



WHY HEAT PUMPS?

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**COFFEE
CONNECTIONS**
Brewing Better Conversations

Agenda



Level Setting



Value Considerations



Q & A

What... is a Heat Pump?

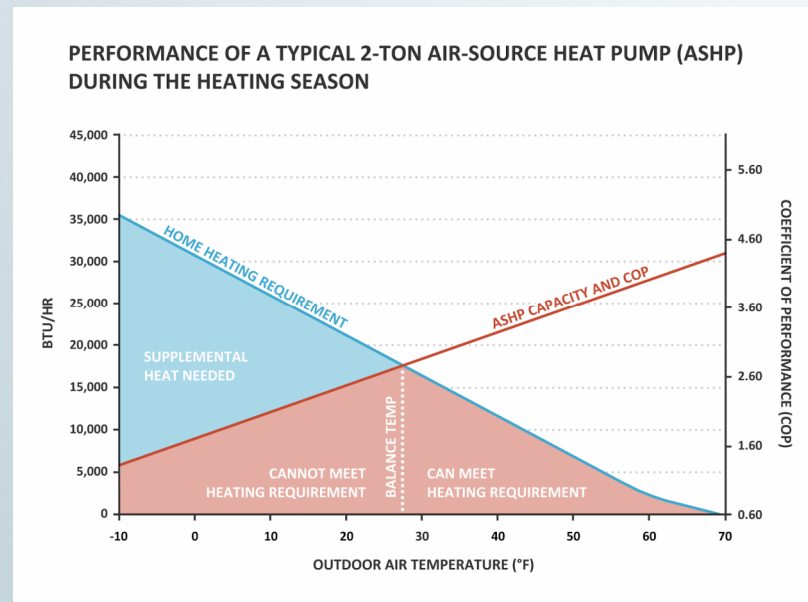
- A device that uses the **2nd law of thermodynamics**
- Heats and cools by **transferring heat** with refrigerants *not* creating it
- HVAC systems

Key terminology

Coefficient of Performance (COP)- measure of efficiency at a specific outdoor temperature.

- Like EER in A/C units
- Typically range from 1.5 – 4.5+
Ex: COP 3.0 or 300%- delivers three units of heat for every one unit of electricity
- Electric resistance= 1.0 or 100%
- HE furnace = .97%

Switchover Temperature- outdoor temperature at which a dual fuel system automatically changes from using the heat pump to using a furnace

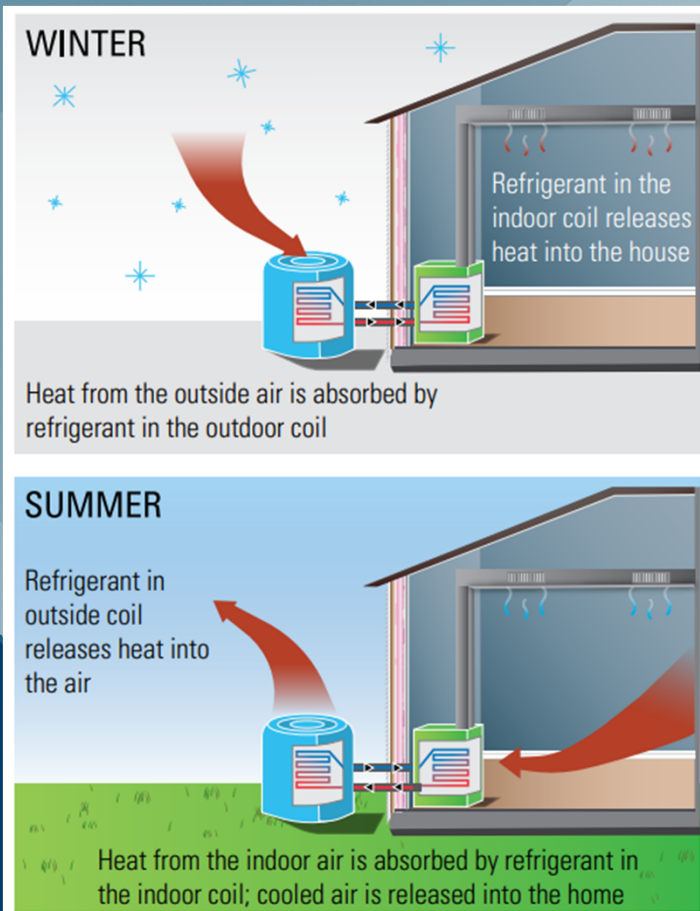


GEO- Thermal



- Ground Source
- Consistent COP 3.5 - 5
- \$15k - \$45k installed
- 100% of space conditioning and 50% + domestic water with desuperheater
- 20 - 25year life span

