

# Connecting with Air Source Heat Pump Customers

Alexis Troschinetz  
Energy Design Conference  
February 2022

# Agenda

Introductions

Customer Perspectives

Customer Educational  
Tools

Partners Spurring  
ccASHP adoption

Electrified Lifestyle



# Introductions

Alexis Troschinetz

CERTs Behavioral Science and  
Evaluation Manager

University of Minnesota Extension  
Regional Sustainable Development  
Partnerships

[atroschi@umn.edu](mailto:atroschi@umn.edu)

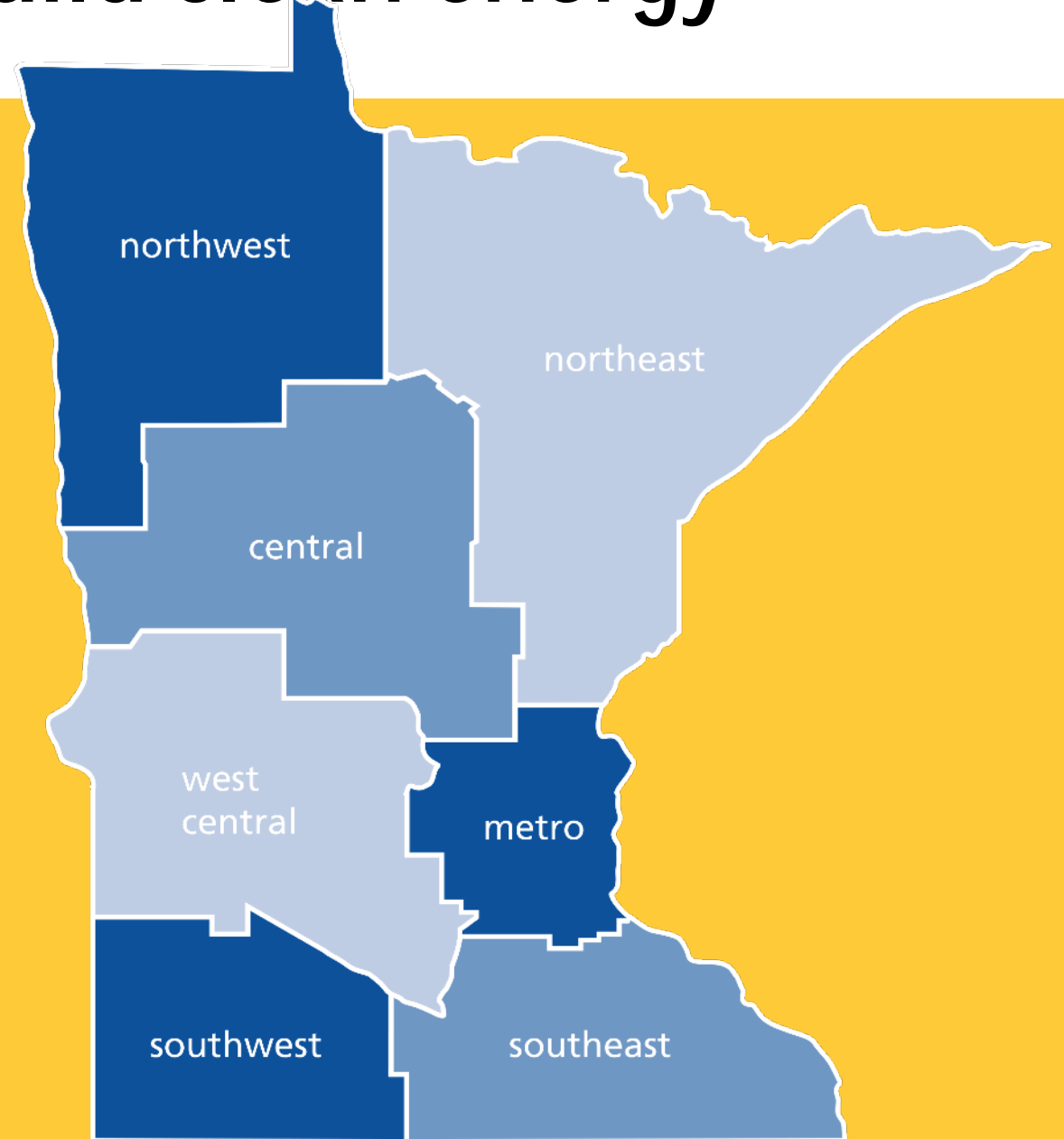
612-626-0455



# Helping Minnesotans build clean energy

## CERTs MISSION

We connect individuals and their communities to the resources they need to identify and implement community-based clean energy projects



# How does CERTs help?



## **Hands-on assistance**

For cities, counties, utilities, farmers, businesses, and other organizations looking to make a change



## **Practical steps to clean energy**

Resources for getting started, moving forward, and completing projects



## **Learning opportunities**

We host events, create resources, and highlight clean energy stories and jobs

**CERTs**  
Partners

Regional Sustainable  
Development Partnerships  
UNIVERSITY OF MINNESOTA  
**EXTENSION**



**GREAT PLAINS**  
**INSTITUTE**



**m1** **COMMERCE**  
**DEPARTMENT**

[www.CleanEnergyResourceTeams.org](http://www.CleanEnergyResourceTeams.org)

# Heat and Cool with



# Air Source Heat Pumps

**Air source heat pumps (ASHPs) use electricity to heat and cool.**

- ASHPs work like air conditioners to cool, and work in reverse to move warmth from outside air into your home to heat.
- ASHPs heat homes up to three times more efficiently than forced air and electric resistance heating systems.



## Two Setups: Ductless or Central

WHICH IS THE BEST FIT FOR YOUR MINNESOTA HOME?



**OUTDOOR UNIT**  
above snow depth



**INDOOR UNIT**  
mounted on wall

### DUCTLESS / MINI-SPLITS

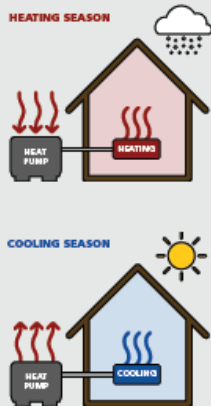
Ductless ASHPs don't require ductwork in your home. There is one outdoor condenser connected to one or more indoor air distribution units. Indoor units are typically mounted on the wall, floor or ceiling. The individually-controlled indoor units allow for zoned heating and cooling and maximize energy savings and comfort.

**INSTALLED COST: \$2,500 - \$8,500**

#### GOOD FIT WHEN:

- Already heating with radiators, in-floor, or electric baseboard
- Getting rid of window A/C units or adding home cooling

### HOW IT WORKS



### CENTRAL / DUCTED

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#### GOOD FIT WHEN:

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## Efficiently Heat and Cool with Air Source Heat Pumps

WHAT LEVEL OF PERFORMANCE DO YOU NEED IN MINNESOTA?

### HEATING WITH ASHPs



If you want an ASHP to be your primary heating system, you'll need a cold climate ASHP (ccASHP) and a back-up heating system. While ccASHPs are more expensive upfront than ASHPs, there is a potential for heating fuel cost savings if you already heat with electricity or propane. ASHP's heating performance is noted with its HSPF (heating season performance factor).

### DID YOU KNOW?

It takes far less energy to move heat than it does to create heat, and you can even extract heat from really cold air!

### COOLING WITH ASHPs



ASHPs and ccASHPs offer the same cooling benefit as an air conditioner (A/C). ASHP's cooling performance is noted with its SEER (seasonal energy efficiency ratio), same as you would see for A/C units. Look for SEER 15 or higher for improved energy efficiency.

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### NEXT STEPS

- Determine which setup is right for you**  
Use the info on this sheet and a comparison table on our website to see whether a ductless or central ASHP will work best with your existing heating system.
- Check with your electric utility**  
See what equipment they rebate and whether they require using one of their participating or qualified contractors.
- Find a few certified contractors**  
If your utility has no requirements, find NATE-Certified technicians at [cleanenergyresourceteams.org/hvac-help](https://cleanenergyresourceteams.org/hvac-help).
- Ask contractors the right questions**
  - Does the company have a state license for HVAC?
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  - Tell the contractor your needs (cooling, heating, both).  
If heating through winter, ask for a "cold climate ASHP."

