Expanding Electrification Pathways in Multifamily Housing Through Cold-Climate Window Heat Pumps

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ABSTRACT

Decarbonizing existing multifamily buildings remains one of the most persistent challenges in the clean energy transition, particularly in communities where aging infrastructure, limited capital, and the need to minimize tenant disruption constrain traditional retrofit approaches. This paper examines the potential of a novel cold-climate-capable window heat pump to expand the toolkit available to utilities and program implementers by enabling scalable, low-cost electrification pathways.

Window heat pumps are a modular solution that combines efficient cooling and reliable heating in a compact through-window configuration that requires no refrigerant handling, specialized electrical upgrades, or professional installation. Operating on standard 120V power, it can be installed in under 30 minutes, allowing for room-by-room retrofits that minimize disruption and reduce upfront costs. Field data from a recent deployment in a low-income multifamily community demonstrated consistent temperature control, measurable reductions in heating energy use, and only a modest increase in total electric load.

These findings, supported by ongoing field demonstrations, underscore several emerging opportunities for utilities and policymakers. Specifically, they point to the potential for deploying phased, modular electrification strategies that enable multifamily building owners to proceed incrementally as financial resources permit; for evaluating the grid-interactive capabilities of modular heating and cooling systems to enhance demand flexibility and resilience; and for integrating window heat pumps into workforce development initiatives aimed at training and certifying new entrants to the HVAC industry.

Introduction

Decarbonizing the built environment is essential to meeting municipal, state, and national climate targets (DOE, 2024). In dense urban areas, existing multifamily housing represents a significant share of building-sector emissions, yet it remains among the most difficult segments to electrify. Many of these buildings serve low- and moderate-income residents who already face disproportionate energy burdens, compounding the urgency of identifying retrofit solutions that are both climate-aligned and socially equitable.

Despite growing policy momentum, including the growing prevalence of building performance standards such as New York City's Local Law 97 and robust state and local incentives promoting building electrification, multifamily electrification continues to face persistent structural barriers (New York City Department of Buildings 2026). Aging building infrastructure often limits the feasibility of central heat pump installations due to electrical capacity constraints, spatial limitations, and hazardous material remediation such as asbestos or lead paint. Installing ductless mini-splits can also prove to be cost-prohibitive due to the need to run condensate and refrigerant lines from each dwelling unit. Upfront capital costs remain substantial, particularly for public and affordable housing providers with constrained balance sheets. In occupied buildings, retrofit projects also introduce operational complexity and the risk of tenant disruption or displacement. Together, these barriers have slowed large-scale electrification across the multifamily sector.

Recent innovation in modular, window-mounted heat pump technology, otherwise known as packaged window heat pumps (PWHPs), introduces a potential alternative pathway. Designed to install within an existing window opening, install without drilling or building modifications, and operate on a 120V outlet, PWHPs significantly lower the barrier to large-scale building retrofits. Through New York's Clean Heat for All Challenge, manufacturers have further developed cold-climate-capable PWHPs designed to perform reliably in cold climates. A full list of specifications are outlined in the Clean Heat for All Pilot evaluation report (NYSERDA, 2025).

This paper evaluates the potential of cold-climate PWHPs as a scalable retrofit solution for existing multifamily buildings. Specifically, it examines whether modular, in-unit electrification can address key barriers of cost, infrastructure constraints, and tenant disruption. This paper will also explore how incentive programs can best integrate PWHPs into their offerings, drawing on real-world implementation lessons. It focuses onone key deployment in Lynn, Massachusetts, highlighting the in-field experience of property management staff converting from a failing steam boiler to window heat pump technology. Overall, it argues that window-mounted heat pumps represent a lower-cost, minimally disruptive electrification pathway that will enable more buildings to pursue building decarbonization, especially in constrained multifamily contexts, particularly in publicly owned and affordable housing portfolios.

Barriers to Multifamily Building Electrification

Electrifying multifamily buildings presents a set of technical, financial, and operational challenges that make this sector a unique portion of the building stock to electrify. These barriers stem largely from upfront costs, electrical capacity, workforce availability, and tenant displacement.