Air Source



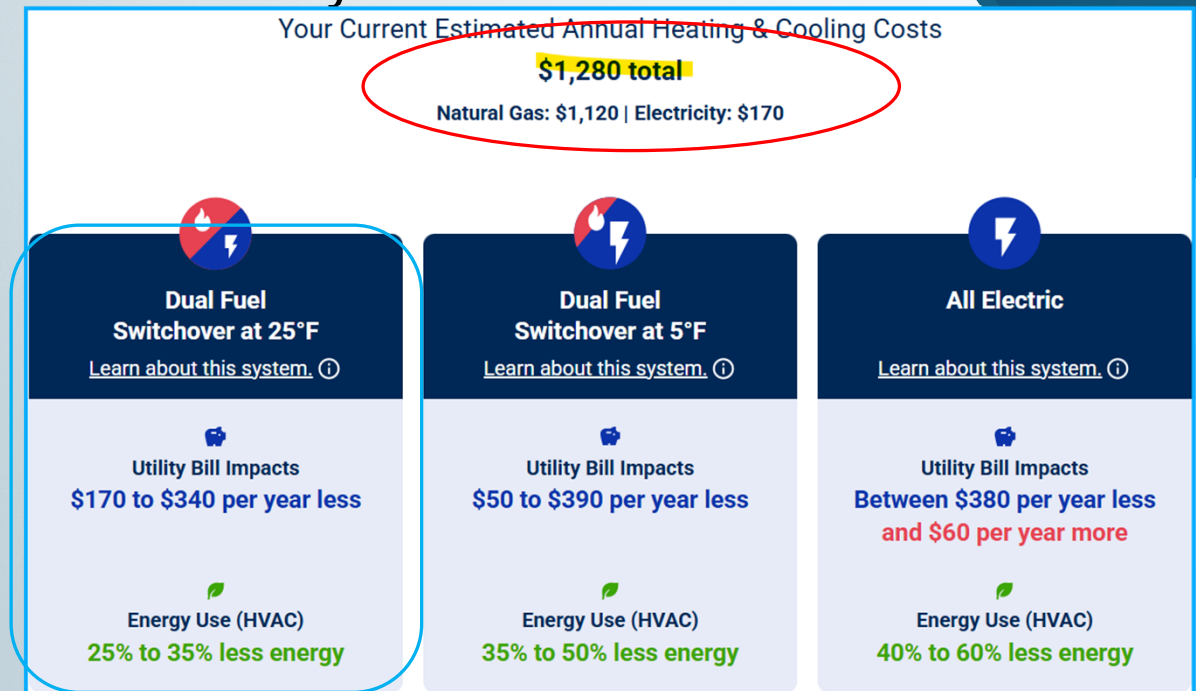
- Ducted & ductless (mini- splits)
- COP 1.5 - 4.0 outdoor temp dependent
- \$6k - \$18k installed
- Cold Climate: -15°F or lower
- 10 - 15year life span
- 80 - 90% of space conditioning

Why... a Heat Pump? customer

➤ **Goal:** A/C end of life & reduce utility costs

✓ **Use less energy**

- Single family 2,000 sq ft
- Built in 1980
- Natural Gas
- ALP
- Standard rate -> Off-Peak rate



Heating & Cooling Savings Estimator | Air Source Heat Pump Collaborative

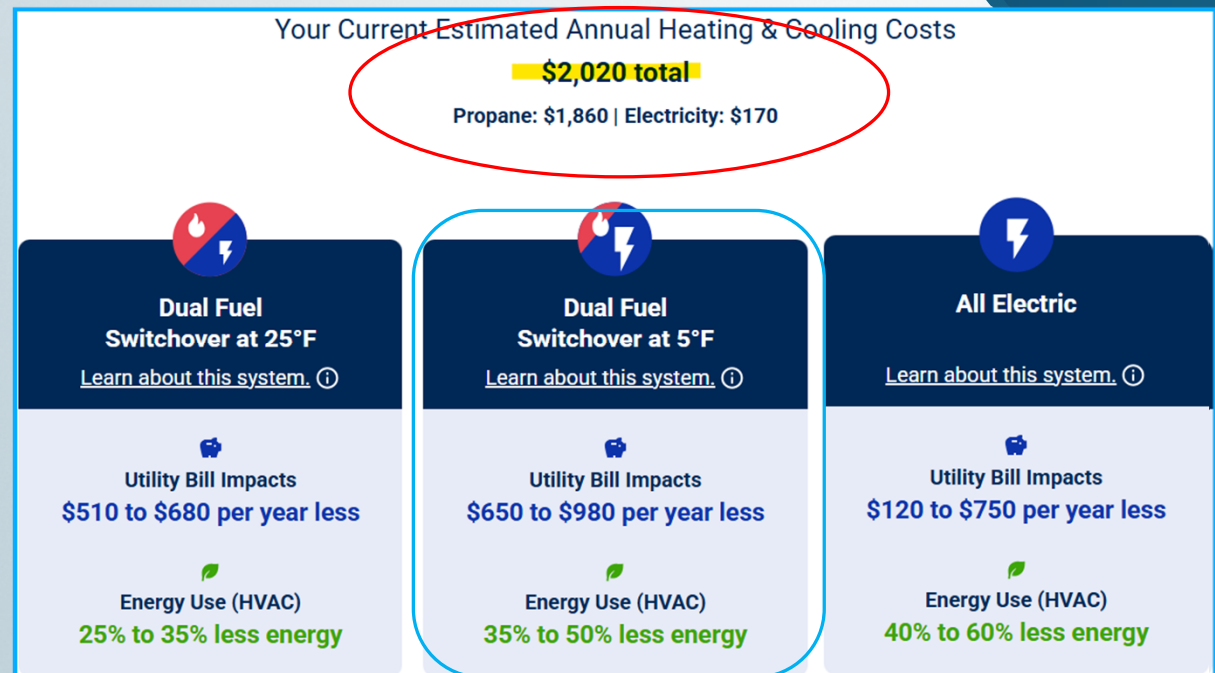
Why... a Heat Pump?