FIND COSTS, COMPARISONS & MORE

[CleanEnergyResourceTeams.org/ASHP](https://CleanEnergyResourceTeams.org/ASHP)

ASHP GUIDE

**Efficiently Heat and Cool with  
Air Source Heat Pumps**

**Air source heat pumps (ASHPs) are electric appliances that are used for both heating and cooling. They work like an air conditioner to cool, and work in reverse to move warm air into your home to heat.**



# Contractor Intro to Heating with Air Source Heat Pumps

## ASHPs: a win-win for you and your customers

Air Source Heat Pumps (ASHPs) are now a proven energy-saving technology for heating, tested through years of practical application and multiple studies.



KEEPING UP WITH THE MARKET

- 1 Widespread adoption**  
A recent statewide study shows ASHPs as one of the primary ways Minnesota will reach its energy efficiency goals by 2029.
- 2 Large market in Minnesota**  
ASHPs are a good fit for the 585,000 households heated with electricity and propane.
- 3 Significant utility rebates**  
Most electric utilities offer rebates for ducted and ductless ASHPs—from \$250-\$2,000+.
- 4 Quality installation**  
Trained and certified contractors will be best positioned to take advantage of this growing market.

 GET TRAINING

**Pursue technical training and certification.**

Contractor Training: [hvacadu.net](http://hvacadu.net)  
Contractor Certification: [natex.org](http://natex.org)  
Equipment Certification & Industry Standards: [ahrinet.org](http://ahrinet.org)

Some electric utilities and manufacturers may offer their own training.

Some utilities require that you become a qualified contractor to be eligible for rebates.

## Provide customers with a proven energy-saving technology



CONSUMER BENEFITS & SATISFACTION

- ASHPs offer cost-effective heating for customers heating with electricity or propane.
- Heat homes up to three times more efficiently than forced air and electric resistance heating systems.
- Works for homes with and without ductwork.
- Set it and forget it. ASHPs operate most efficiently without thermostat setbacks.
- Great option when adding or upgrading air conditioning.

“There’s no question whether customers are going to reap the benefits—the efficiency of these units is way better than electric or propane.”

MITCH MINARDI, BRENT’S HEATING AND COOLING IN DULUTH, MN

**When a customer wants to use an ASHP as their primary heating system, install a cold-climate ASHP and ensure back-up heating is operational.**

**What makes it a ccASHP?**

- Variable capacity (inverter) compressor
- Coefficient of performance (COP) at 5°F ≥ 1.75 at maximum capacity
- Heating season performance factor (HSPF) ≥ 9 (ductless) or ≥ 10 (ducted)
- Sized to meet 100% of the home’s heating load at outdoor temperatures ≤ 10°F

Source: Northwest Energy Efficiency Alliance and Center for Energy and Environment

MORE TIPS & RESOURCES [CleanEnergyResourceTeams.org/ASHP](http://CleanEnergyResourceTeams.org/ASHP)





# MINNESOTA Energy Stories



## [Finding success with air source heat pumps in cold climates](#)

Another home-owner/air source heat pump love story!



## [A family's journey to decarbonize their home](#)

We're sneaking in a story published at the tail-end of 2020, because you loved it so darn much! A heart-warming how-to on decarbonizing a century-old home.

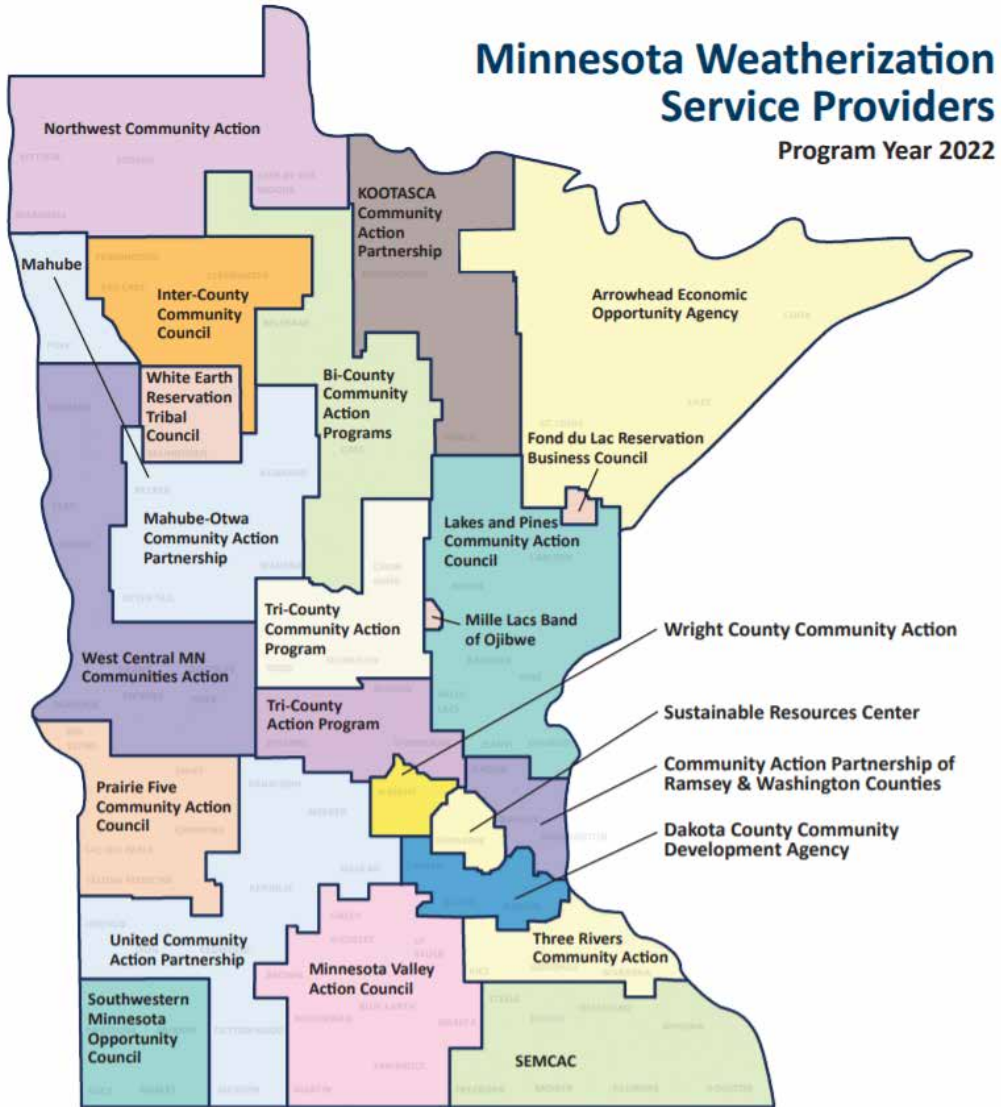
[cleanenergyresourceteams.org/stories](https://cleanenergyresourceteams.org/stories)

# Engaging Electric Utilities

- Customized guides
- Sessions for utilities to learn from one another on ASHP marketing and programming



# Partnering with Others



**COOK COUNTY LOCAL ENERGY PROJECT**



# Poll

- Who's here?
- Access Mentimeter

# Customer Perspectives

# Gathering Perspectives

- Storytelling
- Direct technical assistance

Customers need technical reassurance



# Saginaw, MN – Repeat, satisfied customer

**\$1,200 rebate!**

on cold-climate  
air source heat  
pumps.

