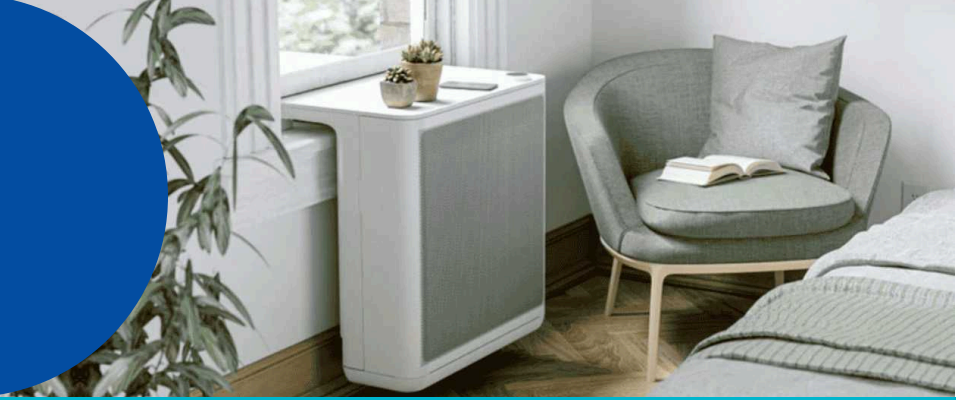


FOCUS ON EMERGING TECHNOLOGY



ALTERNATE FORM FACTOR HEAT PUMPS (AFFHP)

Technology Description

AFFHPs are compact low-cost systems suitable for homes without ductwork and offer easy installation due to requiring minimal electric or structural changes. AFFHPs are different from typical split systems and packaged units because they do not include indoor and outdoor units connected by refrigerant lines and do not have all components in one outdoor cabinet. Examples of AFFHPs include cold climate saddlebags, two-way window units, portable units, packaged terminal units, and vertical stack systems.

Features of AFFHP often overlap, therefore choosing the appropriate AFFHP for a retrofit application is largely dependent upon the property type, available space, and costs. Adoption of these units has been slower than other heat pump types, which can be attributed to them not being as well known to contractors or Trade Allies along with site considerations, such as outlet location, breaker capacity, and window geometry.

AFFHP can be installed as a full displacement, meaning the existing equipment is removed completely, or partial displacement, where the baseline heating system serves as a backup to the AFFHP. Although field validation is still limited, early deployments suggest these technologies hold strong potential for providing heating in colder climates such as Wisconsin making them a viable option for a full displacement scenario.

Benefits

- Quieter, more efficient, and more visually appealing than legacy equipment, boosting tenant satisfaction and helping property owners meet health, safety, and efficiency goals.
- Offer room-by-room temperature control and fast installation, allowing comfort to be restored quickly.
- Deliver a flexible, cost-effective, energy-efficient heating and cooling option for buildings previously with limited or impractical equipment choices.
- A growing range of product types and features allows systems to meet the unique heating and cooling needs of diverse spaces.
- Increasingly capable of reliable performance in extreme cold, with more models demonstrating strong cold climate operation.

Customer Type

- Manufactured housing owners.
- Multifamily property owners, managers, and/or operators.

Market Sectors

Residential and commercial businesses.

Potential Energy Savings

Partial displacement can save 15-30 MMBTU per residence, and full displacement can save 20-35 MMBTU per residence. This equates to a reduction of as much as 30% in a home's annual energy usage. (Assumes a Wisconsin home uses 100 MMBtu/year).

Potential Payback Range

Payback periods vary based on the existing heating system: electric heat replacements typically pay back in 8–10 years; fuel oil or propane in 10–15 years, while replacing natural gas systems generally exceeds a 50-year payback—well beyond equipment life.

Research Findings

- AFFHP effectiveness depends on matching the form factor to real-world building conditions such as outlet access, window geometry, and user interaction.
- Incentive eligibility is limited for some AFFHP types due to classification and testing gaps, requiring more flexible program designs.
- Contractor reluctance toward window units and early-stage cost barriers make Trade Ally engagement and financial incentives critical for market adoption.
- Adoption is further constrained by high first costs, limited distributor participation, supply chain and refrigerant transition challenges, and persistent information gaps.
- Even “plug and play” units often require installer assistance, reducing the viability of DIY approaches.
- AFFHPs offer strong value for replacing propane, fuel oil, and electric resistance systems, and provide moderate benefits in new construction, hard to electrify spaces, and manufactured homes.
- Full system replacement is possible but often impractical; many applications will only partially displace existing heating loads, and full natural gas displacement rarely achieves reasonable payback.

REDUCING ENERGY WASTE ACROSS WISCONSIN

Focus on Energy, Wisconsin utilities' statewide program for energy efficiency and renewable energy, helps eligible residents and businesses save energy and money while protecting the environment. Focus on Energy information, resources, and financial incentives help to implement energy efficiency and renewable energy projects that otherwise would not be completed.