

# Heat Pump 101 for Connecticut Residents

January 2023

BROUGHT TO YOU BY

**EVERSOURCE**



An AVANGRID Company

PROUD SPONSORS OF



# Agenda

1

Introduction

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Heat Pump Overview

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Benefits &  
Considerations

4

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# Empowering Connecticut to Make Smart Energy Choices



Eversource, CNG, SCG and UI, the Energy Efficiency Board, Connecticut Green Bank, and the State have united on a shared mission - to provide Connecticut residents and businesses the resources they need to **save money and use clean energy**.

The Energize Connecticut initiative empowers our communities to make smart energy choices, now and in the future.

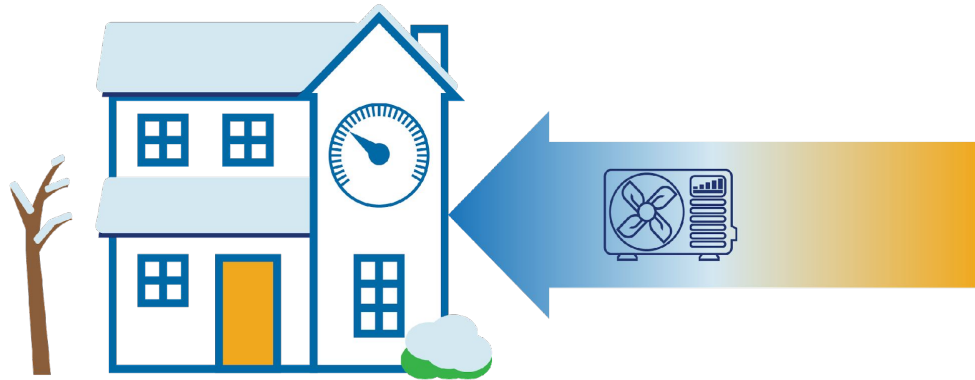


# Heat Pump Overview



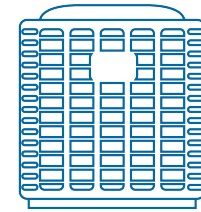


**Summer:** Pumps heat from the inside to the outside

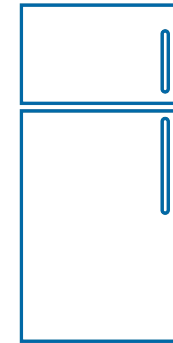


**Winter:** Pumps heat from the outside to the inside

Same technology as:



Air Conditioner



Refrigerator

*Image courtesy of New York State Energy Research and Development Authority (NYSERDA)*

# What is a heat pump?

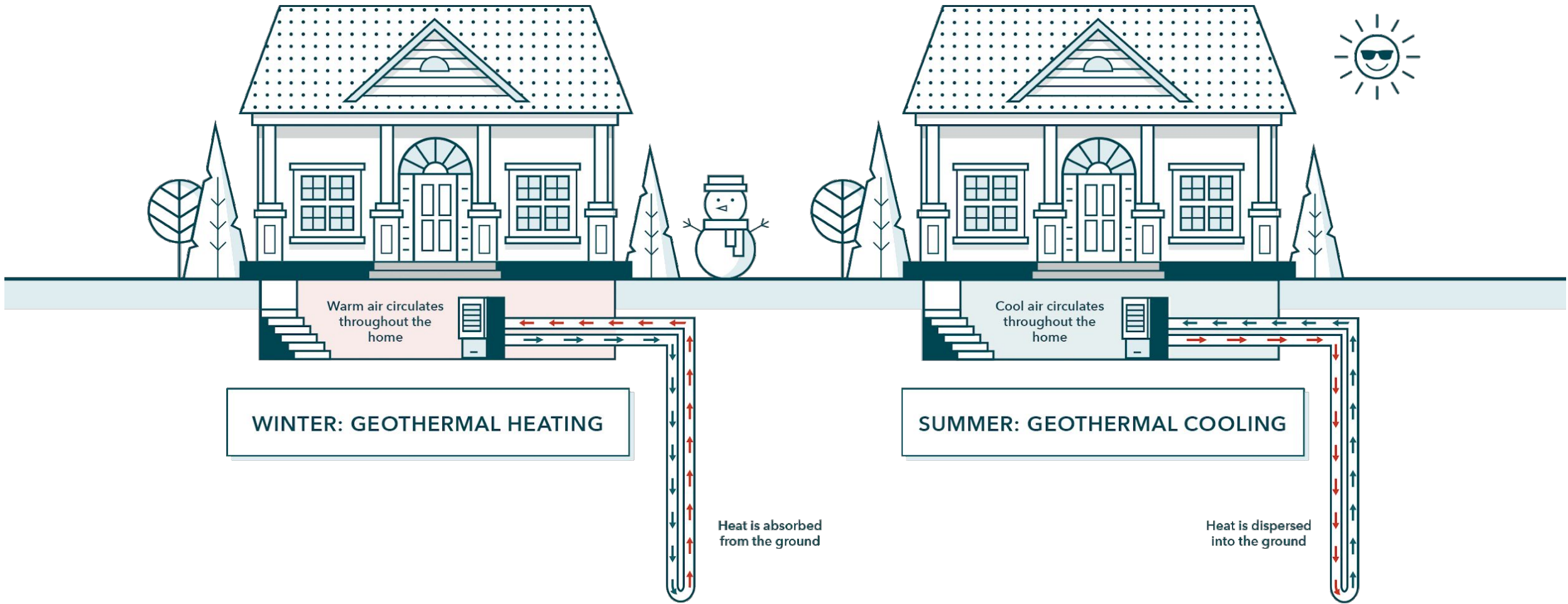
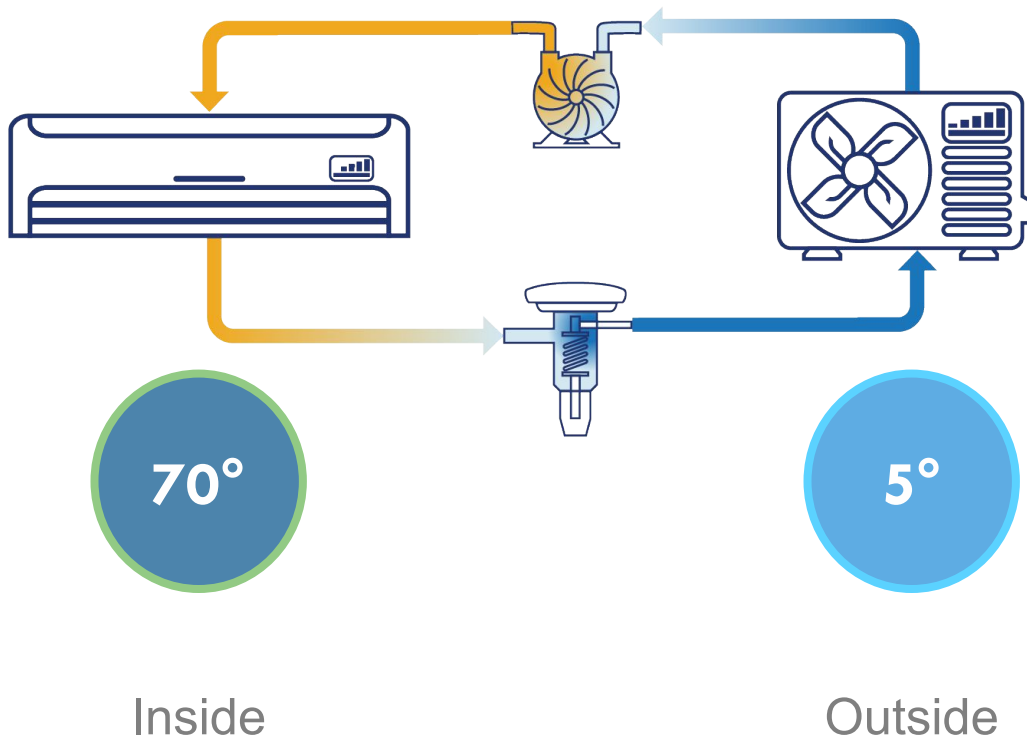


