



# Heat Pump Technology Making It work for you

June 28, 2022 6:30 PM  
West Hartford Library  
Via Zoom



# Tonight's Agenda


Goal: Prepare you for making choices

- HeatSmart West Hartford
- Heat Pump Technology
- Air source v. ground source
- Air Source heat pumps:
  - Ducted
  - Ductless
  - Hot Water Heaters
- Ways to incorporate Air Source Heat Pumps
- Economic factors:
  - Installation
  - Rebates
  - Operating Cost
- Q&A Discussion
- Education materials




# HeatSmart West Hartford

heatsmartct.org/westhartford/



About HeatSmart   Heat Pumps   For Installers   **Our Towns**   FAQs   Video Gallery



**West Hartford**

**Home Energy Prices Are On The Rise in CT. HeatSmart West Hartford Can Help.**

Sign up now for HeatSmart West Hartford, a free program sponsored by the town of West Hartford and PACE (a local energy education nonprofit), and we'll help you find the resources that you need to improve your home's energy efficiency and comfort.

**Ready to Get HeatSmart?**

**Call (860) 580-9076 — Mention HeatSmart West Hartford**

[CLICK HERE TO GET STARTED](#)

# Home Efficiency Is a 3-Step Process

1

## Evaluate

The best way to get started on a path to home energy efficiency is with a HES audit. Certified technicians will perform safety checks and do air sealing.

2

## Insulate

With energy prices rising, there's never been a better time to insulate your home. State programs are providing huge rebates on insulation and for income-eligible residents it