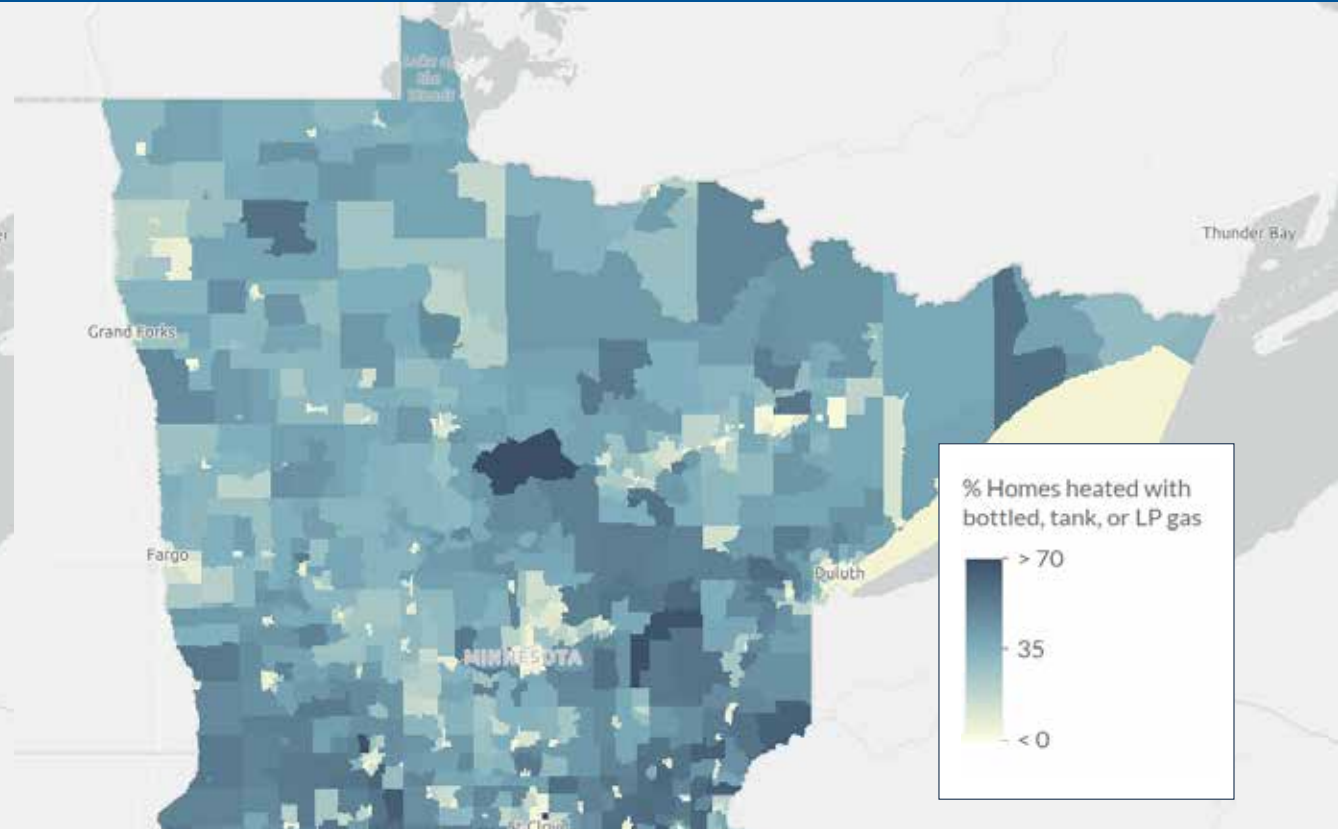
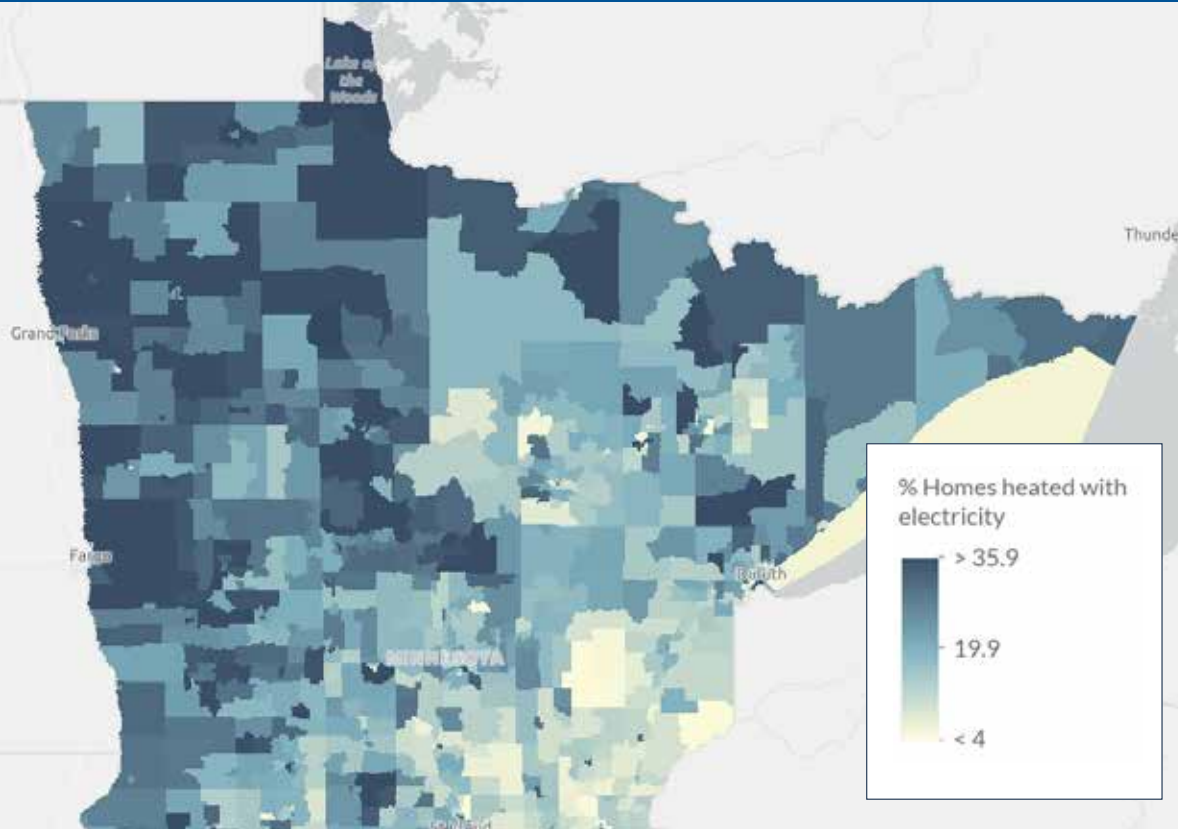
Limited time offer: April 1-June 30 ©



[cleanenergyresourceteams.org/finding-success-air-source-heat-pumps-cold-climates](https://cleanenergyresourceteams.org/finding-success-air-source-heat-pumps-cold-climates)

# Northern Minnesota: Prime for ccASHPs

- Cost savings when already heating with electric or propane
- Much of northern MN heats with electric or propane





# St. Paul, MN - All-Electric Retrofit



# Natural Gas Conversions

- It depends, but natural gas for home heating is still most economical
- Make certain customer is aware of financial impact
- Provide operating cost estimates to demonstrate



Photo credit:  
Justin Baeder

From the customer perspective...

