

December 2023

# HVAC + WEATHERIZATION

Two great tastes that taste great together!

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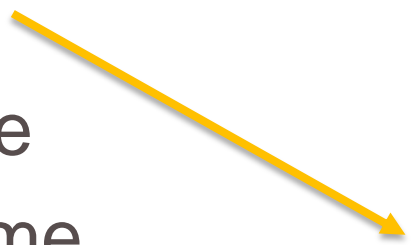
Center for Energy and Environment



# What's the difference?

## Beneficial Electrification

- Fosters grid resilience
- Saves money over time
- Reduces negative environmental impacts
- Moves away from fossil fuel appliances



## Responsible Decarbonization

- Load reduction
- Beneficial Electrification
- Good for supply chain
- Flexible homeowner problem solving
- Pairs with renewable generation

# What's in it for us?

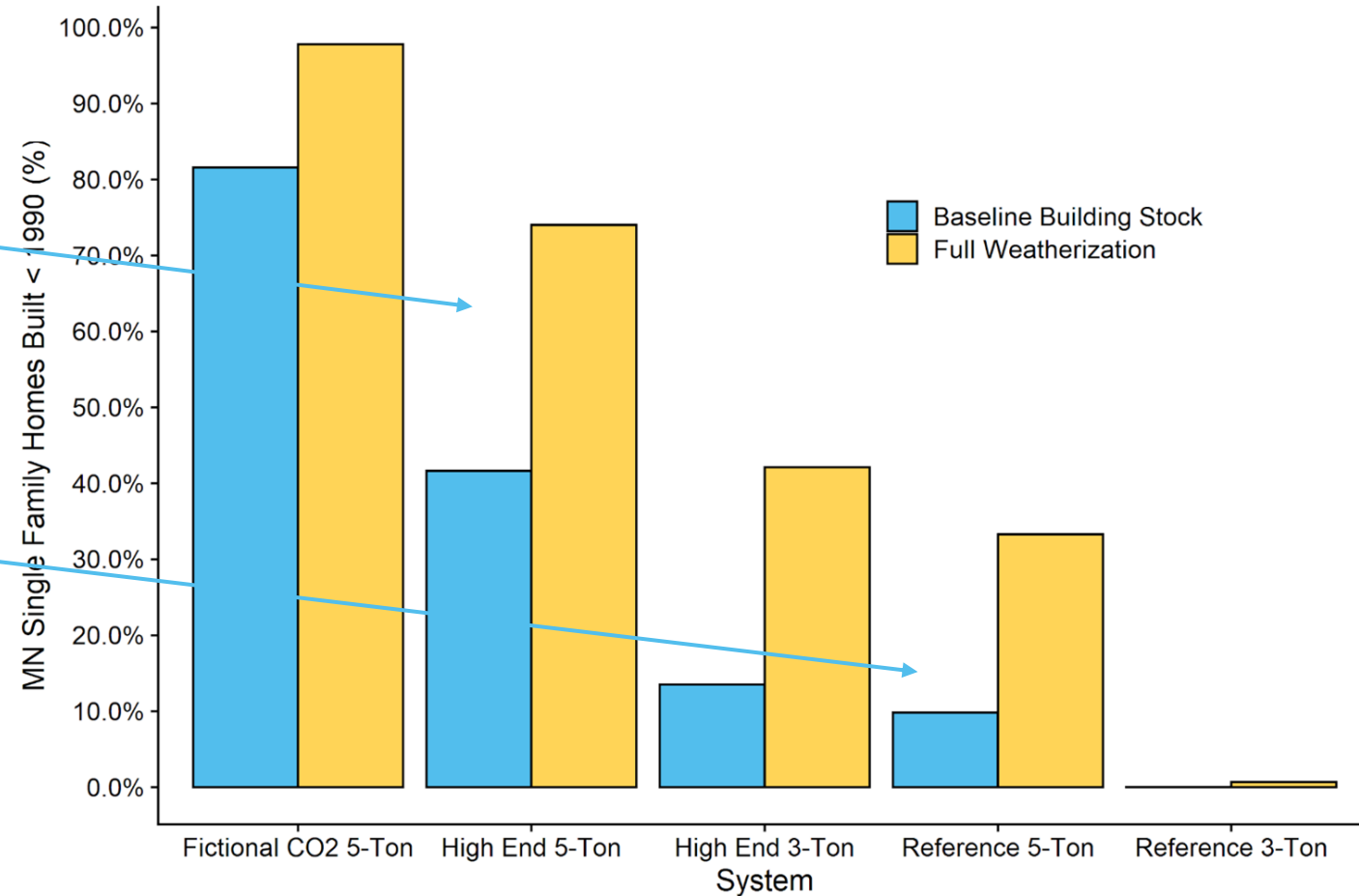
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# Utilities