3

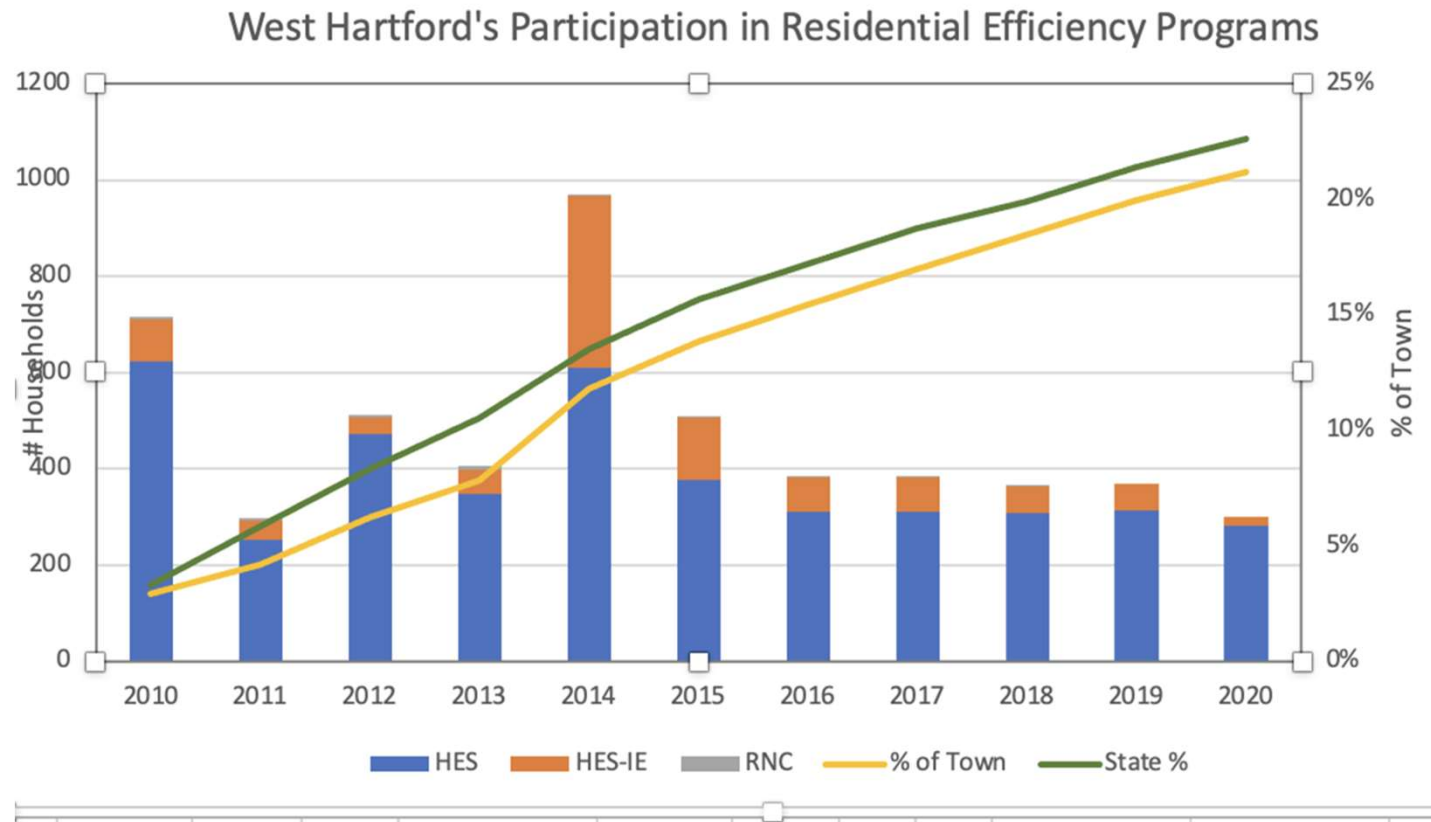
## Electrify

The most energy efficient heating and cooling technology on the market today is the heat pump. They are much more efficient than traditional combustion systems, safer, and better for the planet.



# HeatSmart West Hartford

- Promotes Home Efficiency through efficiency programs
- Provides educational information about renewable thermal technology!





# Why Get a Heat Pump?

- **Comfort**
- **Heating AND Cooling**
- **Economics**
- **Environmental considerations**





# Heat Pumps and the Environment

**Global Warming Solutions Act calls for a 45% reduction in greenhouse gas by 2030, and an 80% reduction by 2050**

**Commercial and residential buildings are major contributors to greenhouse gas emission- generating 40% of global gas emissions each year!**

# Heat Pump Technology:

We all know what a heat pump is!