Access to Capital & Upfront Cost

Upfront costs are a common barrier to building electrification. Multifamily buildings require a tremendous amount of upfront capital to commit to a building retrofit. A cost study examining retrofit costs in California, New York, and National estimates found that retrofitting large multifamily buildings with air source heat pumps can cost roughly $16,800–$31,600 per dwelling unit, and $38,300–$44,700 per dwelling unit if using ground-source heat pumps (CEE 2026). Costs include building service upgrades, panel upgrades, make-ready work to accommodate the new equipment, installation labor costs, and, if necessary, costs to displace tenants while work is being performed. Constrained operating budgets can make large-scale retrofits financially prohibitive without substantial incentives or subsidies.

Electrical Capacity

Many multifamily buildings, particularly those constructed before modern electrical standards, lack sufficient electrical capacity to support all electric heating loads, particularly during winter peak demand. Many buildings require upgrades to their electrical service before electrification projects can proceed. These upgrades including upgrading service connections, transformers, and building panels can be expensive and oftenrequire coordination with local utilities, increasing both project costs and project timelines. Additionally, electrical capacity upgrades can exceed the cost of the electrification equipment itself (StopWaste 2023). In dense urban areas in particular, limited utility distribution capacity and lengthy interconnection processes can further complicate or delay electrification projects. Consequently, electrical capacity constraints in older buildings are one of the primary technical and economic barriers to large scale decarbonization of existing buildings.

Skilled Labor

Installation labor is also a consideration when it comes to multifamily building electrification, as there is a growing demand for skilled labor capable of designing and installing heat pump systems. However, building trades face a significant workforce shortage, with a significant demand for HVAC technicians in the United States and an aging workforce nearing retirement, prompting increased investment in apprenticeship programs and other workforce development initiatives (Martucci 2024).

Technology Overview

PWHPs represent a distributed, in-unit electrification approach that integrates the performance characteristics of high-efficiency mini-split systems with the installation format of a conventional window air conditioner. PWHPs such as Gradient's system operate on a standard 120V outlet, reducing or eliminating the need for costly electrical service upgrades in many buildings.

Figure 1. A Gradient PWHP installed in a window

The technology employs a below-sill “saddlebag” architecture, positioning components on both sides of the window plane. This configuration enables larger heat exchangers than those found in traditional window air conditioners, improving thermal performance while maintaining compatibility with existing window openings. The system uses variable-speed compressors and fans, similar to those found in typical high-performance mini-split systems, to deliver efficient heating and cooling across a range of operating conditions, including cold climates.

A distinguishing feature of the system is its factory-charged, hermetically sealed refrigerant circuit which uses R-32 refrigerant with a global warming potential (GWP) of 675, approximately one-third that of commonly used R-410A refrigerant (GWP 2,088). This significantly reduces the system’s potential climate impact in the event of a refrigerant leakage. Unlike conventional mini-split or ducted systems that require field-installed refrigerant line sets, this closed-loop configuration reduces the potential for refrigerant leakage over the system’s lifetime. Because the system is charged and sealed at the factory, the system is estimated to reduce refrigerant leakage by 89-95% compared to systems that rely on field-made refrigerant connections (EPA 2023).

Installation Process

PWHPs are designed to minimize building-level intervention during installation. Installation of the PWHP requires two installers due to the unit's weight of approximately 140 pounds, as shown in the photo below. The system installs through an existing window opening using a mounting bracket that secures the unit without wall penetrations or structural modifications. This installation approach reduces the need for invasive construction work, which can otherwise trigger hazardous material mitigation (such as asbestos abatement) or require significant interior access in occupied buildings. By avoiding these interventions, the technology may reduce both project complexity and the risk of tenant displacement during retrofit projects.

Figure 2. (left to right) Gradient's installation bracket in an open window; Two installers preparing to install the Gradient unit onto the bracket.

To maintain the integrity of the building envelope, the system incorporates weather-resistant sealing materials. Insulated blocks are used to insulate the opening created by the window opening; these blocks can be highly customized to fit various window widths that lock in either side of the window unit.

