



# COLORADO RESIDENTIAL TRADE PARTNER TECHNICAL HEAT PUMP CLASS

**Ann Kirkpatrick | Xcel Energy**

**Lee Valenzuela | City of Denver**

**Isaac Smith | Center for Energy and Environment (CEE)**

**Bruce Manclark | CLEAResult**

**Emily McPherson | Center for Energy and Environment (CEE)**

April 7, 2022

# OVERVIEW

1. Agenda and Introduction
2. Beneficial Electrification
3. Rebate Program Announcements
4. Cold Climate Heat Pump (ccHP) Study

# Agenda

Topic	Time
Intro to the day	7:30 – 8:15
HP intro and history	8:15 - 8:45
Ducted dual fuel – the new good, better, best of HPs	8:45 - 9:30
Good – single-stage HP instead of AC	
Better – variable-speed HP	
Best – cold climate HP	
<b>Break and showcase</b>	<b>9:30 - 10:00</b>
Ducted - Manual J – calculating home load	10:00 – 10:30
Ducted - Manual S – Selection and sizing guidance	10:30 – 11:00
<b>Break and showcase</b>	<b>11:00 – 11:15</b>

# Agenda

Topic	Time
Ducted – Install guidance – air flow, thermostat, wires, outdoor unit considerations, etc, com	11:15 - 11:45
Ducted – Additional applications – All-electric, propane	11:45 - 12:00
<b>Lunch and showcase</b>	<b>12:00 – 1:00</b>
Ducted All electric considerations – sizing, strip heat, etc.	1:00 - 1:15
Consumer Survey and Top 10 heat pump homeowner brochure	1:15 – 1:45
Mini-split solutions – elec. baseboard and boiler. Product definition, application consideratio	1:45 - 2:00
Mini-split Installation best practices - mini-split	2:00 – 2:30
Closing remarks	2:45 – 3:00
<b>Showcase</b>	3:00 - 3:30

# Manufacturer and Distributor Showcase

Bosch / Johnstone Supply

Carrier / Carrier West Lohmiller

Daikin / Stevens Equipment Supply

Ecoer / JSG Associates

LG Electronics

Mitsubishi

Rheem / Comfort Air Distributing

Plus:

City and County of Denver

Xcel Energy

# What This Class Is and Is Not

## What It Is Not:

- Not heat pump basics
- Not a sales class
- Not predicting future costs
- Not a Manual J-S-D class
- Not manufacturer specific

## What It Is:

- Addressing some of the things we are all thinking about related to heat pumps
- Intended to increase confidence in selling/installing heat pumps
- Providing tools and information to assist you
- A place to let us know what you need

# Essential Services



You provide essential services

Very important work

Advising customers how to be safe, comfortable and have better control of their energy use and carbon footprint

Decision they'll live with for 20 years

Heat pumps are a great solution

# BENEFICIAL ELECTRIFICATION

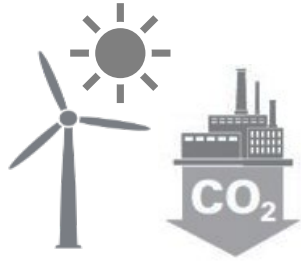
*Definition: use electricity to do things that used to be done with fossil fuels*





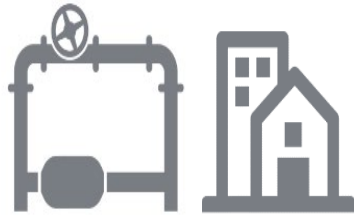
# Xcel Energy's Comprehensive Clean Energy Strategy