Image courtesy of Dandelion Geothermal

# Ground Source (Geothermal) Heat Pumps

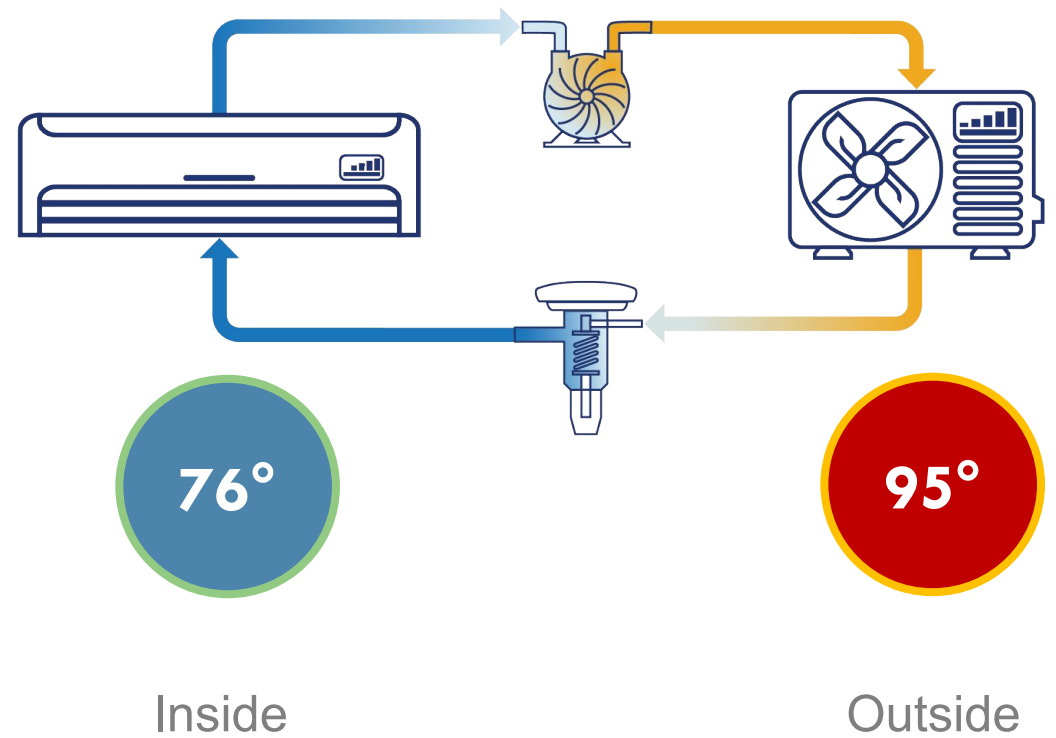
## Winter: Heating

Heat is moved from the air outside (even when it is cold) into your home.



## Summer: Cooling

Heat is moved from inside your home to the air outside (even when it is hot).



