BONNEVILLE POWER ADMINISTRATION

Northwest HVAC Sales Insights

2022–2024

Report Overview

Bonneville Power Administration (BPA) has partnered with the Northwest Energy Efficiency Alliance (NEEA) for the past eight years to gather and analyze heating, ventilation, and air conditioning (HVAC) equipment sales data from suppliers across the Northwest. This report presents recent sales trends from 2022 through 2024, focusing on key residential technologies including air source heat pumps (ASHP), variable speed heat pumps (VSHP), mini-split heat pumps (MSHP), gas furnaces, and central air conditioners (CAC).

The analysis performed by BPA and Resource Innovations (the research team) indicates that the supplier dataset captures a substantial share of residential HVAC activity in the Northwest. Accordingly, this report centers on the residential sector and highlights the technology mix and efficiency distribution of major heating and cooling equipment from the supplier dataset as representative of the entire Northwest regional residential HVAC market.

This report evaluates the second year of market impacts following the new federal efficiency standards implemented in early 2023. Together with other market drivers and regional program efforts, these developments continue to shape HVAC sales trends across the Northwest. The findings inform BPA's Residential HVAC Market Model, contribute to regional power planning, and support program and market transformation efforts.

While this report emphasizes results from 2022–2024, historical data from 2016–2021 is available for reference.[1]

2022–2024 Northwest Residential HVAC Sales Trends

- Sales volumes rebounded in 2024 following the decline observed in 2023.
- Combined heat pump sales exceeded gas furnace sales for the third consecutive year.
- VSHP sales outnumbered ASHP (single- and two-stage) sales in 2024 for the first time.
- Vertical discharge VSHP sales nearly doubled from 2023 to 2024, while horizontal discharge VSHP sales remained relatively flat.

1 https://www.bpa.gov/-/media/Aep/energy-efficiency/momentum-savings/2016-2021-hvac-sales-data-summary.pdf

Description of Collected Data

NEEA collected the sales data, relying on trusted relationships with regional HVAC suppliers. NEEA also augmented the data by matching equipment model numbers to equipment efficiency attributes from the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) certification database, marking the first time this model-matching process has been conducted internally rather than being outsourced.

The data collected are from suppliers who sell products in Oregon, Washington, Idaho, and/or Montana. While there was supplier attrition this year, the larger suppliers have participated consistently over the last few years.[2] Nearly all are traditional HVAC distributors, while a few are manufacturers or manufacturer representatives.

The collected sales data for residential-sized products are mainly distributed among the key technologies listed in Table 1: ASHPs, VSHPs, MSHPs, gas furnaces, and CACs.

A Note on Commercial Sales

While many of the suppliers who provided data sell to both the residential and commercial sectors, none of them distribute solely to commercial buildings. Many commercial sales go through manufacturer representatives, which are currently underrepresented in the data. As a result, the collected data include significantly limited information on commercial equipment, as categorized based on capacity and power requirements.[3] Some commercial buildings use smaller, residential-sized equipment,[4] but the sales data do not provide insights into where technologies are installed. Given the limited commercial data availability, this report focuses on residential-sized equipment. Table 2 in Appendix A provides quantities of commercial equipment from the collected data.

2 NEEA onboarded a new HVAC account manager to improve supplier participation next year.
3 All ASHP, CAC, and MSHP over 60 kBtu/hr, all furnaces over 225 kBtu/hr, and any equipment that requires three-phase power were classified as commercial.
4 https://www.bpa.gov/-/media/Aep/energy-efficiency/momentum-savings/2022-commercial-hvac-permit-database.xlsx

TABLE 1 Description of Key Residential Technologies in the Collected Data

Name	Abbreviation	Description
Air Source Heat Pump	ASHP	A single- or two-stage outdoor compressor that provides electric heating and cooling to a centrally ducted indoor air handling unit (AHU).
Variable Speed Heat Pump	VSHP	A variable speed, sometimes called inverter-driven, compressor that provides heating and cooling to a centrally ducted indoor AHU. VSHP includes any MSHP that manufacturers always pair with an indoor AHU. VSHP may have either vertical discharge or horizontal discharge outdoor units.* Vertical discharge units expel air upward through the top of the cabinet, while horizontal discharge units direct airflow out the side, a distinction that can influence both installation space and airflow patterns.
Mini-Split Heat Pump	MSHP	A variable speed outdoor compressor with a horizontal discharge fan that serves one or more indoor units. The indoor units are most commonly ductless but can also be short-ducted, paired with an AHU, or have a combination of ducted/ductless configurations.
Gas Furnace	n/a	An indoor AHU that provides heat from the combustion of natural gas. These can be condensing or non-condensing units.
Central Air Conditioner	CAC	An outdoor compressor that provides cooling to a centrally ducted indoor AHU. CACs are typically paired with gas furnaces to provide both heating and cooling.

*The research team distinguished between vertical discharge and horizontal discharge units through developing a list of specific model numbers known to represent horizontal discharge heat pumps that are always installed in centrally ducted locations. This list was determined by reviewing manufacturer websites and cutsheets.

