

AIR-SOURCE HEAT PUMPS CHECK THE FACTS



When it comes to home heating, it's important that homeowners check the facts – about cost, efficiency, comfort and environmental impact. At CenterPoint Energy, we want to be sure you have the information you need to be informed about home heating options.

Heat pump basics

An air-source heat pump is equipped with a mechanical refrigeration device (compressor) that operates like a central air conditioner, with additional components and controls allowing it to be operated in reverse during the heating season. Heat pumps do not consume fuel like a natural gas furnace, but do require large amounts of electricity as the electric compressor drives the compressor cycles to transfer heat from one area to another.

The EIA also notes that the actual heating efficiency and seasonal performance of an air-source heat pump will vary significantly from ARI test results.

In fact, the EIA recommends that heat pumps with an HSPF rating of 9.0 be revised to a HSPF rating of 5.0 for the Twin Cities area.

Cost comparison

Some manufacturers or contractors claim the payback for a heat pump system could be two to three years because it can offset natural gas costs. However, these claims fail to fully explain how they arrived at the savings figures. Often, the savings promoted are simply from an increased overall efficiency factor upgrade (which can also be accomplished by upgrading to a higher efficiency natural gas furnace and electric air conditioner), not specifically from installing a heat pump.

Natural gas home heating is simply a better value – even when considering operating costs. The chart below illustrates the cost difference between a high-efficiency natural gas furnace and an air-source heat pump. The facts clearly show there are no operating costs savings by installing an air-source heat pump.

Learn about:

- Effectiveness in cold weather
- Cost comparison
- Comfort factor
- Environmental impact
- Maintenance, installation and sizing

Effectiveness in cold weather

Air-source heat pumps are designed for, and can be effective in, mild winter climates. In climates like Minnesota, where the temperature is frequently below 35 F, customers using a heat pump will need a supplemental heating system such as a natural gas furnace. At the most, the air-source heat pump will operate only 52 percent of the time during the entire heating season in the Twin Cities.

Here's what the Energy Information Administration (EIA) – Department of Energy has to say: *All heat pumps are rated and tested to ARI (Air Conditioning Refrigeration Institute) standards, but are labeled with a Heating Season Performance Factor (HSPF) for a more temperate area than Minnesota.*

Operating cost comparison: Save by choosing natural gas

	Natural Gas Furnace 94% AFUE	Air Source Heat Pump (9.0 HSPF)
Equivalent energy output (Btu)	39,000,000	39,000,000
Annual heating input in Therm or kWh	415	7,794
Annual operating costs	\$332	\$701
Savings with natural gas furnace	\$370	

* Based on an average Twin Cities-area single family home and using 52% seasonal (heating) output requirement. Air-source heat pump inputs adjusted to Twin Cities per EIA.

** Using \$0.80/Therm residential natural gas and \$0.09 / kWh average residential electricity costs.



Air-source heat pumps are not effective below 32 F, as they require a substantial amount of defrosting cycle time – making them less efficient.

Installation matters

A heat pump unit must be placed above the snowline, requiring unusual and aesthetically unpleasing placement for many homeowners.

The Consortium of Energy Efficiency recommends heat pumps be installed at least 16 – 24 inches above grade. Given Minnesota’s average annual snowfall of 48 inches, the overall installed height could be more than four and a half feet.

Regardless of where the unit is located, heat pump customers must frequently remove snow, leaves and debris from the condensation and defrost drain hole, or risk the unit not working and invalidate the warranty.

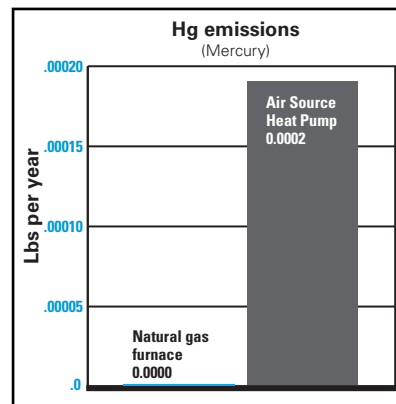
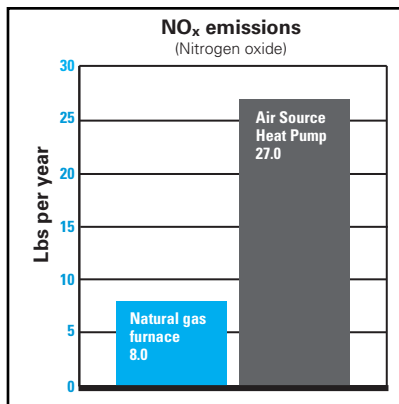
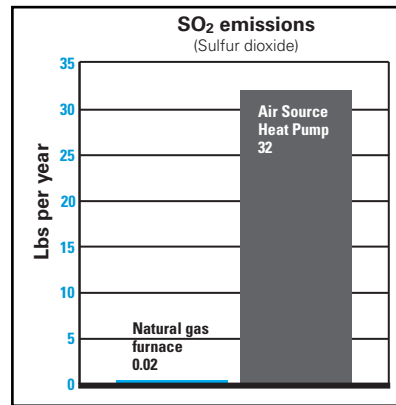
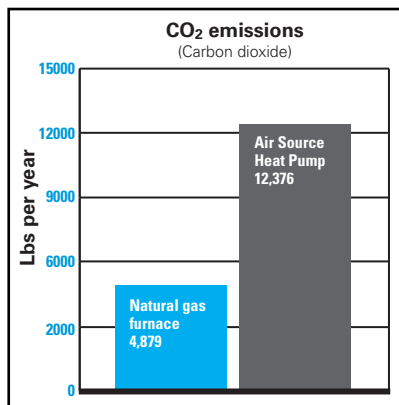
612-372-4727 (1-800-245-2377)
CenterPointEnergy.com

CenterPoint Energy
Customer Relations
PO Box 59038
Minneapolis, MN 55459-0038

Comfort factor

Many builders have learned first-hand that customers often are unhappy with heat pumps because of their lower comfort level.

- A natural gas furnace delivers air at a comfortable 120 F to 125 F through air ducts.
- Heat pumps deliver air lower than body temperature, at a cool 90 F to 100 F. The air feels drafty or cool – a problem that cannot be resolved by simply turning up the thermostat, as one would do with a natural gas furnace.
- It can take several hours for a heat pump to move from a set-back temperature of 60 F to a 70 F room temperature.
- A natural gas furnace quickly delivers comfortable heat when you want it, because the heat delivered begins at a higher temperature.



Environmental factor

When you choose a natural gas furnace you are choosing the most efficient and clean-burning fuel to heat your home. The charts above detail the levels of various pollution-causing emissions released by air-source heat pumps versus natural gas furnaces, using the same equivalent output example as described in the cost comparison table (see front). Clean burning natural gas releases far fewer harmful emissions into the environment.

Air-source heat pumps are actually less environmentally friendly than natural gas furnaces because they require substantial electricity – a secondary fuel – to operate. In Minnesota specifically, more than half of the electricity is produced by burning coal, the biggest source of CO₂ pollution

in this area. Also, if your heat pump is run with an off-peak, electricity rate, the emissions released are most likely higher, as off-peak electricity is primarily coal-based.

Considering effectiveness, cost, comfort and the environment, a natural gas furnace continues to be your best home heating option in Minnesota.



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