MIDWEST COLLABORATIVE

Heat Pump Pricing Study

April 2026

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This report references a variety of resources from across the region. If you have any questions or would like more information or support, please reach out to info@mwcollab.org.

DEFINITION OF TERMS AND ACRONYMS

Below are common acronyms and definitions referred to in this report, along with links to relevant documents. A full glossary of terms is available on the Midwest Heating and Cooling Collaborative website: https://mwcollab.org/program-administrators/glossary-terms.

Acronym / Term	Definition
25C	A federal tax credit to make qualified energy-efficient home improvements, available through December 31, 2025
AFUE	Annual Fuel Utilization Efficiency
ASHP	Air Source Heat Pump – An electrically powered HVAC system that provides efficient heating and cooling
Cold Climate ASHP	An iteration of traditional heat pump technology, engineered to efficiently heat homes in extremely cold conditions, typically at or below 5°F, while also providing cooling during warmer seasons
CEE	Center for Energy and Environment
GSHP	Ground Source Heat Pump
HSPF/HSPF2	Heating Seasonal Performance Factor
HVAC	Heating, Ventilation, and Air Conditioning
R-454B	A lower GWP refrigerant intended to replace R-410A starting in January 2025
SEER / SEER2	Seasonal Energy Efficiency Ratio
TRM	Technical Reference Manual

EXECUTIVE SUMMARY

While interest in residential heat pumps has grown, accounts of installation costs can be both high and highly variable, leading to bid confusion and differing expectations. Why is this the case? The Midwest Heating and Cooling Collaborative (the Collaborative) investigated this core question. **This report outlines known air source heat pump (ASHP) equipment and installation costs and describes associated drivers of these costs.**

This research effort utilized a variety of methods and market actor perspectives including:

- A review of available **literature on ASHP installation costs**
- An analysis of **HVAC equipment installation costs** gathered from homeowners in Michigan, Illinois, and Minnesota (N=271 preliminary bids and final invoices)
- An analysis of **wholesale equipment prices** from distributors (N=4) in a major metropolitan area in the Midwest
- **Semi-structured interviews** with distributors (N=8), utility rebate providers (N=6), and non-utility program innovators (N=6) operating state-, region-, and nationwide

This research primarily focused on residential dual fuel ducted ASHP installations that replace existing central air conditioning (AC) systems while retaining backup fuel-fired furnaces (typically natural gas or propane).

Homeowner installation costs

Invoice and bid data gathered from homeowners across the Midwest indicated that installation costs vary greatly across all equipment types, with variability increasing when replacing full system combinations (a furnace *plus* an ASHP or AC). While cost ranges were wider when projects included an ASHP, even invoices for an AC and furnace combo spanned nearly $10,000, which suggests that cost variabilities are not isolated to ASHPs.

Data also indicated that an ASHP-only installation was an average of $3,400 more than a central AC installation (Table A). However, when subdividing invoices to consider compressor type, single-stage ASHPs were only about $1,600 more than standard single-stage AC equipment. While there was only one bid for the more efficient variable speed AC equipment, it suggested that single- or two-stage ASHPs may be less expensive, and variable speed ASHP equipment may be on par with variable speed AC equipment.

Table A. 2022–2025 cost ranges by compressor type, central AC only (N=18) and ASHP only (N=84)

Central AC only	Minimum	Maximum	Mean	Incremental mean cost
AC only OVERALL (N=18)	**$4,500**	**$10,800**	**$6,400**	**N/A**
AC Single-stage (SS) (n=14)	$4,500	$8,700	$6,400	N/A
AC Variable speed (n=1)	$10,800	$10,800	$10,800	$4,400 (to SS AC)
ASHP only	**Minimum**	**Maximum**	**Mean**	**Incremental mean cost**

ASHP only OVERALL (N=84)	**$5,600**	**$16,500**	**$9,800**	**$3,400 (to overall AC)**
ASHP Single-stage (n=15)	$5,600	$11,000	$8,000	$1,600 (to SS AC)
ASHP Two-stage (n=8)	$6,800	$16,500	$10,000	$3,600 (to SS AC)
ASHP Variable speed (n=57)	$5,600	$15,900	$10,500	$4,100 (to SS AC)

Note: Compressor type was not described or able to be determined for all invoices; costs rounded to the nearest $100.

Cost drivers

This research identified multiple reasons for the wide variance in ASHP installation costs. While some drivers are specific to ASHP technologies, this research also identified a litany of other factors that are not exclusive to ASHPs yet still have a major effect on cost. Cost drivers were grouped into five components: equipment, labor and overhead, situational complexities, contractor mark-ups, and market forces mark-ups.

Equipment

Equipment costs are a large part of installation costs for all HVAC equipment and highly variable depending on factors such as compressor type, system size, and controls flexibility. A review of four distributor price books indicated that while there is a noticeable incremental cost difference between higher efficiency ASHP equipment and a standard central AC, on average, the minimum efficiency ASHP was approximately $850 cheaper than the higher efficiency AC, and the incremental cost difference between a minimum efficiency ASHP and a standard central AC was approximately $900 (Table B). This cost parity for minimum efficiency ASHP equipment indicates that, from an equipment standpoint, some ASHP options may be within reach for those priced out of more expensive equipment.

Table B. Incremental wholesale costs by HVAC equipment type

Base HVAC equipment	Higher efficiency HVAC equipment	Incremental cost
Standard furnace (60 kBtuh)	Higher efficiency furnace	$1,450
Standard central AC (36 kBtuh)	Higher efficiency central AC	$1,730
Standard central AC (36 kBtuh)	Minimum efficiency ASHP	$900
	Average variable speed ASHP	$3,310
	Cold climate ASHP	$4,540
Higher efficiency central AC (36 kBtuh)	Minimum efficiency ASHP	-$840
	Average variable speed ASHP	$1,590
	Cold climate ASHP	$3,960

Note: Costs rounded to the nearest $10.

Distributor interviewees corroborated these cost ranges and added that product value, internal company metrics, and brand can also impact pricing. They also noted volume pricing, rebates, and other discounts are available to reduce equipment costs, but structural barriers still need to be addressed to maximize the effectiveness of these interventions.

Labor and overhead

Interviewees suggested HVAC project costs and labor are generally at least double equipment costs, but contractor calculations vary considerably. Distributors, utilities, and program innovators said ASHP labor and overhead costs can be affected by heat pump-specific factors like additional pre-installation prep work and potential callbacks. However, interviewees also said general challenges to the HVAC industry, especially increased staff costs and cash flow issues, are having a major impact.

Situational complexities

Interviewees noted ASHPs can be more complicated to install because midwestern housing stock is often older, poorly weatherized, or has additional complexities. Ductwork modification and updates to electrical wiring or panels were some of the most reported situational drivers of ASHP installation costs.

Contractor mark-ups

Multiple interviewees said contractors mark up ASHP bids to account for the hassle of working with equipment that is new or different from what they're used to, and a few said mark-ups are sometimes added to IRA projects or to cover the risk of rebate rejections. However, interviewees also mentioned some contractor mark-ups not exclusive to ASHPs, such as project distance, demand for HVAC contractors, and general customer willingness to pay.

Market forces mark-ups

Distributor interviewees reported tariffs, consolidations and acquisitions of HVAC companies, and the transition to R-454B refrigerant as some of the most influential yet unavoidable reasons for market force inflation. While these market conditions affect the HVAC industry at large, one distributor noted tariffs have been a particular challenge for heat pumps because the equipment is difficult to produce entirely in the U.S.

Programmatic solutions

Utility rebate providers and non-utility program innovators highlighted some of the successes and challenges related to ASHP cost reduction. Overall, utility interviewees emphasized their programs' investment in heat pump education, streamlined rebate application process, and expedited rebate disbursement as major accomplishments, while acknowledging ongoing problems with finding qualified contractors, administrative burdens, and lack of interest in incentives. Program innovator interviewees said they have found success in identifying good audiences for heat pumps, guaranteeing a quality installation, and embracing long timelines and job flexibility, though they noted equipment replacement timing, sticking points in processes intended to make ASHP affordable, and lack of contractor buy-in to heat pumps as lingering barriers.

Conclusions

Conclusion #1: ASHP installation costs vary widely. Minimum installation costs for ASHP-only equipment can be as low as $5,600, close to ACs, but some invoices can be more than triple that. If a furnace is added for full system replacement, the range widens further.

Conclusion #2: ASHPs are often more expensive than ACs, but not always. Highly efficient cold climate equipment does cost more than traditional ACs. However, minimum efficiency ASHP equipment can cost less than higher efficiency ACs, and some minimum ASHP invoices were on par with minimum AC replacement invoices.

Conclusion #3: When ASHPs are more expensive or have variable pricing, there are often rational reasons. These reasons include:

1. **More complex and higher-end equipment** (e.g., communicating furnaces, higher efficiency specifications)
2. **Rebate administration labor and risks around cash flow**
3. **Concerns about callbacks, learning new equipment, and increased pre-/post-work**
4. **Situational complexities** (e.g., older homes needing updates)
5. **Market forces** (e.g., HVAC company acquisitions, tariffs, refrigerant changes)

Conclusion #4. Some reasons for cost variability may be more easily addressed, while others are more inherent and intractable. Certain cost-driving factors may be addressed at the market, program, or policy level. However, real and rational reasons where we would expect variability and higher costs will remain.

Recommendations

1. **Include entry-level heat pump systems alongside more advanced heat pumps in programs and education efforts.** While advanced heat pumps can offer many benefits, they can be costly. Entry-level ASHP products can be at price parity with, or less than, highly efficient ACs, making them a strong choice for cost-conscious consumers. Including them in incentive programs and market awareness efforts can further increase the salience of these products, boosting ASHP adoption overall.
2. **Continue, expedite, align, and improve incentive programs.** Rebates are important to reduce upfront costs, but they can create additional challenges. Focus on simplifying and streamlining rebate processes to reduce administrative burden, expediting rebate payments to shorten cash flow delays, and aligning incentive programs to give market actors clear and consistent signals and processes.
3. **Expand contractor knowledge and workforce**. Robust contractor education can increase knowledge, experience, and opinions of different cost-effective application types. Upskilling and adding to the workforce can be important for overcoming cost increases associated with lack of experience, improving market competition and strengthening overall ASHP market growth.
4. **Support increased cost transparency and pricing models aimed to decrease cost.** Many costs included in bids are reasonable and appropriate; however, it’s challenging to distinguish cost components, and final costs are still high for customers. Increasing

transparency on bids can help alleviate confusion and allow better bid comparison. Additionally, consider strategies like bulk purchasing to decrease costs.

