



A conversation about heat pumps

August 26, 2021 @ 10:00 am

- Distributing slides to attendees following the meeting. •

Speaker panel

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Xcel Energy	Ann Kirkpatrick	ann.kirkpatrick@xcelenergy.com

Agenda

- Changes are coming – what's driving it
- Real life cold climate heat pump success stories
- Market barriers discussion
- What we're doing to help you sell more heat pumps



Changes are coming — what's driving it



Changes are coming – *what's driving it?*

- Surprising nationwide wide utility commitments made for carbon-free, clean-energy grids by 2030
- What's driving it? Cost of renewables is less than natural gas and coal now
- Cold Climate Heat Pumps costs and performance has come into parity with HVAC in the last year
- How many Colorado cities are considering or already created '*Climate Action Change*' Committees

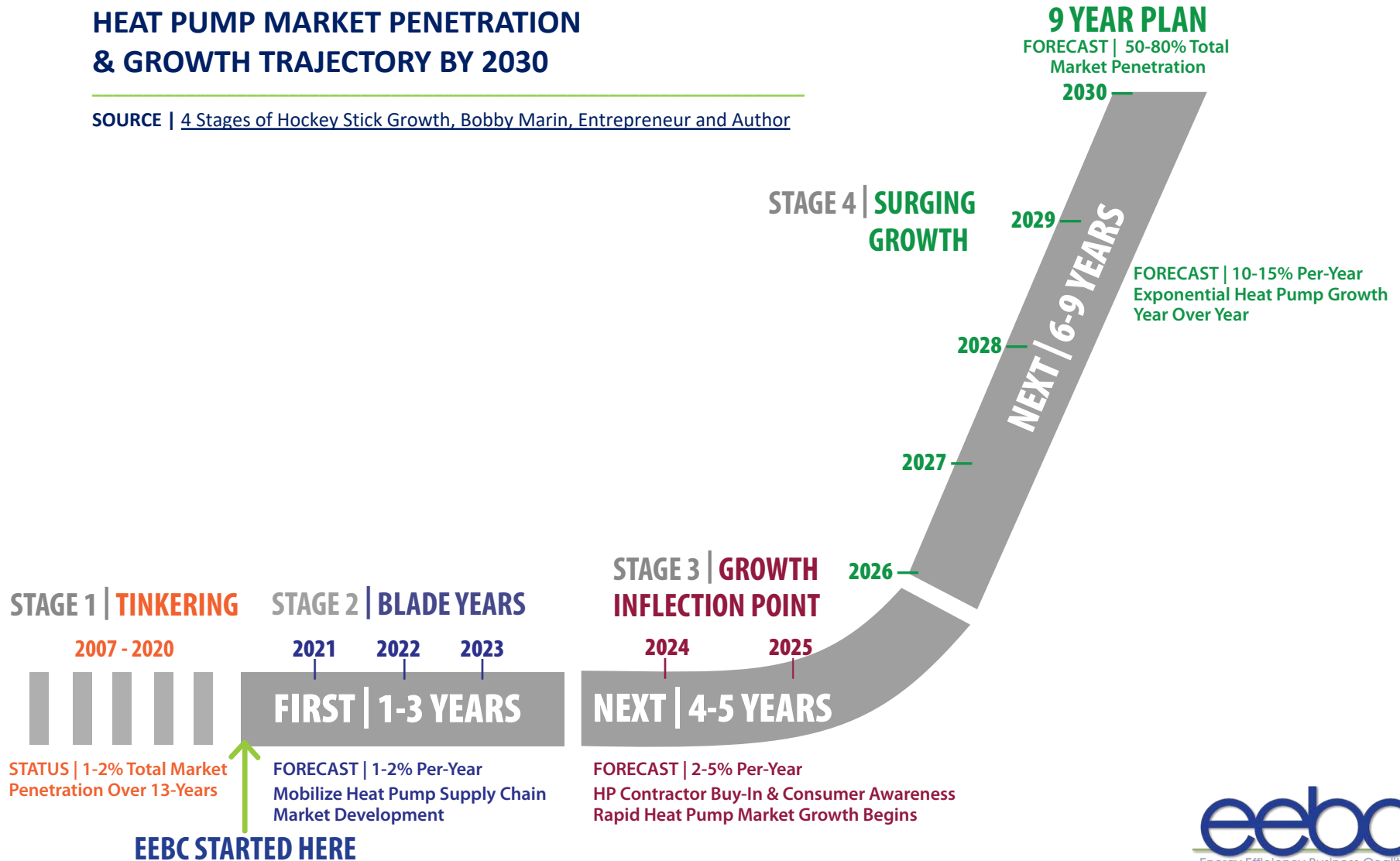
BOTTOM LINE | Now electrification and carbon-free technologies *make good financial sense*
- and are less driven by the concepts of *climate change and environment*