*Image courtesy of New York State Energy Research and Development Authority (NYSERDA)*

## Ductless



## Ducted

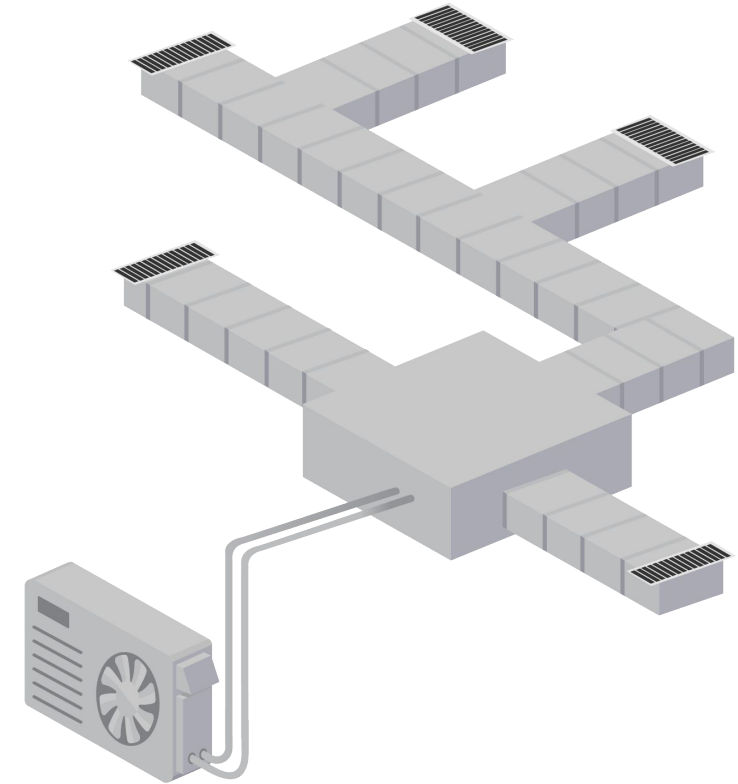
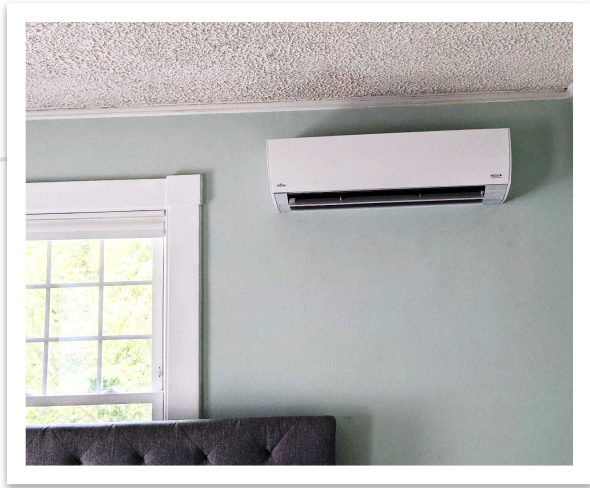


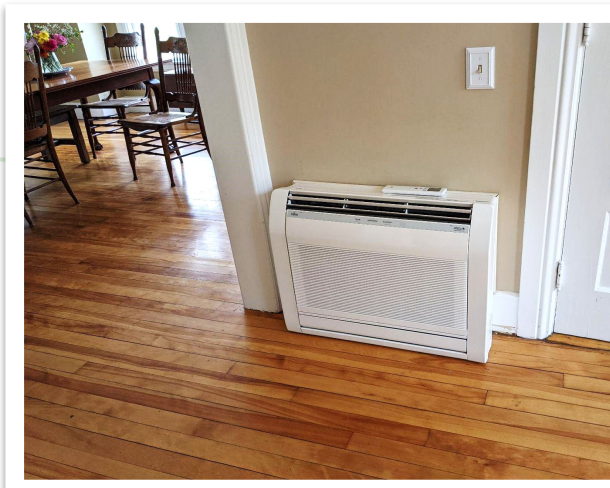
Image courtesy of New York State Energy Research and Development Authority (NYSERDA)