## Barriers

- Contractor availability and cold-climate specific skills
- High upfront costs
- Uncertainty of bill impacts
- Tying multiple systems together
- Electric panel capacity

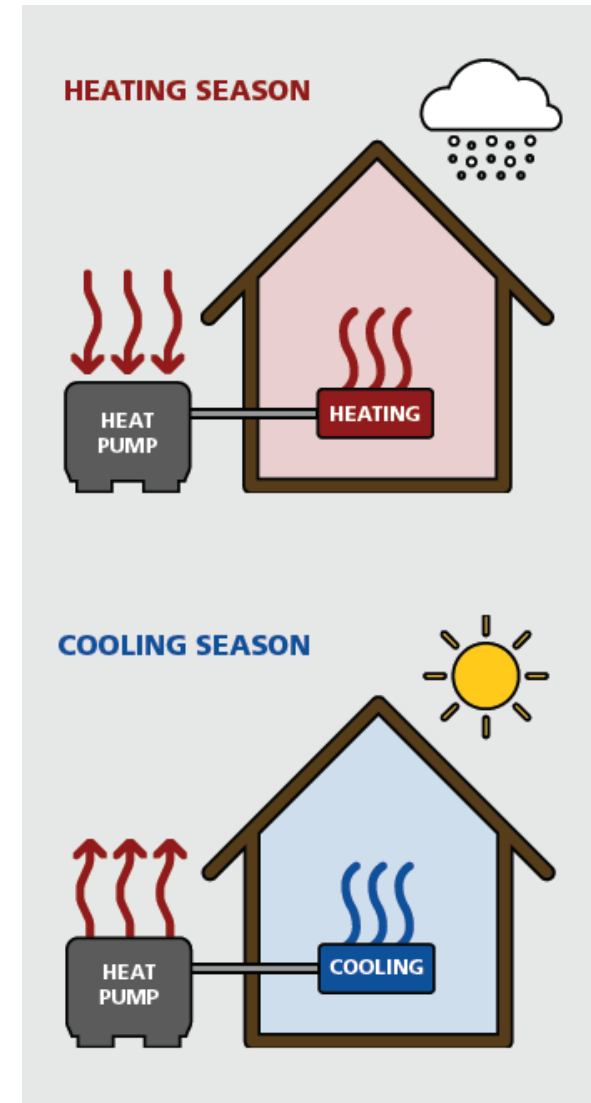
## Benefits

- Lower bills (usually)
- Dehumidification in spring and summer
- Steady comfort
- Efficiency (decarbonize)
- Quiet operation
- Big utility rebates

From the customer perspective...

# Common Points of Confusion

- No temperature setbacks for best efficiency
- *Heat* pumps can provide cooling; Mini-splits can provide heating
- COP vs SEER & HSPF
- Moves heat versus makes heat



# Savvy Customers...

- Tighten up and insulate homes before ASHPs
- Want heat load calculations done for proper sizing
- Know bills are going to be affected and want to know by how much

***“They provided important facts and data I needed to make an informed decision and gave me evidence of their competency.”***

**– Metro area customer,  
going all-electric**

# Partner & Discuss

- **Which of the barriers or benefits to getting an ASHP have you heard from customers?**
- **Any other reasons you've heard first hand?**

# Polls

- What reasons are you hearing for:
  - Avoiding an ASHP? (multiple choice, write-in)
  - Getting an ASHP? (multiple choice, write-in)
- Access Mentimeter

# Customer Educational Tools



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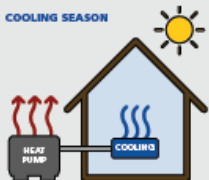
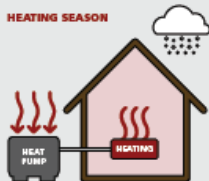
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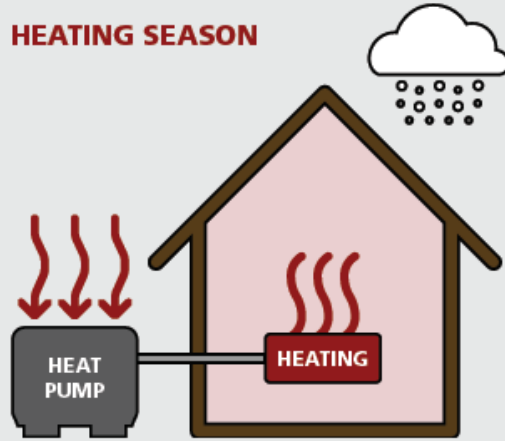
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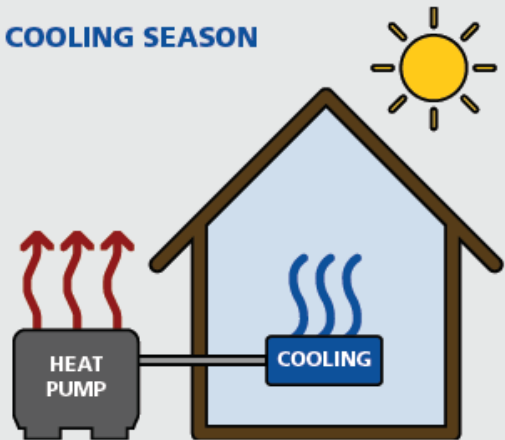


## HOW IT WORKS

HEATING SEASON



COOLING SEASON

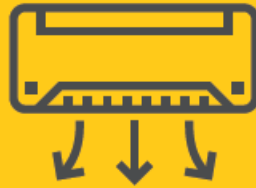


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Coefficient of Performance (COP):  
*not just yet, but probably soon*

Still heats lower than 5°F,  
just not as efficiently.

Next Gen: -13°F

## **DID YOU KNOW?**

It takes far less energy to move heat than it does to create heat, and you can even extract heat from really cold air!


15°F → 5°F

Mind-blowing fact #2

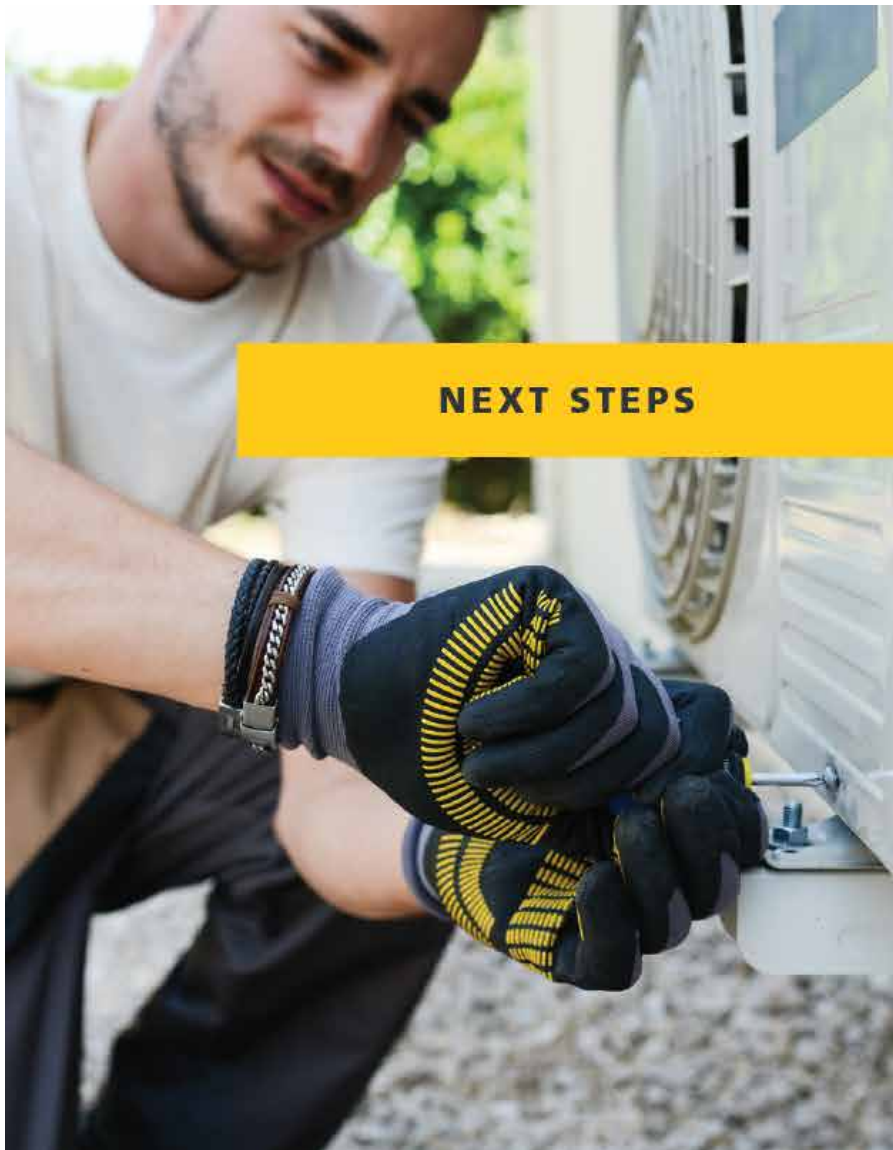


# Home Energy Audits

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- Utility offerings
  - Cost of audit
  - Additional service by your company?
- 
- MN Power: Free
  - OTP: Limited, Free (Transformer) & Online (Analyzer)
  - Minnesota Energy Resources: \$50 co-pay, free for low-income households
  - Mille Lacs Energy Cooperative: Free