The Internet of things (IoT) and energy transition is the fastest market adoption since smart phones and the internet. — Jeff Bezos, Founder of Amazon

COLORADO'S SHARED HEAT PUMP FORECAST

HEAT PUMP MARKET PENETRATION & GROWTH TRAJECTORY BY 2030

SOURCE | [4 Stages of Hockey Stick Growth](#), Bobby Marin, Entrepreneur and Author



Colorado's Commitment to Climate Action

Colorado's Climate Goals:

- Reduce GHG pollution 50% by 2030 and 90% by 2050 from 2005 levels
- Achieve 100% renewable energy by 2040

To achieve our goals we need to:

- Continue the swift transition away from coal and towards renewables
- **Increase building efficiency and electrification**
- Accelerate the transition to electric cars, trucks and buses
- Change transportation planning and infrastructure to reduce driving

See CO's [GHG Pollution Reduction Roadmap](#) for more near-term actions

2020 CO GHG Emissions (MMT CO₂e, AR5 100-yr GWP)



2021 CO Historic Clean Energy Legislation

More than 30 bills passed in the 2021 Colorado legislative session advancing clean buildings, climate action, environmental justice, renewable energy, energy efficiency, transportation electrification, and just transition. View a summary of the legislation [here](#).

Bill	Title	Summary
SB21-246	<i>Electric Utility Promote Beneficial Electrification</i>	<i>- Requires regulated electric utilities to file plans with the PUC to promote and incentivize the use of energy-efficient electric equipment in place of less efficient fossil fuel-based systems.</i>
SB21-264	<i>Adopt Programs Reduce GHG Emissions Utilities</i>	<i>- Sets GHG reduction requirements for gas utilities of 4% by 2025 and 22% by 2030 from a 2015 baseline. - Requires investor owned gas utilities to file a “Clean Heat Plan” with the PUC to meet reduction targets. - Defines eligible technologies including gas energy efficiency, beneficial electrification, green hydrogen, and recovered methane.</i>





Beneficial Electrification
League of Colorado

BEL-CO's mission is to advance beneficial electrification in Colorado's buildings and industrial facilities.

Specific goals for residential buildings, by 2030:

- 160,000 heat pumps installed
- 220,000 heat pump water heaters installed

Utility Commitments to Cleaner Energy

The 6 utilities that provide 91% of Colorado's electricity have committed to reduce GHG emissions by at least 80% by 2030.

Xcel Energy

- Reduce GHG 85% by 2030
- 80% RE by 2030
- Retire Hayden 1 by 2027, Hayden 2 by 2028, Comanche 3 by 2040
- Convert Pawnee to gas 2028
- 3,900 MW renewables

Holy Cross Energy

- 100% carbon-free electricity by 2030
- Filing a Clean Energy Plan
- 100 MW new wind
- 35 MW new solar
- 25 MW solar + storage
- 5 MW additional hydro

Black Hills Electric

- Filing a Clean Energy Plan
- Reduce GHG 80% by 2030
- 70% emission reduction by 2023 with 200 MW solar project.