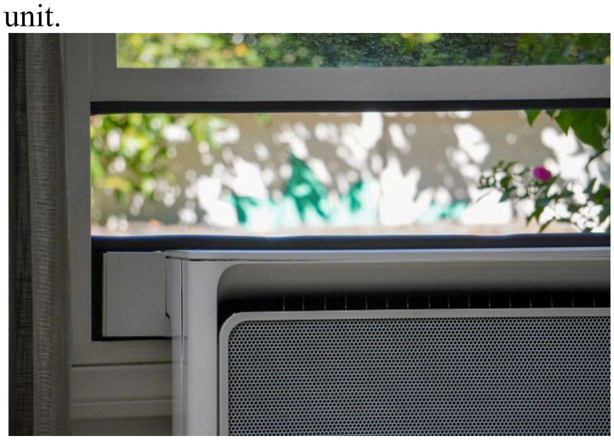

Figure 3. A close-up of Gradient's weatherization blocks and weather stripping.

Novel Features

The most novel part of the packaged window heat pump system is its condensate management. Condensate is disposed of through an exterior atomization mechanism that disperses meltwater and condensate as a fine mist outside the building, eliminating the need for dedicated condensate drainage lines.

Figure 4. Gradient's outdoor atomizers

The unit is equipped with a standard MERV-2 air filter and can optionally accommodate a MERV-13 filter. Higher-efficiency filtration allows the system to provide particulate removal in addition to space heating and cooling, improving indoor air quality. Gradient's internal performance data suggests that this level of filtration can be achieved with minimal impact on overall system efficiency.

The Gradient system can also connect to Wi-Fi, allowing occupants to control their heat pump remotely through the Gradient mobile application. The app enables users to adjust temperature setpoints, create operating schedules, change fan speeds, and receive predictive maintenance alerts, among other features.

Wi-Fi connectivity also allows the system to integrate with Gradient Nexus; a backend management platform designed for building owners and property managers. Nexus provides centralized visibility across a portfolio of Gradient units through a dashboard that displays unit setpoints, tracks setpoint compliance, and identifies units that may require maintenance or troubleshooting. The platform also supports predictive maintenance by flagging potential performance issues before they result in system failures.

In addition, Nexus enables building owners to establish setpoint limits that define the allowable temperature range occupants can select, helping improve building-wide energy efficiency while maintaining occupant control. Gradient expects to introduce demand response capabilities within Nexus by the end of 2026, which would allow connected units to participate in grid-responsive energy programs.

Deployment Highlight: Lynn Housing Authority

This section describes lessons learned from a real-world deployment of PWHPs at a multifamily property managed by the Lynn Housing Authority in Lynn, Massachusetts. The building was built in 1956 and had a total of 47 dwelling units.

Baseline Equipment

The property orginially had a central steam boiler system for heating and most tenants had a window AC units for cooling The boiler system was at the end of its life and begun to fail. Aging and leaking pipes caused property damage and created moisture conditions that contributed to mold formation. Maintenance staff were required to call plumbers almost weekly to address pipe failures and system leaks. The initial remediation plan was to replace the failing boiler system with a like-for-like replacement at an estimated cost of approximately $2,000,000, or about $42,500 per apartment unit.

Initial Assessment

Before committing to a full system replacement, the housing authority conducted an initial assessment of Gradient PWHPs. In March of 2025, four PWHPs were installed in two one-bedroom apartments, with two PWHPs per apartment. The systems were plugged into existing 15-amp outlets and operated without tripping breakers, even during severe cold-weather events. The primary goal of this pilot installation was to confirm that the units could provide sufficient heating capacity, as the property manager initially expressed skepticism about whether the systems could adequately heat the apartments. Because of this uncertainty, the original steam heating system was shut off but not fully decommissioned at the beginning of the project. Most radiators remained in place during the trial period as a precaution. After observing satisfactory performance from the demonstration units, property management decided to proceed with a full retrofit of all 47 apartment units throughout the summer of 2025. The boiler was fully decommissioned in early 2026.

Training and Installation

Gradient provided training for the building's maintenance staff so they could complete the installation of the PWHPs themselves. Once familiar with the process, maintenance staff were able to install units in as little as 16 minutes, with an average installation time of approximately 30 minutes per system. Installers identified efficiencies during the process. Because the building had standardized window dimensions, brackets could be pre-fitted in advance using the same measurements, which reduced installation time inside each apartment unit. Additionally the weatherization kit for each installation could be pre-cut for each window, expediting the installation time. Property management staff reported that the training provided by Gradient was "excellent" and enabled their team to complete the installations confidently.

