

What is a heat pump?

An air source electric heat pump is a dual heating/cooling system that uses electricity to “pump” ambient heat from outside to inside when it’s cold, and vice versa when it’s hot. Modern heat pumps don’t create heat—they just move it to where it’s needed. Heat pumps work best when they’re properly installed in a tightly insulated building.

Myths and misconceptions about heat pumps are everywhere. It’s time to get the facts!

MYTH: Consumers don’t want heat pumps.

FACT: The market has spoken, and heat pumps are here to stay.

American heat pump sales surpassed gas furnace sales in 2022, with the HVAC industry moving more than 4 million heat pump units.¹ Whether heat pump customers buy for comfort, cost, or climate, they seem happy with their purchases: in one DOE-sponsored study of recent New England heat pump adopters, nine out of ten would recommend heat pumps to their friends and family.²

MYTH: Heat pumps don’t work in cold weather.

FACT: Heat pumps sell well in cold climates—because they work in below-freezing conditions.

Heat pumps got a bad reputation for struggling in cold climates in the 1980s—but they’ve come a long way since! New Englanders are now embracing heat pumps, with the region’s power grid operator predicting that 57% of the region’s housing stock will use electric heating by 2050.³ As of early 2023, Efficiency Maine has provided over 100,000 heat pump rebates, while a Maine pilot program to re-install fossil fuel systems for unsatisfied heat pump customers has received zero such requests.⁴ Modern heat pumps sell in these frosty states because cold-climate models achieve over 175% efficiency in temperatures as low as 5° F.⁵ Models from Daikin and Mitsubishi can operate well in temperatures as low as -13° F!⁶

MYTH: Heat pumps don’t make a difference in the fight against climate change.

FACT: Heat pumps slash emissions.

The numbers are clear: heat pumps fight climate change. The International Energy Authority (IEA) estimates that widespread heat pump adoption could cut CO2 emissions by at least 500 million tonnes in 2030—the equivalent of eliminating all annual car emissions across the entirety of Europe.⁷ In New Jersey, residential electrification could cut over 10 million metric tons of CO2E emissions by 2030.⁸

As power grids pivot to low-carbon sources, electric heat pumps can switch with them. But that’s no reason to wait. In 2022, the IEA found that heat pumps still had 20% lower emissions than a gas boiler even on a carbon-intensive grid. A 2022 UC Davis study found that installing residential heat pumps *now* will cut the typical American home’s greenhouse gas emissions over 15 years by more than half, even with conservative decarbonization projections.⁹

MYTH: Heat pumps are uncomfortable.

FACT: Heat pumps are designed for maximum comfort.

Modern heat pumps use inverter technology, which allows them to operate almost continuously and quietly respond to temperature changes in your home, rather than cycling on and off at full blast like a traditional furnace or old air conditioner. No more opening the window because of a boiling radiator or freezing in August from an old air conditioner!

MYTH: Heat pumps are too expensive to run.

FACT: Heat pumps can lower monthly energy bills for many mid-Atlantic households.

A 2021 review of nationwide data from the National Renewable Energy Laboratory established that Americans could save anywhere from \$105 to \$1,287 on annual energy bills when they installed a heat pump.¹⁰ An Acadia Center study found that a typical New Jersey home utilizing air-source heat pumps in the 2021-22 winter season would have saved \$325 on their annual energy bill compared to a gas-heated house.¹¹ Those savings shot up to \$1,812 per year when modelers compared gas heating in a drafty house to heat pumps paired with weatherization.

Savings seen by each household will vary depending upon prior fuel sources, weatherization, local utility rates, and ongoing fluctuations in energy markets. Households that insulate their homes and switch from expensive fuels – like heating oil or propane – will realize the most dramatic savings.

MYTH: Heat pumps are too expensive to install.

FACT: Thanks to incentive and rebates programs, your heat pump could be a lot cheaper than you think!

Despite their name, heat pumps provide both cooling and heating, which means consumers are buying two high-efficiency systems in one! Many variables influence each installation's upfront cost, including the size of the home, prep work needed for the home, type of unit, and labor costs.

As of this January, federal tax credits of up to \$2,000 are available to help cushion the up-front cost.¹² Many New Jersey utilities also currently offer incentives for high-efficiency models. And more help is on the way. The Inflation Reduction Act's High-Efficiency Electric Home Rebate Program will soon provide rebates for heat pumps that cover up to 100% of the cost for low-income households and up to 50% for moderate-income households, along with rebates for associated upgrades where necessary.¹³

MYTH: Contractors won't install heat pumps.

FACT: More and more HVAC contractors recommend heat pumps.

Contractors used to steer clear of heat pumps because of their poor track record in the 1980s and 1990s—but thanks to new heat pump technology, that's changing. The largest utility in New Jersey, PSE&G, lists almost 200 contractors in their HVAC instant rebate program for mini-split or central air-source heat pumps.¹⁴

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- ¹ <https://www.canarymedia.com/articles/heat-pumps/chart-americans-bought-more-heat-pumps-than-gas-furnaces-last-year>
 - ² https://neep.org/sites/default/files/media-files/residential_ccashp_building_electrification_study_cadmus_final_031022_public.pdf
 - ³ https://www.iso-ne.com/static-assets/documents/2022/12/heatfx2023_update_final.pdf
 - ⁴ <https://www.washingtonpost.com/climate-environment/2023/02/07/maine-gas-industry-heat-pumps/>
 - ⁵ https://www.energystar.gov/products/heating_cooling/heat_pumps_air_source/key_product_criteria
 - ⁶ <http://daikinac.com/content/residential/single-zone/daikin-aurora-wall-mounted/>,
<https://www.mitsubishicomfort.com/articles/what-is-a-heat-pump>
 - ⁷ <https://iea.blob.core.windows.net/assets/4713780d-c0ae-4686-8c9b-29e782452695/TheFutureofHeatPumps.pdf>
 - ⁸ <https://www.sierraclub.org/articles/2020/04/new-analysis-heat-pumps-slow-climate-change-every-corner-country>
 - ⁹ <https://www.sciencedirect.com/science/article/pii/S0301421522000386>
 - ¹⁰ <https://carbonswitch.com/heat-pump-savings/>
 - ¹¹ https://acadiacenter.wpenginepowered.com/wp-content/uploads/2022/02/AC_PH_NJ_FINAL.pdf
 - ¹² <https://www.irs.gov/credits-deductions/frequently-asked-questions-about-energy-efficient-home-improvements-and-residential-clean-energy-property-credits-energy-efficient-home-improvement-credit-qualifying-expenditures-and-credit-amount>
 - ¹³ <https://www.energy.gov/scep/home-energy-rebate-programs-frequently-asked-questions>
 - ¹⁴ <https://homeenergy.pseg.com/hvac-contractor>