## Wall Hung



## Floor Mount

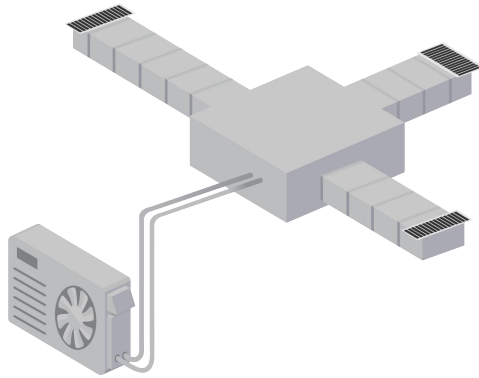


## Ceiling Cassette



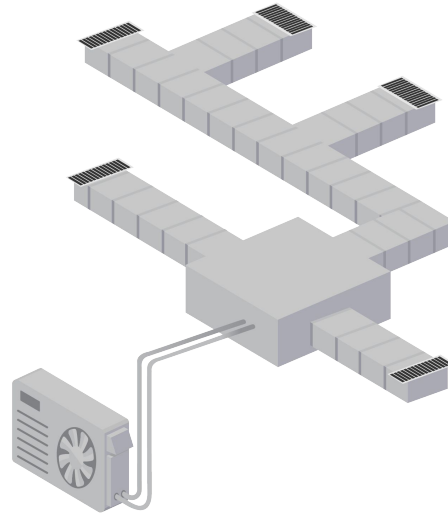
# Ductless Indoor Units

## Compact Ducted

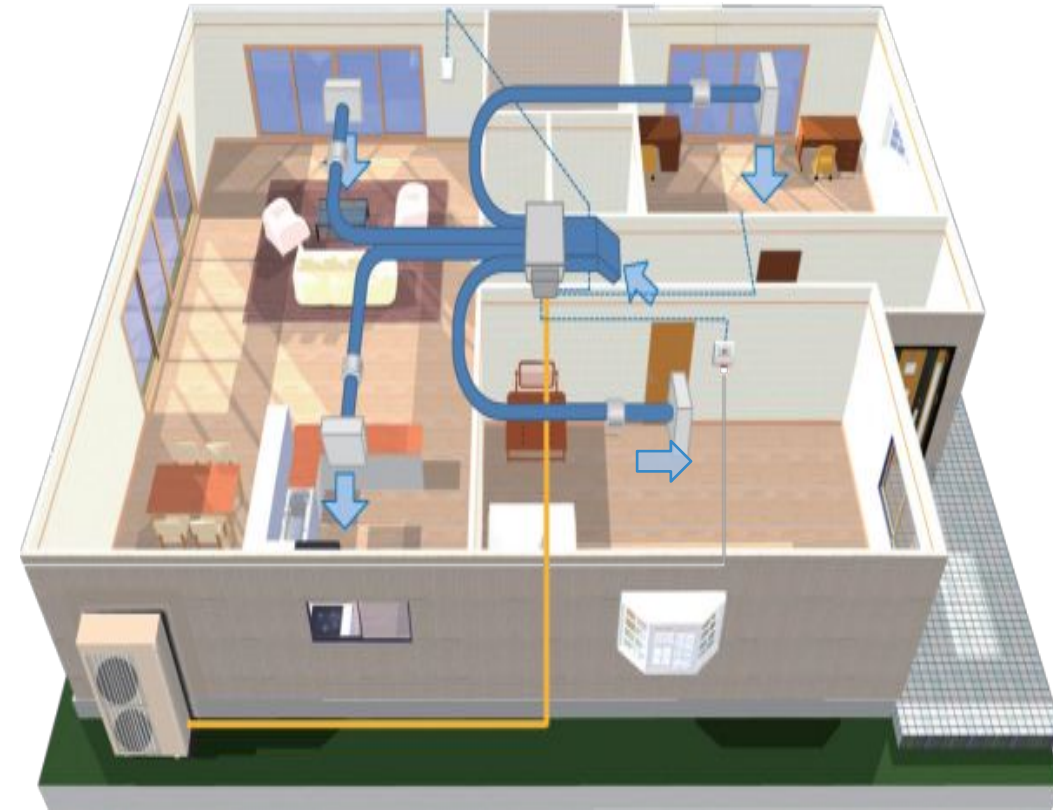


Low Static: a few rooms  
Med Static: an entire floor

## Centrally-Ducted



High Static: An entire floor  
or home  
Can be paired in dual-fuel  
configurations



*Image courtesy of New York State Energy Research and Development Authority (NYSERDA)*

## Single-Zone (mini split)

- 1 to 1



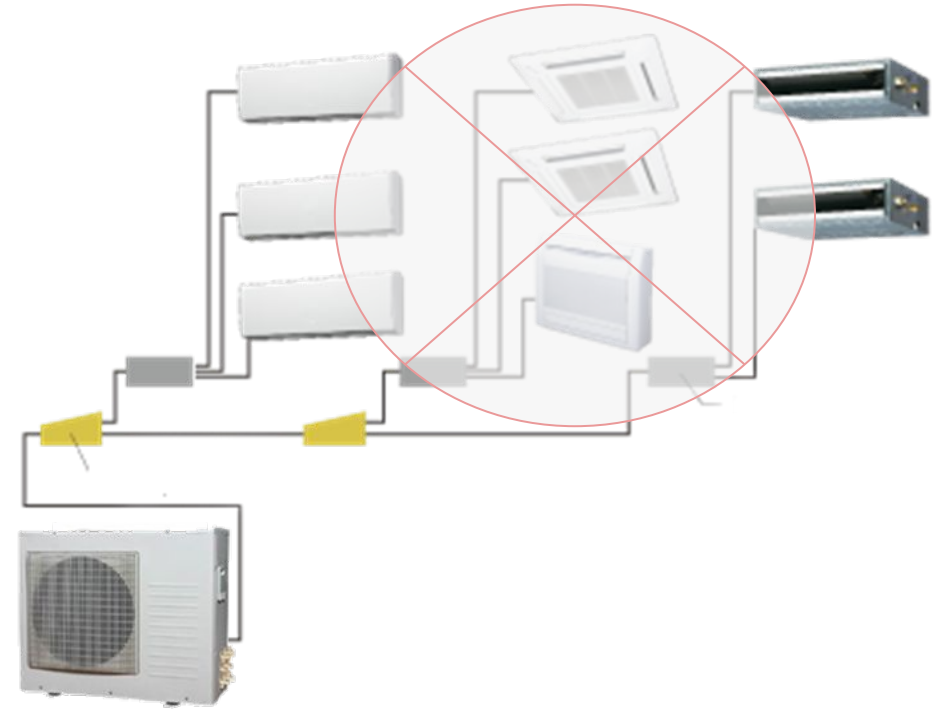
## Multi-Zone (multi split)

- 2 to 4



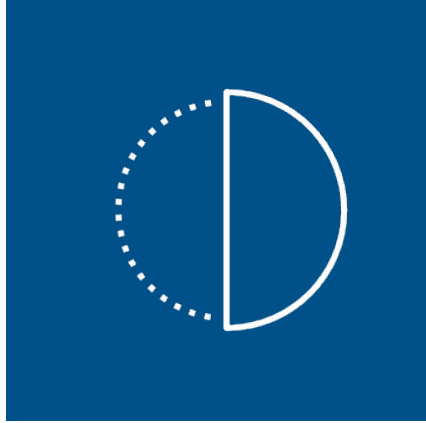
## Multi-Zone (w/ branch box)