Colorado Springs Utilities

- Filing a Clean Energy Plan
- Reduce GHG 80% by 2030
- 32% renewable energy by 2030
- Close all coal plants by 2030

Platte River Power Authority

- Filing a Clean Energy Plan
- 100% non-carbon by 2030
- Retire all coal-fire generation by 2030
- 500 MW of new solar, wind
- 300 MW of energy storage

Tri-State G&T

- Reduce in-state GHG 90% by 2030
- Reduce total GHG 80% by 2030
- Close Colorado coal plants by 2030
- Preferred plan adds 900 MW of wind, 900 MW of solar, 200 MW of battery storage

Summary of CO Heat Pump Rebates

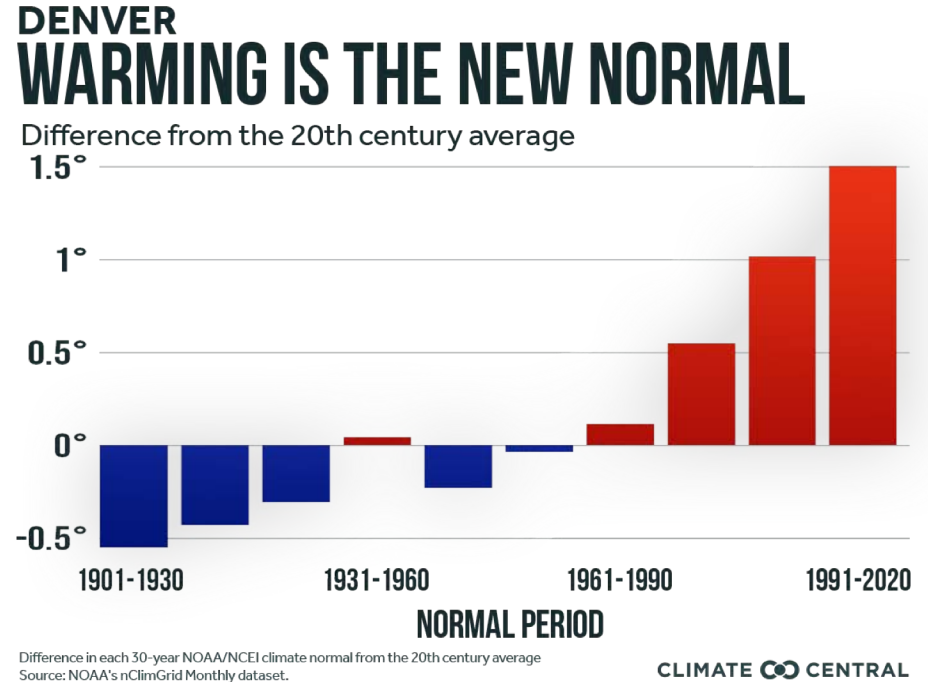
- **40 out of 52** electric utilities in CO provide rebates for HPs:
 - \$500 for ducted or mini-split HP (PRPA member muni's)
 - \$800 for ducted HP/\$1,000 for cold-climate (Xcel Energy)
 - \$450/ton (Tri-State member co-ops)
 - \$850/ton for cold-climate (Holy Cross Energy)
- Some local governments and nonprofits (e.g., Boulder, Denver, CORE) provide additional rebates
- All CO rebates listed at loveelectric.org/rebates

City and County of Denver

New Building Codes – 2022 and 2024.
Denver is growing 2% per year

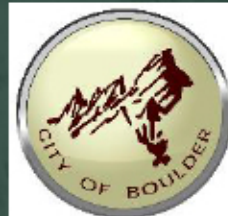
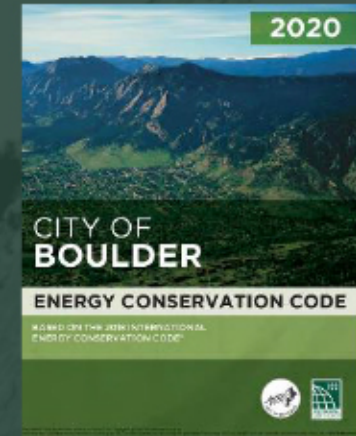
Existing Commercial Buildings – heat pumps required in 2025

