ComEd
Energy Efficiency Program

GUIDE

AIR SOURCE HEAT PUMPS: A VIABLE ENERGY-SAVING OPTION FOR ALL-ELECTRIC HOMES

Thanks to advancements in technology, electric heating does not have to be expensive. Modern air source heat pumps (ASHPs) can effectively heat Midwestern homes, even in extreme cold. They are highly efficient, producing three to four units of heat for every unit of electricity consumed and can provide significant cost savings compared to homes heated with traditional electric systems. Adding an ASHP can also provide air conditioning to your home in the summer, more efficiently than a traditional air conditioner.

This guide helps demonstrate and quantify the impacts of integrating ASHPs into all-electric homes for the most common home types in northern Illinois: a 1950s-built home and an early 2000s-built home.

OPERATIONAL COST IMPACTS

Review the scenarios on the reverse to better understand the potential cost and energy-use impacts a homeowner might experience if they upgraded to an ASHP. In these scenarios we've compared the costs of heating and cooling two different kinds of homes, one built in the 1950s and one built in the early 2000s.

The baseline HVAC system for both scenarios uses the electric space heating rate. The baseline system is compared to two different ASHP system types.

We found that for both home types, the homeowner saves money on heating and cooling costs when an ASHP is integrated. It is critical to right-size an ASHP regardless of home type. Oversizing can lead to improper dehumidification and ineffective cooling during the summer and higher upfront costs. In some cases, it may make sense to install an ASHP to meet cooling needs only. However, most energy and cost savings from ASHP installations come from home heating, not cooling.

SOME DEFINITIONS

Average Variable Speed Heat Pump (Avg. VSHP): Any ASHP with an inverter-driven compressor, capable of many different stages of heating and cooling.

Capacity Champ: A central ASHP that can maintain 100% of its heating capacity at 5 degrees Fahrenheit.

Electric Rates:

» The electric space heating rate is $0.1101/kWh

» The standard electric rate is $0.1321/kWh

ComEd customers with all-electric space heating are eligible for a reduced electric rate where all electricity consumed by the home is billed at a lower distribution charge. When considering a heat pump purchase, be sure to review your electric bill. If you are not currently on the electric space heating rate, contact ComEd customer service at 1-800-334-7661 for the reduced rate.

CONTACT US

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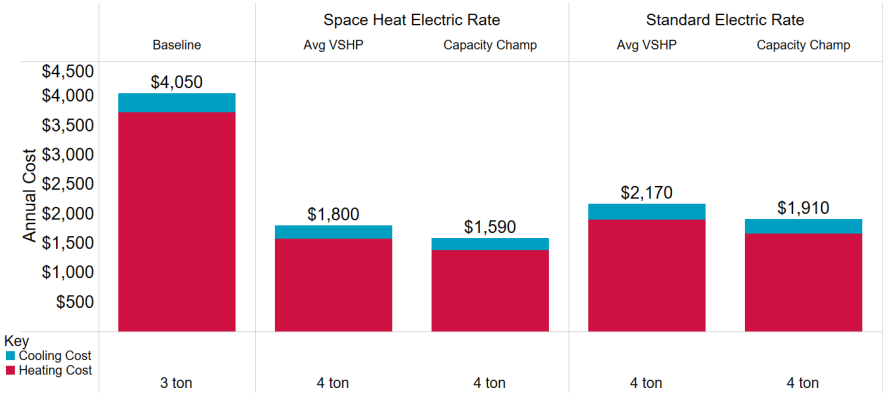
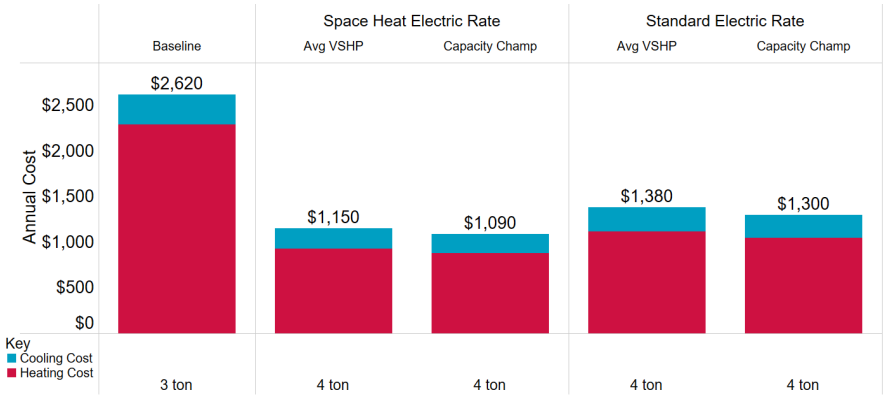
SCENARIO 1 – HOME BUILT IN THE 1950S

The home considered here is one built in the 1950s, which means it costs the homeowner more to heat and cool. For this homeowner, installing an ASHP could save $1,800 or more per year, depending on the system size and type.



SCENARIO 2 – HOME BUILT IN THE EARLY 2000S

In this scenario, the home built in the early 2000s is assumed to have improved construction from an older home, which means lower heating and cooling costs. In this scenario, the homeowner can save $1,200 or more annually by installing an ASHP, depending on the system size and type.



MODEL ASSUMPTIONS:

The potential savings values listed here are estimates, which are generalized results from field research, and are intended to provide relative performance information, rank options and make high-level decisions. These estimates should only be used when comparing scenarios for planning purposes. Both scenarios were modeled using data from a typical meteorological year for Chicago O'Hare Airport, and the typical heating load of either a 1950s-style home (scenario 1) or a 2000s-style home (scenario 2) in Chicago. Listed electric rates include a $0.01/kWh adder for state/municipal taxes. System performance was based on a field performance-adjusted 100% efficient electric furnace, 10 SEER single-stage AC, and average cold-climate ASHP system archetype (16 SEER, 9.5 HSPF, 2.15 COP @ 5°F) developed for the modeling tool.

UNDERSTANDING THE RETURN ON INVESTMENT

After a ComEd Energy Efficiency Service Provider provides a cost estimate or quote for an ASHP purchase and installation, a return-on-investment (ROI) analysis can be performed. Here is one way to perform an ROI calculation:

1. Choose the baseline annual cost (from scenario 1 or 2) that best matches the amount spent on heating and cooling last year.
2. Looking at the same scenario selected in step 1, choose the ASHP type and size the Service Provider recommends. The annual cost indicated for that system is the cost the homeowner can expect if they upgraded to an ASHP.
3. Complete the calculation:

   Baseline annual cost
   – New heat pump annual cost
   Approximate yearly savings

   New equipment and installation cost
   ÷ Approximate yearly savings
   Number of years to payback

Example:

	Equipment cost	– Rebates/tax credits	
÷	Baseline annual cost	– New annual cost	
	0.00		
	Payback in years		

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