## NEXT STEPS

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# Additional Customer Educational Tools

- Resources for Homeowners and Contractors
- A joint effort between a nonprofit and 5 MN utilities to accelerate market adoption of heat pumps



# FAQ for Homeowners

- 4-pages, 13 Q&A
- Basics & Homeowner Experience
- Costs & Installation
- Operation & Maintenance

## For Homeowners



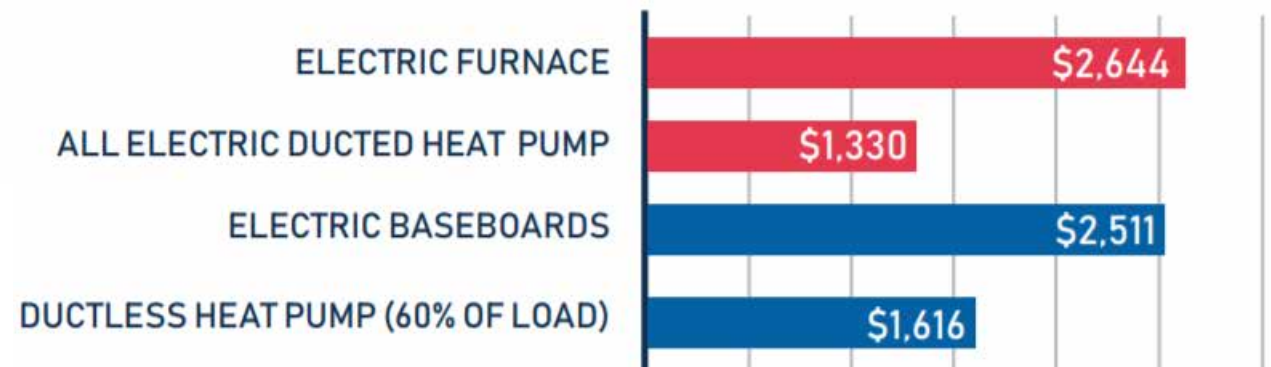
### Basics and Homeowner Experience

#### 1. Why choose a heat pump?

- a. A heat pump provides multiple benefits in one heating and cooling system. It can provide cooling at twice the efficiency of common window unit air conditioners and can save between 30% and 55% on heating costs compared to other electric and propane heating types. This provides better energy savings, more comfort, and lower carbon emissions.

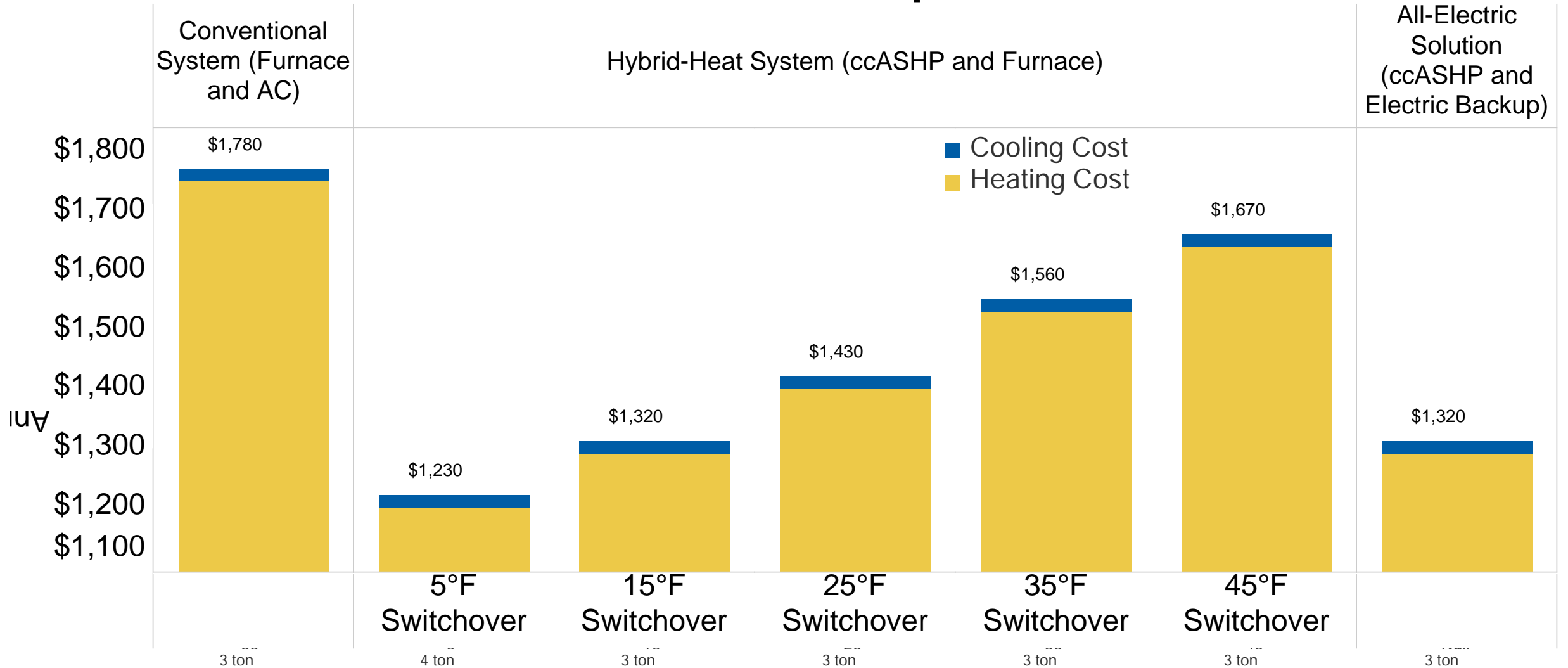
#### 2. How does it work?

- a. A heat pump works by gathering and transferring heat energy from the outside air. Like an air conditioner or a refrigerator, heat pumps use electricity to move heat from one place to another. Heat pumps are special because they can provide heating, in addition to cooling, by running in reverse.



# Operating Cost Comparison Chart

## MN Power Standard Electric and Propane Rates



# Installation Guide (for contractors)

## Installation Guide



### Air Source Heat Pumps Best Practices Installation Guide

Companion Guide to the Minnesota ASHP Collaborative's Design Guide

#### Introduction

High quality installation of air source heat pumps (ASHPs) improves system performance and efficiency, optimizing heating down to colder temperatures. This performance improvement can ensure customer satisfaction and comfort, which in turn reduces callbacks, generates referrals, and increases sales. This guide outlines the best practices for all ASHP installations, as well as guidance on homeowner education to help keep customers happy and ASHPs efficient in cold climates. For guidance on equipment selection, system sizing, and proper design, see our ASHP Design Guide, which provides information on

spec  
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#### Installation Requirements and Best Practices

##### Line Set

- Installers should follow the manufacturer's instructions for and maximum line set length and height change.
- Line set must meet the manufacturer's specification for the unit — adaptations to the outdoor portion can be made if necessary.
- Insulation must cover the entire line set length (i.e., both pipes) to avoid condensation and energy loss. Once insulated, the outdoor portion of the line set should be protected with a rigid cover to prevent insulation damage. Note: It is important to also insulate flares to stop liquid or frost from developing under the flare nut, which can cause cracks.
- UV-resistant tape or other mechanical protection should be used as needed to protect any remaining exposed insulation. UV-resistant insulation products meet this requirement.
- Line set penetration through the building enclosure should be protected from rodents (e.g., with a PVC sleeve and cap drilled to the size of the refrigerant lines, metal-wool stuffing, or similar).
- All penetrations through the shell of the home should be sealed with insulating sealant/spray foam. Any aspects of the insulation by installed line set should be returned to proper condition.