# Envelope Improvements Show Results

- Best system available now can meet load on 75% of <1990 homes
- Even reference 5-ton system meets 33% of homes
- ***25% peak load reduction***

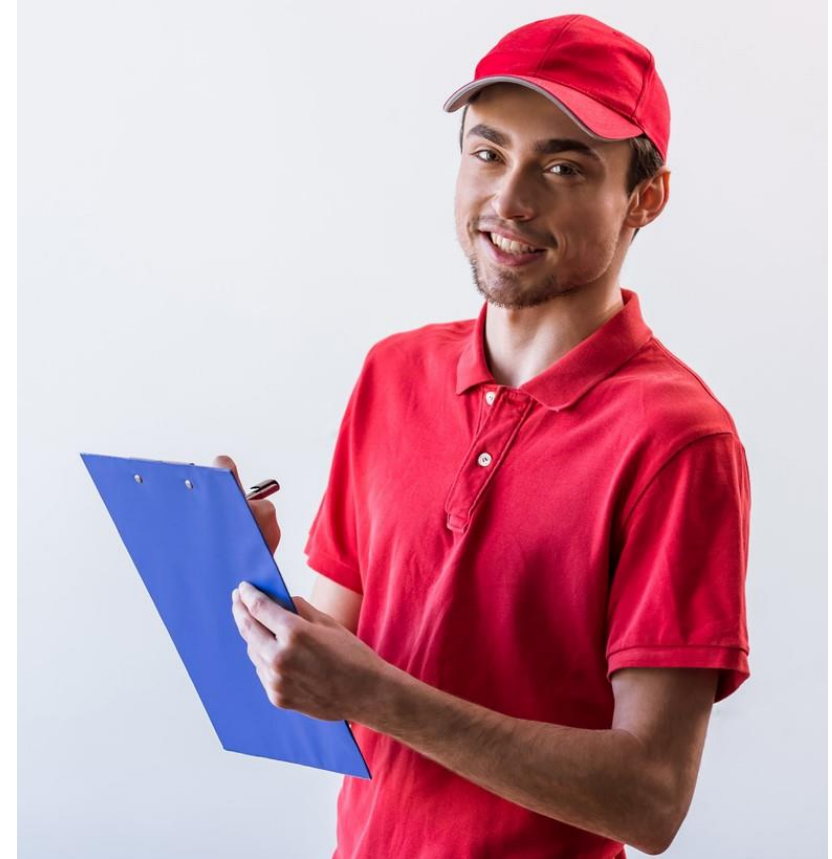


From assessment in Minnesota

# Settlement item 8.b. in the Colorado 2023 DSM Plan

“Public Service will add an additional bonus rebate of at least \$500 for customers who install major weatherization measures within six months of installation of heat pumps for space heating.”