Clean energy across all the ways we power people's lives



---

**100% Carbon-free Electricity**



---

**Net-zero Natural Gas**

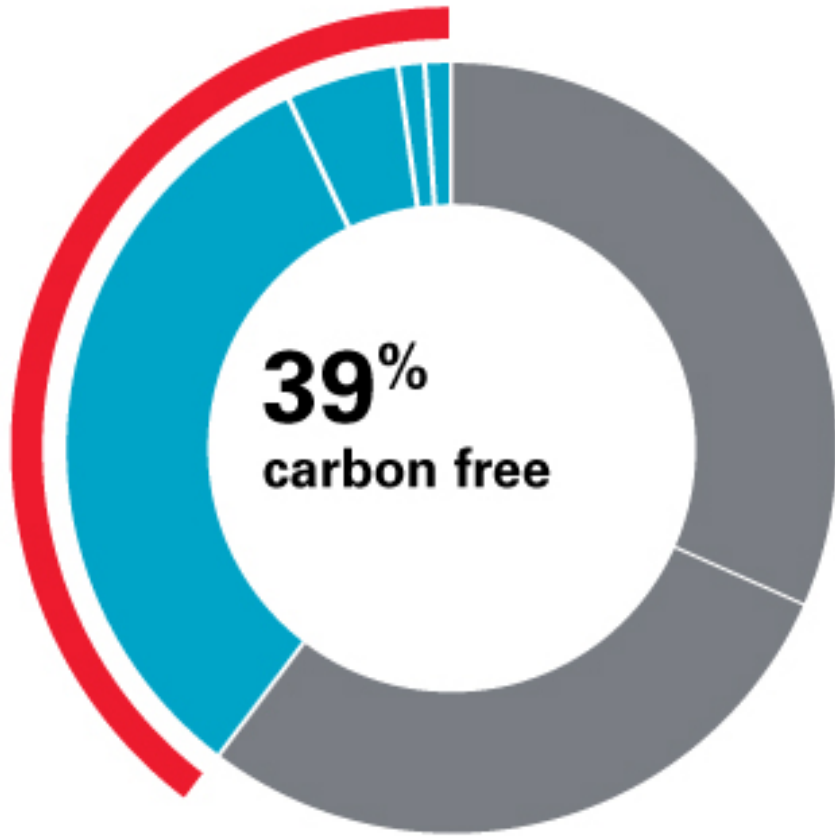


---

**1.5 Million EVs**

# Delivering Increasingly Cleaner Electricity

## 2021 Energy Mix – Colorado



Coal	32%
Natural Gas	29%
Wind	33%
Solar	5%
Other Carbon Free	1%
Other	<1%

## Resource Additions by 2030

Approximately 2,300 MW of wind

Approximately 1,600 MW of large scale solar

Approximately 400 MW of storage

Just under 1,300 MW of firm dispatchable resources (or those available 24/7)