5. **Provide wraparound support, especially around situational complexities**. Standard rebate programs can be very effective, but there are other program innovations (e.g., providing information, project consultations, quote comparisons) that can help navigate additional barriers. Situational complexities like poor weatherization or the need for ductwork modifications will also continue to be present and increase bid variability and costs. Wraparound supports addressing these additional complexities and adding navigation and rebate/financing options can help address these challenges.

INTRODUCTION

Background

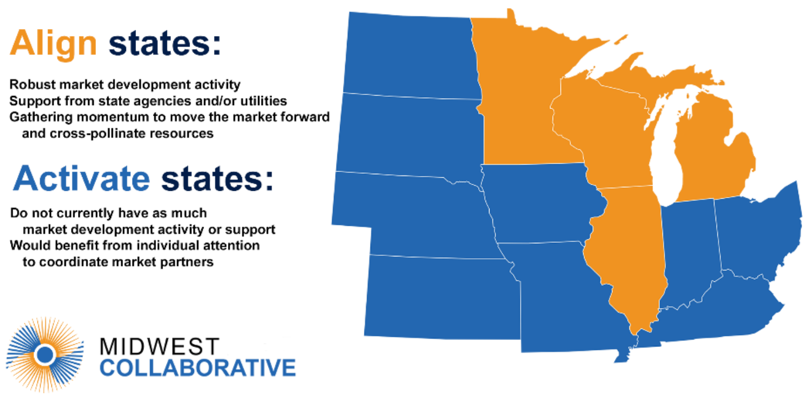
Despite growing interest in and incentives for heat pumps, installation costs for residential air source heat pumps (ASHPs) remain poorly understood. Unexpectedly high contractor quotes and cautionary tales from neighbors perpetuate the belief that ASHPs are unaffordable for the average homeowner, while online articles and resources from clean energy advocates can create false expectations that heat pumps cost only marginally more than central AC.[1,2] The reality lies somewhere in the middle — ASHP installation costs are inconsistent, wide-ranging, and highly influenced by an array of factors.[3,4,5]

In an ideal world, ASHP costs would naturally decline in response to improvements in production efficiency, installer experience, and customer demand. However, real-world market conditions, knowledge gaps, and other "unknown unknowns" can cause friction that ripples throughout the supply chain and drives up final costs for homeowners. **This research aims to identify these ASHP costs and drivers and propose actionable and strategic recommendations for mitigating them.**

Midwest Heating and Cooling Collaborative

This research was conducted by the Midwest Heating and Cooling Collaborative (the Collaborative). The Collaborative spans thirteen states (Figure 1) and is delivered by four mission-aligned nonprofit organizations in the Midwest: Center for Energy and Environment (CEE), Slipstream, the Midwest Energy Efficiency Alliance (MEEA), and Elevate.

Figure 1. States included within the Collaborative footprint



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[1] Pantano et al., "3H 'Hybrid Heat Homes' An Incentive Program to Electrify Space Heating and Reduce Energy Bills in American Homes."

[2] Hansen-Connell and McPherson, "Air Source Heat Pump Market Characterization Report."

[3] McCabe and McDevitt, "How Much Does a Heat Pump Cost in 2025?"

[4] Rewiring America, "Here's How Much Heat Pumps Cost to Install."

[5] Carthan, "How Much Does a Heat Pump Cost?"

The Collaborative brings together industry leaders to share and scale best practices and accelerate progress toward a common goal: making high-performance, cost-saving HVAC technologies the preferred choice for homeowners and contractors throughout the Midwest. In doing so, the Collaborative supports a broader mission of establishing U.S. energy leadership worldwide. High-performance HVAC technology provides numerous benefits, such as lower utility costs and improved comfort for homeowners and grid resiliency for utility providers. More information about the Collaborative can be found at https://mwcollab.org/.

Research goals and scope

This research describes the key drivers of installation costs for ASHPs from a variety of market actor perspectives. **This research primarily focuses on residential dual fuel, ducted ASHP retrofit installations** that replace existing central AC systems while retaining backup fuel-fired furnaces (typically natural gas and propane).

Key research goals included:

1. Summarize **current assumptions** about ASHP installation costs.
2. Deepen understanding of what **comprises and drives ASHP costs.**
3. Identify **programmatic solutions for and challenges to ASHP cost reduction.**
4. Propose **actionable and strategic recommendations** for mitigating ASHP installation costs and drivers.

Methods overview

Multiple primary data collection efforts were conducted to better understand ASHP costs and drivers at various stages of the purchase process. These included:

- A **review of available literature** on ASHP installation costs to summarize current understandings and conventional wisdom, providing a basis for primary data collection research questions and assumptions.
- An **analysis of wholesale HVAC equipment prices** from distributors (N=4) in a major metropolitan area in the Midwest to pinpoint, isolate, and compare actual hard product costs across different product archetypes and specifications.
- An **analysis of HVAC final installation costs** gathered from homeowners in Michigan, Illinois, and Minnesota (N=271 preliminary bids and final invoices) to understand how final costs differ across system combinations and compressor types.
- **Semi-structured interviews** with distributors (N=8), utility rebate providers (N=6), and non-utility program innovators (N=6) operating state-, region-, and nationwide to gain expert insights on cost drivers and ways to improve product affordability.

Each of these research activities work in tandem to verify, refine, and augment current knowledge of ASHP installation costs and drivers. Additional context about each of these efforts is included throughout this report. Detailed descriptions of the interview methodology can be found in Appendix A. Market actor interview methodology.

LITERATURE REVIEW AND PROJECT FRAMEWORK

A literature review was conducted to make sense of current assumptions about ASHP installation costs. Findings were categorized into five components: equipment, labor and overhead, situational complexities, contractor mark-ups, and market forces mark-ups. These categories were used to guide the development, execution, and analysis of cost and interview data and serve as an overarching project framework for the report. A summary of this literature review can be found below.

Component 1: Equipment

A primary component of ASHP installation costs is the cost of the unit, including individual parts and associated performance capabilities. Compressor type (i.e., single-stage, two-stage, and variable speed) plays a major role in a heat pump's efficiency, heating and cooling capacity, and controls flexibility, and is thus a major driver of equipment cost.[6,7] The size of a heat pump (i.e., tonnage) also affects the system's capacity needs and cost, with larger capacity equipment requiring a larger (and more expensive) compressor.[8] Similarly, cold climate ASHPs, which offer high efficiency and cooling capacity at cold temperatures, cost much more than minimum efficiency heat pumps, which are limited in their cold temperature performance.[9] Additional factors that can influence ASHP equipment price include refrigerant type, brand, and model, among others.[10,11]

Component 2: Labor and overhead

Contractor labor rates account for the expected staff time needed to complete an installation, as well as pre-installation prep (e.g., home assessment and system design) and post-installation support (e.g., commissioning, homeowner training, and troubleshooting). Staff wages are a major driver of this cost, with salaries for HVAC-related roles increasing approximately 9.5% in 2024 alone.[12,13] Callbacks also factor in to labor rate calculations, as every return to a job site costs additional staff hours and potential lost income from other jobs.[14] In addition to direct labor costs, many contractors factor in overhead expenses, including costs associated with permitting

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[6] Moor, "Understanding Heat Pump Compressor Costs."

[7] Less, Casquero-Modrego, and Walker, "Home Energy Upgrades as a Pathway to Home Decarbonization in the US: A Literature Review."

[8] Moor, "Heat Pump Capacity: 2-Ton, 3-Ton, and 4-Ton."

[9] Wilson et al., "Heat Pumps for All? Distributions of the Costs and Benefits of Residential Air-Source Heat Pumps in the United States."

[10] Moor, "Understanding Heat Pump Compressor Costs."

[11] Shotland and Kit, "2025 Heat Pump Model Showdown."

[12] ARCH, "The Impact of Wage Inflation on the HVAC Industry."

[13] Knox, "Inflation Means Higher Prices for HVAC Contractors."

[14] ACCA, "The True Cost of Callbacks (and How to Stop the Bleeding)."

and licensing fees, inventory and warehousing, staff insurance and benefits, tools and equipment, and advertising and marketing.[15] Administrative costs related to completing and submitting ASHP rebates can also be a notable expense.[16,17] Unfortunately for homeowners, labor and overhead are rarely itemized or even mentioned on bids, which makes it difficult to make apples-to-apples comparisons between quotes.[18]

Component 3: Situational complexities

Heat pump installations are frequently retrofits, meaning homeowners are often updating equipment in older homes.[19] The Midwest has the second largest percentage of homes built before 1940 (after the Northeast), meaning cities like Chicago, Minneapolis, Milwaukee, Detroit, St. Paul, Cincinnati, St. Louis, and Des Moines all rank in the top 15 cities of comparable size for the highest percentage of homes built before 1940.[20] Because older homes often come with characteristics like tight spaces, limited electric capacity, or other complexities, many midwestern homeowners find electric resistance backup, new wiring, or electrical panel and other service upgrades are suggested or required before a heat pump can be installed.[21,22] Similarly, ductwork modification, which can range from $1,500 to over $10,000 depending on home size, is sometimes needed to ensure proper airflow and equipment performance.[23,24]

In cold climates like the Midwest, building and weatherization needs such as additional insulation, equipment stands, or snow deflectors can also increase final installation costs, placing heat pumps further out of reach for low-income households.[25,26] Complexity adders such as these are highly variable and difficult to predict yet often represent a significant portion of the total cost of an ASHP installation.[27]

Component 4: Contractor mark-ups

Contractors mark up equipment costs for a variety of reasons, leading to inconsistences. Many use mark-ups to cover the natural inconveniences of running an HVAC business in general, such as working in an isolated or rural location, emergency or same-day installation, or failing to

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[15] Sudhakar, "Pricing Transparency: Peeking Behind the Curtain of Heat Pump Quotes."

[16] Slipstream and CEE, "Moving Toward High-Performance HVAC: Applications for Dual Fuel Heat Pumps in the Midwest."

[17] Luoma et al., "Northeast High-Performance HVAC Market Assessment Report."

[18] Sudhakar, "Pricing Transparency."

[19] Bastian and Cohn, "Ready to Upgrade: Barriers and Strategies for Residential Electrification."

[20] Heacock, "U.S. Cities With the Largest Share of Homes Built Prior to 1940"

[21] Bastian and Cohn, "Ready to Upgrade."

[22] Luoma et al., "Northeast High-Performance HVAC Market Assessment Report."