# Our Heat Pump Expert

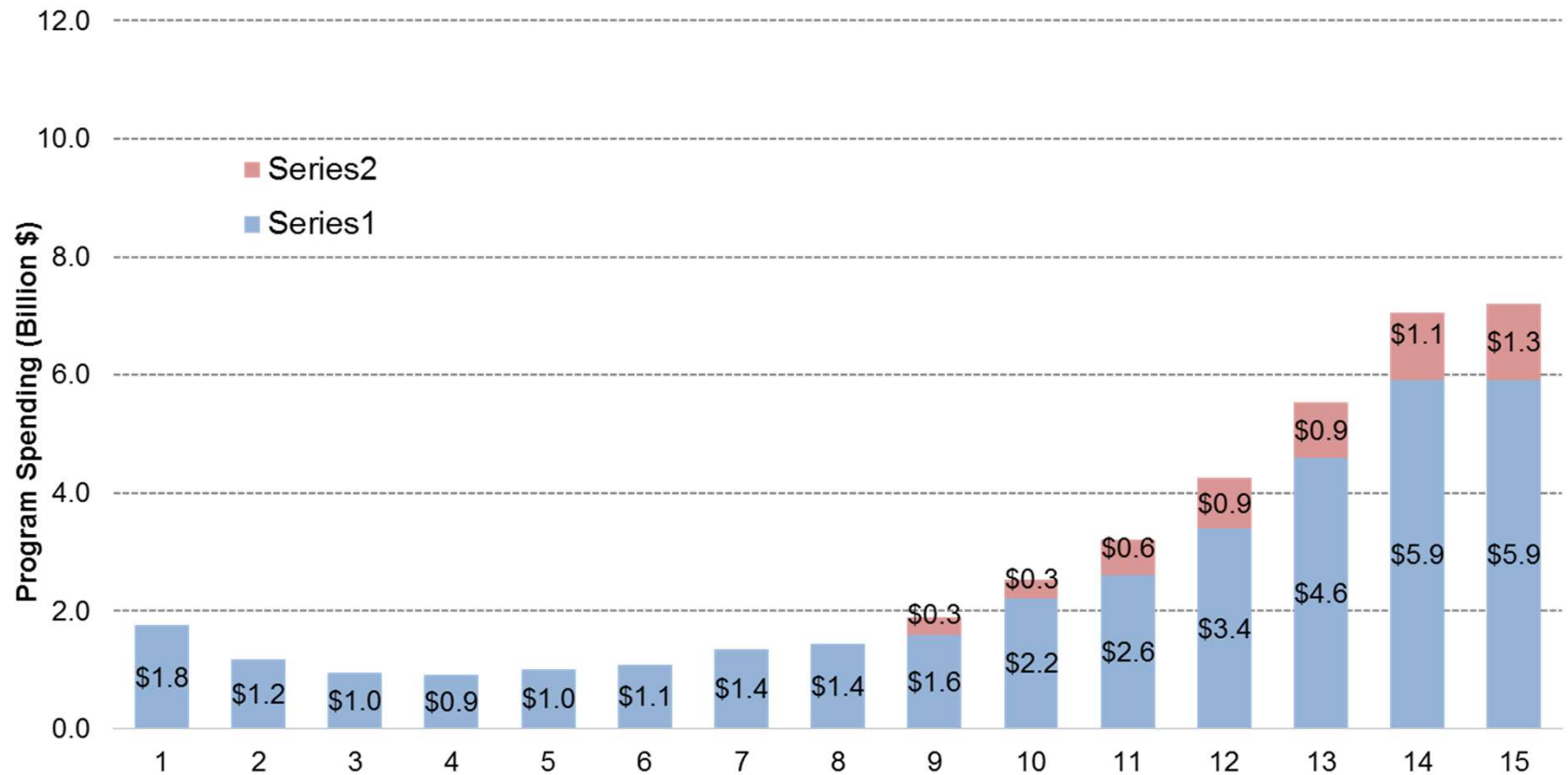
- Henry Suski:
  - Link Mechanical in New Britain
  - Finance Coordinator
  - Business Development