- 2 to 8



# Benefits & Considerations





Ability to heat  
and cool with  
one unit

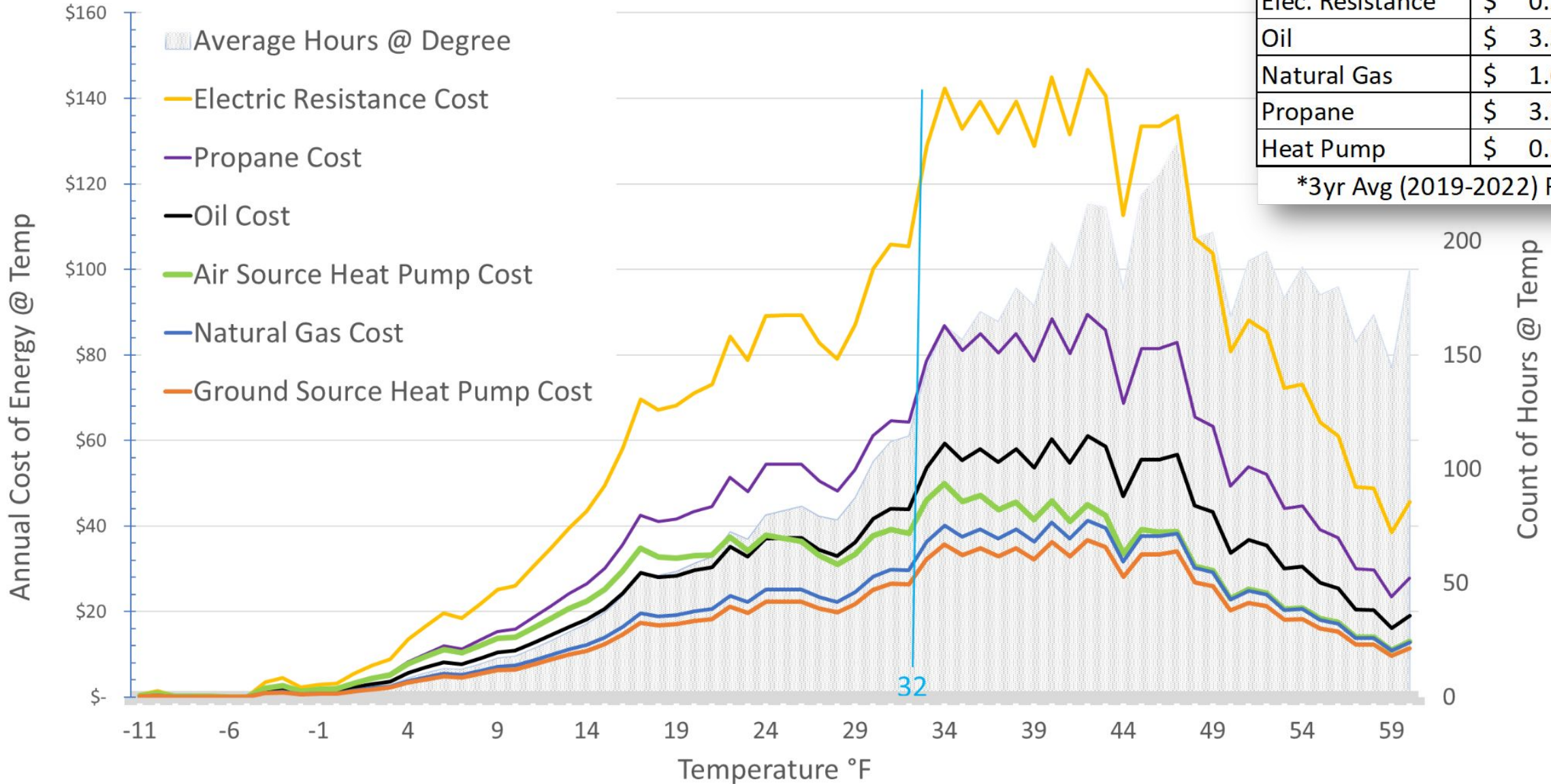


Lower cost  
heating and  
cooling



Reduced  
carbon  
emissions

# Energy Cost Related to Temperature

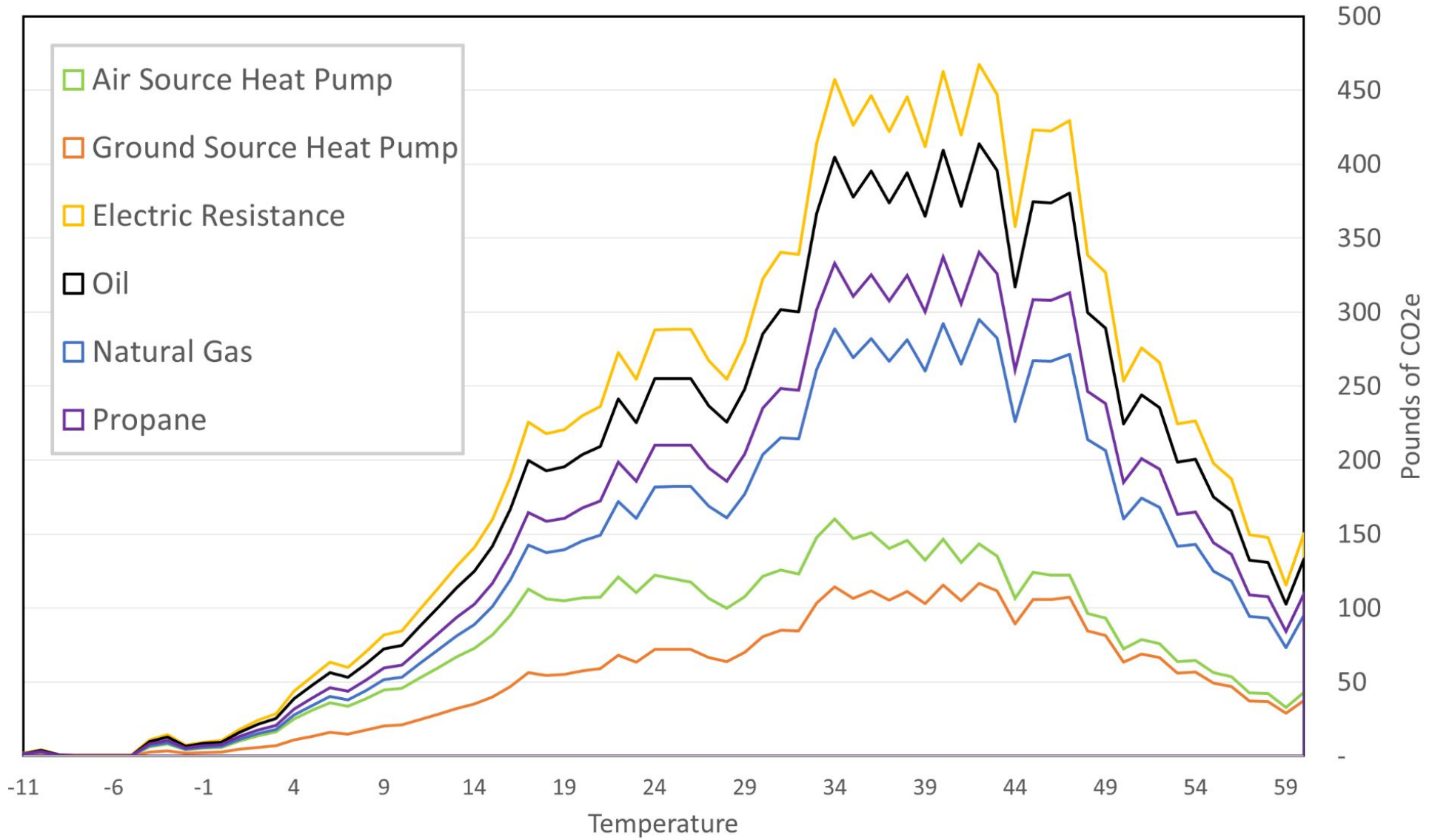


Fuel	Cost*	Units
Elec. Resistance	\$ 0.23	kwh
Oil	\$ 3.38	gallons
Natural Gas	\$ 1.65	therms
Propane	\$ 3.29	gallons
Heat Pump	\$ 0.23	kwh

\*3yr Avg (2019-2022) From EIA

Heat Pumps are Highly Cost Competitive

Annual Average CO2e Emissions @ Temperature °F