5 https://www.bpa.gov/-/media/Aep/energy-efficiency/momentum-savings/2016-2021-res-hvac-market-model-report-eo-compliant.pdf

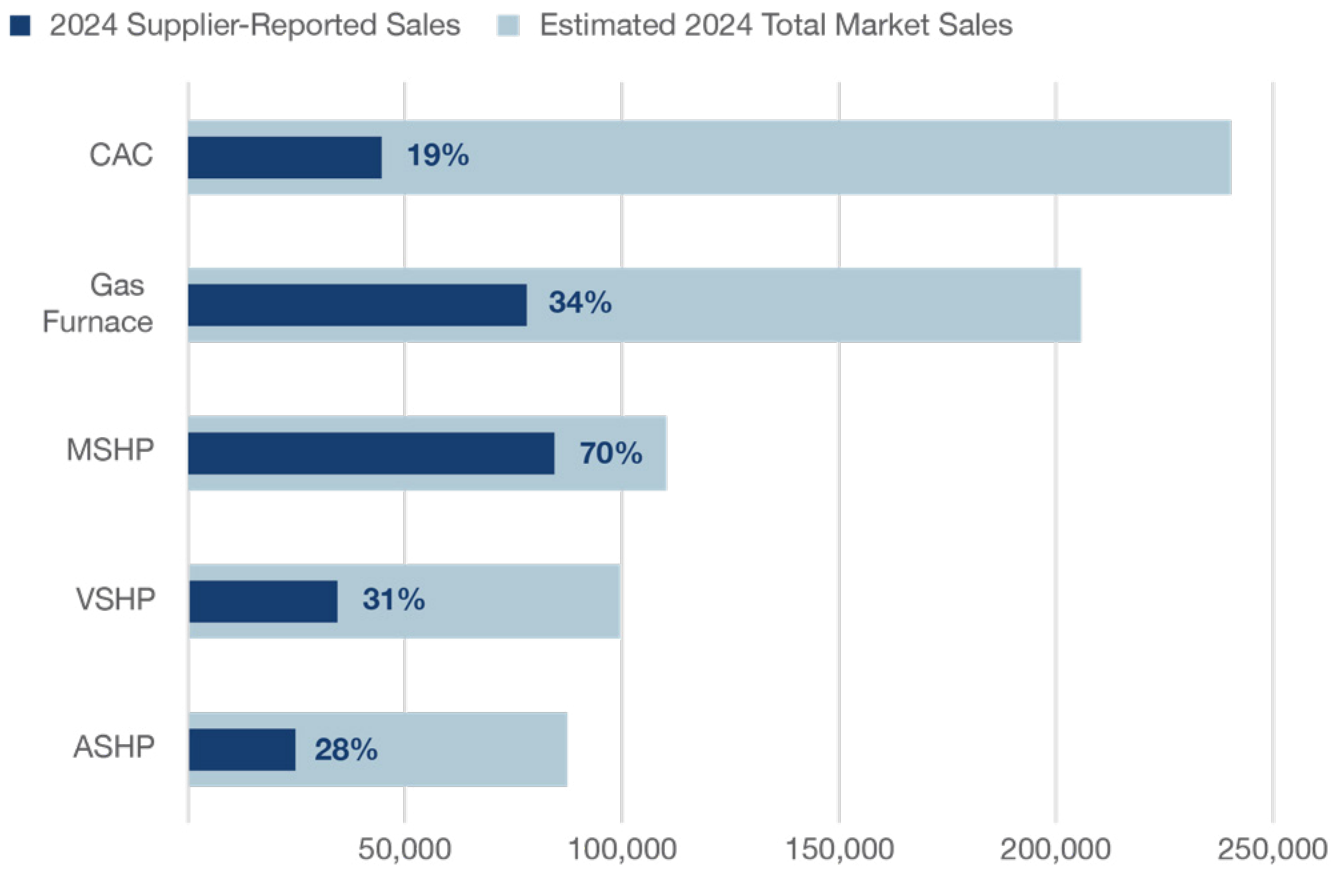
6 BPA's 2021-2027 Interim Residential HVAC Market Model produced technology-specific estimates of total market sales for the main residential technologies using a stock turnover model and various data sources. The research team applied 2021-2024 growth rates from the collected sales data to the model's 2021 total sales estimates to obtain the 2024 total sales estimates.

Market Coverage

The 2024 collected sales data contain over 250,000 units covering the above key residential technologies. Appendix A provides the collected sales volume by technology, including other less common residential-sized technologies. Since participating suppliers do not represent the entire regional market, the research team used BPA's Residential HVAC Market Model to estimate overall market coverage by technology.[5] Figure 1 compares the share of sales reported by participating suppliers with the estimated total market sales.[6] Supplier-reported sales data in Figure 1 represent the raw sales data from participating suppliers prior to any data extrapolation.

MSHPs achieved the strongest market coverage among the five technologies. Reported MSHP sales account for roughly 70 percent of the total Northwest residential market—reflecting NEEA's long-standing engagement with MSHP distributors and manufacturers. ASHPs, VSHPs, gas furnaces, and CACs each represented approximately 20–30 percent of the estimated overall regional, Northwest residential market.

