

# PERFORMANCE BUILDER NEWSLETTER

## Heat Pump Efficiency and Effectiveness in Cold Climates

As the HVAC industry moves toward strategic electrification, more builders are applying heat pump systems to reduce reliance on fossil fuels. With today's advancements in heat pump technology, builders can now feel confident of heat pump performance in any climate.

A recent study of [Minnesota's Center for Energy and Environment \(CEE\)](#), a 501c(3) nonprofit, demonstrates the effectiveness of modern heat pumps in cold climates.

For two heating seasons, the CEE conducted a field study of air-source heat pumps (ASHPs) to measure capacity, effectiveness in cold weather and assess the potential to reduce reliance on gas-burning furnaces. Two test homes were equipped with split-ductless FH Series systems from Mitsubishi Electric Trane HVAC US (METUS). The CEE subsequently extended the field study and equipped two additional homes with PVA Multi-position Air Handlers from METUS.



### Key Takeaways from the Studies

- INVERTER-driven cold climate ASHPs are capable of operating efficiently as rated at very cold temperatures.
- Significant reduction in energy consumption was the function of an increase in the coefficient of performance (COP) compared to baseline systems.
- Two homes with the FH series installed saw a 53-56% reduction in both the cost and amount of electricity used. COPs ranged from 4.0-4.5 during the shoulder season and between 1.0-1.5 during the coldest period. One split-ductless unit operated with a COP greater than 1.0 at -19°F.
- Two homes with PVA Multi-position Air Handlers installed resulted in 56% and 57% reduction in homeowner site heat energy Btus used. Annual COPs were 1.82 and 1.85.

The CEE report concludes that electric-powered heat pumps can reduce reliance on less-efficient heating sources and fossil fuels while contributing to a more sustainable built environment. To learn more, please read the full report on the [CEE site](#) or watch the CEE webinar [Air Source Heat Pumps: Cost-Effective & Cold-Climate Ready](#).

# Hyper-Heating INVERTER® Technology

When renovating or building a new home, selecting the appropriate HVAC system is critical to ensure the health and comfort of homeowners. In regions subject to severe cold, builders now have the opportunity to select variable-capacity heat pumps that deliver energy-efficient heating and cooling during part-load conditions and also perform effectively in extreme temperatures. M- and P-Series Outdoor Units equipped with Hyper-Heating INVERTER® (H2i®) technology from METUS, such as the heat pumps mentioned in the above article, provide effective warmth, even in colder climates. Visit [mitsubishicomfort.com](https://mitsubishicomfort.com) to learn more.



## Features

- Single- or multi-zone models available for both M- and P-Series
- Units achieve high heat without electric-resistance heaters
- Units produce 100% heating capacity down to 5°F
- Hot-start feature allows homeowner to heat zones quickly

## Matt Scott Residence



### Challenge

Optimize control and changeover for a heat pump and supplemental heating in an extremely cold climate



### Solution

kumo cloud®, kumo station® and Zoned Comfort Solutions®



### Result

A system that automates changeover and adjusts cooling and heating according to ambient temperatures

## Project Details

- Located in Dover-Foxcroft, Maine
- Lake-front home that experiences freezing winters
- Efficient HVAC needed to keep residents comfortable
- Homeowner needed controls that could optimize changeover

**“I see this product and its ability to use both stages of heating as a huge benefit to homeowners. It can get 20 below here and it’s nice to have a device that you can control from your pocket and know that your house is safe.”**

**— Matt Scott, Homeowner**