Heat pumps are significantly less carbon intensive

# Efficiency First

- Does your home have adequate insulation levels?
- Is your home well air sealed?
- Have you had a Home Energy Solutions<sup>SM</sup> visit?





# Goals and Motivation

Clearly articulating your goals to a contractor can help ensure you receive a quote for a system design that meets your needs and expectations.

Are you motivated by:

- Cost savings?
- Increased comfort?
- A reduced carbon footprint?



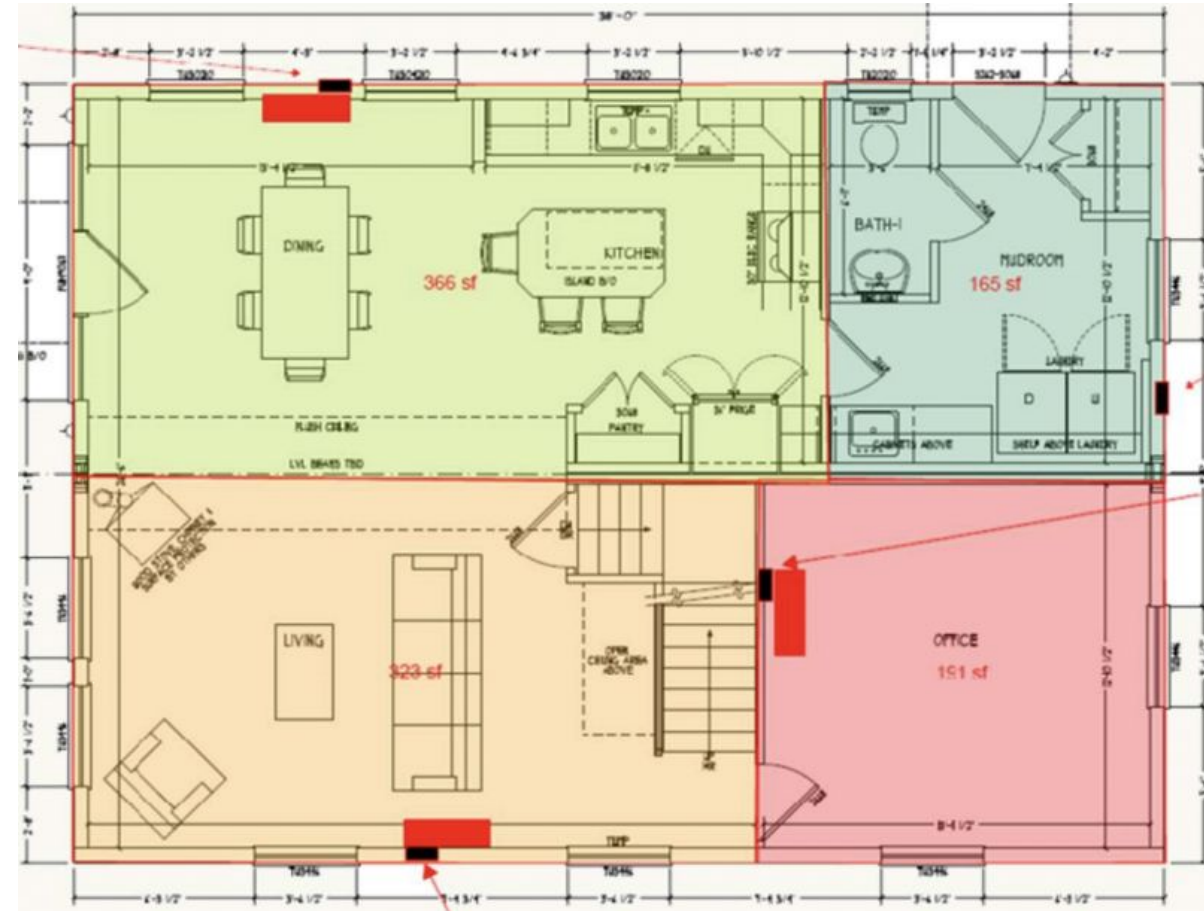
# Will you keep your existing heating system?