Unit Performance

The PWHPs performed reliably during the hot summer weather. Monitoring of the building's electrical load indicated that the systems operated well within the capacity of the building's existing electrical infrastructure, eliminating the need for an electrical service upgrade.

To assess the impact of the retrofit, utility consumption and costs from July 2025 through March 2026 were compared with those from the same period one year earlier (July 2024 through March 2025). This analysis captures the first full heating season following installation of the

PWHPs and reflects actual building operation under occupied conditions. This analysis was done at a master meter level, so it includes other gas and electric appliances on the meter. Table 1 presents the resulting changes in gas and electricity consumption, utility costs, and overall energy savings.

Gas	therms	Percent Energy Savings	Utility Bill Savings
Summer (July – October)	518	26%	$ 714.42
Winter (November – March)	14,525	85%	$ 21,499.36
Total	15,043	78%	$ 22,213.78
Electricity	kwh	Percent Energy Savings	Utility Bill Savings
Summer (July – October)	8,573	13%	$ 2,482.63
Winter (November – March)	-84,369	-100%	$ (20,460.77)
Total	-75,796	-51%	$ (17,978.14)
		Overall Annual Cost Savings	$ 4,235.64

Table 1. Pre/ post retrofit gas and electricity savings at Lynn Housing Authority

Utility consumption, when accounting for both gas and electricity, was roughly comparable to the previous boiler system despite a colder winter. While the average winter temperature from 2024-2025 was 34.7°F the following winter averaged 31.9°F, approximately 3°F colder (National Weather Service 2026). Additionally, tenants were allowed to set their indoor temperatures as high as 80°F using the heat pumps, a level of individual temperature control that was not available with the previous central boiler system. Analysis of utility bills showed that the retrofit reduced natural gas consumption by 15,043 therms when comparing the pre and post retrofit periods. This represented a 78% reduction in gas use and approximately $22,214 in gas utility cost savings.

The retrofit also significantly improved cooling performance across the property. Prior to the retrofit, most apartments were served by a single window air conditioner. Following the retrofit, each apartment received two Gradient PWHP units, effectively doubling the number of cooling units while providing whole-apartment cooling coverage. Despite this substantial increase in cooling capacity and resident comfort, electricity consumption during the summer period decreased by 8,573 kWh, representing a 13% reduction compared to the pre-retrofit period.

Overall, electricity consumption increased by 75,796 kWh annually due to the electrification of space heating, resulting in approximately $17,978 in additional electricity costs. However, the gas savings more than offset the increased electricity expenses, producing a net annual utility bill savings of $4,236.

Maintenance

Prior to the installation of the PWHPs, property management staff reported that they received approximately 50 heating-related complaints per month. Following the installation of the heat pumps, those calls dropped to only a few minor service requests, substantially reducing the maintenance workload for building staff. Property management staff also reported that most of these calls were related to confusion about how to use the heat pump rather than complaints about the system not functioning properly.

The property manager reported that maintaining the PWHP systems is both simpler and more cost-effective than maintaining the previous heating system, primarily because outside contractors are no longer required for routine service. Quarterly maintenance for the PWHPs can be performed by the building's own maintenance staff, reducing overall operating costs. Additionally, any system outage is typically limited to a single room within a dwelling unit rather than affecting the entire building. As a result, potential heating interruptions are more localized, reducing the likelihood that multiple tenants experience a loss of heating simultaneously.

One operational difference is that the PWHPs require unit-level maintenance, meaning staff must access individual apartments to service the equipment. However, property management noted that the maintenance tasks are relatively quick. Routine maintenance consists primarily of cleaning the air filters and condensate filters on a quarterly to semi-annual basis, depending on operating conditions and the indoor environment. Air filters can be removed and cleaned in a manner similar to those used in portable air purifiers, either by gently vacuuming accumulated dust or by rinsing with distilled water or a dilute bleach solution. Condensate filters should be cleaned quarterly by removing the filter assembly, rinsing it with distilled water or a dilute bleach solution to remove accumulated sediment, and reinstalling it according to the manufacturer's instructions. According to the property manager, standard servicing is efficient enough that staff "should be able to do eight apartments, 16 Gradient units, in about an hour."