[23] Carthan, "How Much Does Air Duct Replacement Cost? (2026 Pricing)"

[24] Baugh, "Understanding HVAC Ductwork: What is Ductwork?"

[25] McKenna, Gronland, & Vaishna, "Heating With Justice: Barriers and Solutions to a Just Energy Transition in Cold Climates."

[26] NEEP, "Guide to Installing Air-Source Heat Pumps in Cold Climates."

[27] Amarnath, "Heat Pumps are Hot, but Commercial Retrofits Face Cold Realities."

convert a lead to a sale.[28,29] However, contractors who are inexperienced with or skeptical of heat pump technology may also assume an ASHP installation will take longer or be more complicated than a like-for-like replacement and thus will mark up their labor rate to make the project "worth their while."[30,31] Mark-ups are also used by contractors to cover the risk of failed or rejected rebate applications — for example, in 2024, 34% of applications to New York's statewide heat pump incentive program included errors that required correction, thereby delaying reimbursement to contractors.[32] While many contractor mark-ups are estimated and applied in good faith, the practice can also be used to pressure homeowners, distort prices, and inflate installation costs throughout the market.[33]

Component 5: Market forces mark-ups

Economic impacts such as tariffs, material scarcity, and overall price inflation can ripple throughout the supply chain, leading market actors at each stage to raise their prices accordingly.[34] Increased consolidation and acquisition throughout the HVAC industry, especially by private equity, has also dampened distributor negotiating power and pressured contractors to raise prices, creating a perfect storm for potential price inflation.[35] Identifying and accounting for changing market conditions, though crucial to clarifying installation costs, is thus one of the most difficult factors to address.

ASHP INSTALLATION COSTS

Before diving into the factors that impact installation costs, we wanted to examine the actual cost values that homeowners see, inclusive of all these factors. To do this, we examined homeowner bids and invoices from across the Midwest to look at real-world costs across multiple types of HVAC projects. To supplement these numbers, we also asked distributor, utility, and non-utility program innovator interviewees to estimate and reflect on the reasonableness of these costs.

Homeowner installation costs

To understand how ASHP installation costs compare to installation costs of other system combinations, we examined HVAC invoices and bids from homeowners across the Midwest. Data was gathered from three sources and combined into a single data set (N=271) that was analyzed by Collaborative staff:

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[28] Sudhakar, "Pricing Transparency."

[29] Summers, "Make a Profit: A Must for Contractors."

[30] Murray, "Lessons From the Heat Pump Market: Why Market Structure Analysis Matters for Effective Industrial Policy Design and Implementation."

[31] Wilson et al., "Heat Pumps for All?"

[32] NYSERDA, "New York State Clean Heat Program 2024 Annual Report."

[33] Kit, "Heat Pump Installations & Market Failure."

[34] Knox, "Inflation Means Higher Prices for HVAC Contractors."

[35] Murray, "Lessons From the Heat Pump Market."

- A **Michigan** data set (n=51) of final project invoices for ASHP and furnace (dual fuel) combinations. Invoices were collected by three rural Michigan electric cooperatives as part of a 2024 rebate incentive program.
- An **Illinois** data set (n=31) of final project invoices for ASHP-only installations conducted in 2022. Invoices were collected by an Illinois electric utility for use in a separate research project. Permission was granted for use in this study. It should be noted that these invoices were from a pilot to evaluate a new class of coil-only variable speed ASHPs that can be installed as AC replacements only, without any air handler work other than replacing the AC coil; thus, these installations may be less expensive than traditional matched variable speed products.
- A **Minnesota** data set (n=189) of preliminary bids and final project invoices collected from CEE staff and their personal networks as well as recipients of CEE's home energy audit service between 2022 and 2025. The following system combinations were represented:
    - AC only
    - ASHP only
    - AC and furnace
    - ASHP and furnace (dual fuel)
    - All-electric ASHP system

For the purposes of this study, "ASHP only" is used to describe an AC replacement scenario where the ASHP is tied into an existing furnace or heating system. Given this research's focus on residential dual fuel ducted ASHP retrofit installations, "furnace" refers to fuel-fired (typically natural gas and propane) applications. Finally, "all-electric ASHP system" is used to describe a system that includes an ASHP and supplemental electric heating equipment.

Data were exclusively retrofit ducted systems. New construction projects, ductless heat pump applications (e.g., mini splits), and bids and invoices that included other upgrades (e.g., water heaters) in the total cost were excluded from analysis, but projects with ductwork modifications, electrical upgrades, or other complexity adders required for efficient use of the HVAC system were intentionally retained. While we recognize these complexity adders can increase cost variability, they are also sometimes necessary for a full system installation; including these outliers is thus crucial for understanding the full spectrum of real costs that homeowners encounter when receiving bids and invoices.

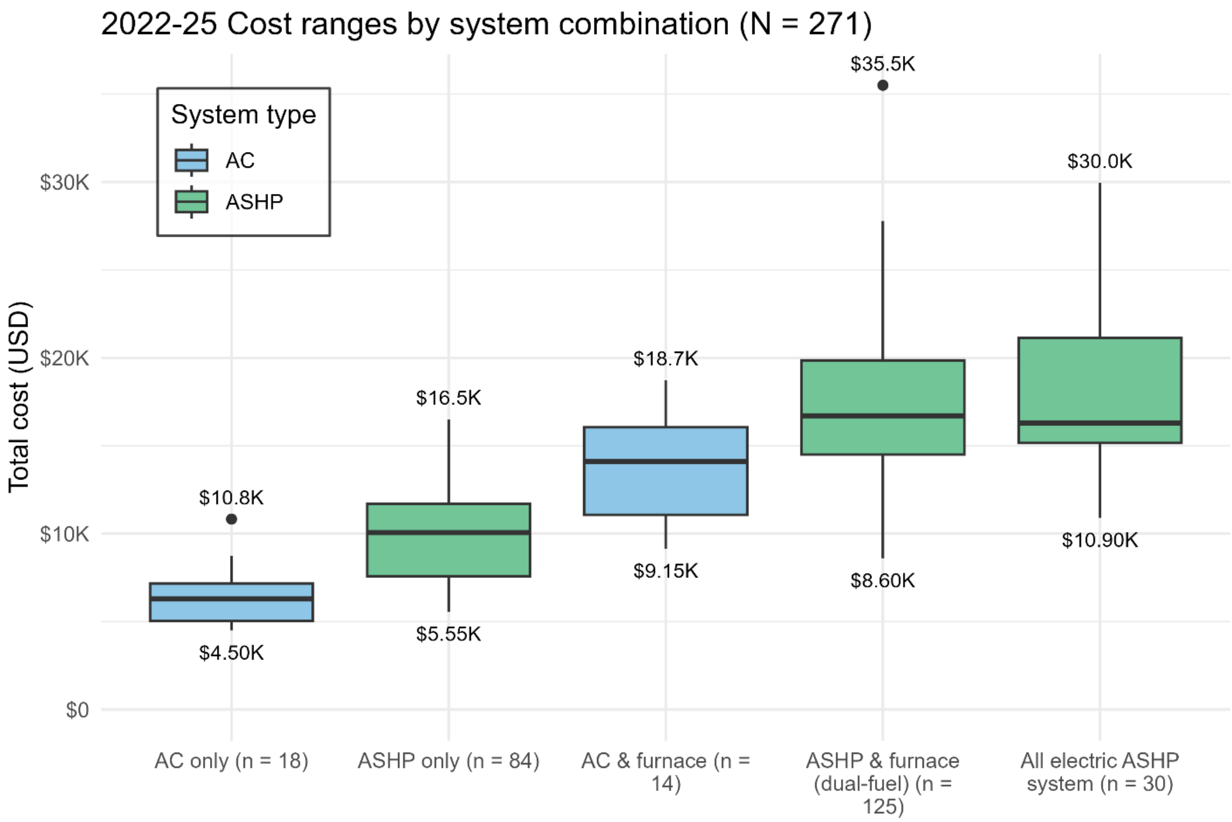
Similarly, invoice data covered a four-year span, making cumulative inflation a likely factor when comparing costs. Although initial comparison of system combination costs by year did not show much of an expected inflation trend for some application types, inflation implications are noted in instances when relevant to findings and discussed further in Limitations and Areas for Future Research.

Finally, it is important to note that invoices are often opaque. Labor costs, which we had hoped to isolate, were almost never separated from other costs, and it can sometimes be challenging to parse out exactly which costs and specifications (e.g., compressor type, SEER ratings) are associated with each tangible component. Because this can inherently cause uncertainty and errors in analysis, numbers and averages from this analysis have been rounded to the nearest hundred, and supplemental analysis of distributor price books was conducted to isolate equipment costs at the point of contractor purchase (see Distributor wholesale equipment prices).

System combination costs

To understand how ASHP installation costs compared to installing other HVAC systems, data were analyzed by system combination (Figure 2, Table 1). Costs varied widely across all system combinations. Although ASHP installation costs were generally more expensive and more variable than AC installation projects, small sample sizes for AC systems may also have played a role in reduced variability and cost estimates.

Figure 2. 2022–2025 Cost ranges by system combination (N=271)



The incremental mean costs for ASHP installations over central AC installations were roughly $3,400–$4,400, with cost differences increasing as furnaces and all-electric systems were included (Table 1). Maximum costs for ASHP-only installations were considerably greater than AC-only installations ($16,500 for ASHP only compared to $10,800 AC only) and were much greater for projects with furnaces included ($35,500 ASHP and furnace compared to $18,700 AC and furnace). It is worth noting, however, that projects toward the maximum amount often included specific components that would not be needed for every installation. For example, the invoice for $35,500 included a large 5-ton system and considerable ductwork modifications with supply and return registers and furnace venting.

Table 1. 2022–2025 Cost ranges by system combination (N=271)

System combination (N=271)	Minimum	Maximum	Mean	Incremental mean cost (ASHP vs. AC combinations)
AC only (n=18)	$4,500	$10,800	$6,400	N/A
ASHP only (n=84)	$5,600	$16,500	$9,800	$3,400
AC and furnace (n=14)	$9,100	$18,700	$13,500	N/A
ASHP and furnace (dual fuel) (n=125)	$8,600	$35,500	$17,300	$3,800
All-electric ASHP system (n=30)	$10,900	$30,000	$17,900	$4,400

Note: Furnace refers to dual fuel unless otherwise specified; costs rounded to the nearest $100.