- Prevent partial kinks in line sets. Partial kinks can cause significant performance in cold temperatures. Kinks typically occur to 7/8" in diameter. Follow these steps to check for partial kinks:

- Remove line set covers.
- Set the machine to its most powerful mode so it heats the line set.
- Feel along the entire length of the line set for hot spots where any partial kinks are located.

**REQUIRED TOOLS:** Ratchet flaring tool, programmable refrigerant gauge and hose set, vacuum pump (not pictured)



##### Refrigerant Tubing

- Create new flare fittings using a ratchet flaring tool and measure the refrigerant and in accordance with the manufacturer's instructions for each flare.
- Connect tubing with the appropriate nuts (supplied by manufacturer) and torque specifications.
- Once used, **DO NOT REUSE** manufacturer-provided tubing flare fittings that were not provided by the manufacturer.
- Any brazed connections should be completed with dry nitrogen.

##### Refrigerant Charge

- Pressure test the line set using dry nitrogen and triple vacuum pump evacuation per manufacturer's instructions.
- The vacuum should be held at 500 microns or less for a minimum of 24 hours.
- Each evacuation should be alternated with nitrogen under pressure.
- Test refrigerant line pressures lower than the rating of service valves.

##### Condensate Drain

- The drain should slope downhill. It can be routed with line set and run to a suitable termination point — away from crawl spaces, walkways, and outdoor equipment.
- Alternately, use an external condensate pump when required.

- Ductless systems may have limited horizontal or vertical lift built in. Do not exceed the manufacturer's specifications for allowable vertical lift before a continuous downward slope.

##### Outdoor Unit Installation

- Outdoor units should be placed to allow for free air flow. Follow manufacturer's guidance on clearance from obstructions, including walls, overhangs, protrusions, and other features. Ensure that outdoor units do not interfere with windows or doors.

Install outdoor units in a location protected from the wind as much as possible. Wind chill can affect heat pump performance, and into the wind can push freezing rain or snow into the system. If this cannot be avoided, install a wind baffle from the manufacturer to protect the system.

- The customer should always approve the location of outdoor units. The units should be located in inconspicuous places for aesthetic and noise considerations (e.g., behind the building).

Locate outdoor units away from bedrooms and other quiet areas.

- Follow manufacturer-allowed clearances when placing multiple units. Multiple units should not be installed above each other with outdoor fan outlet flow pointing directly at another unit (explicitly recommended by manufacturer).

- Ensure adequate clearance above historical average maximum snow depth, typically 14" in Minnesota. Secure outdoor units to risers, or the surface they sit on using a factory-approved screw bolts or adhesive. Ensure that any ground-mounted unit is on a level surface and is well drained and will not heave with frost. The outdoor unit should be level both side-to-side and front-to-back. Best practice is to use brackets designed for attachment to foundation wall, when clearance allows.

Installations can also use wall mounts or brackets designed for attachment to foundation wall. In these cases, use double vibration absorbers to prevent both noise transfer through the wall and premature failure of the attachments.

- Avoid proximity to walkways or other areas where re-freezing defrost meltwater might cause a slip-and-fall hazard.

- When possible, avoid installing outdoor units directly under any overhang from the roof or other overhang that would subject them to falling snowmelt, ice, or concentrated rain runoff.

When this is unavoidable and a functioning gutter is not present, outdoor units should be installed with drip caps or shields approved by the manufacturer.

- Install surge suppressors at service disconnect to protect sensitive electronics. Alternatively, suppressors may be installed at circuit breaker box if device is approved for such application. Follow manufacturer's instructions and all applicable codes and standards.

- Drain pan heaters are strongly recommended for cold-climate ASHPs that operate below 0 degrees Fahrenheit. These are not generally needed for non-cold-climate systems in situations where meltwater clearance and protection from precipitation are adequate.



Proper outdoor placement, showcasing a drip cap/snow shield.

##### Homeowner Education

- Provide a copy of the manufacturer's owner manual to the homeowner.
- Take the time to demonstrate basic controls and operations to homeowners. Review maintenance schedule and other activities with them.

##### Additional Resources

- U.S. Department of Energy Building America Solution Center (HVAC-Heating Equipment) — [bascc.pnl.gov](http://bascc.pnl.gov)
- ENERGY STAR®-Verified HVAC Installation (ESVI) Program — [energystar.gov/index.cfm?c=shvac\\_install hvac\\_install\\_index](http://energystar.gov/index.cfm?c=shvac_install hvac_install_index)
- ACCA Standard 5 (ANSI/ACCA 5 QI-2015); HVAC Quality Installation Specification — [acca.org/standards/quality](http://acca.org/standards/quality)

installation manual and/or software design tools to verify

**View resources on MN ASHP website**  
**[www.mnashp.org](http://www.mnashp.org)**

# *Who you gonna call?*

- For now, direct folks to use contractors listed in FAQs or NATE-certified or similarly credentialed technician
- Suggest bids from 2-3 different companies
- *Just Launched* – Preferred Contractor Network:
  - Listed publicly by an unbiased, third-party as having the knowledge and capabilities for quality ASHP installations in MN for heating



[mnashp.org/preferred-contractor-network](https://mnashp.org/preferred-contractor-network)



# *Knowing is half the battle!*

- Simply educating customers isn't the only tool in our toolbox
- Learnings from field of behavioral science apply too



**Barriers**



**Benefits**

# Technology Co-Adoption

- Looked at adoption of:
  - Smart thermostats
  - Efficient HVAC
  - Solar
- Adopting smart thermostat first led to quicker and more likely adoption of solar or efficient HVAC



Study: University of Texas LBJ School of Public Affairs, Vivek Shastri

# Today's customers – Foundation to ASHP future

- Social diffusion happens
- Best advertising is word of mouth
- Negativity bias is real



Image source: The Noun Project

# Group Discussion

- **Tools you use to educate your customers**
- **Sources of info customers are referring to when they come to you (if any)**

# **Group Discussion**

**What additional needs for educational tools could be helpful to your customers?**

Partners spurring  
ccASHP adoption

# Customizing CERTs ASHP guide

- Utility
- City
- County
- Weatherization Providers
- Contractor Association

*Keep it 3<sup>rd</sup> party to your firm*



**Heat and Cool with Air Source Heat Pumps**

Open in Adobe Acrobat and click here to add your logo

**Air source heat pumps (ASHPs) use electricity to heat and cool.**

- ASHPs work like air conditioners to cool, and work in reverse to move warmth from outside air into your home to heat.
- ASHPs heat homes up to three times more efficiently than forced air and electric resistance heating systems.

**Two Setups: Ductless or Central**  
WHICH IS THE BEST FIT FOR YOUR MINNESOTA HOME?

**DUCTLESS / MINI-SPLITS**

Ductless ASHPs don't require ductwork in your home. There is one outdoor condenser connected to one or more indoor air distribution units. Indoor units are typically mounted on the wall, floor or ceiling. The individually-controlled indoor units allow for zoned heating and cooling and maximize energy savings and comfort.

**INSTALLED COST: \$2,500 - \$8,500**

**GOOD FIT WHEN:**

- Already heating with radiators, in-floor, or electric baseboard
- Getting rid of window A/C units or adding home cooling

**CENTRAL / DUCTED**

Central ASHPs use existing ductwork to distribute heated and cooled air throughout your home. The outdoor condenser is connected to the indoor furnace's fan. Unlike central A/C units, central ASHPs provide both heating and cooling in a single system.