Just under 1,200 MW of distributed solar resources

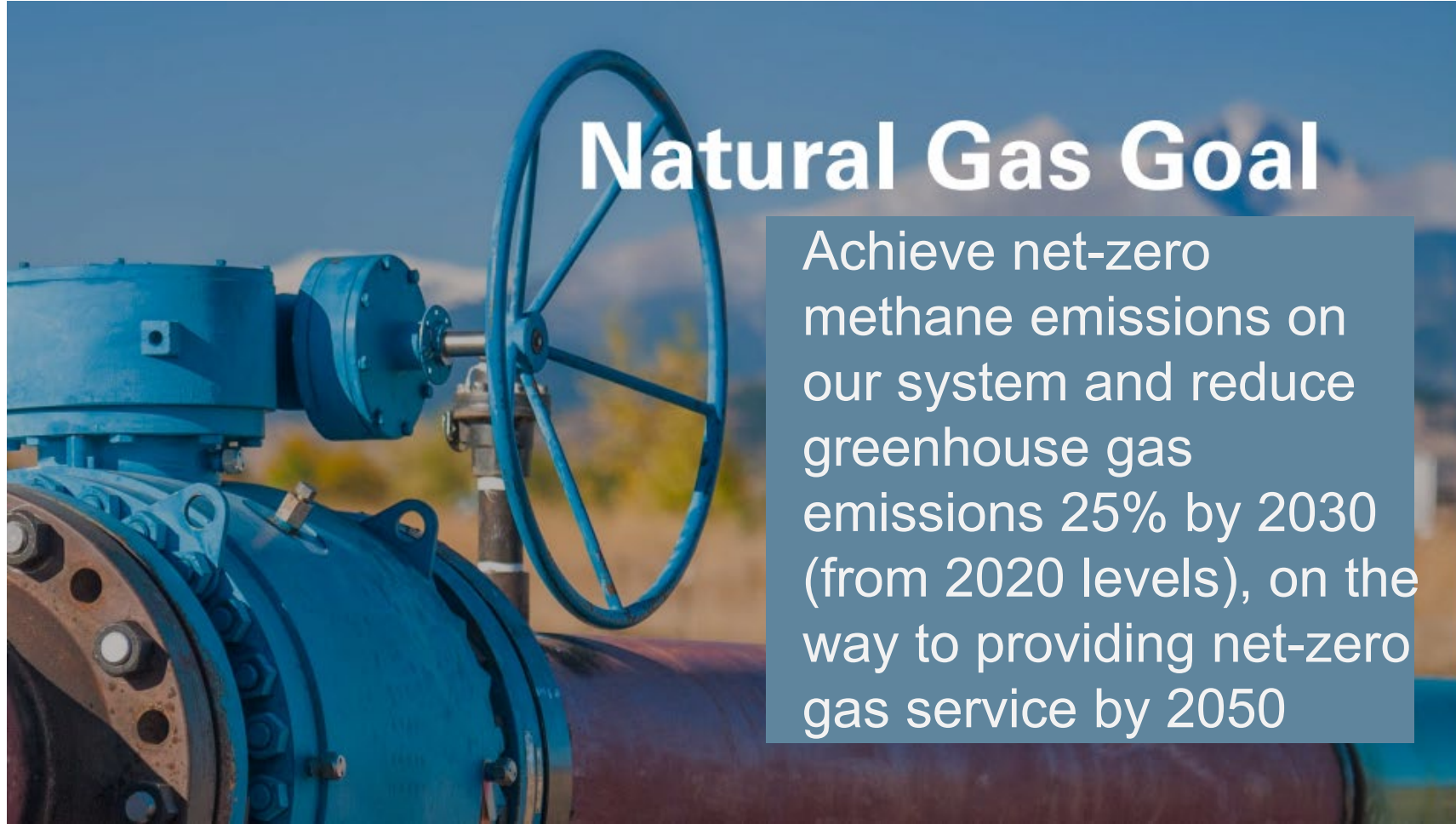
# Energy costs differ by time of day

## Time of Use (TOU) rates now in effect

<u>TOU</u>	<u>Times</u>	<u>Summer rates</u>	<u>Winter rates</u>
On-peak	3 - 7 pm	\$0.28/kWh	\$0.17/kWh
Mid-peak	1 - 3 pm	\$0.19/kWh	\$0.14/kWh
Off-peak	7 - 1 pm	\$0.10/kWh	\$0.10/kWh

Standard rate alternative: \$0.13/kWh summer, \$0.12/kWh winter

# Xcel Energy Will Continue Offering Natural Gas



## Natural Gas Goal

Achieve net-zero methane emissions on our system and reduce greenhouse gas emissions 25% by 2030 (from 2020 levels), on the way to providing net-zero gas service by 2050

# Natural Gas System: Emission Sources

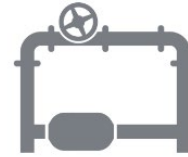
Production/Processing



Transmission/Storage



Xcel Energy System



Customers



← Methane Emissions →

Carbon Emissions

Released during production and delivery of natural gas intentional or accidental venting

Methane global warming potential is 25x that of CO<sub>2</sub>

Multiple operators and millions of miles of pipe delivering natural gas from the well and distribution system to the customer

Emitted by burning natural gas in appliances and equipment

2.1M customers across five states

# Can the Grid Handle the Eventual Wintertime Peak?

- Xcel Energy is expert at [distribution planning and grid readiness](#) [recording link]
- Xcel Energy has adapted to many major changes successfully
- Beneficial electrification is destined to become the new normal
- Change is not going to happen overnight
- If you build it, the grid will support it
- The sooner you share your plans the better we can prepare to meet the demands
- Natural gas will get cleaner and will continue to be supported
- **Proceed with confidence that the grid can handle the eventual wintertime peak**

# ANNOUNCEMENTS: REBATE PROGRAMS

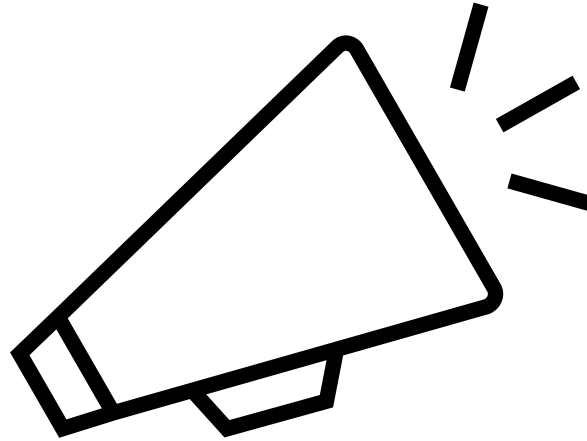


# Xcel's Current and Proposed Rebates

	SEER	EER		HSPF		Rebates
Heat pump type	no change	Now	Probable	Now	Probable	no change
ASHP	15	12.5	11.5	9	9	\$800
ccASHP	18	12.5	11.5	10.5	9.5	\$1,000
MSHP	15	11	11	9	9	\$500
ccMSHP	18	11	11	10.5	9.5	\$600