While ASHP installations were generally more expensive, this was not always the case. The minimum project costs for all ASHP system combinations were less than the average cost for their AC counterparts. In fact, the minimum cost for an ASHP and dual fuel furnace project was $500 **cheaper** than the minimum cost of an AC and furnace. The minimum ASHP-only invoice was part of the new variable speed product pilot in 2022, and while variable speed, it was still a smaller, minimum efficiency SEER 14.25 rated product. Additionally, while inflation's role in these cost differences should be considered, the minimum AC and furnace and ASHP and dual fuel furnace were relatively close in year (2023 and 2024) and the minimum AC-only and ASHP-only invoices were both from 2022, making data more comparable. The minimum cost ASHP and furnace combination ($8,600) included a 2.5-ton single-stage heat pump and a minimum efficiency (80% AFUE) 60kBtuh furnace. This indicates opportunities may exist for lower cost installations and price parity, especially when considering smaller, minimum efficiency equipment.

Compressor costs

To further understand how compressor type impacts installation cost, AC only and ASHP only data were also separated by single-stage, two-stage, and variable speed compressor types (Table 2). Average costs by compressor type were relatively similar. While single-stage ASHPs were still generally more expensive than single-stage ACs, the incremental mean cost was only $1,600, compared to the $3,400 incremental mean cost agnostic of compressor type. While only one variable speed AC invoice was available, it was essentially the same cost as the average variable speed ASHP ($10,500 for an ASHP vs. $10,800 for a central AC). This indicates that compressor type has a sizeable impact on cost, and when comparing more similar compressor types, ASHPs can be even closer to parity with ACs.

Table 2. 2022–2025 Cost ranges by compressor type, central AC only (N=18) and ASHP only (N=84)

Central AC only	Minimum	Maximum	Mean	Incremental mean cost
AC only OVERALL (N=18)	**$4,500**	**$10,800**	**$6,400**	**N/A**

AC Single-stage (SS) (n=14)	$4,500	$8,700	$6,400	N/A
AC Variable speed (n=1)	$10,800	$10,800	$10,800	$4,400 (to SS AC)
ASHP only	**Minimum**	**Maximum**	**Mean**	**Incremental mean cost**
ASHP only OVERALL (N=84)	**$5,600**	**$16,500**	**$9,800**	**$3,400 (to overall AC)**
ASHP Single-stage (n=15)	$5,600	$11,000	$8,000	$1,600 (to SS AC)
ASHP Two-stage (n=8)	$6,800	$16,500	$10,000	$3,600 (to SS AC)
ASHP Variable speed (n=57)	$5,600	$15,900	$10,500	$4,100 (to SS AC)

Note: Compressor type was not described or able to be determined for all invoices; costs rounded to the nearest $100.

Homeowner installation cost – Interviewee insights

To supplement this invoice data, distributors, utilities, and non-utility program innovators were asked to estimate final homeowner installation costs ranges for ASHP and furnace combinations. Interviewee knowledge and awareness of these final costs varied considerably both within and across market actor categories, with multiple interviewees asserting that the bids homeowners receive for these systems are simply all over the map.

Given this variance, we asked distributor interviewees specifically if they thought the prices homeowners received from contractors were reasonable. Of the 7 who responded, two thought contractor pricing was appropriate, two disliked how high contractor prices have risen but understood the increase, and two said some contractors charge high prices because they prioritize profit or take on urgent projects. Interestingly, one distributor said reasonableness shouldn't be a factor because costs are a matter of black-and-white calculation:

> *McDonald's has one number, grocery store has one number… "Your value meal is $9.95." But in HVAC for whatever reason, this industry doesn't know what to charge and feels bad charging it. When you bring your car in for an oil change, they don't feel bad charging you $250 for that service. But when we bring a full truck to someone when they want us to, we feel bad charging $50 for a filter.*

ASHP COST DRIVERS

The following section delves into the five cost components outlined previously to further unpack the drivers behind these costs. Insights are provided through an analysis of distributor wholesale equipment prices and semi-structured interviews with ASHP distributors, utility rebate providers, and non-utility program innovators.

Component 1: Equipment

Distributor wholesale equipment prices

Distributor wholesale pricing data can be used to isolate price differences across product types and specifications unrelated to variables such as labor, situational complexities, and other mark-ups. Further comparison of these hard costs can then be used to help answer whether ASHP equipment is inherently more expensive than other equipment.

To understand how ASHP equipment costs compared to costs of other HVAC equipment, we reviewed wholesale price book data acquired from four distributors in a major metropolitan area in the Midwest. Data represented a small sample of major equipment brands and spanned spring–summer 2025. Different equipment archetypes were created to better compare similar cost information. Table 3 outlines efficiency thresholds, sizing ranges, and other equipment attributes that served as equipment archetypes for our analysis. Additionally, it should be noted that central AC and ASHP equipment costs include both the outdoor unit and indoor coil.[36] Additional context on the development of these equipment archetypes can be found in Appendix B. Residential HVAC Equipment archetype development.

Table 3. HVAC equipment attributes by archetype

Archetype	Minimum efficiency	Compressor or furnace stages	Blower type	Includes communicating control?	Applied to wholesale price book data?	Applied to interview cost data?
Standard furnace	95% AFUE	Single	Multi-speed	No	Yes	Yes
Higher efficiency furnace	97% AFUE	Two	Variable speed	Yes	Yes	No
Standard central AC	13.4 SEER2	Single	Multi-speed	No	Yes	Yes
Higher efficiency central AC	15.2 SEER2	Single	Multi-speed	No	Yes	No
Minimum efficiency ASHP	14.3 SEER2, 7.5 HSPF2	Two	Multi-speed	No	Yes	*Yes
Average variable speed ASHP	16 SEER2, 8.5 HSPF2	Variable capacity	Either	Maybe	Yes	No
Cold climate ASHP	15.2 SEER2, 8.1 HSPF2, COP@5°F 1.75	Variable capacity	Either	Maybe	Yes	Yes

[36] While average variable speed and cold climate ASHPs are commonly matched with a furnace that includes a variable-speed blower and communicating controls between the heat pump and furnace, coil-only systems may be matched with any furnace.

***Minimum efficiency ASHP equipment costs were further separated by single- and two-stage for distributor interviewees only.**

Wholesale cost sizing impact

Data was compared to assess the added cost of increasing the heating or cooling capacity of equipment (upsizing). Overall, the incremental wholesale cost to upsize equipment was relatively minor across all archetypes (Table 4). Upsizing from a smaller 40 kBtuh furnace to an 80 kBtuh furnace only added approximately $100–$300. Similarly, upsizing an AC or ASHP from a 2- to 3-ton system (24–36 kBtuh) added roughly $150–$500, and upsizing to bigger equipment was proportional. Notably, there was not a discernable difference between upsizing ASHPs or ACs.

Table 4. HVAC equipment sizes and incremental wholesale cost to upsize, by equipment archetype

Furnace	Smaller (kBtuh)	Larger (kBtuh)	Incremental cost to upsize from small to large
Standard furnace	40	80	$110
Higher efficiency furnace	40	80	$260
Central AC	**Smaller (kBtuh)**	**Larger (kBtuh)**	**Incremental cost to upsize from small to large**
Standard central AC	24	36	$220
Higher efficiency central AC	24	36	$330
ASHP	**Smaller (kBtuh)**	**Larger (kBtuh)**	**Incremental cost to upsize from small to large**
Minimum efficiency ASHP	24	36	$510
Average variable speed ASHP	24	36	$160
Average variable speed ASHP	24	60	$1,200
Cold climate ASHP	24	36	$440
Cold climate ASHP	24	48	$1,080

Note: Costs rounded to the nearest $10.

Wholesale cost efficiency impact

Wholesale cost data was also compared by equipment efficiency. Data was collected for 60 kBtuh furnaces and 36 kBtuh (3-ton) ACs and ASHPs, which are commonly installed equipment sizes in the Midwest for dual fuel applications. Costs across equipment types ranged from $1,300–$6,000 with minimum efficiency equipment being cheaper than higher efficiency equipment (Table 5).

Table 5. Total wholesale equipment cost for HVAC system components

Furnace (60 kBtuh)	Cost
Standard furnace	$1,330
Higher efficiency furnace	$2,780
Central AC (36 kBtuh)	**Cost**
Standard central AC	$1,540
Higher efficiency central AC	$3,260
ASHP (36 kBtuh)	**Cost**
Minimum efficiency ASHP	$2,430
Average variable speed ASHP	$4,790
Cold climate ASHP	$6,070

Note: Costs rounded to the nearest $10.

Cost data for each higher efficiency equipment type was then compared against baseline equipment. A higher efficiency furnace (with a variable speed blower motor and communicating controls) cost nearly $1,500 more than the standard furnace (95% AFUE two-stage), and a higher efficiency AC cost about $1,700 more than the standard baseline AC (Table 6). As expected, variable speed and cold climate ASHPs cost considerably more than a standard central AC ($3,300–$4,500), and while these higher efficiency ASHPs do offer considerable efficiency gains and other benefits that may be attractive to customers, an upfront equipment cost roughly four times that of a standard AC is a challenge for some. However, the minimum efficiency ASHP (two-stage) was approximately $850 cheaper than the higher efficiency AC, and its incremental cost to a standard central AC was approximately $900 — the lowest incremental cost for efficiency gain across equipment types. This cost parity for minimum efficiency ASHP equipment indicates that, from an equipment standpoint, some ASHP options may be within reach for those priced out of more expensive equipment.

Table 6. Incremental wholesale costs by HVAC equipment type

Base HVAC equipment	Higher efficiency HVAC equipment	Incremental cost
Standard furnace (60 kBtuh)	Higher efficiency furnace	$1,450
Standard central AC (36 kBtuh)	Higher efficiency central AC	$1,730
Standard central AC (36 kBtuh)	Minimum efficiency ASHP	$900
	Average variable speed ASHP	$3,310
	Cold climate ASHP	$4,540
Higher efficiency central AC (36 kBtuh)	Minimum efficiency ASHP	-$840
	Average variable speed ASHP	$1,590

	Cold climate ASHP	$3,960

Note: Costs rounded to the nearest $10.