More Denver homes looking for cooling solutions over the next decade

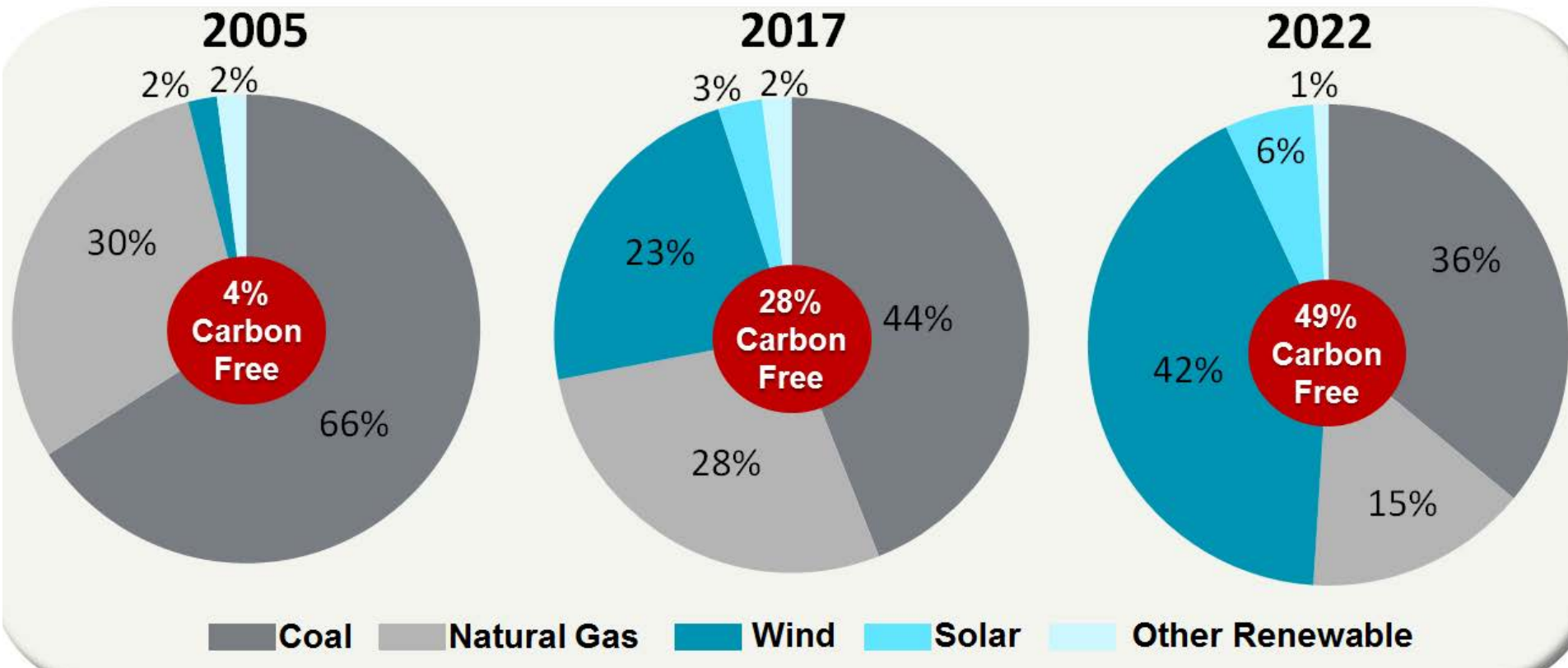


Boulder Heat Pump Adoption

- Aggressive Building Codes: Driving Electric HVAC
 - All new single-family
 - Many multi-family and commercial
- Spring and Fall Marketing Campaigns: Creating Consumer Awareness
 - >200% increase in adoption
- Residential and Commercial Programs: Increasing Voluntary Adoption
 - Incentives
 - Advising services



