

# Quick Tips for a Home Air-source Heat Pump Installation

This document is for Ontario homeowners wanting a centrally-ducted air-source heat pump (ASHP) for an existing home. For a quick introduction to ASHPs, see our *Fast Facts* sheet at [smarterhomeheating.ca](http://smarterhomeheating.ca).



## Planning: Time it Right

If your old home heating or cooling system suddenly breaks down during extreme weather, you might get a quick fix that's not the best fit. Heating and cooling systems often last about 15 years. As your A/C or furnace gets older, it's smart to plan for an ASHP.

## Planning: Check Permit Requirements

If applicable, check city permitting requirements.

## Planning: Speak to Your Property Insurer

Speak to your property insurer to understand insurance implications. Shopping around may yield lower rates.

## Planning: Consider Other Energy Upgrades

Additional energy upgrades may be beneficial for comfort and ASHP sizing. An attic insulation top up and air sealing are often recommended. A Registered Energy Advisor can help spot other opportunities.

## Planning: Review Incentive Guidelines

In Ontario (2023), the Enbridge HER+ Program offers rebates up to \$6,500 and the Canada Greener Homes Loan Program provides interest-free financing. Other programs exist. Some include both an ASHP replacement for A/C and full system replacements.

## Planning: Know the Key Terms

**Heating Season Performance Factor (HSPF)** describes the average ASHP efficiency. Incentives require a minimum HSPF (or HSPF2).

**Coefficient of performance (COP)** describes ASHP efficiency at set outdoor temperatures. Greater incentives are available for ASHPs that have a higher COP in cold temperatures.

**Thermal balance point temperature** is the outdoor temperature when back-up heating is required. Your contractor should estimate this as part of the sizing.

**Capacity** describes the heating output of an ASHP. Greater incentives are available for ASHPs that maintain higher capacity in cold temperatures.

**Cold-climate ASHPs** meet minimum requirements for capacity and COP at cold temperatures.

**Hybrid (or dual fuel)** systems use an ASHP with a fossil fuel furnace as back-up.

**Inverter-driven** systems provide different levels of heating output to closely match the needs of the home.

**Tons** are also used to describe ASHP capacity; 2-ton, 3-ton, 4-ton, describes increasing heating output.

## Planning: Understand Other Heat Pump Options

This document covers centrally-ducted ASHPs but there are many types of heat pumps. Geothermal systems are the most efficient. Air-to-water options are available for hydronic heating. Ductless systems are available, as are heat pump water heaters. There are options for most homes.

## Finding a Contractor: Evaluate Contractors

Get written quotes, with equipment details, from multiple contractors. Look for ASHP experience. Request references. Lowest cost isn't always best. Costs vary based on equipment and other factors. Ask about experience with the suggested ASHP model(s).

## Finding a Contractor: Check Certifications

As with A/C installs, installers need a Certificate of Qualification in the refrigeration or residential air-conditioning trades. Working with gas or oil-fired equipment requires separate TSSA certifications. Contractor businesses often need a municipal license. They should have liability insurance. Installers with proper trade certification can do limited electrical work directly related to the ASHP they are installing. All other electrical work requires a licensed electrician.

## Your Home: Consider Outdoor Noise

ASHPs make outdoor noise during the heating season, but modern inverter-driven ones can be much quieter than typical A/C units. Check ASHP noise specs (the "dB" rating), noise bylaws, and outdoor unit placement

to minimize noise near neighbors or bedrooms. In denser areas, backyard installation is often best.

#### **Your Home:** Determine Outdoor Unit Placement

Ensure your ASHP will be mounted above potential snow drift heights. Use a stand, not a wall-mount, for quieter indoor operation. It should be clear underneath the ASHP. It should generally be away from pathways where condensate may freeze and create a hazard.

#### **Your Home:** Estimate Heat Loss

ASHPs need careful sizing. Your contractor will need to estimate the heat loss of your home, typically with software that uses an accepted approach (like Manual J or CSA F280-12). Energy audit reports can also help.

#### **Your Home:** Evaluate Electrical Panel

Your contractor should check your electrical panel size with calculations in the Canadian Electric Code. Most with a 200 Amp service and panel may be OK, but 100 Amp or lower may place limitations on the ASHP. If there are limitations, options include a panel upgrade (and possibly a service upgrade), load management tech, reducing other loads (e.g, replacing an electric dryer with a heat pump dryer), or fossil fuel back-up.

#### **Your Home:** Be Aware of Ductwork Airflow Capacity

Some ASHPs have a modulating indoor fan for quieter indoor operation. However, at full capacity, ASHPs need more airflow than traditional systems. To avoid equipment faults and excessive noise, your contractor should estimate how much airflow your ductwork can handle. Ductwork upgrades may be feasible.

#### **Choosing an ASHP:** Consider Equipment Warranties

Some ASHPs have a 10-year (or better) parts and compressor warranty. Review warranty conditions.

#### **Choosing an ASHP:** Select an ASHP Model

For most applications, consider a high-performance inverter-driven model that qualifies for incentives. Normally it should be sized to meet as much of the annual heating load as possible within the constraints of the home and budget. This often means it should be a cold-climate ASHP. Some homes may additionally require a ductless ASHP if there is inadequate ductwork in parts of the home. ASHPs used with an *existing* furnace must be compatible.

#### **Choosing an ASHP:** Select Back-up Heating

Back-up heating helps ensure your home stays warm during extreme cold. Electric back-up is like a space heater for your ductwork. It is a small add-on but

requires space on your panel. Fossil fuel back-up involves a furnace. Systems can often be sized to minimize back-up usage. Back-up is designed to turn on automatically if needed.

#### **Choosing an ASHP:** Right-size the ASHP

"Right-sizing" means your contractor should select the best ASHP options for your needs, considering heat loss, budget, goals (environmental, financial, comfort, performance), and any constraints (electrical panel, ductwork). They can use Natural Resources Canada's Sizing and Selection Toolkit to help with this process.

#### **After the Installation:** Configure the Thermostat

Your contractor should commission your system and configure your thermostat. Ensure the ASHP has time to reach the setpoint temperature before back-up kicks in. Setbacks should sometimes be avoided. If you have fossil fuel back-up, confirm the outdoor temperature where the system reverts to back-up. Note that the best ASHP performance is at moderate indoor setpoint temperatures. Smart-switching thermostats can switch between ASHP and furnace based on operating costs.

#### **After the Installation:** Take Care of the System

Contact your contractor if you suspect an issue with your system. As with traditional equipment, contractors recommend an annual inspection. Change your filter regularly. If your home is still connected to gas, you may want to submit meter readings directly to the gas utility to ensure up-to-date billing. Enjoy!

#### **Learn More**

Visit [smarterhomeheating.ca](http://smarterhomeheating.ca) for case studies, homeowner testimonial videos, other resources, and to contact us with any ASHP questions.

The Sustainable Technologies Evaluation Program (STEP) is a non-profit collaborative research initiative. This document provides general tips. It is not exhaustive. It is the homeowner's responsibility to hire qualified licensed tradespeople, follow incentive requirements, understand and abide by applicable regulations, and to take all necessary steps to ensure a successful installation. Funding support for this document from The Atmospheric Fund (TAF) is gratefully acknowledged. Base support for STEP from the City of Toronto, Region of Peel, and York Region, is also gratefully acknowledged. Note that the contents of this document do not necessarily represent the policies of supporting agencies.