Tenant Sentiments

Property management staff reported that most tenants were accommodating during installation scheduling, particularly because many welcomed the addition of both reliable heating and new air conditioning.

Some tenants required education on operating the heat pump systems. Remote monitoring and control through the Nexus platform proved valuable, allowing property managers to adjust settings and monitor performance when tenants had difficulty selecting heating or cooling modes. As with other heat pump technologies, tenant education and engagement remain important considerations for successful deployment.

The property manager also noted that some tenants initially expected immediate bursts of high-temperature heat similar to a furnace or radiator system. Instead, the heat pumps gradually increased the room temperature, which required some adjustment in expectations.

Feedback from a resident interviewed approximately one year after installation was largely positive. The resident reported high satisfaction with both the heating and cooling performance of the PWHPs, rating each aspect of the system 5 out of 5 as outlined in Table 2.

Aspect Evaluated	Rating (1–5)	Resident Comments
Overall Satisfaction	5	"I'd say a five. It's good."
Heating Performance	5	"The heating is five. It's excellent."
Cooling Performance	5	"It was excellent."
Noise Level	5	"It's great. It's not noisy at all."

Appearance / Design	5	"It's a five, it doesn't bother me."

The resident noted that the units provided reliable heating during cold winter weather, effective cooling during the summer, and operated more quietly than the previous window air conditioner. The resident also reported that the controls were easy to use and that the units did not interfere with the use of the apartment. The primary concerns raised related to understanding system operation, including questions about automatic cycling behavior and recommended operating practices. Overall, the resident reported that they liked the Gradient. The operational concerns should be addressed through additional tenant education and guidance on system use.

Program Implementation Considerations

PWHPs can be used as a tool to overcome many of the challenges associated with building decarbonization. This section will outline considerations and strategies that utilities and implementation firms may leverage to integrate PWHPs into energy efficiency and decarbonization programs.

Utilities and program implementers considering PWHPs as part of their portfolio should evaluate several factors to maximize both uptake and impact. These include program design choices such as incentive structure and delivery mechanisms, approaches to installer training and quality assurance, and strategies for addressing the metering and billing considerations unique to in-unit electrification.

Installation Considerations

PWHPs have a factory-sealed refrigerant loop, as a result, installers do not need to handle refrigerants during installation, eliminating the need for specialized tools and certifications such as EPA Section 608 refrigerant handling credentials. Additionally, the design of PWHPs substantially simplifies the installation process relative to conventional mini-split or ducted heat pump systems, which require the installations of refrigerant line sets and condensate lines. PWHPs integrate both indoor and outdoor components into a single unit mounted at the window, eliminating the need to install exterior condenser units or run refrigerant or condensate lines through building walls. These characteristics reduce the amount of invasive construction typically required for heat pump retrofits, which can be particularly beneficial in occupied multifamily buildings where tenant disruption and building access constraints can complicate installation work. This simplified installation process reduces labor costs and shortens deployment timelines, particularly in buildings where access constraints, tenant coordination, and limited contractor availability present barriers to electrification projects.

These design characteristics also reduce the level of specialized HVAC expertise typically required for installation. In many cases, PWHPs can be installed by building maintenance staff or other trained personnel rather than licensed HVAC contractors. As a result, PWHP deployment may provide building owners with greater flexibility in selecting installation labor and could significantly reduce project costs if owners are able to rely on in-house maintenance teams or general contractors rather than specialized HVAC technicians.

Given these characteristics, utilities and program administrators should consider how PWHPs fit within existing heat pump incentive programs, which often require installation by utility-approved HVAC contractors such as MassSave or the TECH Clean California program. Such requirements may limit the cost and deployment advantages offered by this technology. Allowing trained maintenance staff, general contractors, or other qualified installers to perform installations could help reduce installation costs and expand adoption.

