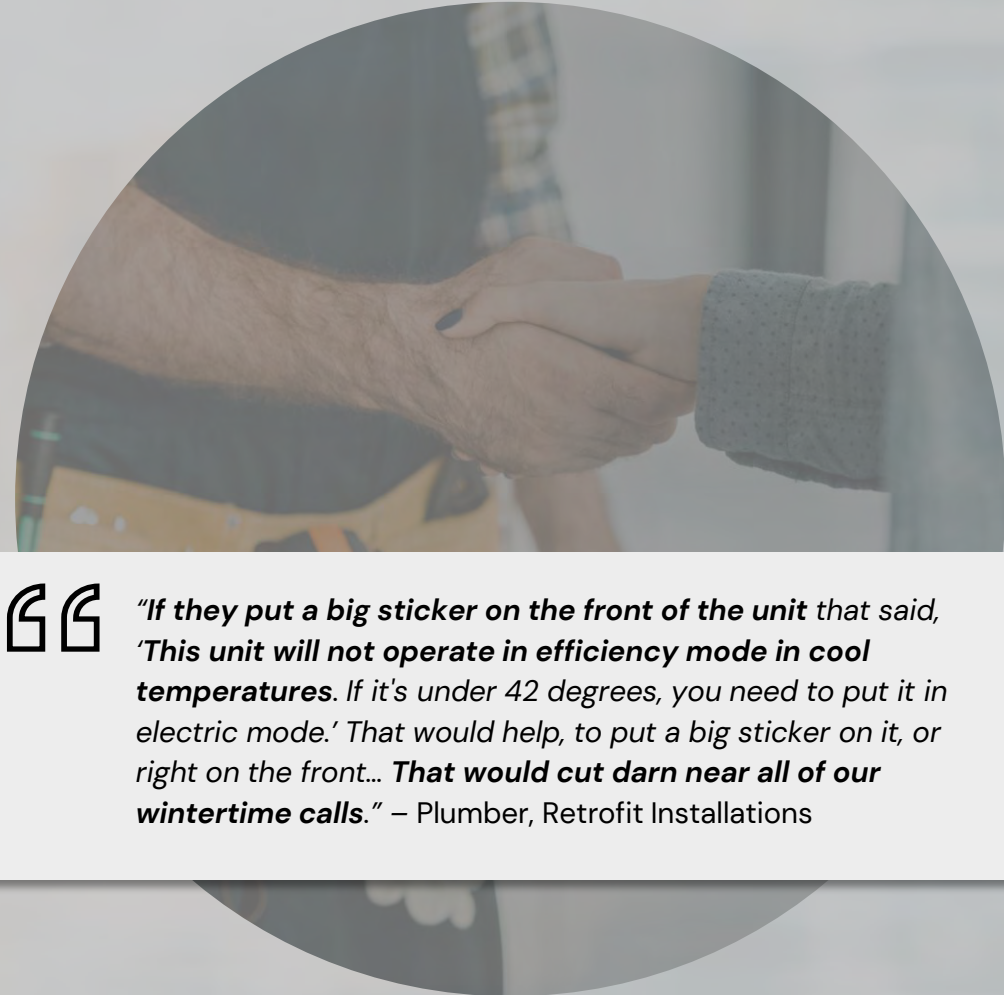


Modes of Information

- Brochures / pamphlets
- Stickers on the unit
- Video demos
- Emails
- Social media ads / posts



*“If they put a big sticker on the front of the unit that said, ‘This unit will not operate in efficiency mode in cool temperatures. If it’s under 42 degrees, you need to put it in electric mode.’ That would help, to put a big sticker on it, or right on the front... **That would cut darn near all of our wintertime calls.**” – Plumber, Retrofit Installations*



Some Installers are aware of new technology in the plumbing industry, receiving new information from suppliers, manufacturers, their companies, and through personal research.

- **New Technology in the Plumbing Industry:**

- Two-piece unit with a fan outside and the tank inside the home
- Compressors that can work in lower temperatures
- Electric tankless wall-mounted unit
- Touch screen control board for diagnostics
- CO2 refrigerant
- New manufacturers producing HPWHs (American Standard and Brunei)
- Integrated systems (HPWH and HVAC or HPWH and radiant floor heating)
- Geothermal HPWHs; piping water from a well



*“They’re now integrating heat pumps within floor heating systems... I was reading it on my **Local 32 union page**... [Also], **supply houses have pretty good bulletin boards**, and they give **workshops** from time to time.”* – Plumber, Retrofit Installations