➤ **Goal:** A/C end of life & reduce utility costs

✓ Use less energy

- Single family 2,000
- Built in 1980
- Propane @ \$1.5
- ALP
- Standard rate -> Off peak rate

✓ Avg. home saves \$370 - to \$1000 with an ASHP



Heating & Cooling Savings Estimator | Air Source Heat Pump Collaborative

Why... a Heat Pump?

➤ **Goal:** Improve Comfort

Existing

- Single and 2 stage
- Short cycling
- Cool and clammy
- Hot and cold spots

New Advanced HP's

- Inverter Driven / Modulating / Cold Climate
- Low turn down- low as 20%
- Long – slow run times
- Better Dehumidification

Why... a Heat Pump?

➤ Other reasons...

- Cleaner energy source
 - Modern ASHP 55-85 lbs of CO₂
 - 35-55% less than typical NG furnace

- Customers want them

46% of new homes have HP's

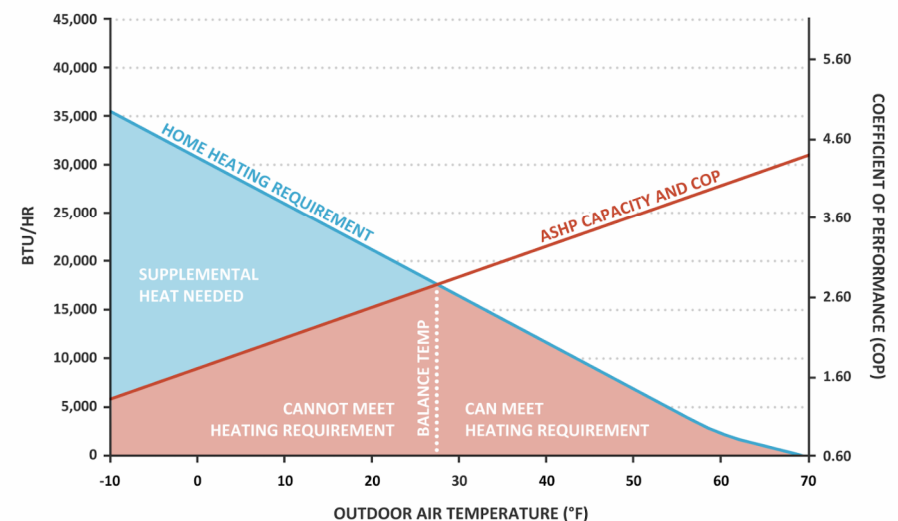
[In the US, heat pumps in new homes](#)

Why... a Heat Pump? utility

➤ Demand flexibility and stability

- Stable at moderate temperatures
- As temperature drops, the load factor of HP increase as they reach their max capacity
- Controllable- Dual fuel, units smooth demand
- Reduce strain on the grid during high-use times
- Demand response can lower bills for customers

PERFORMANCE OF A TYPICAL 2-TON AIR-SOURCE HEAT PUMP (ASHP) DURING THE HEATING SEASON



Why... a Heat Pump?

➤ Load growth

- HP's can provide a stable load especially in shoulder months
- Maintain a load as customers move away from electric resistance heat or toward more efficient equipment
- “Spark Gap”: cheap natural gas is barrier to electrification adoption

Because....

Customer

- Lower utility bill
- Improve Comfort
- Reduce CO₂
- Works in all climates (most of the time)

Utility

- Load Growth
- Stabilize grid
- Load flexibility
- Customer satisfaction

Questions

? How does a heat pump actually work?

[YouTube: How a Heat Pump Works | This Old House](#)

? Where can I go for more information?

NEEP Buying guide: [ASHP_buyingguide_5.pdf](#)

MN Air Source Heat Pump Collaborative www.mnashp.org

Heat Pump Nation video: [The Top 10 Things to Know About Living With Your Heat Pump](#)

? Other questions?



Upcoming Coffee Connections

Sept. 9:

HVAC- AHRI
Questions

Oct 14:

Intro to AMI & Load
Control

Nov. 18:

Contractor
Relationships

JANUARY

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DECEMBER

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Thank you!

We appreciate your
time and would
love your feedback!



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