While enabling a wider range of installers to be able to install PWHPs, utilities and program administrators should continue to work with building owners to ensure that equipment is appropriately sized for the spaces being served. While PWHPs can be effective for conditioning individual dwelling units, certain building areas such as common spaces, hallways, or other shared areas may require alternative heating or cooling solutions. Careful system design and planning can help ensure that all spaces within a building are adequately served while maximizing the benefits of PWHP deployment.

Additionally, utilities and program implementers could consider integrating PWHPs into workforce education and training (WE&T) programs as an accessible introduction to heat pump technologies. Because the systems are relatively simple to install, PWHPs could provide trainees or apprentices with hands-on exposure to heat pump equipment while learning fundamental installation concepts. This approach could broaden participation in HVAC-related training programs and help expand the pipeline of workers entering the HVAC field.

Lower Upfront Costs

Packaged window heat pumps can substantially reduce the upfront capital costs associated with building electrification in multifamily housing. As illustrated in the Lynn Housing Authority example described earlier, the original remediation plan called for a like-for-like replacement of the building's failing steam boiler system at an estimated cost of approximately $2,000,000, or about $42,500 per apartment unit. By contrast, retrofitting the building with Gradient PWHPs resulted in an estimated per-unit installed cost of approximately $6,250, representing an 85% reduction in upfront capital costs relative to the planned boiler replacement. This

Recent research supports the cost advantages of this technology. A 2025 report from the American Council for an Energy-Efficient Economy (ACEEE) examining electrification options for centrally heated multifamily buildings found that PWHP retrofits can be significantly less expensive than other heat pump technologies. As shown in Figure 5, the installed cost per apartment averaged approximately $9,300 for Window HP (also referred to as PWHPs), compared with $16,435 for mini-split systems and $20,379 for variable refrigerant flow (VRF) systems (Nadel, Traynor, and Gruen 2025). These cost differences are driven largely by the simplified installation process, which eliminates the need for refrigerant lines, condensate lines, and extensive electrical upgrades in many buildings.

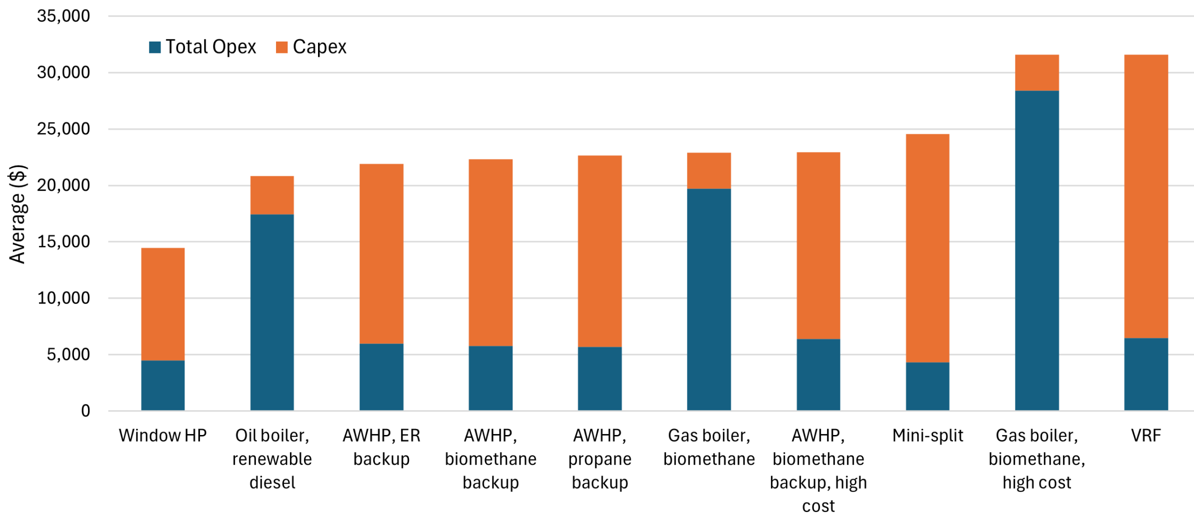

Figure 5. Average operating cost (opex), capital costs (capex), and life-cycle costs (LCC) over the 24-year study period for decarbonization options, *Source:* ACEEE. 2025

For utilities and program administrators, the lower upfront costs associated with PWHPs may have important programmatic implications. Because incentive budgets are typically fixed, technologies with lower installed costs may allow programs to serve a larger number of housing units with the same funding allocation, potentially accelerating electrification progress in the multifamily sector. Lower project costs may also make electrification projects financially feasible for building owners who would otherwise defer upgrades due to high capital requirements.