FIGURE 1 Market Coverage of 2024 Collected Residential Sales Data

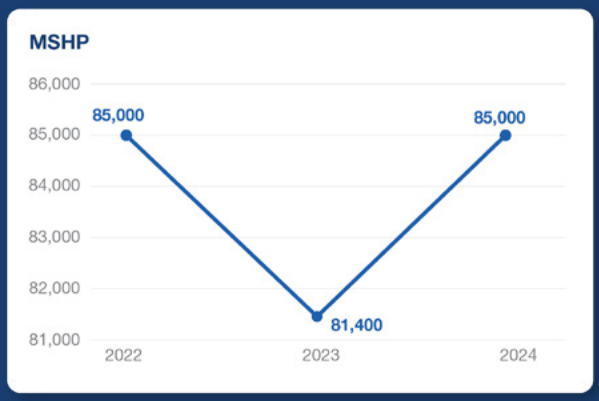


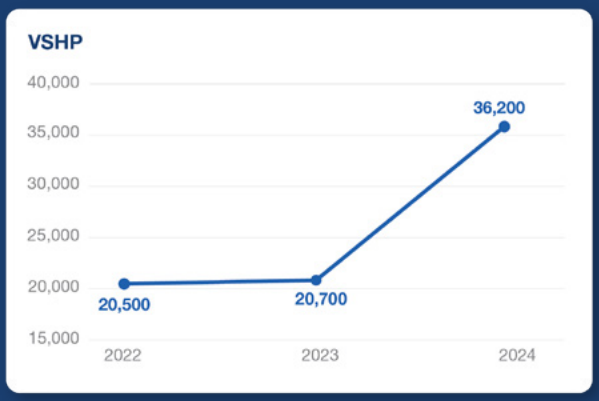
Residential Insights

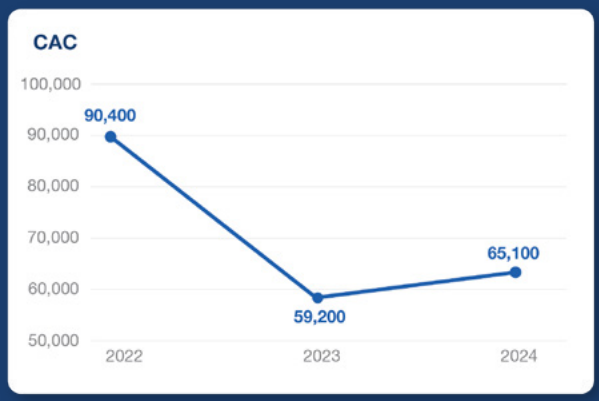
This section provides insights from the 2022–2024 collected sales data (post-extrapolation) for residential applications specific to these five technologies: ASHPs, VSHPs, MSHPs, gas furnaces, and CACs.

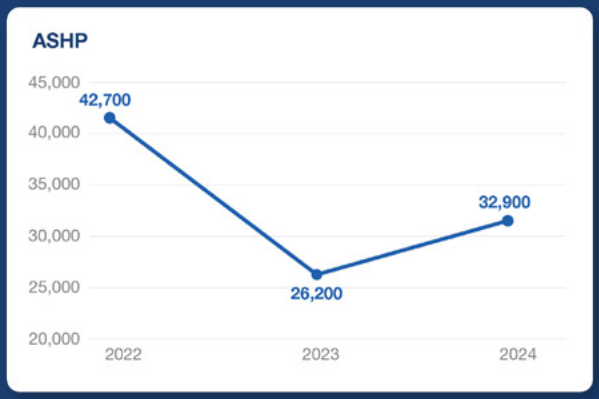
As illustrated in Figure 2, the 2024 data show a sales rebound from 2023 for most key residential technologies. This trend is consistent with AHRI shipment data and may reflect distributor inventory build-up ahead of the 2025 refrigerant transition.

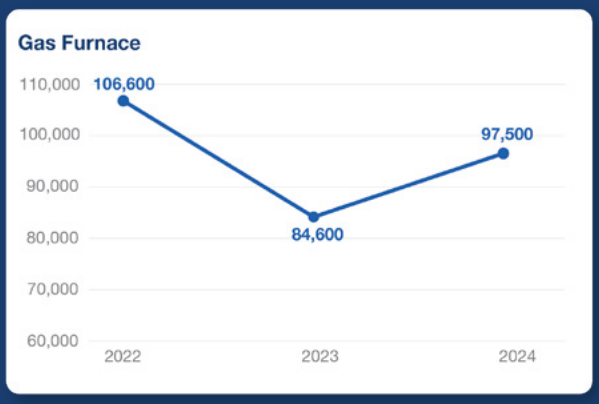
FIGURE 2 Sales Volume by Technology, 2022–2024











Inverter-Based Systems

From 2023 to 2024, inverter-based technologies (VSHPs and MSHPs) experienced a stronger increase in sales than non-inverter systems, reflecting the region's continued shift toward higher-efficiency equipment. Over the past decade, inverter-driven systems—first through MSHPs and more recently through VSHPs—have steadily expanded their market share in the Northwest as performance, installer familiarity, and incentive support have increased.[7,8]

Non-Inverter Systems

As overall HVAC sales recovered in 2024, sales for non-inverter systems saw relatively modest increases compared to 2023. While they continue to represent a substantial portion of the Northwest market, growth for ASHPs, CACs, and gas furnaces has been slower than for inverter-based systems, reflecting their lower efficiency, fewer incentives,[9] and competition from inverter-based technologies.

7 NEEA market progress reports show sustained long-term growth in MSHP adoption since the mid-2010s. https://neea.org/wp-content/uploads/2025/03/Ductless-Heat-Pump-2022-Long-Term-Monitoring-and-Tracking-Report.pdf

8 VSHPs have emerged as a rapidly expanding segment in the early 2020s. https://www.bpa.gov/-/media/Aep/energy-efficiency/momentum-savings/2016-2021-res-hvac-market-model-report-eo-compliant.pdf

9 While Section 25C of the Inflation Reduction Act specifies a $2,000 incentive for high-efficiency heat pump systems, this incentive is only $600 for CACs and gas furnaces. https://www.energystar.gov/about/federal-tax-credits

Key Heating and Cooling Technology Mixes

Figure 3 ranks each technology by annual market share for heating equipment sales from 2022–2024. The portion of gas furnace sales dropped below 50 percent for the first time in 2022, with the majority of heating sales provided by the three categories of heat pumps. This trend continued through 2023 and 2024 as gas furnace market shares declined each year. Figure 3 also highlights that VSHPs grew from 8 percent of sales in 2022 to 14 percent in 2024, an increase of nearly 80 percent across the period, and surpassed ASHPs for the first time in 2024.