- Heating
- Cooling
- Hot Water

# Utility Programs See Energy Efficiency as a Resource

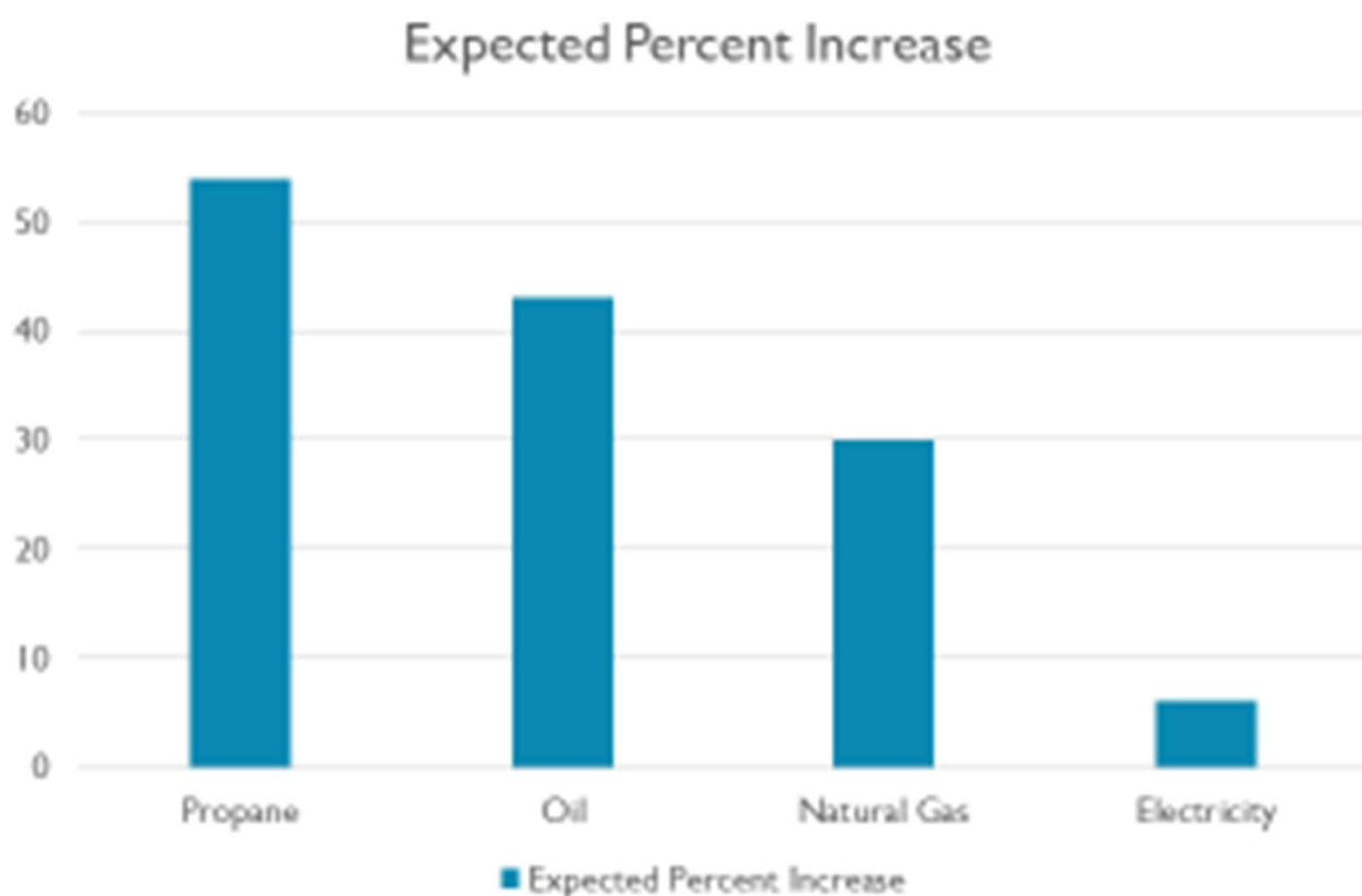
## Customer-funded Energy Efficiency Program Spending



\*2009-2012 are budgets, 1993-2008 actual spending



## WINTER FUELS OUTLOOK – COST OF ALL MAJOR HOME HEATING FUELS EXPECTED TO RISE



Propane – 54%

Oil – 43%

Natural Gas – 30%

Electricity – 6%

<https://www.eia.gov/outlooks/steo/>



# Link Mechanical

For expert Water Heater, AC/Heat Pump, and Heating Services

- \* Serving Middlesex Counties Since 1992
- \* 24 hour 365 emergency service for maintenance plan customers.
- \* Provides residential and commercial, service, maintenance, replacements & installations
- \* Background Checked, Professionally Trained & Licensed Technicians
- \* On-Time Service & Fair Up-Front Pricing
- \* No Hassle, Money Back Guarantee





# Energy Efficient Technologies & Zero Energy Ready Homes

- Building Heat and Hot Water
  - 90% Efficient Boilers and Furnaces
  - Heat Pumps
    - × Air-Source Heat Pumps
    - × Ductless Mini-split Heat Pumps
    - × Geothermal Heat Pumps
  - On Demand or Tankless Hot Water Heating
  - Heat Pump Hot Water Heaters
- Appliances
- Lighting
- Retro-commissioning for multi-family and large facility scale buildings
- Software and energy modeling tools for buildings
- Zero Energy Ready Homes