# Special Pre-Announcement from Denver



Lee Valenzuela, Community Energy Programs Administrator  
Office of Climate Action, Sustainability, and Resiliency  
City and County of Denver

# DENVER CLIMATE ACTION REBATES

**Launch Date:** April 22, 2022

Leverages Climate Protection Fund to support residential electrification and e-mobility

Contractors **must** be on Xcel’s Trade Partner’s List to apply for rebates

1. Equipment Installer provides up-front discount to Denver resident
2. Equipment Installer submits rebate application at [DenverClimateRebates.com](https://denverclimaterebates.com)
3. City & County of Denver provides a rebate to Equipment Installer via ACH transfer

Eligible Equipment	Denver Rebate (up to 80% of total installed project cost)
Air Source HP	\$7,200
	\$9,000 (cold climate)
Ground Source HP (replacing electric resistance heat or natural gas furnace)	\$1,800 per ton up to \$9,000
Mini-split HP	\$4,500
	\$5,400 (cold climate)
Heat pump water heater	\$1,400 (high efficiency)
	\$3,200 (smart)

Questions? Contact us at [ClimateActionRebates@denvergov.org](mailto:ClimateActionRebates@denvergov.org)

# Making it Easier to Commission Systems

- Past:
  - 67 degree outside temperature
  - Non-inverter: subcool method
  - Inverter: line set/weigh in method
- Going forward:
  - Any refrigerant charge quality install method approved by manufacturer is allowed
  - Follow manufacturer's minimum ambient temperature guidelines
  - Document refrigerant charge method and testing on the commissioning sheet

# Making it Easier to Participate

## CERTIFICATION AND TRAINING REQUIREMENTS

### **Air Conditioning , Air Source Heat Pump, and Ground Source Heat Pump Rebates**

- Six-digit Xcel Energy contractor ID
- Required training

### **Evap Cooling, Mini Split Heat Pumps, 95% AFUE Furnaces, and Natural Gas Water Heater Rebates**

- Six-digit Xcel Energy contractor ID

### **Electric Heat Pump Water Heater Rebates**

- Six-digit Xcel Energy contractor ID
- Required training

*NATE certification is  
now optional*

[https://www.brainshark.com/xcel/  
2021ACclasses](https://www.brainshark.com/xcel/2021ACclasses)

[https://hvacree.net/xcel-  
co/registration/](https://hvacree.net/xcel-co/registration/)

[https://www.brainshark.com/xcel/  
HPWHclass](https://www.brainshark.com/xcel/HPWHclass)