Because furnace and AC equipment are often replaced together, wholesale cost data was also viewed by common system combinations. Combining the efficiencies of the furnace and the ASHP equipment widened cost differences, with a minimum efficiency ASHP and standard furnace costing $3,750 and a cold climate ASHP and higher efficiency furnace costing over twice that ($8,850, Table 7). Traditionally, average variable speed ASHP and cold climate ASHP options are matched with a more premium furnace to communicate and run most effectively and thus purchased together; those equipment types are combined in the chart accordingly, and results show that the more premium furnace with communicating controls and a variable speed blower does increase total system cost. However, there are average variable speed ASHP and cold climate ASHP options (often referred to as "coil-only" or "AC replacement") where the ASHP can be purchased *separately* and paired with any furnace. These "coil-only" ASHP products posed similar costs to traditional variable speed and cold climate ASHP options, so although using one of these products with a less premium furnace model could be a cost-saving option, it may have efficiency or other tradeoffs.

Table 7. Total wholesale equipment cost for HVAC system combinations

Furnace (60 kBtuh)	AC/ASHP (36 kBtuh)	Total HVAC system cost
Standard furnace	Standard central AC	$2,860
Standard furnace	Higher efficiency central AC	$4,590
Standard furnace	Minimum efficiency ASHP	$3,750
Higher efficiency furnace	Average variable speed ASHP	$7,570
Higher efficiency furnace	Cold climate ASHP	$8,850

Note: Costs rounded to the nearest $10.

Distributor cost drivers

While distributor pricing focuses on hard equipment costs, there are still variations and other factors that go into setting prices. To better understand which factors contribute to distributor pricing, we interviewed 8 ASHP distributors across the Midwest, representing all but one of the Collaborative's thirteen Aligned and Activate states (all except Kentucky).

Equipment cost estimates

Between 7 and 8 distributor interviewees estimated costs for a furnace, central AC, minimum efficiency ASHP (single- or two-stage), and cold climate ASHP. Estimates for both furnace and central AC equipment started around $1,300 and maxed out around $2,000, while estimates for minimum efficiency ASHP equipment started around $2,000 and maxed out around $4,000. Estimates for cold climate ASHP equipment indicated a similar minimum cost to minimum efficiency ASHPs but a slightly higher maximum cost of around $5,000. Although considerable variability emerged among these estimates, particularly around size specifications, interviewee responses largely reflected the cost estimates provided in the wholesale price book analysis, further corroborating these findings.

Product availability

Distributors were also asked about product availability issues. Most respondents (5 out of 8) said they were experiencing no supply chain issues at present, but some (3 out of 8) said they have encountered production issues or delays specific to manufacturers or the refrigerant transition.

Two distributors also said that the upcoming disappearance of the 25C tax credit may impact their ASHP product offerings moving forward. One said they may transition to "more cost-effective offerings with standard products" while the other implied they may reduce their emphasis on heat pumps overall, saying:

> *Our job is to take advantage of the market, to take advantage of what's there… that's driving it. Right now, government tells you to go with heat pump, utility rebates [tell you] to go with heat pump. Three years ago, this stuff wasn't there so we didn't sell a single heat pump, none of it existed. [But] as soon as 25C goes away end of year…*

Pricing factors and discounts

All 8 distributors were asked which factors they consider when pricing equipment. Of these, two said their companies have little say in pricing due to existing manufacturer agreements or claim-backs, while others said they consider factors such as:

- **Product value** (n=3)
- **Internal company metrics** or pricing margins (n=1)
- **Brand** quality (n=1)

Additionally, 7 out of 8 distributor interviewees directly stated or implied that they offer volume pricing. A few distributors (3 out of 7) provided specifics about these volume discounts; discounts ranged from 1–2% to upwards of 35–40%, based on factors such as job size and product mix. One added that their discounts are "based on goals set at the start of the year" and percentages increase as the contractor's proximity to the end target gets closer.

Although volume discounts can be effective at reducing prices, two interviewees noted many contractors have moved to "sell today, install today" or "just in time" ordering because they lack the infrastructure necessary to store bulk orders. "Not that many customers can say, 'Hey, ship us a truckload of units and we'll sit on them for a month,'" one interviewee explained. "Instead, they have trucks with 2–3 days' worth of jobs."

Additional contractor or homeowner discounts mentioned by interviewees included:

- **Manufacturer or factory rebates**, such as Carrier Cool Cash and Bryant Flex (n=3)
- Special **financing, extended terms, or delayed payment** structures (n=2)
- Discounts to **contractors who are trained by a utility** (n=1)
- **Product-specific incentives** paid to contractors via gift cards (n=1)

Rebate awareness and pain points

Five out of 8 distributors mentioned downstream or midstream incentive programs over the course of their interviews. Of these, one distributor specified that they largely avoid incentives and other utility offerings, preferring instead to offer educational seminars to contractors. Other incentive program pain points mentioned by distributors included:

- **Rebate amounts change too often** (n=2)
  - "[Utility] has been on a roller coaster of numbers, goes up and down depending on where the year stands before they have to give away all the money by the end of the year."
- **Rebate amounts are too low** (n=1)
  - "We have a few contractors that participate [in Utility's program], give them an upfront instant rebate. Even if it is SPIF [Sales Performance Incentive Funds] it's $25 per application, so [the incentive] is negligible."
- **Dislike of distributor-based midstream programs,**[37] which position distributors as an intermediary between contractors submitting rebate applications and utilities providing reimbursement (n=1)
  - "Biggest complaint is they wish that it could go from contractor to [utility], bypass distributor. Complaint is they don't have time to fill out paperwork to submit."

Three distributors proposed solutions for addressing some of these rebate challenges. To combat annoyance at the distributor-based midstream program, one interviewee said their company has centralized the process through a single administrative staff person who covers all rebates and incentive programs across nine states. To mitigate confusion over changing rebate amounts, one distributor said they would like to see a flat rebate offered at the federal level and another suggested a rebate aggregator website, which they said has been attempted before but failed due to lack of upkeep:

> *Would be great help, but it needs to be [maintained by a] third party that has enough funding from the state to support that. [It's a] massive undertaking and [needs to be] trustworthy. Unless it's perfect… thousands and thousands [of dollars] from one family alone, per day, per contractor… [that's] hundreds of millions of dollars at stake if that website isn't right.*

Component 2: Labor and overhead

Many interviewees shared thoughts about labor and overhead costs. While most comments related to the HVAC industry overall, insights into setting labor costs are useful to better understand overall trends.

Labor rates and profit margins

Multiple distributors and one program innovator commented on contractor labor rates and profit margins. Although most (4 out of 5) suggested project costs and labor are generally double

[37] NEEP, "High-Performance Midstream Program Best Practices Guide."

equipment costs, interviewees overall emphasized that labor rates and profit margins are highly varied, if not arbitrary. One distributor recounted seeing this first-hand during a business development class they offer to contractors free of charge:

> *One class is on job pricing, [like] "Cost of equipment is $5,500, labor is X, this much is overhead," etc. We gave 12 customers the same numbers to work with and asked, "What is the cost of your job?" They gave us 12 different answers. [It just goes to show,] even if you give contractors the same parameters to work with, they will all price jobs different, almost all of which are wrong.*

Labor and overhead cost drivers

Distributor, utility, and program innovator interviewees identified multiple factors that contribute to contractor labor and overheard costs.

When it comes to ASHP projects specifically, multiple interviewees said **prep work necessary before installing an ASHP** (n=4), such as assessing the ductwork and conducting heat loss calculations, is often factored into contractor labor rates. Relatedly, 3 utilities and one program innovator identified **heat pump callbacks** (n=4) as a cost driver, with the program innovator explaining the "biggest [factor] is labor, but more so the fudge factor: if I get this wrong, I'll have to come back 50 times."

Yet interviewees also acknowledged labor and overhead are affected by challenges to the HVAC industry at large. Both distributors and program innovators reported **increased staff costs** (n=5) due to higher wages, employee benefits, and training expenses are a major labor driver, but one program innovator added that contractors who participate in ASHP rebate programs may have even higher overhead costs due to needing additional admin staff.

Similarly, at least one interviewee from each market actor category identified **cash flow and payment delays** (n=4) as a cost driver across the HVAC industry. "If I'm not getting paid four, eight, several months after the work I'm doing, that costs money for lines of credit," one program innovator reported, while a distributor said that financing and wide-range payments can affect how a contractor prices a project. The same distributor added that labor costs are adjusted so "pricing gets you by, season to season," implying that higher rates may be applied in busy seasons to ensure the business makes it through seasonal lulls. Additionally, one utility rebate provider said contractors may struggle to float money while waiting for customer payment or, in the case of ASHP installations specifically, rebate reimbursement.

Additional labor and overhead cost drivers mentioned by interviewees included:

- **Tools**, such as crimping and charging tools for heat pump installation and associated tools needed for the new refrigerant (n=2)
- **General advertising and marketing** costs (n=1)

Component 3: Situational complexities

Both utility and program innovators noted that an area's typical building stock often indicates whether a heat pump project is likely to face a situational complexity that needs to be addressed. However, one program innovator emphasized that midwestern building stock differences are often more “hyperlocal” than those in other locations. For example, one utility interviewee explained that many of the homes in their community were temporary mining housing in the 1880s with now-outdated knob and tube wiring that requires upgrading before transitioning to an electrically based system like a heat pump. The interviewee furthered that while old home challenges may dissuade some contractors, others see old housing stock as a potential avenue for new customers, because “with the pricing of systems and state rebates that are available, they could benefit by going to the customer and saying, ‘You have old housing stock, let’s get in there.’”

Home modifications needed before ASHP installation, while often necessary, can vary drastically, leading to radically different pricing for similar equipment. Specific situational complexities mentioned by interviewees included:

- **Electrical wiring or panel upgrade** (n=4)
  - “The electrical component, setup piece, if you need a panel upgrade... the pricing doesn’t really consider that too much, that’s a barrier.”
- **Ductwork modification** (n=4)
  - “A lot of installs in [our area have] proper design load and we find ductwork isn’t restrictive, [then the price] is not crazy. But if you take it to the other end, go into ductwork that was jammed in between studs as a last second consideration, you’re looking at $25,000 job for the same equipment.”
- **Supplemental dehumidification** (n=1)
  - “Scenarios where the heating load is a lot higher than cooling load, it’s oversized for cooling load, going to cycle on and not humidify, which could add thousands.”
- **Backup heating strategy** (n=1)
  - “Price premium for furnace plus heat pump versus furnace plus AC is marginal, [but] I think it can be a communications challenge to walk people through that backup heating strategy.”
- **Weatherization or air sealing** (n=1)
  - “[What the house] currently looks like, what they have to do to augment, lack of insulation, air sealing…”

Component 4: Contractor mark-ups

Distributors, utilities, and program innovators identified multiple contractor mark-ups, both ASHP-specific and otherwise, that are contributing to ASHP installation costs.