Xcel Energy's changing generation sources





85% Carbon Free By 2030


Xcel Energy Rebates: cooling only

	Rebate area	Qualifiers	Rebate
Key	Heating and Cooling	Criteria	Rebate Amount
	Evaporative coolers	Standard (2500+ CFM)	\$300
		Premium (85% media saturation, purge pump, thermostat)	\$675
		Multi-ducted premium (3 ducts minimum, at least one new)	\$1,200
	Central air conditioners	Up to 14.99 SEER, any EER with Quality Installation	\$200
		15+ SEER, 12.5+ EER with Quality Installation	\$500






Key:

 **Natural Gas:** This symbol indicates a program available to our natural gas customers.

 **Electric:** This symbol indicates a program available to our electric customers.

 **Participating contractor:** This symbol indicates a program that requires customers to use an Xcel Energy participating contractor to install the equipment or make the improvement. Our list of registered contractors can be found at [xcelenergy.com/COTrades](https://www.xcelenergy.com/COTrades).

Xcel Energy Rebates: cooling and heating

	Air source heat pump (ASHP)	15+ SEER, 12.5+ EER with Quality Installation	\$800
	Cold climate air source heat pump (ccASHP)	18+SEER, 12.5+ EER, 10.5+ HSPF with Quality Installation ¹	\$1,000
	Mini-split heat pump (MSHP)	15+ SEER, 11+ EER, 9+ HSPF	\$500
	Cold climate mini-split heat pump (ccMSHP)	18+ SEER, 11+ EER, 10.5+ HSPF ¹	\$600
	Ground source heat pump (GSHP) with Quality Installation	14.1+ EER, closed loop, had gas heat as the primary heat source previous to the GSHP installation, or for new homes	\$400 per heating ton, maximum \$2,000
		14.1+ EER, closed loop, with electric resistance heat as previous heat source	\$300 per ton, maximum \$1,500

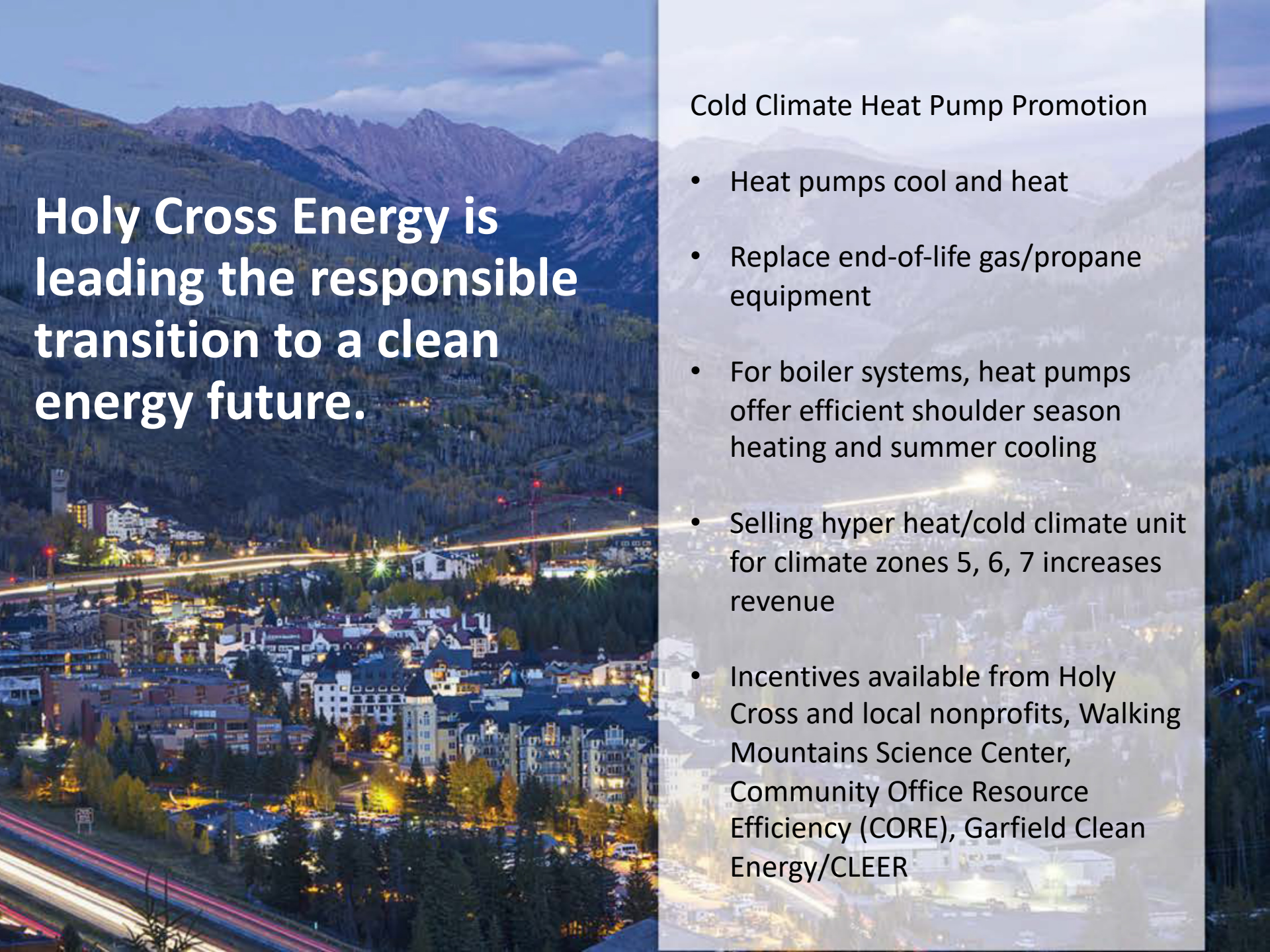
COLD CLIMATE HEAT PUMPS MUST HAVE A HEATING CAPACITY AT 5° OF AT LEAST 70% OF THE HEATING BTU AT 47°