**INSTALLED COST: \$4,000 - \$8,000**

**GOOD FIT WHEN:**

- Already heating with forced air (with ductwork in place)
- Replacing central A/C or adding it for the first time

**HOW IT WORKS**

**HEATING SEASON**



**COOLING SEASON**



Developed in partnership with:



CERT<sup>®</sup>  
CLEAR ENERGY RESOLVING TEAMS

# Cook County Local Energy Project (CCLEP)

Non-profit

Coordinate & catalyze collaborative projects with partner organizations

Promoting & facilitating increased use of

- renewable energy
- energy efficient practices & technologies



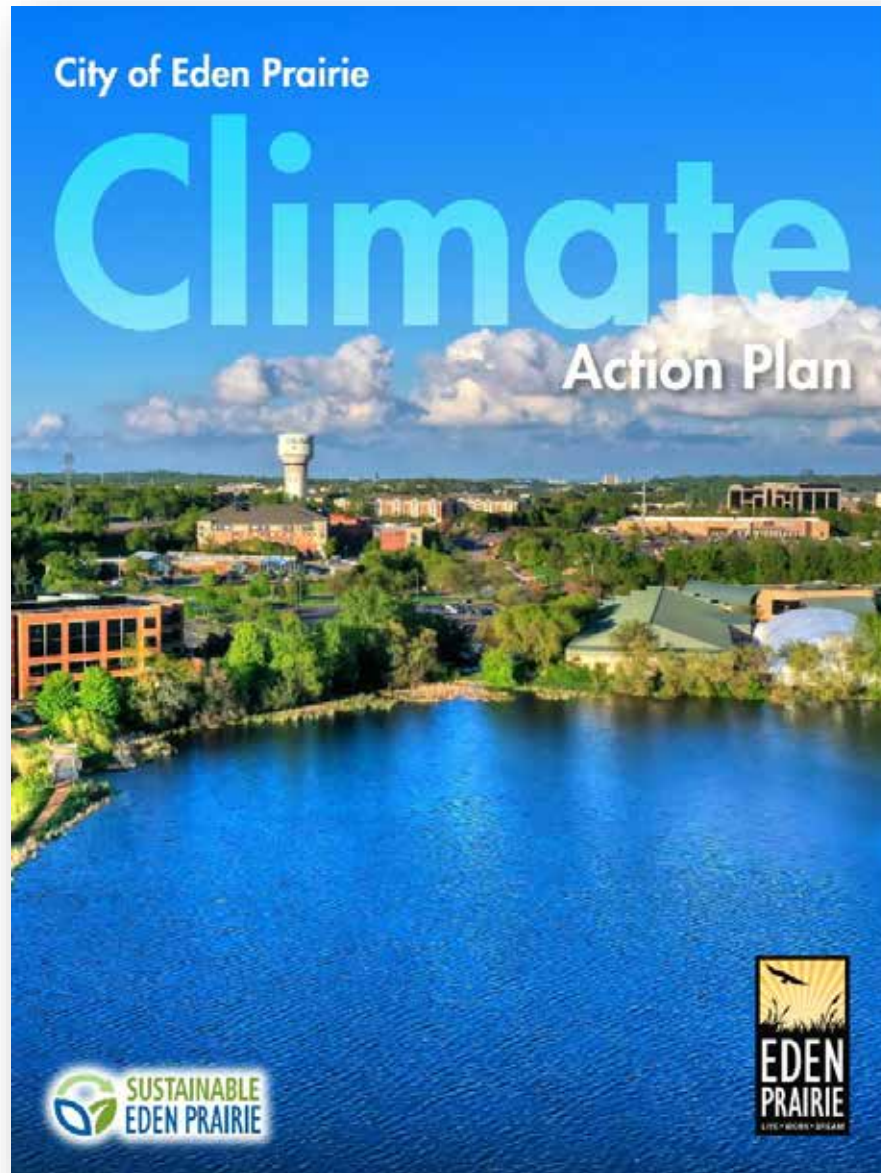
**COOK COUNTY LOCAL ENERGY PROJECT**



# Developing CCLEP Contractors List

- List contractors on their website for customers to know which contractors can serve Cook County
- Promote ASHPs to homeowners and businesses
- CERTs surveyed about 100 contractors within 200 miles
- 10 interested and getting MN-specific cold-climate ASHP training

# City Climate Action Plans



## Eden Prairie Climate Action Plan Factsheet Fuel Switching: Electrification

JUNE 2021

The City of Eden Prairie adopted a climate action plan in 2020. Part of the plan looks to reduce emissions from residential and commercial building energy use. The City's goal is to have zero emissions by 2050. Through business and residential electrification, it is estimated that Eden Prairie can attain an emissions reduction of 86,344 tonnes of CO<sub>2</sub>e by 2050, which is approximately 8.6% of all emissions in Eden Prairie. To meet the city's goals, the plan calls for the electrification of hot water and space heating in city buildings as well as residential and commercial buildings.

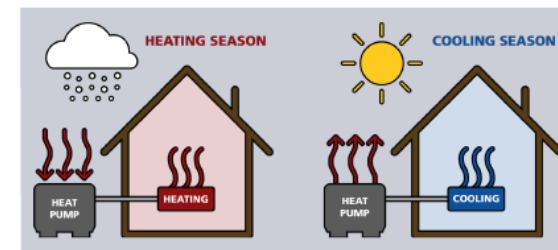
As electricity generation becomes cleaner, switching from natural gas to electric appliances will have climate benefits as well as health benefits from improved indoor air quality. This factsheet helps residents and business owners better understand what fuel switching is, how it can be beneficial to them, and what resources are available to help make the switch.

### Fuel Switching

Different fuels provide the energy people need to move through daily life. This can mean the fuel that goes into our vehicles (gasoline and diesel), fuel to heat our homes (natural gas, propane, etc.), and fuel used to generate electricity (coal, natural gas, wind, solar). As the fuels used to generate electricity shift to cleaner sources, it makes sense to begin to shift other carbon-intensive fuels to low- or no-carbon fuels. For the purpose of this factsheet, fuel-switching refers to switching space and water heating appliances from natural gas to electricity generated from clean fuels.

Electrification of space heating can come from electric baseboard heat or air source heat pump technology. These technologies are 100% efficient in that all of the electricity is converted to heat. However, electric baseboard heat requires more electricity to produce the same amount of heat as air source heat pumps (ASHP). ASHPs have seen advances in technology that allow them to be viable and cost-effective in northern climates.

Air source heat pumps use electricity to both heat and cool your home. The technology pumps one-and-a-half to three times more heat energy to a home than the electricity it consumes — even in temperatures below zero. It can do this because it transfers heat rather than converting it from a fuel like combustion heating systems.<sup>1</sup>



Graphic Source: Minnesota Clean Energy Resource Teams



# Energy Action Plans



- Since 2017, made much progress
- Currently, co-hosting contractor training for ASHP installers through the MN ASHP Collaborative

## Winona's Energy Action Plan

Winona has set a bold goal of carbon neutrality by 2050. This Energy Action Plan represents an important first step that will ultimately lead to an estimated 34 percent reduction in the city's energy-related greenhouse gas emissions.

In adopting this plan, the City of Winona hopes to **spur interest and motivation among community and business leaders**. There has been significant effort over the last two years to build momentum around energy and its relationship to climate change. The goals and strategies outlined in this plan will accelerate that momentum and generate some important and tangible results.

### Winona's Energy Vision

Winona will be a leader in efforts to reduce energy consumption and produce renewable energy, in pursuit of long-term environmental sustainability and reducing our carbon footprint. These efforts will be available to all, will maintain our high quality of life and vibrant economy, and will not limit growth.

### Winona's Energy Goals

Winona aims to:

- Reduce energy use 10 percent by 2025.
- Achieve a 100 percent reduction in energy-related greenhouse emissions (carbon neutrality) by 2050.