Five out of 20 interviewees said contractors mark up ASHP bids because **heat pumps are “new and different”** from what they’re used to. “A lot of HVAC contractors are sticking to their old guns, [they] don’t want to deal with smart thermostats, heat pumps, etc.,” reported one utility, while another added that most smaller contractors still prefer to work with natural gas. Two other utility interviewees said that because contractors don’t want to work with heat pumps, they’ll assign a premium to heat pump estimates to make the hassle worth their time or deter the homeowner from choosing it:

> *I talked to a guy who’s like, “Look, this is a pain in the butt to do an install compared to an AC, [so] I charge a premium on top of that. If they [the*

customer] want to pay it, it made it worth my time. Otherwise, I'm doing regular units and having an easier day.

Additionally, one utility interviewee said they have seen **mark-ups on IRA projects**, while one program innovator said contractors may add a mark-up to cover the **risk of rejected ASHP rebates:**

As I expand, I have to have people who are filling out paperwork, [and] if it's wrong [they have to] go back and forth with program. There's a certain amount of rejects or confusion where [if] I don't get the rebate, I [may have] counted on $5,000 that I'm not getting.

Multiple interviewees also identified mark-ups that are more generalized across the HVAC industry. For example, 4 interviewees said contractors may mark up projects that are in **rural locations or far from places they need for the job** such as Home Depot or distribution centers. Another 4 interviewees said contractors may mark up their costs because **they can still undercut competitors even when inflating their bids.**

Additional contractor mark-ups mentioned by interviewees included:

- **Contractor market demand** (n=3)
- To cover **potential failed leads** (n=1)
- **Higher income homeowners** (n=1)
- To **make discounts or free add-ons feel more significant** (n=1)
- **Immediacy premiums** for emergency or same-day installation (n=1)

Given their close relationship with contractors, distributors specifically were asked about the likelihood of incentives being used to justify a mark-up. Half of distributors (4 out of 8) commented on whether incentives have led to increased pricing or increased margins in contractor bids. One distributor was 100% certain that incentives lead to mark-ups at least sometimes because "it's a great strategy." However, 3 distributors said they did not see it or doubted it was common practice, with one explaining:

Consumers are becoming more price sensitive, [so I] would be shocked if contractors are doing that. Would think they would focus more on upselling: dehumidifiers, IEQ accessories, do you want us to replace this old register, etc. So, smaller items maybe.

Component 5: Market forces mark-ups

Multiple interviewees, especially distributors, highlighted broader market forces that influence pricing across the supply chain and lead to additional mark-ups.

HVAC acquisitions and consolidations

While a couple of interviewees mentioned an increase in distributor consolidation, all 8 distributor interviewees reported to have witnessed growing acquisition and consolidation of contractor businesses. As a result of these consolidations, 6 distributors said they have faced **higher client turnover** as new ownership changes which brands or equipment contractors are permitted to sell; when distributors are uncertain about client relationships, they may factor in potential lost revenue to their product pricing. Three distributors also said they have **less**

leverage in pricing negotiations as contractors pivot to dealing directly with manufacturers. Aside from pricing, two distributors noted consolidations and acquisitions have **soured their relationships** with previous long-term clients.

Half of distributor interviewees (4 out of 8) suspected private equity to be the source of this consolidation, though one said they also see local businesses buying each other. Regardless, most distributors (5 out of 8) cautioned these takeovers rarely go well for the contractor, with one recounting, “We saw a couple [consolidations] fail miserably where one company got enormous and absolutely imploded, lost all its employees, all its trucks, etc.”

A single program innovator interviewee also mentioned the presence of private equity acquisitions in the market. While they admitted private equity may be driving up heat pump installation costs, they added that it’s difficult to ascertain causation without first homing in on “what a fair market price is.” Until then, they’re hesitant to do anything that might limit the market’s capacity:

> *[We] want to break up conglomerates, but not yet. [They] might not be a bad thing. If you believe in the thesis that [our state] is progressively buying more and more heat pumps, it’s not a matter of breaking up conglomerates — maybe the market is just getting bigger every single year. As that happens, we’re seeing growth, [and] higher priced private equity companies aren’t losing business. As the market expands there’s so much work to do, everyone is getting more work.*

Tariffs

Seven out of 8 distributors also reported that tariffs have had a major effect on equipment mark-ups. Multiple distributors said the frequency of tariff announcements has forced them to implement multiple rounds of price increases, and if the rate changes between when the product is purchased and when it is shipped, the cost difference is passed down the supply chain.

Although the intent of tariffs is to incentivize American-made products, one distributor explained that heat pumps are a tricky item to produce entirely in-country: “Even if the equipment is fully made in the U.S., there are some components that are imported, and they get taxed.” Furthermore, American-made heat pumps don’t always have the same customer trust as other non-American products, as one program innovator described:

> *We're in rural America. People ask, “Do you have anything American made?” Nothing American made is going to perform at 8,000 feet in Colorado. Tariffs are hitting this, [so] I wish we did have an American made product, [but] if I do it’s going to stop working at 20°F.*

Refrigerant transition

Multiple distributors (5 out of 8) said the switch to R-454B has impacted pricing across market segments, and half (4 out of 8) said it has led distributors to raise equipment prices. On the other hand, two distributors reported the switch incentivized them to temporarily slash their prices out of fear they would be left “holding the bag” when the refrigerant ban went into effect on January 1, 2025. One distributor also said the transition has surprised some contractors, which could be impacting their pricing to homeowners.

E-commerce

Finally, two distributors said mark-ups are sometimes added to account for business losses to e-commerce and online shopping. For example, one interviewee said customers prefer to "go on e-commerce and click through what they need" instead of coordinating with the distributor, while a second interviewee said customers will sometimes use the pricing information available online to buy the equipment themselves, cutting out both the distributor *and* the contractor.

PROGRAMMATIC SOLUTIONS

The final section explores successes and challenges associated with ongoing efforts to address ASHP costs and drivers. Findings focus on interviews with utility rebate providers and non-utility program innovators.

Utility rebate programs

Incentive programs are a longstanding, common programmatic solution to lower first cost of high-efficiency HVAC technology like ASHPs. To learn more about traditional heat pump incentive programs, we interviewed representatives from 6 utility rebate providers.

Overview

Utility interviewees represented rebate program implementers (n=3), investor-owned utilities (n=2), and one member-owned utility cooperative. Programs spanned Michigan, Minnesota, Wisconsin, and Indiana, and most had been operating 3–15 years. Providers employed various rebate models:

- **Downstream only** rebates (n=2)
- **Midstream only** rebates (n=2)
- **Both downstream and midstream** rebates (n=2)

Interviewees said their utilities consider a variety of criteria or factors for structuring rebates, including:

- **Equipment efficiency**, with most permitting incentive stacking based on the system type and/or tonnage (n=4)
- **Income tier**, with most offering a "market" or "standard" rate, as well as an "income-qualified" or "subsidized" rate (n=3)
- The **state's TRM** (n=1)
- **System being installed**, such as ASHP, GSHP, or mini split (n=1)
- Use of **delivered fuel** (n=1)

Utility interviewees also spoke about the rebate submission and payment process. Most interviewees (4 out of 6) said the contractor is responsible for completing their rebate application, though two added they have staff or advisors to help applicants calculate the rebate amount and submit the paperwork. Payment distribution varied:

- Two interviewees said they pay via **direct deposit or mailed check.**

- Two interviewees said they follow an **"instant discount"** approach where contractors subtract the rebate amount on their customer invoice and are later reimbursed by the distributor.
- One interviewee said they **credit their rebate on homeowner electric bills.**
- The member-owned utility cooperative representative said that **each program adheres to different payment processes.**

Successes

The majority (5 out of 6) of interviewees touted their program's strong investment in **heat pump education**, especially of contractors. Multiple interviewees said they host trainings or summits to increase contractor knowledge of setpoints, sizing, and performance metrics and help them tell the heat pump story. These events were said to be particularly useful in correcting misinformation and outdated stereotypes, as noted by one utility representative:

> *[Especially for] a lot of multi-generational HVAC companies, [we use trainings] to get them to acknowledge that, yes, at one point there were problems with the technology, but there has been evolution of the tech over the years, and here's how to talk about it now.*

Most (4 out of 6) rebate providers said they have found success in **simplifying the ASHP rebate application process**. Of these, two said their midstream applications were quick and painless to submit, as they require no utility numbers and no spec sheets. Another interviewee whose utility offers downstream rebates said they have improved their rebate calculation process to be clearer and more upfront.

Additionally, half (3 out of 6) of interviewees said they have made positive changes to **expedite rebate disbursement**. For example, one rebate provider said their program switched from a downstream model, which required them to mail checks that would take months to arrive, to a midstream model that applies instant discounts on customer invoices, which means "no forms, no waiting." Similarly, a second interviewee said they used to mail checks but now provide rebates as a weekly utility bill credit, which enables them to reimburse within 10 days of application submission. A third interviewee said they have improved the efficiency of the submission process itself by switching from paper applications to an online intake tool.

Additional successes mentioned by utility rebate providers included:

- **Broadening or increasing participation** (n=3)
- **Connecting the utility's brand with tangible savings** (n=1)
- **Offering multiple incentive channels** (n=1)

Challenges

The majority (5 out of 6) interviewees said they have had **problems finding ASHP contractors.** While 3 interviewees said there is simply a shortage of contractors available to install an ASHP, two specified that finding contractors who can perform a *quality* heat pump installation is even harder:

> *Commercials came on [saying] "Get an ASHP for half the cost!" Now you have people calling and requesting information from contractors who don't know*

much about them… That's what I would say is the biggest day-to-day challenge that utilities are facing with heat pumps — not the fact of getting people to look at one, [but that] they're [contractors] doing it for their own reasons and they're [homeowners] left with no help when things don't go well.

Most (4 out of 6) interviewees identified **heat pump rebate administrative burdens**, both to implementers and submitters, as a program impediment. Three said that past or present rebate models have required significant staff time to review applications, respond to questions, and process payments. One interviewee said switching to online intake tool has alleviated some of these issues, but "training folks on it [the new system], adding them, changing behavior and incorporating it is a heavy lift up front." Additionally, two interviewees said filling out rebate paperwork, even with program support, can be "kind of a pain" for applicants.

Four out of 6 interviewees also said they have **struggled to generate interest in ASHP incentives.** One said situational complexities like new panels, wiring, and ductwork modification make ASHPs cost-prohibitive to set up, so rebates would need to be at least $1,200 to get any uptake. Another said they've yet to identify an amount that has "enough customer drive to force contractors to do what we want them to do."