# Making the Online Application Easier

--None--

AC with QI, and a furnace is being used in the home

AC/ASHP with QI, no furnace is being used in the home

Boiler Sidearm add on

Boilers and Furnaces

Evaporative Cooler

Heat Pump-Air Source - backup heat is furnace

Heat Pump-Air Source - cold climate - backup heat is furnace or boiler

Heat Pump-Air Source - cold climate - replacing electric resistance heat

Heat Pump-Air Source - replacing electric resistance heat

Heat Pump-Ground Source - replacing electric resistance

Heat Pump-Ground Source - replacing furnace

Heat Pump-Mini-Split - backup heat is furnace or boiler

Heat Pump-Mini-Split - cold climate - backup heat is furnace or boiler

Heat Pump-Mini-Split - cold climate - replacing electric resistance heat

Heat Pump-Mini-Split -for partial home OR replacing elec

Heat Pump-Water Heater replacing electric water heater

Heat Pump-Water Heater replacing gas water heater

Smart Thermostat


Water Heater-natural gas - storage tank

Easier for your  
administrative staff  
to choose correctly

# Materials in the Showcase


**2021/22 REBATE SUMMARY**  
 COLORADO RESIDENTIAL ENERGY EFFICIENCY PROGRAMS  
 Updated November 2021

INFORMATION SHEET  
COLORADO




Key	Rebate area	Qualifiers	Rebate	
			Rebate Amount	Eligible for Whole Home Efficiency
🔥	Heating and Cooling	Standard (2500+ CFM)	\$300	
		Premium (85% media saturation, purge pump, thermostat)	\$675	🏠
🔥	Evaporative coolers			
🏠🔥	Central a			
🏠🔥	Air source h			
🏠🔥	Cold clim heat pu			
🔥	Mini-split h			
🔥	Cold clim heat pu			
🏠🔥	Ground so (GS) Quality			
🔥	Gas			
🔥	Smart			
🔥	Smart enrolled			
🔥	Water			
🔥	Tankless g			
🏠🔥	Electri wa			
🏠🔥	Electric h			

**COLD CLIMATE HEAT PUMP STUDY**  
 INFORMATION SHEET COLORADO



**Overview**  
 As part of our commitment to clean energy and reducing carbon emissions, Xcel Energy is funding a beneficial electrification study in partnership with the National Renewable Energy Laboratory (NREL). NREL will provide unbiased analysis of how the cold climate heat pumps perform in Colorado's varied climates. In addition to tracking the heat pump's performance, costs and energy savings, NREL will also be evaluating the homeowner's satisfaction with the technology.



**What is a cold climate heat pump?**  
 A modern variable capacity home until the outdoor temperature is supplemented by a backup centrally ducted heat pump. definition of a centrally ducted of SEER 18, EER 12.5, HSPF 70% of the heating capacity split heat pump are minimum the rated heating capacity at

**What participating residents can expect:**

- Participation pays double – \$2,000 for centrally ducted – \$1,200 for mini-split heat pumps
- The home must have natural gas
- The previous home heating system must be a furnace
- A participating cold climate heat pump purchase and installation cost
- Homeowner requirements:
  - Agree to study terms and conditions
  - Allow Xcel Energy, or its contractor, access to the home at no cost
  - Complete the rebate application
  - Respond to market research
  - Within reason, expectant

**Key:**

- 🔥 **Natural Gas:** This symbol indicates that the rebate is available to our natural gas customers.
- 🏠🔥 **Electric:** This symbol indicates that the rebate is available to our electric customers.

\*Cold climate heat pumps must be installed in homes with a single family home, duplex or townhome.  
 \*\*Must be either (1) using Xcel Energy's Single Family Homes, Duplex or Townhome program.

**GUIDE TO INSTALLING AIR-SOURCE HEAT PUMPS IN COLD CLIMATES**  
 INFORMATION SHEET COLORADO

A COMPANION TO NEEPS GUIDE TO SIZING & SELECTING AIR-SOURCE HEAT PUMPS IN COLD CLIMATES



**GUIDE TO SIZING & SELECTING AIR-SOURCE HEAT PUMPS IN COLD CLIMATES**  
 INFORMATION SHEET COLORADO

A COMPANION TO NEEPS GUIDE TO INSTALLING AIR-SOURCE HEAT PUMPS IN COLD CLIMATES

**INTRO**  
 High-quality

**Introduction**  
 The use of air-source heat pumps (ASHPs) in cold climates is growing rapidly, but kept up with the wide range of applications commonly found in cold climates. Systems are significantly impacted by poor sizing and system selection. The purpose of this guide is to help installers and homeowners understand the requirements for cold climate applications, while maintaining high efficiency, performance, and customer satisfaction.

There are many types of equipment and a variety of common applications for ASHPs in single and multi-zone, mini-split "ductless" and/or "compact-ducted" systems, systems, may be installed in existing or new homes. When an ASHP is installed in an existing home, existing heating equipment is left in place as a supplement, conventional approach

**XCEL ENERGY AND TRADE PARTNER EXPECTATIONS AND RESPONSIBILITIES**  
 INFORMATION SHEET COLORADO



**CONTRACTOR PARTICIPATION REQUIREMENTS**

Xcel Energy has Demand Side Management (DSM) goals that trade partners who are listed on the Xcel Energy website, on registered contractor lists for specific rebate programs, will help Xcel Energy achieve by submitting rebate applications for their qualifying customers. By participating in the programs trade partners agree to stay in communication with Xcel Energy and provide their customers with accurate and updated information about qualifying equipment and associated rebate programs and policies; trade partners will not misrepresent themselves as Xcel Energy, nor misrepresent Xcel Energy programs; trade partners will follow the Xcel Energy advertising guidelines (see below); trade partners will submit information to Xcel Energy that is accurate and truthful; trade partners will provide quality customer service and resolve issues quickly; trade partners will provide quality work, in the field and on rebate forms.