The bonus insulation rebate is \$600



# Contractors

# Who is working with customers when they aren't in crisis?





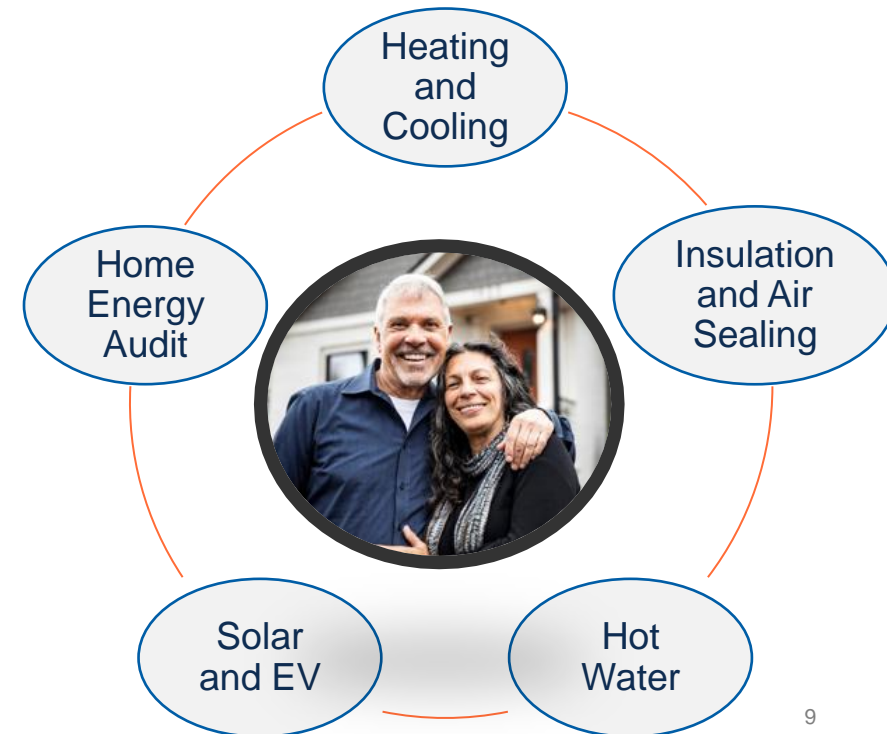
# What opportunities can we connect?

Home Energy Audit first → later 25% more rebates possible from Xcel

Envelope first → ½ to 1-ton smaller heat pump possible

Heat pump before envelope → lower switchover temperature later

Solar or EV first → panel upgrade may already be done





### MECHANICAL MEASURES

- Clean, tune, repair, or replace heating and/or cooling systems.
- Install duct and heating pipe insulation.
- Install programmable thermostats and other HVAC controls.
- Repair/replace water heaters.
- Install water heater tank insulation.
- Insulate water heating pipes.
- Install solar water heating systems.
- Install waste heat recovery devices.



### HEALTH & SAFETY MEASURES

- Complete combustion appliance safety testing.
- Repair/replace vent systems to ensure combustion gas draft safely outside.
- Install mechanical ventilation to ensure adequate indoor air quality.
- Assess fire hazards. Install smoke and carbon monoxide alarms when needed.
- Evaluate mold/moisture hazards.
- Perform incidental safety repairs when needed.



### BUILDING SHELL MEASURES

- Install wall, floor, ceiling, attic, and/or foundation insulation.
- Complete Blower Door Testing.
- Perform air sealing.
- Repair/replace primary windows/doors.
- Install storm windows/doors.
- Install window film/solar screens/window louvers and awnings.
- Repair minor roof and wall leaks prior to attic or wall insulation.



### ELECTRIC BASELOAD MEASURES

- Install motor controls.
- Install efficient light sources.
- Replace refrigerators and freezers with energy efficient models.

# Homeowners

# What is the customer asking?

Why were you called?



What should I do first?



Who should I call to learn more?



# Homeowner Motivations

Might be something like this:

- Be more comfortable
- Save energy
- Don't overspend
- Use rebates and tax credits available
- Find great contractor vendor partners
- Plan for resale value
- Maybe: Keep up with the Smiths and Medinas next door



**The Rules – Imagine that you’ve been called to each house described below. Using your expertise, read up on the description of the issue(s) and think through solutions following the template provided.**

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**How do we fix this?**



# House Number 1

Built in 1950

1600 square feet

Homeowners uncomfortable much of the year

Upstairs too hot in the summer

Upstairs too cool in the winter

Furnace + Central AC

60,000 BTU gas furnace, 80% efficient

4-ton AC unit

Two 6 inch ducts to top floor

Homeowner doesn't know if it's ever been weatherized.



# House Number 2

2004 House

Condensation on the windows  
November-April

Dual fuel heat pump was installed 4  
years ago

Musty smell in the basement and  
closets

Issues have been going on since  
homeowners bought the house in 2018





And now, the panel!

Dan Wildenhaus