Xcel Energy's New Homes program

	Combo 2021-22	Gas only 2022	Electric only 2021-22
Performance better than energy code	Rebate		
10-15%	\$250	\$125	\$500
15-20%	\$400	\$200	\$800
20-25%	\$600	\$300	\$1,200
25-30%	\$900	\$450	\$2,800
30-35%	\$1,300	\$650	\$3,900
35-40%	\$2,000	\$1,000	\$5,200



Real life cold climate heat pump success stories



Holy Cross Energy is leading the responsible transition to a clean energy future.

Cold Climate Heat Pump Promotion

- Heat pumps cool and heat
- Replace end-of-life gas/propane equipment
- For boiler systems, heat pumps offer efficient shoulder season heating and summer cooling
- Selling hyper heat/cold climate unit for climate zones 5, 6, 7 increases revenue
- Incentives available from Holy Cross and local nonprofits, Walking Mountains Science Center, Community Office Resource Efficiency (CORE), Garfield Clean Energy/CLEER

MYTH BUSTER 1: Heat pumps don't work in cold climates

FACT: Today's cold climate units have enhanced heating capacity in cold weather and should be left running under all outdoor conditions.

302 heat pump units installed between 6,000 and 8,000 feet in Holy Cross territory

Holy Cross | [The Hub At Willits](#)

Holy Cross, Habitat for Humanity | [Basalt Vista Affordable Housing Community](#)

Holy Cross, Northwest Colorado Council of Governments | [eNews January 2021](#)



MYTH BUSTER 2: Heat pumps are expensive to operate

FACT: Air source heat pumps can heat a home at efficiencies over 400% in cool weather. Heat pumps variable speed capacity cool at twice the efficiency of common window air conditioners.

- Heat pumps use 68% less electricity than electric baseboards
 - Reduce heating bills 30-50%
- Coefficient of Performance (COP)
 - Furnaces: .8 - .95
 - Electric baseboard: 1
 - Heat pumps: 3 or higher

A COP of 3 delivers three-times as much heat as it uses in watts

RMI: We found that the heat pump was not only capable of maintaining a comfortable and safe indoor air temperature during extreme heat, but it also costs \$228 less per year to operate than a dual fuel cooling and heating system (AC unit + gas furnace).