Half (3 out of 6) of interviewees reported they are still encountering **lack of contractor buy-in to ASHPs.** Two rebate providers indicated the misgivings are linked to older iterations of the technology, with one explaining that some contractors are "still accustomed to first generation heat pumps from years ago, [but they've] evolved greatly, this is not what they might remember." Another added that they've been actively providing contractor trainings to combat these outdated perceptions but to no avail.

Relatedly, two rebate providers said they have struggled with **contractor distrust of ASHP rebate programs**. One interviewee explained that some contractors are skeptical of new incentive programs due to previous experiences investing time in programs that ran out of money. This skepticism leaves utilities with little leverage when the few who do participate fail to maintain program standards, as one interviewee learned when a contractor sought rebate approval for a heat pump water heater:

[This contractor] wanted the customer to pay $3,500 for installation of a $1,500 piece of equipment, then was going to ask the state to pay $1,700 to pay for the same piece of equipment. It's a rip-off, and it's price gouging. And I'm torn because I know that contractor [and I should be] reporting them to the state for that, but they're one of the only contractors that's doing the program that should be.

Two interviewees also said **program limitations on fuel-switching or electrification** have caused headaches for heat pumps. For example, one said their utility does not permit fuel switching, which limits the number of homes that are eligible for heat pump rebates. Similarly, the other explained they are "often limited" in how they can position their incentives, adding, "We are actually taking an electric penalty on the electric side. We have negative goals for instant discounts for heat pumps that replace gas."

Additional challenges mentioned by utility rebate providers included:

- Needing to **wait for project completion** before sending payment (n=2)

- **Higher or inconsistent electric bills** (n=2)
- **Lack of brand association** with savings (n=1)

Non-utility program innovators

Beyond utility-provided rebates, there are various other programs operating in the market to help customers adopt heat pump technology. To learn more about alternative and targeted approaches to ASHP incentivization, we interviewed 6 non-utility program innovators.

Overview

Unlike other market actor interviews, non-utility program interviews were intentionally not focused on the Midwest, as we wanted to gain a broad understanding of programmatic interventions and lessons happening outside this region that could be applicable. Consequently, interviewee service areas ranged greatly:

- Two innovators operated **nationwide**, with one offering heat pump programming in close to 30 states.
- Two innovators were based in the **northeastern region** but preferred to focus on 2–3 states.
- One innovator served a **single state.**
- One innovator worked within a one-hour radius of a **single municipality.**

Those with a regional and statewide focus expressed minimal interest in expanding their service areas, though two said they would consider serving states with similar housing stock or stable rebate offerings. The majority (5 out of 6) of programs had emerged within the past 2–5 years, although one had been operating for more than 15 years.

Innovators' program focus varied, with only one exclusively focusing on heat pumps. Instead, many innovators supported home electrification efforts more broadly, incentivizing heat pump installation alongside home improvements like solar panels and heat pump water heaters. More than one innovator mentioned that heat pumps were a recent addition to their program's portfolio.

When it came to ASHP incentivization efforts specifically, program innovators mentioned offering some or all the following:

- **Accessible and unbiased heat pump information** to help consumers understand the product and make the right selection (n=6)
- **ASHP rebate curation and processing support** for both homeowners and contractors (n=4)
- A **contractor network** to connect homeowners with qualified ASHP installers (n=3)
- **Project consultations** to advise and prep homeowners for ASHP installation (n=3)
- **Bulk or group deals** to lock in discounted rates (n=3)
- **Quote comparison** (n=2)

Successes

Most program innovators (4 out of 6) said they have found success in **identifying audience segments that are good fits for heat pump adoption**. For example, 3 interviewees said homeowners on a “home electrification journey,” such as those looking to install solar, are often interested in heat pumps or open to considering them if provided more information. Two said they do well in rebate- or incentive-rich states, while another has found success focusing on a low-income, rural community that is well suited for a propane alternative.

Most interviewees (4 out of 6) also said their program has found success by **guaranteeing a quality heat pump installation experience** for both customers and contractors. Four program innovators said they curate a contractor network through formal or informal vetting procedures, and one added they work hard to ensure contractors aren’t left hanging at the end of the project:

> *For contractors, trust is earned. They’ve all participated generally in Sears or Home Depot referral programs, [where the] price might be set but no one did the design work so they’re left holding the bag. Reception with contractors always, initially, is you have to prove this. After we proved this, the reception has been really good.*

Half (3 out of 6) of interviewees said they have found it helpful to **embrace long timelines and job flexibility**. One innovator explained that many homeowners are still learning about heat pumps and “want to understand the product, maybe connect with a contractor, get an initial price point, see if their home is a good fit” but not looking to schedule anytime soon. Relatedly, another interviewee said that contractors sometimes prefer job flexibility over bulk installations:

> *We thought batching would be a bigger play, [but contractors actually prefer flexibility] — “If you give me flexibility, I don’t need three jobs in one day.” We take pictures, videos, share everything remotely [so the contractor knows what to expect]… “This is everything I need, I don’t have to show up until day-of.*

Additional successes mentioned by non-utility program innovators included:

- Establishing and maintaining a **credible brand** (n=3)
- **Connecting with homeowners early** in the installation process (n=2)
- **Demystifying cost complexities** with market benchmarks and transparent pricing (n=2)
- **Local or grassroots marketing** (n=2)

Challenges

The majority (5 out of 6) of program innovators named **equipment replacement timing** as a primary barrier to ASHP adoption and, by extension, their program. When homeowners’ current systems are functioning, buying a heat pump seems unnecessary: explained one interviewee, “If they have a five-year old furnace, [they] don’t need a heat pump, [it] doesn’t matter how cheap the heat pump is.” Another added that even those interested in heat pumps can become so overwhelmed doing research that they determine it’s easier to stick with a known fuel-based system, which “resets the clock.” Half (3 out of 6) of innovators said the toughest situations are when equipment breaks unexpectedly, with one specifying, “Any program that doesn’t allow for an emergency replacement or time sensitive [replacement] is broken.”

Five out of 6 interviewees also identified **sticking points in the processes intended to help make ASHPs more affordable.** One interviewee said they struggle to sell heat pumps in states that have no financing options, and a second reported that because most of the homeowners they work with depend on income-qualified rebates, “If they fall through, I think half those homeowners will not move forward and keep their 30-year-old furnace because prices without incentives are higher." Another interviewee said the AHRI matching requirement that is a condition for many rebates is "well intentioned" but flawed:

I think in practice it often means that people that might consider a heat pump when their AC fails are seeing a rebate for a heat pump, being told that they can't get it without retiring their existing furnace, and then buying a crappy low SEER one-way AC.

Similarly to utility rebate providers, 4 out of 6 program innovators also said **lack of contractor buy-in to ASHPs** has made program implementation difficult. "Contractors will try to talk them [homeowners] out of it," explained one innovator, with another adding, "If a contractor says it's [a heat pump] not going to work, it's a huge, huge turnoff in an early adopter market."

Additional challenges mentioned by program innovators included:

- **Contractors failing to complete rebates** (n=3)
- Shortage of **qualified ASHP contractors** (n=3)
- **Contractors changing what they charge** when a project ends (n=2)
- **Misunderstanding of ASHP cost-effectiveness** (n=2)
- **Lack of product offerings** (n=2)
- **Lack of price negotiating leverage** (n=1)

CONCLUSIONS AND RECOMMENDATIONS

Conclusion #1: ASHP installation costs vary widely. Minimum installation costs for ASHP-only equipment can be as low as $5,600, but some invoices can be more than triple that. If a furnace is added for full system replacement, the range widens further.

Conclusion #2: ASHPs are often more expensive than ACs, but not always. Highly efficient cold climate equipment does cost more than traditional ACs. Additionally, if replacing both a furnace and AC, the more efficient, variable speed communicating furnaces that work best with ASHPs also cost more than standard furnace equipment. However, minimum efficiency ASHP equipment can cost less than higher efficiency ACs, and some minimum ASHP invoice costs were on par with average minimum efficiency AC replacement costs. This indicates price parity for certain applications is within reach.

Conclusion #3: When ASHPs are more expensive or have variable pricing, there are often rational reasons. Many of these reasons also lead to higher costs and variability across the HVAC industry, though some are more specific to ASHPs. Reasons for this variability include:

1. **More complex and higher-end equipment** (e.g., communicating furnaces, higher efficiency specifications). With more complex equipment, better efficiency ratings, or higher-end equipment in general, we would expect higher equipment costs.
2. **Rebate administration labor and risks around cash flow**. While rebates can provide great benefits and help sell ASHPs, they can also create additional labor for contractors or distributors depending on the rebate structure, and those labor costs should be considered. Those who participate in heat pump rebates also typically experience a lag in payments, and when combined with inherent seasonal lulls and waiting for customers'

final payments, these delays can lead to cash flow concerns while waiting for reimbursement and rebates falling through or being delayed further.

3. **Concerns about callbacks and learning new equipment.** With any new equipment, a learning curve is to be expected for both contractors and customers. This can lead to longer labor hours, including pre-installation time and more callbacks as both parties figure out new systems.
4. **Situational complexities.** Especially when working in older homes and retrofit applications, situational complexities are bound to arise and make each situation unique. ASHPs may also present different complexities for installation. For example, ductwork modifications and electrical wiring or panel upgrades may be required for ASHPs but may not be required for like-for-like gas-fired equipment replacement.
5. **Market forces** like HVAC company acquisitions, tariffs, and refrigerant changes can affect pricing, which can ripple through the supply chain. While many of these market forces apply more broadly to all HVAC equipment, there may be cases where ASHPs are more affected.

In addition to the more reasonable cost increases, some market actors may be unnecessarily raising prices, though opinions were mixed on how often this happens. However, it’s also worth considering the broader context for HVAC pricing in general, in which contractors often double the costs of equipment for their margins, and each person or company will price equipment differently, thus leading to variability across the board.

Conclusion #4. Some reasons for cost variability may be more easily addressed, while others are more inherent and intractable. Certain cost-driving factors may be addressed at the market level (e.g., contractor training to increase knowledge and familiarity), some can be addressed at the programmatic level (e.g., rebate administration process improvements), and some at the policy level (e.g., tariff implementation). However, there are still reasons why we would expect higher costs and higher bid variability for ASHPs (e.g., more complex or efficient equipment, situational complexities), thus requiring cost subsidies or other market interventions for full parity.

Recommendations

The following are recommendations for the market as a whole to consider; some are more applicable to program design, whereas others are more applicable to supply chain actors. Generally, support from all levels would be recommended to increase heat pump adoption.