FIGURE 3 2022–2024 Heating Technology Mix of Collected Sales Data

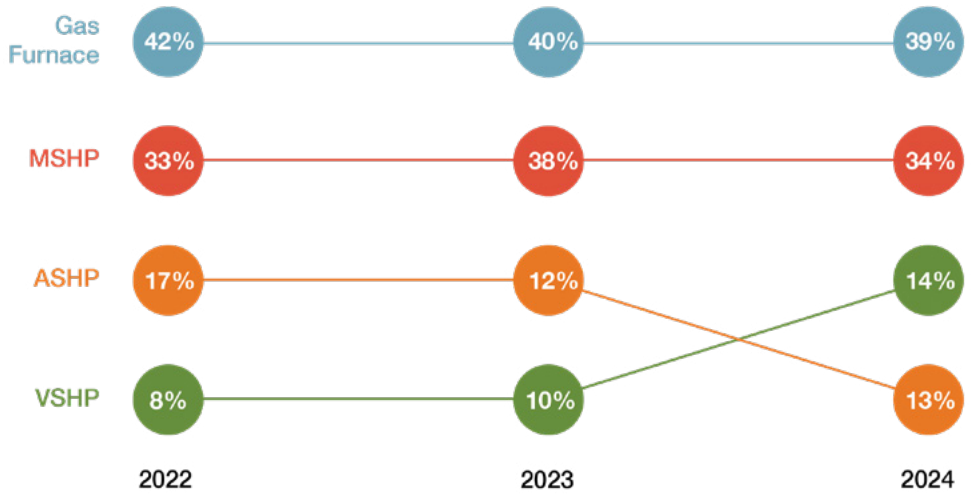
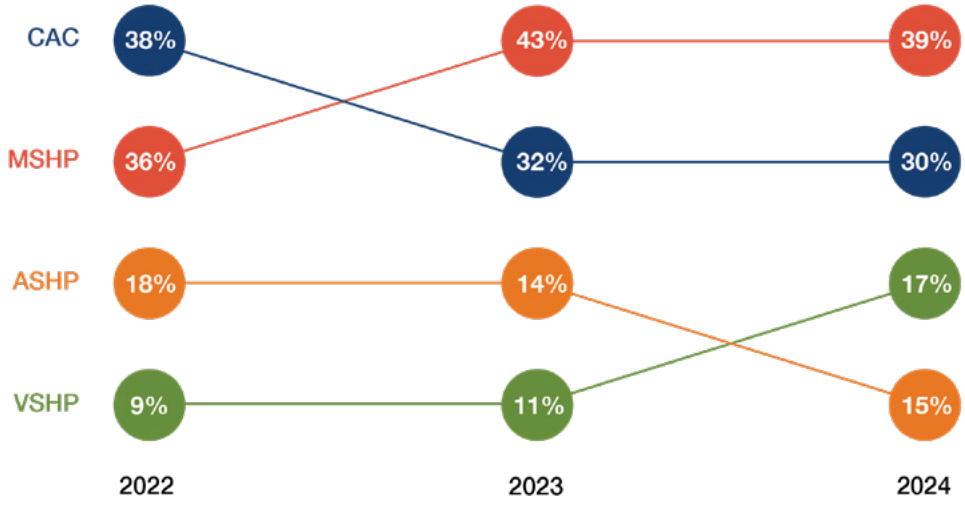


Figure 4 ranks each technology by annual market share for cooling equipment sales from 2022–2024. In 2022, combined heat pump sales outpaced CACs for the first time, and the market share of CACs continued to decline each year. In 2023, MSHPs became the top-selling cooling technology, surpassing CACs in annual sales.

FIGURE 4 2022-2024 Cooling Technology Mix of Collected Sales Data

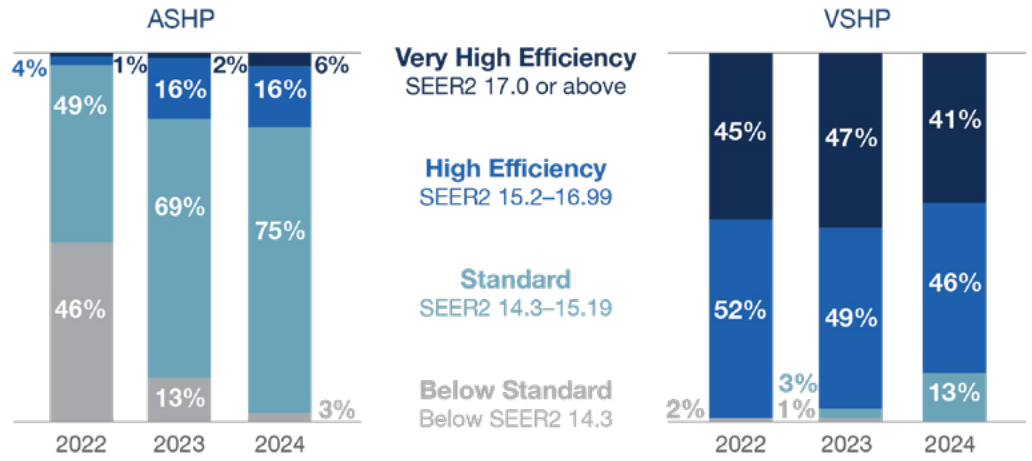


ASHPs and VSHPs

Centrally-ducted heat pumps, both ASHPs and VSHPs, represent over a quarter of heating equipment sales, with similar representation in cooling equipment sales. In 2024, VSHPs outpaced ASHPs for the first time. As noted in Table 1, ASHPs are defined in this report as including only single- and two-stage ducted split-system units, whereas VSHPs are defined as ducted split-system units with variable speed compressors.