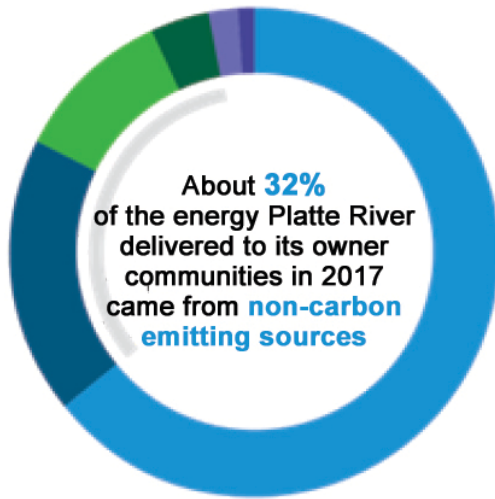
Holy Cross, RMI | [Why Heat Pumps Are the Answer to Heat Waves](#)

	Heat Pump	
	kWh	Billed Amt
Jan-21	2,634	\$294
Feb-21	1,577	\$181
Mar-21	1,636	\$187
Apr-21	1,021	\$122
Total	6,868	\$785
	Electric Baseboard	
Jan-20	3,454	\$382
Feb-20	2,541	\$284
Mar-20	2,124	\$238
Apr-20	1,525	\$176
Total	9,644	\$1,079

Platte River Power Authority

Energy delivered to owner communities

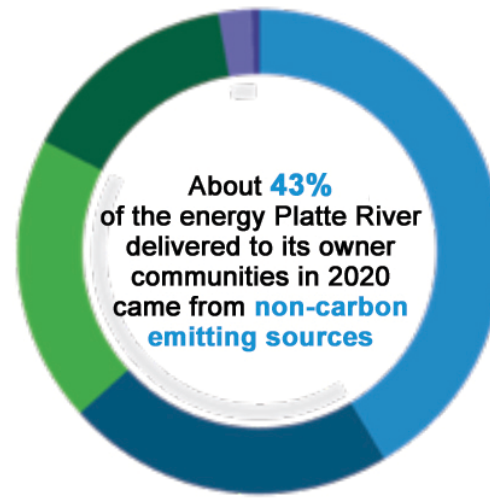
2017



2017 deliveries of energy to communities

- Coal **66.4%**
- Hydropower **19.5%**
- Wind **10.7%**
- Solar **1.9%**
- Purchases **1%**
- Natural gas **0.5%**

2020



2020 deliveries of energy to communities

- Coal **41.5%**
- Hydropower **22.0%**
- Wind **19.2%**
- Purchases **14.7%**
- Solar **2.2%**
- Natural gas **0.4%**

Platte River Power Authority goals

- 100% noncarbon energy by 2030
 - Coal-fired generation retired
 - 500 MW of new solar, wind
 - 300 MW of energy storage
 - Energy efficiency (Efficiency Works)
- Clean Energy Plan to be filed in 2021

Beneficial electrification

Longmont

- Planning steps under key priorities
 - Equity, public health, carbon reduction
 - Public education, transparency, pragmatism

Fort Collins

- Goal: 80% overall carbon reduction by 2030, 100% by 2050
 - Cut use of natural gas 10% by 2030
 - Energy efficiency and Heating electrification key drivers to reaching goal



Tri-State Generation and Transmission Air Source Heat Pumps [ASHP] Support

Long Term Program

- Tri-State has been rebating air source heat pumps since 2014
- Completed multiple cold climate studies in the field, including a national study with EPRI and multiple utilities that ran from 2018 to 2020.

