



# AIR-SOURCE HEAT PUMPS



According to the U.S. Department of Energy, if you heat with electricity, a properly installed heat pump can reduce the amount of electricity you use for heating by as much as 30 to 40 percent.



### APPLICATIONS

Air-source heat pumps are easy to install in new construction and are the ideal choice when it is time to update or replace older, inefficient heating systems or aging central air conditioners. Heat pumps can use your home's existing ductwork, making it easy to upgrade to a new high-efficiency heating and cooling system. They can also be used in an add-on role, working in tandem with your existing furnace in addition to adding a highly-efficient cooling system for significant savings year round.

### FINANCIAL INCENTIVES

Financial incentives may be offered to members who install air-source heat pump systems. Special heating rates, low-interest financing and federal and state tax credits may also be available.

### YEAR-ROUND BENEFITS

#### Comfort

Whether heating or cooling, new high-efficiency heat pumps keep homeowners comfortable by providing precise temperature and humidity control.

#### Energy Savings

Heat pumps provide savings from efficient heating and cooling delivered by a single unit. Ultra-efficient inverter drive systems can provide even greater savings than standard heat pump systems.

#### Affordability

Heat pump systems cost about the same to install as central air conditioner and fossil fuel furnace combinations. In some instances, they may even cost less.

### FOR MORE INFORMATION VISIT

U.S. Department of Energy (DOE)  
Energy Efficiency and Renewable Energy  
[www.energysavers.gov](http://www.energysavers.gov)

Iowa Energy Center  
[www.iowaenergycenter.org](http://www.iowaenergycenter.org)



Energy Efficient



Environmentally Responsible



Cost Effective



## ADDING VALUE TO YOUR ELECTRIC SERVICE



**Guthrie County REC**

A Touchstone Energy® Cooperative



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# THE VERSATILE AIR-SOURCE HEAT PUMP



## ADDING VALUE WITH TWO UNITS IN ONE

An air-source heat pump is versatile. It's actually two units in one: an efficient home heating system and an economical air conditioner. Advancements in efficiency and technology have greatly improved air-source heat pump reliability and home comfort. The air-source heat pump transfers heat between your house and the outside air. Some models even provide supplemental water heating for your home.

While heat can be extracted from the air even in the coldest weather, heat pumps typically use built-in supplemental heating in extremely cold climates to ensure comfort. As a hybrid solution, these units work great in combination with your oil or gas fuel furnace.

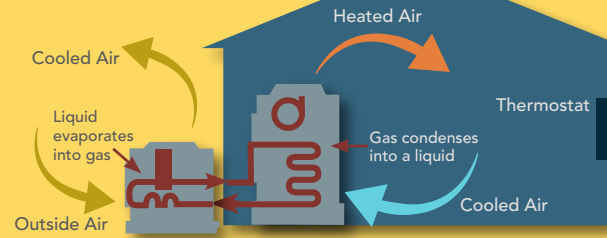
## ENERGY-EFFICIENT SAVINGS

The process of moving heat that already exists in the air is extremely efficient. As a result, heat pumps produce two to three times more heat than the energy they use, translating to more efficiency and lower operating costs.

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## WINTER



## SELECTING AN AIR-SOURCE HEAT PUMP

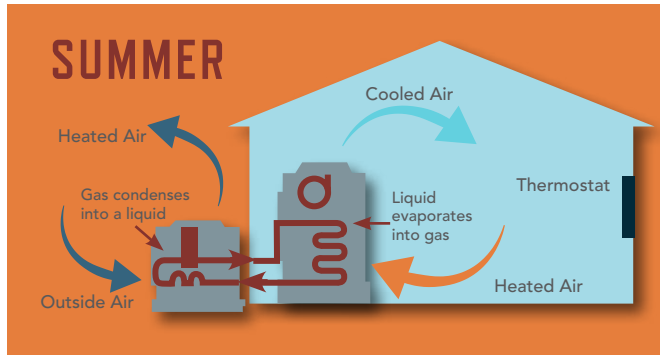
- Consider the heating efficiency, indicated by the heating season performance factor (HSPF) and cooling efficiency, indicated by the seasonal energy efficiency ratio (SEER). The higher these factors, the more efficient the system. Although the cost of the more efficient system is higher, the energy savings can pay for the initial investment in a short time.
- For greater efficiency and reliability, look for a system that qualifies as ENERGY STAR®.
- For superior energy savings, choose a system with a variable speed inverter drive. These systems adjust the speed of the compressor to optimize comfort while keeping sound levels to a minimum.
- Consider a quality thermostat that will help control the entire system, ensuring you take full advantage of the comfort and efficiency your unit has to offer.
- Select a qualified contractor who will properly install your heat pump and thermostat.
- Check with your cooperative to make certain the equipment you choose qualifies for their incentive programs.

## HOW AIR-SOURCE HEAT PUMPS WORK

An air-source heat pump moves heat, using refrigerant and coils in much the same way as a refrigerator. Heat pumps do not rely on the combustion of fuels like oil, propane or natural gas. In winter, the heat pump's outside unit captures heat that exists naturally in the atmosphere and transfers it to the inside unit where it is amplified to warm your home. In summer, the process is reversed to remove heat and excess humidity, leaving your home cool and comfortable.

## HEATING MODE

In heating mode, an air-source heat pump evaporates a refrigerant in the outdoor coil; as the liquid evaporates it pulls heat from the outside air. After the gas is compressed, it passes into the indoor coil and condenses, releasing heat to the inside of the house. The pressure changes caused by the compressor and the expansion valve allow the gas to evaporate at a low temperature outside and condense at a higher temperature indoors.



## COOLING MODE

In cooling mode, an air-source heat pump evaporates a refrigerant in the indoor coil; as the liquid evaporates it pulls heat from the air in the house. After the gas is compressed, it passes into the outdoor coil and condenses, releasing heat to the outside air. The pressure changes caused by the compressor and the expansion valve allow the gas to condense at a high temperature outside and evaporate at a lower temperature indoors.