Xcel Energy is not responsible if trade partners provide customers with inaccurate information about the amount of the actual rebate. Xcel Energy will not rebate



**TOP 10 TIPS FOR GETTING THE MOST OUT OF YOUR HEAT PUMP**



our one-page application types so users can effectively manage their energy usage and displacement.

relevant information on sizing and equipment selection. Note: this guide assumes the appropriate application type. In cold climate heat pump can provide cost-effective heating for your home.

this guide is focused on products that appear on the Xcel Energy website. Variable-speed systems are assumed in this guidance. Cold climate heat pumps are not recommended in climate zone 4 and higher, though interest in cold climate heat pumps is growing. The following section provides additional general guidance to all the application types.

Always be installed by licensed, trained professionals. Follow all applicable building codes and regulations.

**enjoy**

# Links to Other Training Materials

[Res HVAC rebate application overview](#)

[2021 AC Required classes](#)

[Required 2021 AC-ASHP class \(QI\)](#)

[Required 2021 AC-ASHP class \(Sales\)](#)

[Heat Pumps: NEEP cold climate HP website demo](#)

[Heat Pumps: Recording - Xcel Overview](#)

[Heat Pumps: Recording - Market Opportunities](#)

[Heat Pumps: Recording - Do they work in our climate?](#)

[Heat Pumps: Recording - Installation Considerations](#)

[Heat Pump Water Heater class \(required to participate\)](#)

**ANNOUNCEMENT:  
COLD CLIMATE HEAT PUMP STUDY**





## ccHP Study – The Why

- Receive unbiased analysis of CO ccHP performance
- Tracking costs, energy savings, homeowner satisfaction

## Partners

- Michaels Energy – program administrator, providing monitors
- NREL (National Research Energy Lab) – testing systems, providing analysis

## ccHP Study Specifics

- 40 cold climate heat pumps
  - 10 in Summit County
  - 30 in Denver
  - 10 in other locations
- Ducted or mini split
- Backup heat source of customers' choosing

# What Homeowners Need to Know

- Participation pays **double rebates** for the cold climate heat pump
  - \$2,000 for centrally ducted cold climate heat pumps (standard rebate \$1,000)
  - \$1,200 for mini-split heat pumps (standard rebate \$600)
- A **participating cold climate heat pump study contractor** must be used for the purchase and installation of the system
- The home must have natural gas and electric service from Xcel Energy
- The previous home heating system must be a natural gas furnace or boiler

## What Homeowners Need to Know, Cont.

- Agree to study terms and conditions
- Allow Xcel Energy, or its agents, to place a monitoring system on the heat pump, at no cost
- Complete the rebate application to receive the regular cold climate heat pump rebate
- Respond to market research inquiries regarding your usage patterns and satisfaction
- Within reason, expectation to remain the homeowner until April 2024, when the study ends
- A copy of the final study findings will be provided

# What Trade Partners Need to Know

- Must be an AC – Heat Pump participating contractor
- Equipment and customer must qualify for Xcel Energy ccHP rebate
- **Extra trade incentives, up to \$900**, given when customer rebate given
  - \$200 for signing and abiding by the study's trade partner t's and c's
  - \$200 for being on site when the monitoring system is installed
  - \$500 for providing the electrician to install the monitoring system
- The heating load calculation and equipment selection must be reviewed and approved by Michael's Energy **prior to system installation**
  - Contact Paige Markegard, Michaels Energy:  
[plmarkegard@michaelsenergy.com](mailto:plmarkegard@michaelsenergy.com) 608-785-3343

## What Trade Partners Need to Know, Cont.

- Ensure the homeowner signs the terms and conditions for the study
- A monitoring system will be installed at no cost; must stay active
- Assist Michaels Energy with functional testing of the installed equipment

# QUESTIONS

Rebate questions:

Energy Experts

800-824-1688

ee-team@xcelenergy.com

Escalations and unusual situations:

Ann Kirkpatrick

303-886-9567

ann.kirkpatrick@xcelenergy.com

Lucy Lee, Marketing Assistant

lucy.lee@xcelenergy.com