1. **Include entry-level heat pump systems alongside more advanced heat pumps in programs and education efforts.** While more advanced heat pumps provide a range of benefits and should continue to be a focus, their higher costs could be out of reach for some homeowners. However, entry-level ASHP products can be at price parity with, or less than, highly efficient ACs, and should be included to provide a range of ASHP options to customers. There may still be a gap between the baseline AC and the entry-level ASHP, but incentive programs could help overcome a more minimal first-cost barrier. Making sure market actors are aware of these entry-level systems and that programs incorporate them into their incentive offerings can increase the volume of ASHP system installs overall, in turn helping further overcome experiential and educational challenges for contractors and customers alike.

2. **Continue, expedite, align, and improve incentive programs.** Rebates are important tools for reducing upfront costs and can mitigate some of the inherent and intractable ASHP costs. However, there are some pain points that could be addressed:
    a. Rebates can create an administrative burden across the supply chain and lead to higher labor costs. Simplifying and streamlining rebate processes has been important for successful programs and can help reduce this burden.
    b. Similarly, market actors described issues with cash flow and payment delays. This can be mitigated by expediting incentive processing or introducing staged payments to get money into the hands of market actors sooner.
    c. Market actors noted changing rebates and varying rebate amounts across jurisdictions can be a major pain point. Aligning rebates can help contractors and customers better understand what products qualify and what to expect, as well as clarify the demand signal to distributors, increasing qualified product volume. It may also be beneficial to have a website or repository of rebates available, though it would need consistent maintenance to be valuable.

    Rebate programs also have different models and incentive structures, and all have pros and cons. More research could be done to better understand the most influential and impactful mechanisms and to best align programs where market actors would be most receptive.
3. **Expand contractor knowledge and workforce**. Program staff noted struggles with finding qualified contractors, and several noted lack of buy-in on ASHPs. Increasing contractor education can increase knowledge and experience with different cost-effective application types, improving their comfort in recommending those application types and explaining the operational cost impacts for their customers.
4. **Support increased cost transparency and pricing models aimed to decrease cost.** While many of the costs contractors ultimately include in their bids and invoices are reasonable, it can be hard for homeowners to distinguish and understand different cost components. Increasing transparency on bids can help alleviate confusion and allow customers to better compare system types, while also offering an opportunity to recognize the many real costs of installations that must be accounted for. However, there are still opportunities for pricing models to lower ASHP costs, even before installation. Bulk purchasing, for example, could be a strategy to drive down product costs, although structural constraints to this practice still exist. More conversations with contractors would be beneficial to better understand strategies such as these.
5. **Provide wraparound support, especially around situational complexities**. Standard rebate programs can be very effective, but there are other innovative programs that can help navigate additional barriers. Strategies like providing heat pump information, rebate support, project consultations, and quote comparisons can help homeowners better navigate the ASHP installation process. Additionally, situational complexities can drive cost and price variability and will always be present in retrofit housing stock; weatherization, ductwork modification, and electrical upgrades can also greatly increase the cost of a project. Providing wraparound support on each of these components through one-stop-shops, rebates, and financing for these items can help reduce the sticker shock associated with needed upgrades to support ASHP install.

LIMITATIONS AND AREAS FOR FUTURE RESEARCH

Overall, this work provides robust insights from a literature review, bid and invoice analysis, distributor wholesale price book analysis, and interviews with distributors and program implementers. However, there are some limitations to this work and areas to consider for future research:

- **Inclusion of contractors.** Importantly, this work did not include insights from contractors directly. Contractors are critical market actors and were included in our original study design. However, due to budget constraints, data collection with contractors was removed. This would be a great avenue for future research to better understand their perspectives and gain insight into challenges and opportunities.
- **Inflation considerations.** As mentioned previously, the homeowner bid and invoice data analyzed in this study spanned 2022–2025 but was not adjusted for inflation. Although initial comparison of system combination costs by year did not indicate an expected inflation trend for some application types, we would still expect bids and invoices collected later to be at least somewhat higher than those collected earlier due to general cumulative inflation. Future research could conduct a more detailed comparison of current data by year, adjust bid and invoice data for inflation and re-run analysis, and/or expand the dataset to limit the impacts of year-over-year differences.
- **State representation and sample size.** While this study was able to gather insights from distributors that serve across the Midwest, we recognize parts of this work, like the invoice analyses, were limited to only certain states where data was more readily available. While we assume these are relatively similar across the Midwest, it would be helpful to have more data to compare. Similarly, it would be helpful to have more distributor price books to compare and increase geographic and brand representation.
- **Comparative program environment analysis.** While this work gives a broad overview of cost drivers, it would be interesting to look more carefully at different program environment contexts to further gauge the effect of rebate programs on pricing. Comparing contractor bids across areas with multiple rebate and program options — versus those with limited or no rebate or incentive program options — would help illuminate rebate program impact. It would also be helpful to look more closely at programmatic design to identify most successful program structures and how to best align program components with known market actor needs (e.g., timing for emergency replacement, making planned replacements happen in less busy times) to develop recommendations for strong program structures.

APPENDIX A. MARKET ACTOR INTERVIEW METHODOLOGY

All interviews were conducted by Collaborative staff. Sample lists were created from contacts shared by CEE, Slipstream, and MEEA; interviewee recommendations; and staff reconnaissance of recognizable entities or brands with available contact information. Emphasis was placed on garnering perspectives across the entire footprint of the Collaborative (i.e., interviewing contacts from both Aligned and Activate states).

Emails were sent to all contacts inviting them to participate in a 30-minute interview on Teams or via phone. After one round of email follow-up to all actors, a final contact attempt was made to 8 distributor contacts via phone. All those who participated in an interview were offered a $100 gift card through Tango, an online gift card provider that permitted respondents to select a $100 voucher to a store of their choice.

In total, 34 entities were contacted and representatives from 20 entities participated in a 30–60-minute interview, yielding an overall response rate of 59% (Table 8). Occasionally, multiple representatives from a single entity elected to participate in an interview; in these instances, these individual perspectives were combined to present a singular organizational narrative.

Table 8. Participants by market actor category

Market actor	Included in sample	Responded	Response rate
Distributor	15	8	53%
Utility rebate provider	12	6	50%
Non-utility program innovator	7	6	86%
TOTAL	**34**	**20**	**59%**

APPENDIX B. RESIDENTIAL HVAC EQUIPMENT ARCHETYPE DEVELOPMENT

Residential HVAC equipment archetypes were developed based on key product differentiators in capabilities and performance that drive equipment price differences. For a more comprehensive description of different types of dual heat pumps, see the Collaborative's report "Moving Toward High-Performance HVAC: Applications for Dual Fuel Heat Pumps in the Midwest." [38]

Table 9 details HVAC equipment attributes by archetype. Archetypes were primarily used to analyze distributor price book data, though some were used in distributor interviews for pricing estimates.

Table 9. HVAC equipment attributes by archetype

Archetype	Minimum efficiency	Compressor or furnace stages	Blower type	Includes communicating control?	Applied to wholesale price book data?	Applied to interview cost data?
Standard furnace	95% AFUE	Single	Multi-speed	No	Yes	Yes
Higher efficiency furnace	97% AFUE	Two	Variable speed	Yes	Yes	No
Standard central AC	13.4 SEER2	Single	Multi-speed	No	Yes	Yes
Higher efficiency central AC	15.2 SEER2	Single	Multi-speed	No	Yes	No
Minimum efficiency ASHP	14.3 SEER2, 7.5 HSPF2	Two	Multi-speed	No	Yes	*Yes
Average variable speed ASHP	16 SEER2, 8.5 HSPF2	Variable capacity	Either	Maybe	Yes	No
Cold climate ASHP	15.2 SEER2, 8.1 HSPF2, COP@5°F 1.75	Variable capacity	Either	Maybe	Yes	Yes

[38] Slipstream and CEE, "Moving Toward High-Performance HVAC."

***Minimum efficiency ASHP equipment costs were further separated by single- and two-stage for distributor interviewees only.**

Archetype characteristics

Characteristics used to develop furnace, central AC, and ASHP equipment archetypes are described in the following section.

Furnace

The project team selected a non-communicating single-stage 95% AFUE gas furnace with a constant torque ECM blower to represent the lowest cost blower motor and control board. While the federal minimum efficiency standard for a residential gas furnace is 80%, the project team is aware of circumstantial evidence that 80% AFUE furnaces may be more expensive or unavailable for pricing due to stocking practices. Additionally, ENERGY STAR requires a minimum 95% AFUE furnace, and lower efficiency units do not meet the requirements for rebate programs. To corroborate this decision, Figure 10 shows how going back to 2013–2020, a higher proportion of existing furnaces in the Midwest are above 90% AFUE. As of this study's publication, the project team presumes the sales of higher efficiency furnaces have continued to gain market share.

Figure 10. Percentage of gas furnace sales from 2013–2020, weighted by state population of gas furnaces in 2020[39]

State	Region	80% AFUE	90%-94% AFUE	95+% AFUE
Illinois	North	43%	19%	38%
Indiana	North	35%	12%	52%
Iowa	North	10%	4%	85%
Kansas	North	53%	15%	30%
Kentucky	South	27%	5%	68%
Michigan	North	19%	16%	64%
Minnesota	North	43%	19%	37%
Missouri	North	35%	15%	50%
Nebraska	North	19%	18%	62%
North Dakota	North	35%	12%	53%
Ohio	North	19%	18%	62%
South Dakota	North	7%	13%	78%

[39] AGA, "2024 ENERGY STAR Furnace Comments."

Wisconsin	North	41%	20%	38%
MEEA State Average	**N/A**	**30%**	**14%**	**55%**

For the distributor wholesale price book analysis, the project team also examined prices for two-stage, communicating, 97+% AFUE furnaces with a variable speed ECM blower. This furnace type may need to be matched with higher-end variable speed heat pumps for the heat pumps to achieve their nameplate performance.

Central AC

Two central AC archetypes were used for the distributor wholesale price book analysis. The standard central AC meets federal minimum efficiency standards and the higher efficiency central AC meets ENERGY STAR qualifications.

ASHPs

Three ASHPs were used for the distributor wholesale price book analysis. The standard ASHP meets federal minimum efficiency standards and both the average variable speed and cold climate ASHPs meet ENERGY STAR qualifications. The cold climate ASHP archetype used in analysis is a communicating system and meets ENERGY STAR cold climate efficiency requirements at low temperatures.