In addition to direct equipment and installation savings, utilities may also consider several secondary factors that influence program cost-effectiveness. PWHP deployments can reduce soft costs associated with project design, contractor coordination, and permitting because installations occur at the unit level and require fewer specialized trades. In many cases, installations can also proceed incrementally, allowing buildings to phase deployments over time rather than undertaking a single large capital project.

Limiting Panel Upgrades

Since PWHPs operate on a 120V outlet, they represent a new generation of equipment such as 120V stoves and heat pump water heaters that are significantlysignificantly lowering the need to upgrade electrical service capacity of a building. In the example provided at Lynn Housing Authority, this building, built in 1956, was able to install two 12A PWHPs per apartment without issue on the existing electrical capacity of the building.

Gradient has also released software setting that limits the amperage to 7.5A which has the potential to further limit the need to go through costly electrical upgrade processes. This feature comes with no impact to the cooling performance of the PWHP and very little impact to the heating performance of the Gradient unit.

Incentive Design

Utilities and program implementers considering the inclusion of PWHPs in electrification incentive programs may benefit from adopting a more flexible program design than those typically used for central HVAC retrofits. Because PWHPs are in-unit electrification measures, they can be installed incrementally rather than requiring a single, large capital project. This characteristic creates opportunities for phased electrification, allowing building owners to install units over time as funding, labor availability, and tenant scheduling permit.

Even with lower equipment and installation costs, building electrification can still represent a significant capital expense for many property owners, particularly in affordable or regulated housing where financing options may be limited. Enabling a phased deployment approach can help programs meet building owners where they are financially while still supporting a long-term pathway toward full building electrification. Under this model, building owners could electrify units gradually as resources become available, rather than delaying projects until sufficient capital is secured for a full-building retrofit.

The experience at the Lynn Housing Authority demonstrates how this approach can work in practice. After testing several units, the property management team installed the remaining PWHPs using their internal maintenance staff over the course of approximately three months. Because each unit could be installed independently, the deployment schedule was aligned with the building management team's availability and operational priorities.

To support this type of implementation, utilities may consider designing incentives that allow for unit-by-unit installations, multi-year participation, or partial-building retrofits rather than requiring whole-building upgrades within a single program cycle. Programs could also allow building owners to reserve incentives for future phases of installation or provide streamlined processes for returning participants. By accommodating phased electrification strategies, utilities may enable a broader range of multifamily buildings, particularly those with constrained capital resources, to begin transitioning to electric heating and cooling systems.

Cost Shifting

Given PWHPs are installed within individual dwelling units, their deployment can introduce new policy considerations related to how energy costs are allocated between building owners and tenants. In many multifamily buildings with central heating systems, heating costs are typically paid by the property owner and incorporated into operating expenses rather than billed directly to tenants. Transitioning to in-unit electric heating systems in buildings with split utility metering can shift heating-related electricity costs to tenants unless billing structures, rent adjustments, or other cost-allocation mechanisms are addressed.

This potential cost shift is particularly important in affordable and regulated housing, where policies often seek to limit increases in tenant energy burdens. Without careful program design, electrification retrofits that move heating loads from central systems to tenant-metered electricity could unintentionally increase household energy costs for residents.

To address these concerns, electrification programs and housing authorities may need to consider complementary policy approaches, such as considering timelines for utility allowances, adjusting rent structures, or providing targeted energy assistance to tenants. In affordable housing contexts, updating utility allowances to reflect the new electric heating load can be a critical step in ensuring that tenants are not financially disadvantaged by the transition.

Because utilities and program administrators are often the primary entities encouraging or incentivizing electrification, they may also play an important role in supporting building owners through the utility allowance adjustment process. This could include providing technical assistance, documentation of expected energy usage, or coordination with housing agencies responsible for approving allowance changes. Streamlining or facilitating this process could help reduce administrative barriers for property owners while ensuring that electrification projects proceed in a way that maintains affordability for tenants.