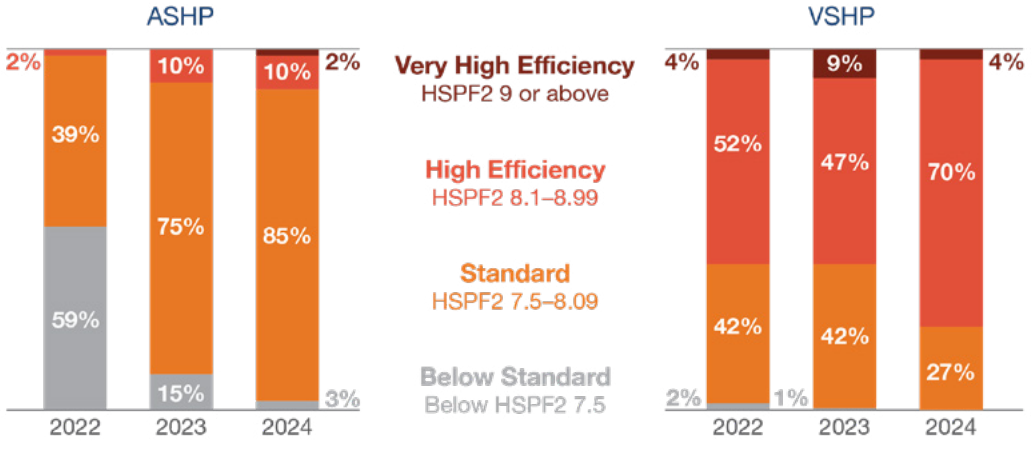
VSHP sales span a variety of cooling efficiency levels above the federal standard, but on average have higher SEER2 than ASHPs (as illustrated in Figure 5). While there are many factors that affect energy use,[10] modeling shows that a typical VSHP consumes less energy than the highest tier of ASHPs.[11]

FIGURE 5 Ducted Heat Pump Cooling Efficiency Levels



For heating efficiency, ASHPs are primarily at the "Standard" efficiency level. As a result of the federal standard implemented in early 2023, the share of ASHPs in the "Below Standard" tier continues to decline as pre-2023 units are sold through. VSHPs showed elevated heating efficiencies, with almost all the units now classified as "High Efficiency" (as demonstrated in Figure 6) or above.

FIGURE 6 Ducted Heat Pump Heating Efficiency Levels



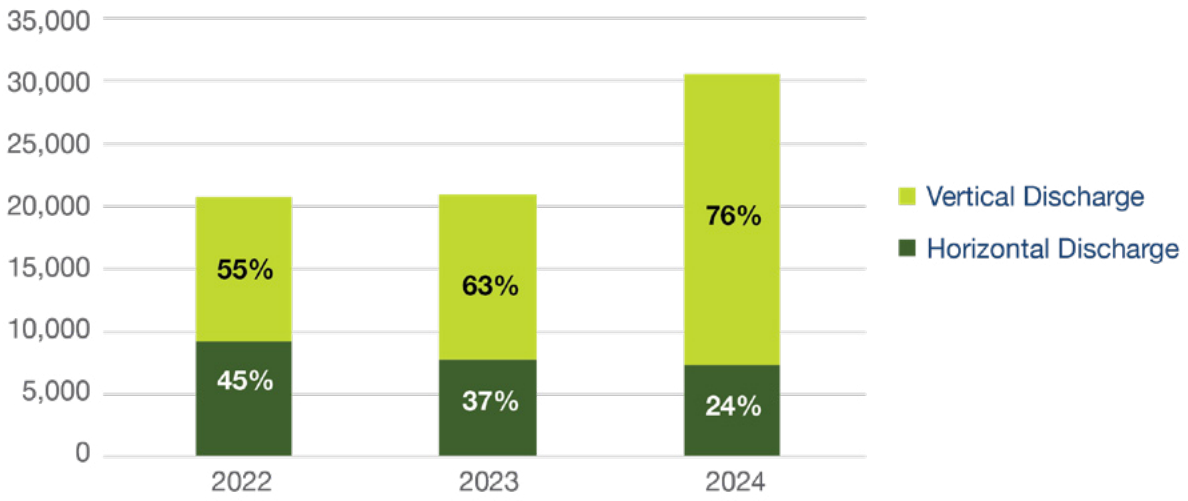
10 For example, the sizing of the heat pump, duct sizing, duct insulation, and controls.

11 Source: https://www.bpa.gov/-/media/Aep/energy-efficiency/momentum-savings/2016-2021-res-hvac-market-model-report-eo-compliant.pdf