Sources of Information

- **Supply Company**
 - Pamphlets and brochures
 - Bulletin boards
- **Manufacturer**
 - Rep information and training
 - Demos on performing diagnostics or troubleshooting
- **Installers’ Company**
 - Local union page
 - Bulletin boards
 - Workshops
 - Conversations with colleagues
 - Hands-on experience in the field
- **Personal search**
 - Researching online (Manufacturers website)
 - Emails / Newsletters / Magazines (Plumber Magazine, Home Builder Executive Magazine)
 - Social media pages (YouTube, Facebook)
 - Books (Caleffi on the fundamentals of HPWHs)



Appendix

Installer Differences Snapshot Summary

Positive HPWH Perceptions

- Most Installers recognize the **importance of energy efficiency** and appreciate the role HPWHs play in energy conservation
 - View HPWHs as the **future of water heating** and are **optimistic** about advancements in the technology over time
 - Installers with **strong relationships** with their **contracted manufacturers** tend to have more positive perceptions of HPWHs and are less negatively impacted by HPWH callbacks

Negative HPWH Perceptions

- However, some Installers who experience **frequent callbacks** are more resistant to the transition from traditional units to HPWHs
 - Feel they are **forced** to install / service HPWHs because of the energy code requirements and view HPWHs as **inferior to gas or electric units**
 - Experience **callback fatigue** from repeated visits to customers' homes to address issues
 - Frustrated by the **additional components** (heat pump and screen / control board), which they see as more parts with potential for failure

Callbacks have a negative impact on perceptions of HPWHs

- Those who had more than 10 callbacks in the past 2 years are less likely to recommend HPWHs
- Slightly more in the northern regions mention colder climates as more of an issue with callbacks
- Slightly more who service units / install retrofits that are in-home (not in the garage) are less favorable towards HPWHs, as limited surrounding space restricts airflow and complicates maneuverability
- Some Installers with negative perceptions of HPWHs due to frequent callbacks have less confidence in training, claiming unit-specific issues are beyond their control
- Installers who are more open to new technology have slightly more positive perceptions of HPWHs compared to those who are less open, preferring to stick with what they are familiar with (e.g., standard electric and gas units)

Perceptions of other water heating systems

- **Standard electric and gas (tank and tankless) water heaters are the most commonly installed systems, valued for their simplicity and efficiency**
 - Perceived to have fewer callbacks and are easier to repair, as parts are often readily available (on-hand or at supply stores), and Installers typically don't need to rely on manufacturers for troubleshooting or material shipments
 - Gas tankless units are considered highly efficient with hot water recovery as they heat water on demand
 - Also valued for compactness, which saves significant space and simplifies the process
 - However, they are more expensive, and customers are not always willing to pay the higher upfront costs



*“Around here, **gas water heaters are the best...** It’s **cheap and efficient.** They’re tank style. We’ve done a few on demand ones, but for the most part they’re just tank style.” – Plumber, New Construction*

*“**If they’re able to meet energy credits, I would highly recommend a tankless unit.** I feel they’re a lot more efficient. They’re **only burning fuel when they’re running, when the demand for hot water is there,** and you have endless hot water **so you never run out of hot water. They’re small, compact. You can fit them in various areas.** Those two things right there speak for themselves, I feel like.” – Plumber New Construction*

Discussion Flow



About You & Perceptions of Current HPWHs

- Respondent introductions and experience as a HPWH installer / technician
- Types of HPWHs installed within the past 2 years (retrofit vs. new)
- Brands of HPWHs installed
- Location in homes HPWHs are installed and types of homes (single-family vs. multifamily)
- General HPWH installation process
- Perceived advantages / disadvantages of HPWHs
- Satisfaction with the installation process, perceived customer satisfaction, and likelihood to recommend

Understanding Callbacks & HPWH Issues

- Number of HPWH-related callbacks received in the past 2 years
- Nature of HPWH-related callbacks
 - Including certain brands and/or areas of homes more prone to issues
- General process of managing HPWH callbacks
 - First notification
 - Approaching discussions with customers
 - Problem-solving measures
 - Situation resolution
- Challenges faced during HPWH callbacks
- Impact of HPWH callbacks on Installer and customer
- Whether Installers can predict which HPWH installations will require a callback

Perceptions of Heat Pump Technology

- Impact of callbacks on overall perceptions of HPWHs
- Unmet needs and desires for increasing willingness to recommend HPWHs
- Interest in training opportunities for Installers and educational materials for customers
- Awareness of new technology in the HPWH space
- Sources used to receive new information on plumbing-related systems