Efficiency Ratings

PWHPs occupy a somewhat distinct category within the broader heat pump market. Although they provide both heating and cooling functionality similar to air-source heat pumps (ASHPs), they are technically classified as room air conditioners with a reverse-cycle capability rather than as traditional split or ducted heat pump systems. As a result, PWHPs are evaluated under a different set of efficiency metrics than most ASHPs.

Specifically, PWHPs are typically rated using Combined Energy Efficiency Ratio (CEER) for cooling performance and Heating Energy Efficiency Ratio (HEER) for heating performance. These metrics differ from the efficiency ratings commonly used for conventional ASHPs, which are typically evaluated using Seasonal Energy Efficiency Ratio (SEER2) for cooling and Heating Seasonal Performance Factor (HSPF2) for heating. Because these metrics measure performance using different methodologies and test procedures, direct comparisons between PWHPs and traditional heat pump systems can be difficult.

As PWHP technologies become more widely deployed, there will likely be a growing need for program administrators, contractors, and other implementation stakeholders to understand how CEER and HEER ratings relate to the more familiar SEER2 and HSPF2 metrics used for conventional heat pump systems. Developing a crosswalk or comparison framework could help stakeholders better evaluate the relative efficiency and performance of PWHPs within existing heat pump programs.

Another distinction is that PWHPs are not listed or rated by the Air-Conditioning, Heating, and Refrigeration Institute (AHRI), which maintains widely used product directories and performance certifications for many HVAC technologies. Because many utility incentive programs rely on AHRI listings to verify equipment eligibility, this absence can create a barrier for incorporating PWHPs into existing program structures. In practice, utilities and program administrators may need to modify program requirements or establish alternative verification pathways to allow these systems to qualify for incentives.

Several organizations are beginning to address this gap. Notably, the Consortium for Energy Efficiency (CEE) has developed a specification recognizing this category of technology, more broadly referred to as room heat pumps, and has begun listing qualifying products through a Qualified Product List (QPL) (CEE 2026). This represents one of the first formal efforts to define efficiency criteria and verification pathways for PWHP technologies within utility efficiency programs. As additional jurisdictions and program administrators evaluate this emerging technology, similar specifications and certification frameworks may continue to evolve to support broader program eligibility.

Conclusion

PWHPs represent a promising pathway for accelerating building electrification in the multifamily housing sector, particularly in existing buildings where traditional retrofit approaches can be prohibitively expensive or complex. PWHPs offer several characteristics that directly address many of the persistent barriers to electrification in multifamily buildings including high upfront costs, electrical infrastructure upgrades, installation complexity, tenant displacement, and workforce limitations.

The example of Lynn Housing Authority illustrates how these systems can be successfully deployed in real world conditions. By avoiding the need for major electrical upgrades, eliminating refrigerant line and condensate line installation, and enabling rapid unit-by-unit installation, PWHPs allowed the building to transition away from a failing steam heating system at a fraction of the cost of a conventional like for like replacement. The project also demonstrated operational benefits, including reduced maintenance demands and improved cooling access for tenants.

The deployment of PWHPs introduces several considerations that utility programs should address to fully realize the potential of this technology. These include enabling a diverse workforce to be able to install PWHPs, adapting efficiency rating frameworks to allow for the inclusion of PWHPs, and developing incentive structures that enable phased unit-by-unit electrification strategies.

Beyond traditional multifamily housing, PWHPs may offer a practical electrification pathway for buildings such as dormitories, manufactured housing, mobile homes, and accessory dwelling units (ADUs). Expanding utility programs to include PWHPs could therefore support electrification not only in multifamily apartments but also across a broader range of residential building types that have historically been difficult to decarbonize.

Incorporating PWHPs into utility energy efficiency and electrification programs will likely require modest adjustments to existing program rules, contractor qualification requirements, and equipment eligibility criteria. However, the potential benefits are substantial. By lowering installation costs, reducing dependence on specialized labor, minimizing electrical infrastructure upgrades, and enabling incremental deployment strategies, PWHPs can expand the range of buildings able to participate in electrification programs, particularly older multifamily buildings and affordable housing properties that have historically faced the greatest barriers to adopting clean heating technologies.

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