ASHPs and VSHPs

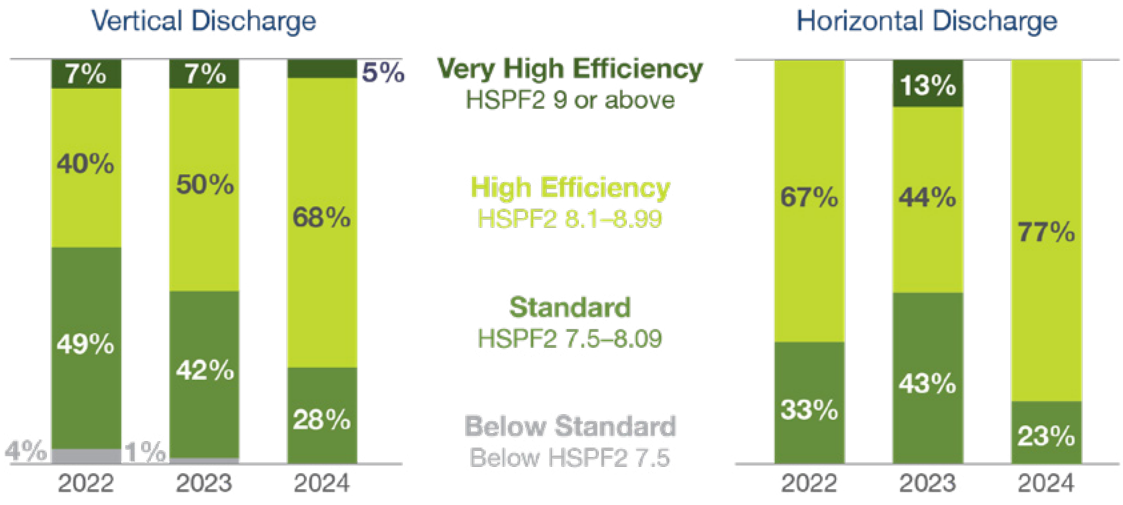
The sales data distinguishes between vertical and horizontal discharge VSHPs. While the sales of horizonal discharge VSHPs remained relatively consistent from 2022 to 2024, the sales of vertical discharge units almost doubled from 2023 to 2024 (as shown in Figure 7).

FIGURE 7 2022–2024 Sales of Vertical and Horizontal Discharge VSHPs



In a side-by-side comparison, Figure 8 highlights that heating efficiencies are similar between vertical and horizontal discharge configurations, indicating that orientation does not significantly affect rated performance. The efficiency bins shown in Figure 8—and used in the remainder of this report—are based on federal standards and levels defined by the Consortium for Energy Efficiency (CEE).[12] Additional details are provided in Appendix B.

FIGURE 8 Heating Efficiencies for Vertical and Horizontal Discharge VSHPs



12 Some of the percentages in Figures 5-12 may not add to 100 percent due to rounding.

MSHPs

MSHPs represented 34 percent of all heating equipment sales in 2024. Similar to VSHPs, they use inverter-driven compressors but are only horizontal discharge and are often applied in smaller or zone-based installations. Distributors supply MSHPs in both single- and multi-zone configurations, featuring ductless indoor fan coils, concealed short-duct systems, or combinations of the two.[13] In some cases, MSHPs are also connected to full-sized air handlers for whole-home applications. Although ducted and mixed installations have become more common in recent years, the majority of MSHPs still serve fully ductless systems—resulting in their common classification as "ductless heat pumps."

MSHPs are subject to the same federal efficiency requirements as ASHPs. Since all MSHPs operate with variable speed compressors, none of the units sold in 2023 or 2024 fell below the current federal minimum standards, and nearly all 2022 equipment models were already compliant with the 2023 federal standard. On the cooling side, Figure 9 indicates that nearly all MSHPs achieved "Very High Efficiency" ratings from 2022 through 2024. For heating performance, Figure 10 shows a slightly smaller share meeting the "Very High Efficiency" threshold, though most units consistently exceeded "Standard" efficiency levels. Overall, MSHP efficiency remained strong and stable across the 2022–2024 period, with little year-to-year change.

FIGURE 9 MSHP Cooling Efficiency Levels

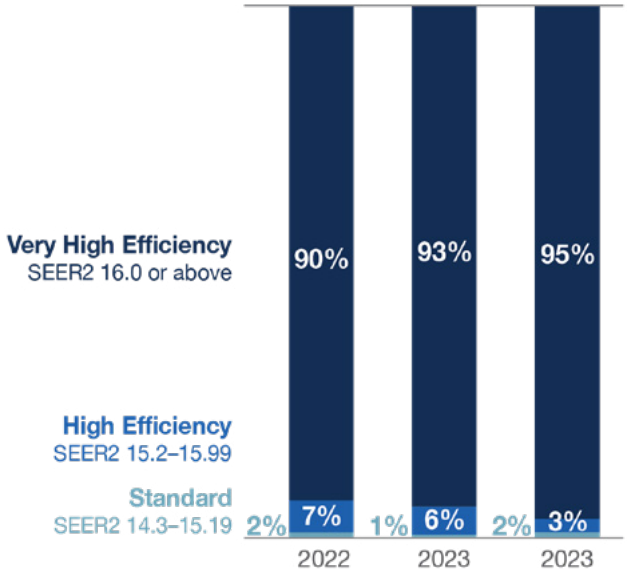
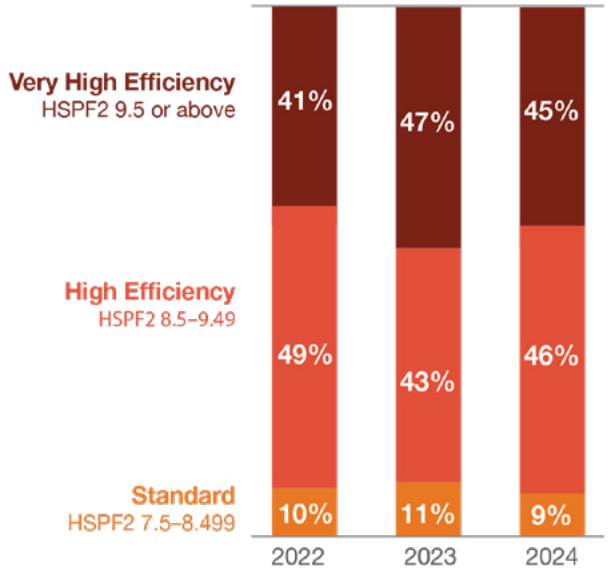