- Consider utilizing integrated controls to:
  - Keep your existing heating system from competing with your heat pump system
  - Prioritize your heat pump for energy savings



## Design Questions:

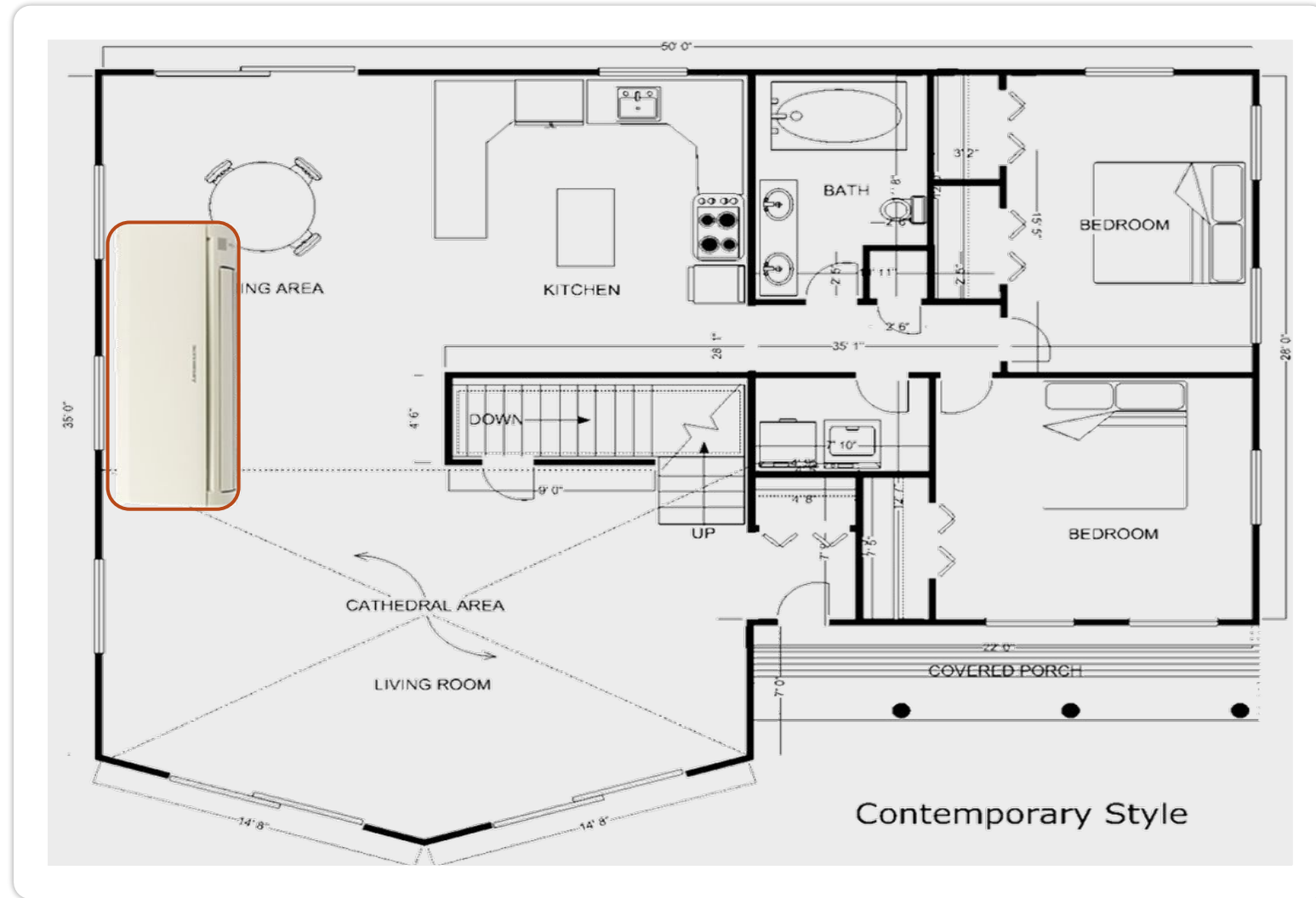
- How many zones do you want to condition?
- Are the zones significantly different sizes and do they communicate with one another?



# Undersized System (\$4-7k)

## Possibly Trying to Condition: Too Much Space

- Too few indoor units may lead to perceived comfort issues
- Wired thermostat is likely needed for this setup to be effective.
- Many homeowners are heating solely with a wood/pellet stove. This in theory is no different.