Incentives

- \$450/ton for units greater than 17 SEER (not to exceed 50% equipment cost)
 - Some member utilities provide partial match, one exceeds (combined \$1000 a ton)
 - Rebate may be simplified to a per unit, tiered rebate in 2022. Stay tuned.
- Provide a Quality Install rebate of \$250 per install for participating installers

Community Education

- Working with our Colorado members on local marketing materials, consumer education videos, and hosting community cold climate ASHP workshops

Recap of big ideas

- Legislation, regulation, and codes are driving change
- 6 utilities that provide 91% of CO's electricity are committed to beneficial electrification of buildings
- 40 out of 52 utilities that provide electricity in CO offer rebates to help close the price gap between an AC and furnace and the cost of a cold climate heat pump
- Cold climate heat pumps work in our climate, that's well-established, including at high altitude
- The consumer demand is growing
- The organizations you've heard from today are making significant investments in heat pumps
- The heat pump market potential is huge



Market barriers discussion

- 20 minutes •

Questions

What questions do you have about what you heard today?

Type your **questions** in the chat

Successes to date

Speak-up about your heat pump successes and plans

Type the word **success** in the chat and we'll call on you in order

Market barriers

What needs to be solved/provided to replace AC sales with heat pump sales?

Type the word **solve** in the chat and we'll call on you in order



**What we're doing to help you sell more
— what's next**

Mobilize the HP Supply Chain Through Distributors

Join HVAC/Heat Pump [HP] Action Groups

| CONTRACTOR HVAC/HP ACTION GROUP

- ✓ Sales acceleration and transition support
- ✓ Distributor and peer collaboration
- ✓ Sales & marketing to homeowners – *sales tipping point*
- ✓ Have a voice at the table to influence HP utility rebates
- ✓ Influence utility HP rebates
- ✓ Resources developed from your feedback and requests

| DISTRIBUTOR HVAC/HP ACTION GROUP

- ✓ Grow your HP contractor business
- ✓ Contractor collaboration resources and training

| MANUFACTURER & STAKEHOLDER HVAC/HP ACTION GROUP

- ✓ Have a voice at the table to influence HP utility rebates
- ✓ Collaborate on HP market development & partnerships

Xcel Energy Training and Resources

- Selling heat pumps: webinars – end of September
- Xcel Energy-NREL heat pump study – coming soon
- Recordings of heat pump webinars 2021
 - [Heat Pumps: Recording - Xcel Energy Overview](#)
 - [Heat Pumps: Recording - Market Opportunities](#)
 - [Heat Pumps: Recording - Do they work in our climate?](#)
 - [Heat Pumps: Recording - Installation Considerations](#)
- Publications
 - [NEEP | Air Source Heat Pump Buying Guide](#)
 - [Xcel Energy | Heat Pump Sizing and Selection Guide](#)
 - [Xcel Energy | Heat Pump Installation Guide](#)



How you would like to collaborate with us?

Type your answer in chat or email ann.kirkpatrick@xcelenergy.com

More Resources

Publications

NEEP | [Air Source Heat Pump Buying Guide](#)
Xcel Energy | [Heat Pump Sizing and Selection Guide](#)
Xcel Energy | [Heat Pump Installation Guide](#)
Holy Cross, Northwest Colorado Council of Governments | [eNews January 2021](#)
Colorado Energy Office | [Colorado 2021 Legislative Session Snapshot | June 2021](#)
EEBC, SWEEP | [New Colorado Policies to Advance Building Electrification & Energy Efficiency Will Boost Jobs-2021](#)
LoveElectric | [All-Electric New Homes & Buildings in Colorado](#)

Websites

Beneficial Electrification League of Colorado [BELCO] | [Website](#)
Holy Cross | [The Hub At Willits](#)
Holy Cross, Habitat for Humanity | [Basalt Vista Affordable Housing Community](#)
Holy Cross, RMI | [Why Heat Pumps Are the Answer to Heat Waves](#)
Colorado Energy Office | [GHG Pollution Reduction Roadmap](#)
LoveElectric | [Best heat pump applications](#)
LoveElectric | [Heat pump installation resources](#)
LoveElectric | [Find a qualified heat pump installer](#)
LoveElectric | [List your HVAC company, resources for installers](#)

Rebates

LoveElectric | [Colorado utility heat pump Rebates](#)

Meeting

[EEBC's HVAC/Heat Pump Action Group Kick-Off Meeting | October 14th @ 3:00 pm](#)
— Contractors, Distributors, & Manufacturers/Stakeholders Only