FIGURE 10 MSHP Heating Efficiency Levels

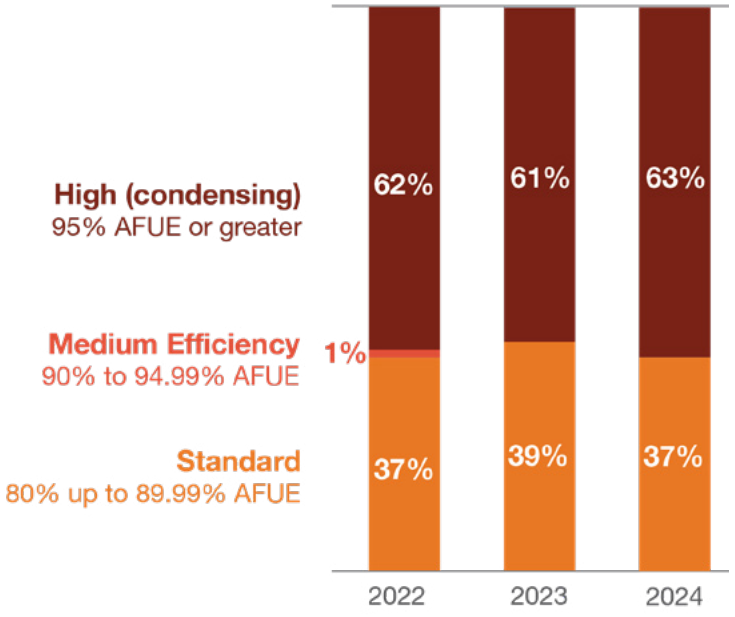


13 The research team was able to identify some MSHP models exclusively used in centrally-ducted systems and included them in the VSHP category.

Gas Furnaces

Overall, there has been little change in the market share or efficiency of gas furnaces from 2022 to 2024. The market share of gas furnaces relative to total heating equipment sales declined slightly, from 42 percent in 2022 to 39 percent in 2024. Figure 11 shows that gas furnace efficiency remains bifurcated, with 37 percent of units meeting the federal "Standard," and 63 percent classified in the "Very High Efficiency" tier in 2024. The latter group represents condensing furnaces with an annual fuel utilization efficiency (AFUE) of 95 percent or higher.

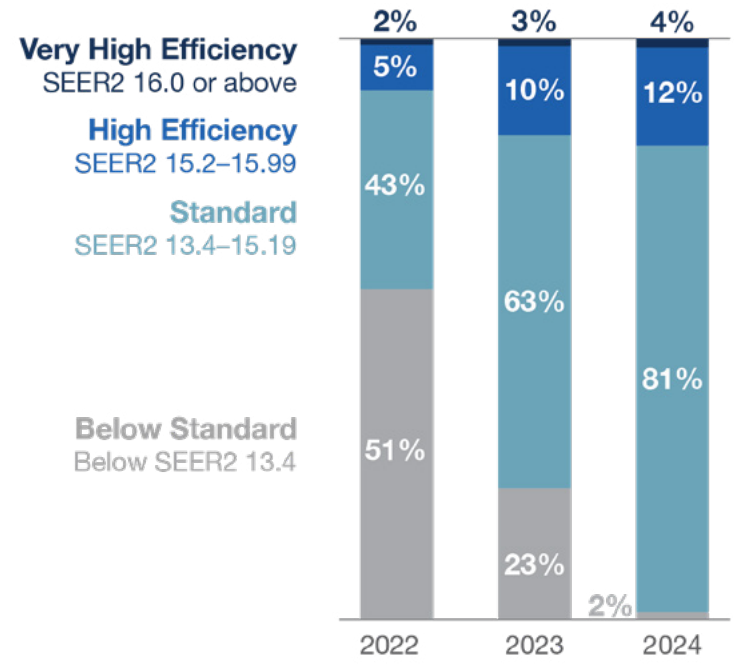
FIGURE 11 Gas Furnace Efficiency Levels



CACs

CAC sales declined by 28 percent from 2022 to 2024 and accounted for 30 percent of all cooling equipment sales in 2024. Although sales ticked up slightly from 2023 to 2024, CAC market share fell by six percentage points from 2022 to 2023, reflecting a decrease of roughly 30,000 units (as shown in Figure 2). Figure 12 shows that while updated federal standards and utility programs helped improve CAC efficiencies overall, the market has largely sold units that meet, but do not exceed, the "Standard" efficiency level. In 2024, more than 80 percent of CAC units sold were classified as "Standard" efficiency.

FIGURE 12 CAC Efficiency Levels



Appendix A: 2022–2024 Collected Sales Data

This section presents the 2022-2024 collected data's aggregated sales volumes by sector and technology (as shown in Table 2). This data include the team's adjustments to fill in minor temporal and geographic data gaps, as well as a sector categorization for residential and commercial equipment using the following criteria:

ASHPs, VSHPs, MSHPs, and CACs

- Residential: capacity of less than or equal to 5 tons (60 kBtu/hr).
- Commercial: capacity of greater than 5 tons (60 kBtu/hr).

Gas furnaces

- Residential: capacity less than 225 kBtu/hr.
- Commercial: capacity greater than or equal to 225 kBtu/hr.

All HVAC equipment

- All ASHP, VSHP, CAC, and MSHP over 60 kBtu/hr, all furnaces over 225 kBtu/hr, and any equipment that requires three-phase power were classified as commercial.