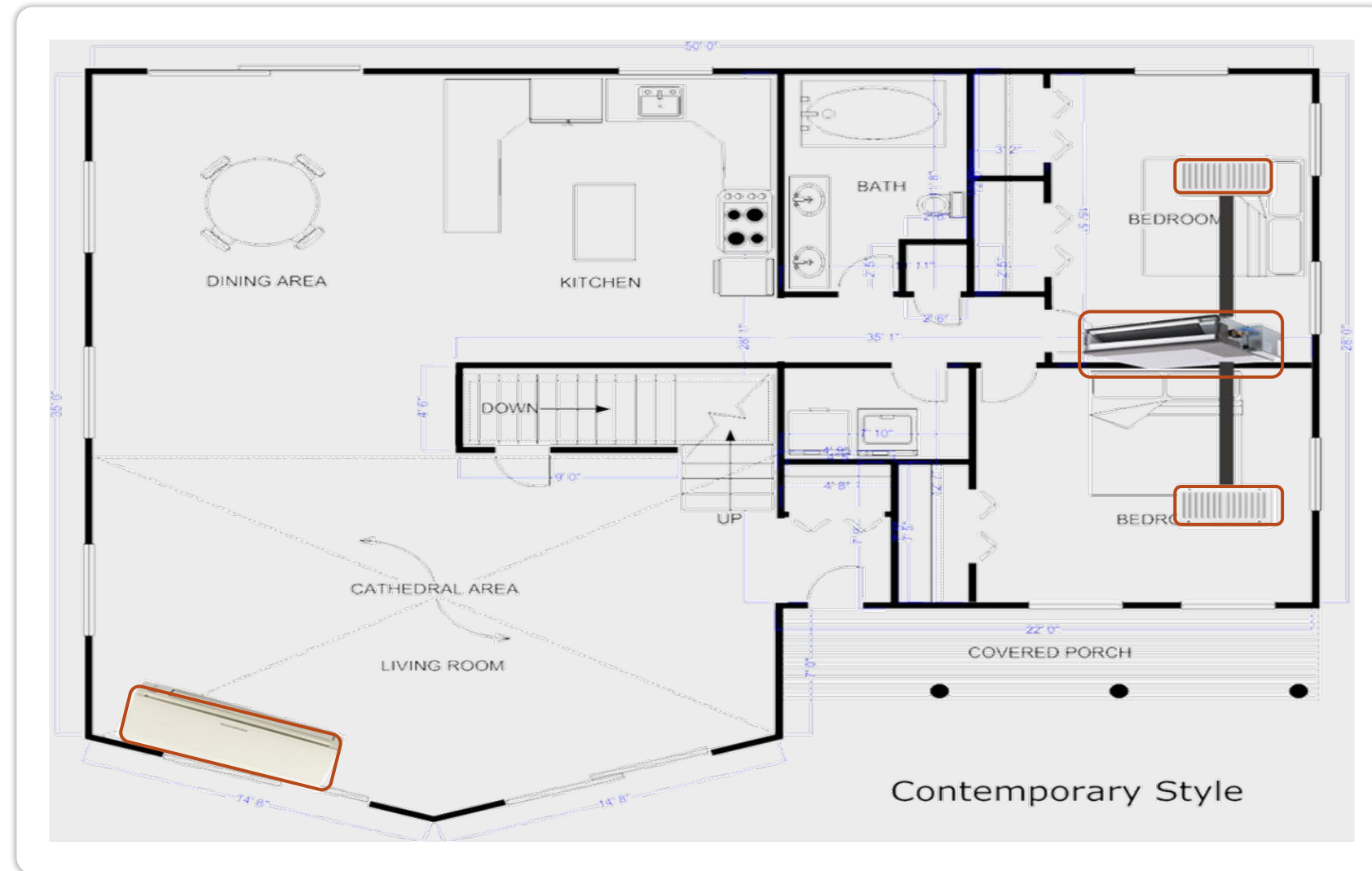




# Properly Sized System (\$14-17k)

## Trying to Condition: Just Right

- Peak operating efficiency
- Installed equipment matches manufacturer's submittals
- Better comfort, less maintenance, better humidity control





# Operational Guidance



Seal in the  
savings



Use heat pumps  
year-round





Set it and  
forget it



Set it for  
comfort



Avoid auto  
mode



Clean the air  
filters



Keep outdoor  
units clean  
and clear



Service systems  
regularly

# Available Resources



# Home Energy Solutions<sup>SM</sup>

Get an in-home energy performance assessment where professionals will make and recommend improvements for your single-family home that lead to immediate and long-term energy savings.

# Energy Resources for Income-Eligible Customers

Whether you rent or own your home, if you meet specific income requirements, you can qualify for low- to no-cost weatherization improvements that save you money and energy.

Call  
**877-WISE-USE**  
(877-947-3873)  
for more information

# Air Source Heat Pump Rebates

Equipment Type	Minimum Efficiency Requirements	Instant Discount	Energy Optimization Rebate	Total Combined Incentive
Air Source Heat Pump	Refer to <a href="http://EnergizeCT.com/HPQPL">EnergizeCT.com/HPQPL</a>	\$250/ton	\$1,000/ton	\$1,250/ton*

\*Maximum of three (3) system and up to \$15,000 combined incentives per home. Tons are calculated based on AHRI cooling capacity. (1 ton=12,000 BTUs).

Complete recommended insulation work through the Energize CT Home Energy Solutions service prior to installing a new heat pump system to be eligible for a **\$500 bonus incentive**.

# Ground Source Heat Pump Rebates

## 2023 Energize CT Ground Source Heat Pump Rebates

Equipment Type	Equipment Capacity		EER	COP	Instant Discount	Energy Optimization Rebate*
						Residential
Ground Source Heat Pump (Closed Loop)	Brine to Air	< 11.3 Tons	17.1	3.6	-	\$2,000/Ton
	Brine to Water	< 5.4 Tons	16.1	3.1		
		≥ 5.4 Tons and < 11.3 Tons	16.1	3.0		



## **Energize CT Heating Loan**

0.99% up to  
\$15,000

On-bill Financing



## **Smart-e Loan**

4.49-6.99%

5-12 Year

Repayment Options

No Money Down



## **Micro-Loan**

0%

\$1,000-3,000

3 year term

On-bill financing



# Heat Pump Water Heaters



- Produces lots of hot water
- Can be up to 2x as efficient as electric resistance water heaters
- Helps dehumidify

# Heat Pump Consultations

We offer no-cost consultations to help provide you the information and resources you need to make a decision that is right for you and your family.



# Qualified Contractors

To be eligible for rebates, work with a contractor participating in the Energize Connecticut **Heat Pump Installer Network**.

Participating contractors are independent, licensed, insured, and actively engaged with the Energize CT Heat Pump program.





# Questions

[EnergizeCT.com/HeatPump](https://energizect.com/HeatPump)

January 31, 2022

# Contractor Support Team

# Thank you

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