### How Will We Get There?

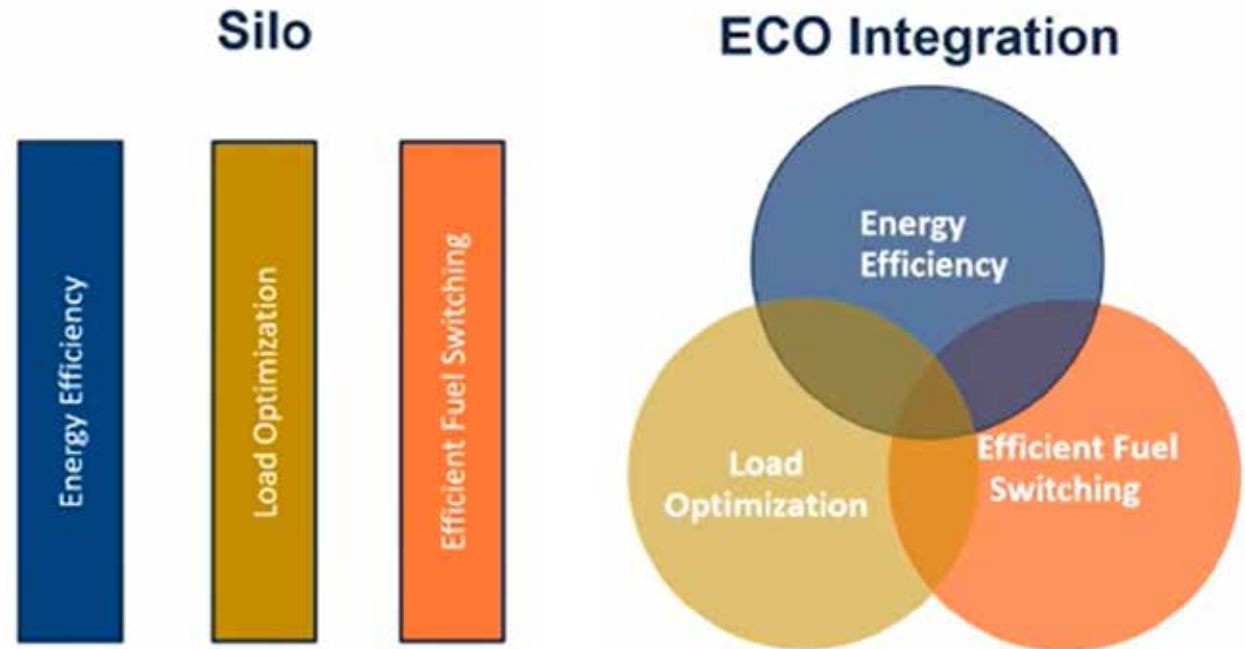
To achieve these results, Winona outlined a set of goals and strategies in four focus areas:

<b>Residential Energy</b>	<b>Goals:</b> <ul style="list-style-type: none"><li>• Double annual participation in conservation programs.</li><li>• Double the average number of renewable energy subscribers and double the average monthly subscription amount within one year.</li></ul>
<b>Institutions</b>	<b>Goals:</b> <ul style="list-style-type: none"><li>• Reduce institutional energy use by 15 percent by 2025.</li><li>• Engage Winona institutions to support renewable energy development equal to 10 percent of their energy use by 2030.</li></ul>
<b>Large Commercial/Industrial Energy Users</b>	<b>Goals:</b> <ul style="list-style-type: none"><li>• Engage 90 percent of large commercial/industrial customers to participate in at least one conservation program within three years.</li><li>• Ensure at least three large commercial/industrial customers commit to adding on-site renewable energy generation within three years.</li></ul>
<b>Small- and Medium-Size Businesses</b>	<b>Goals:</b> <ul style="list-style-type: none"><li>• Engage at least 40 small/medium size businesses to participate in conservation programs annually.</li><li>• Double annual energy use reductions among small/medium businesses.</li><li>• Ensure at least one small business subscribes to or installs renewable energy generation annually.</li></ul>

# Electrified Lifestyle

# Energy Conservation & Optimization (ECO) Act

- Modernizes the Conservation Improvement Program (CIP)
- Fuel neutral framework



# Beneficial Electrification

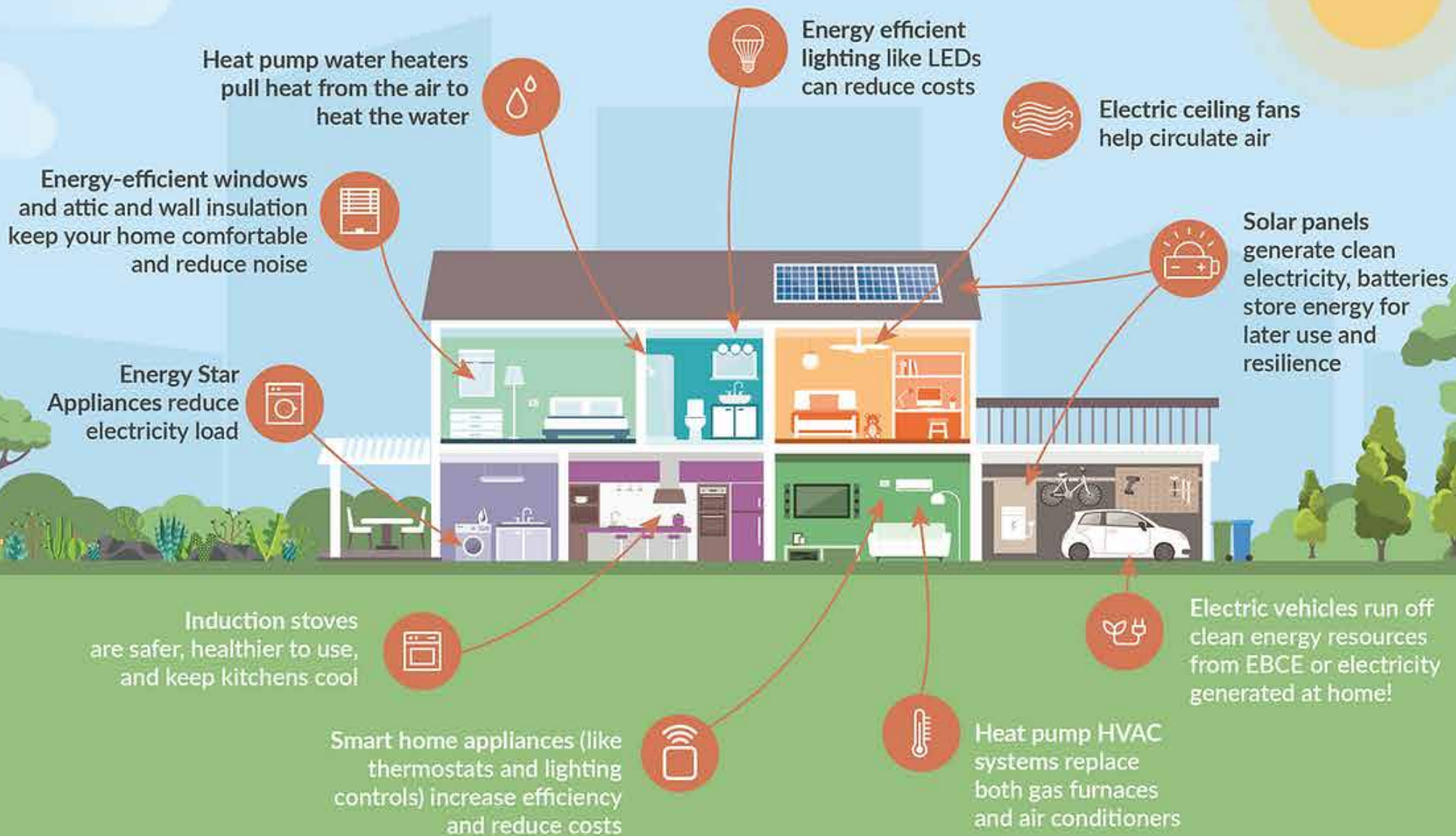


**Save consumers money over the long run**

**Enable better grid management**

**Reduce negative environmental impacts**

# ELECTRIFICATION AT HOME



# Contractors' potential role

- Be ready for this broader electrification conversation
- Learn more about your customers' goals and look out for their best interests
- Consider expanding your services or building a referral network among different trades





# Group Discussion

**This electrified frontier...**

- **What excites you about it?**
- **What are you seeing as potential downfalls?**

# Want to Follow-up?



Alexis Troschinetz

CERTs Behavioral Science and  
Evaluation Manager

University of Minnesota Extension  
Regional Sustainable Development  
Partnerships

[atroschi@umn.edu](mailto:atroschi@umn.edu)

612-626-0455