TABLE 2 2022–2024 Collected Sales Data by Sector and Technology

		Collected Sales Quantity		
	Technology	2022	2023	2024
Residential	Gas Furnace	106,565	84,639	97,456
	MSHP	85,370	81,422	85,444
	CAC	90,369	59,166	65,071
	VSHP	20,526	20,706	36,241
	ASHP	42,681	26,247	32,934
	Variable Speed Mini-Split and Multi-Split AC	4,230	3,024	3,022
	Boilers	608	710	446
	Direct Heating Equipment*	327	N/A	N/A
Commercial	Gas Packaged Unit	5,495	6,020	5,209
	Single Packaged Heat Pump	1,390	1,270	1,280
	Mini-VRF (Variable Refrigerant Flow) Heat Pump	2,739	1,706	1,015
	Unitary Large Equipment	1,085	440	890
	Packaged Terminal Heat Pump (PTHP)	1,228	824	762
	Single Packaged Vertical AC & HP**	N/A	414	495
	VRF***	111	N/A	388
	Water Source Heat Pump	281	406	177
	Packaged Terminal Air Conditioner (PTAC)*	643	N/A	N/A

*Direct heating equipment and PTACs were excluded from the analysis in 2023 and 2024 due to there being too few units and not enough supplier submissions.

**Single packaged vertical AC and HPs were excluded from the analysis in 2022 due to there being too few units.

***VRFs were excluded from the analysis in 2023 due to there being not enough supplier submissions.

Appendix B: New Federal Standards and Efficiency Metrics

As mentioned in the Residential Insights section, new federal standards took effect for heat pumps and CACs starting on Jan. 1, 2023. These federal standards required that manufacturers rate their equipment using SEER2 and HSPF2 rather than SEER and HSPF.

In addition to specifying new efficiency metrics, the new federal standards raised the minimum efficiency levels for these technologies. Table 3 highlights the increases in efficiency standards for these technologies, as well as the differences between the old and new metrics.

TABLE 3 Previous and Current Standards for Residential Heat Pumps and CACs

Technology	Previous Standards		Standards as of Jan. 1, 2023 (using old metrics)*		Standards as of Jan. 1, 2023 (using new metrics)	
	SEER	HSPF	SEER	HSPF	SEER2	HSPF2
ASHP & VSHP	14	8.2	15	8.8	14.3	7.5
MSHP	14	8.2	15	8.8	14.3	7.5
CAC	13	n/a	14	n/a	13.4	n/a

* Standards as of Jan. 1, 2023 (using old metrics) are from Table I-1 of 82 FR 1786 https://www.federalregister.gov/documents/2017/01/06/2016-29992/energyconservation-program-energy-conservation-standards-for-residential-central-air-conditioners

Translating Between New and Old Efficiency Metrics

Products manufactured and sold before 2023 typically have efficiencies reported in SEER and HSPF. For these units, the team converted prior efficiency values to SEER2 and HSPF2, allowing comparison to the 2023 and 2024 data. The team used a conversion methodology provided by AHRI.[14] Because the updated testing procedure calculates SEER2 and HSPF2 differently for ducted and ductless equipment, each uses a unique conversion factor based upon the presence of ducts in the HVAC system of interest. The research team used the multipliers shown in Table 4. For example, a ducted ASHP with an HSPF of 10 would be reclassified with an HSPF2 of 8.5.

TABLE 4 Multipliers Used to Translate from SEER to SEER2 and HSPF to HSPF2

System Type	SEER	HSPF
Ducted	0.95	0.85
Ductless	1.00	0.90

Efficiency Bins

The research team developed a system for categorizing equipment efficiency based on the federal standards and levels specified by the Consortium for Energy Efficiency (CEE). Table 5 contains information on how the efficiency categories developed by the research team relate to the federal standard and CEE efficiency tiers. The top three rows are cooling efficiencies and the bottom two rows are heating efficiencies. Some equipment sold is below the new federal standard. Federal law dictates that only the manufacturing of equipment must meet the updated standards, while allowing for the sales of previously-manufactured units in certain regions, including the Northwest.[15] It is worth noting that CEE published updated efficiency tiers that came into effect at the start of 2025, so the efficiency tiers listed below will become more stringent in next year's analysis.[16]

TABLE 5 Relationships Between Updated Efficiency Bins, Federal Standards, and CEE Tiers and Efficiency Bin Definitions

		Below Standard	Standard	High Efficiency (CEE Tier 1)	Very High Efficiency (CEE Tier 2)
		Below the new federal standard	Above the federal standard, but below CEE Tier 1	Above CEE Tier 1	Above CEE Tier 2
Cooling	ASHP & VSHP	SEER2 < 14.3	SEER2 14.3–15.19	SEER2 15.2–16.99	SEER2 ≥ 17*
Cooling	MSHP	SEER2 < 14.3	SEER2 14.3–15.19	SEER2 15.2–15.99	SEER2 ≥ 16
Cooling	CAC	SEER2 < 13.4	SEER2 13.4–15.19	SEER2 15.2–15.99	SEER2 ≥ 16
Heating	ASHP & VSHP	HSPF2 < 7.5	HSPF2 7.5–8.09	HSPF2 8.1–8.99	HSPF2 ≥ 9*
Heating	MSHP	HSPF2 < 7.5	HSPF2 7.5–8.49	HSPF2 8.5–9.49	HSPF2 ≥ 9.5

*No CEE Tier 2 available for ASHP and VSHP

14 https://www.resnet.us/wp-content/uploads/FS_Adndm71fSEER2_webpost.pdf

15 https://www.ecfr.gov/current/title-10/chapter-II/subchapter-D/part-430/subpart-C/section-430.32

16 https://cee1.my.site.com/s/resources?id=a0V2R00000sUQby

Developed for the Bonneville Power Administration in conjunction with Northwest Energy Efficiency Alliance

Contributors:

Jonathan Pinko, Isaac Schultz, Ciera Roy, Annaleigh McDonald
Resource Innovations

Please refer questions to:
Masumi Izawa, mrizawa@bpa.gov