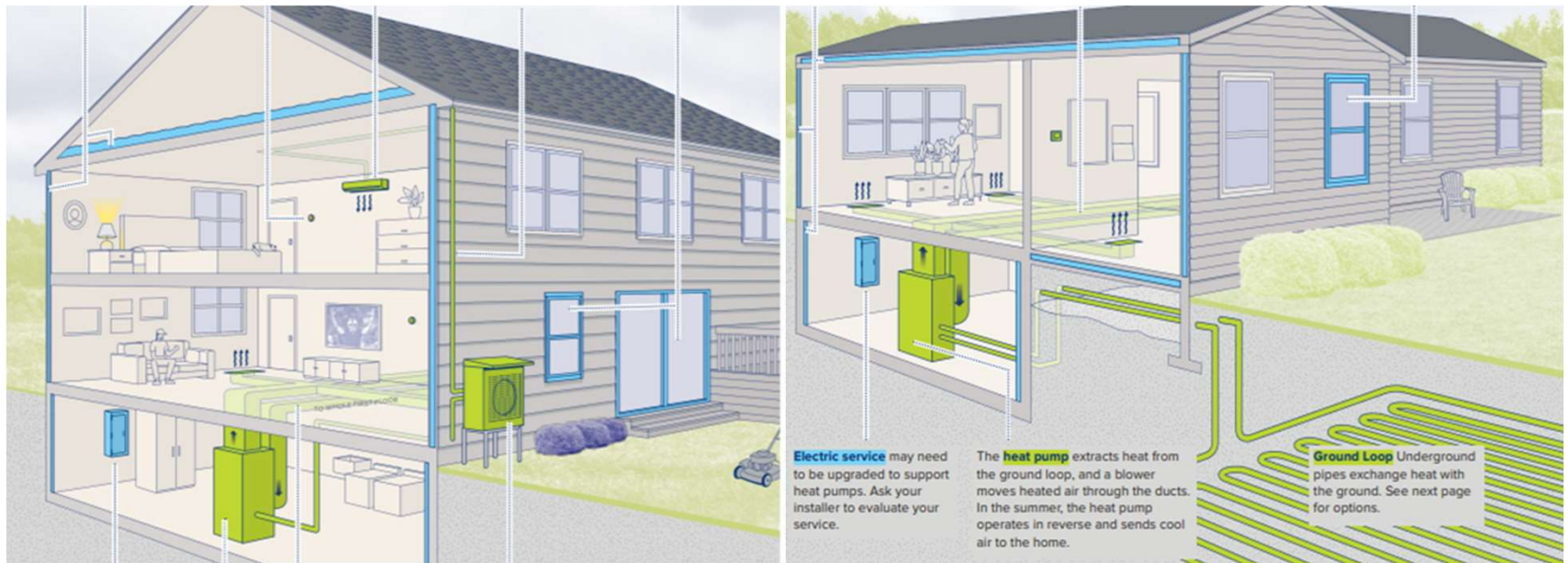


# Building Heat –High Efficiency

- **90% high efficiency forced air furnace or boiler**
  - Annual Fuel Utilization Efficiency (AFUE) ratings range from 80% to 98.5% percent. This is the ratio of the furnace’s annual fossil fuel that is converted into usable heat. The highest performing models convert 98.5% of its fuel into heat.
  - If your gas or oil-burning furnace was installed before 1992, you’re likely wasting 30% or more of your energy and pumping up to 4 tons of carbon dioxide, the “greenhouse gas,” into the atmosphere each year.

# Air source v ground source

Air Source draws heat or moves heat from outside air!





# Heat Pumps

A heat pump can heat and cool your home.

It's called a heat pump because it redistributes heat that is already in the air or ground with a refrigerant. Redistributing heat uses less energy than producing it. And the energy used is electricity which can be generated without fossil fuels!



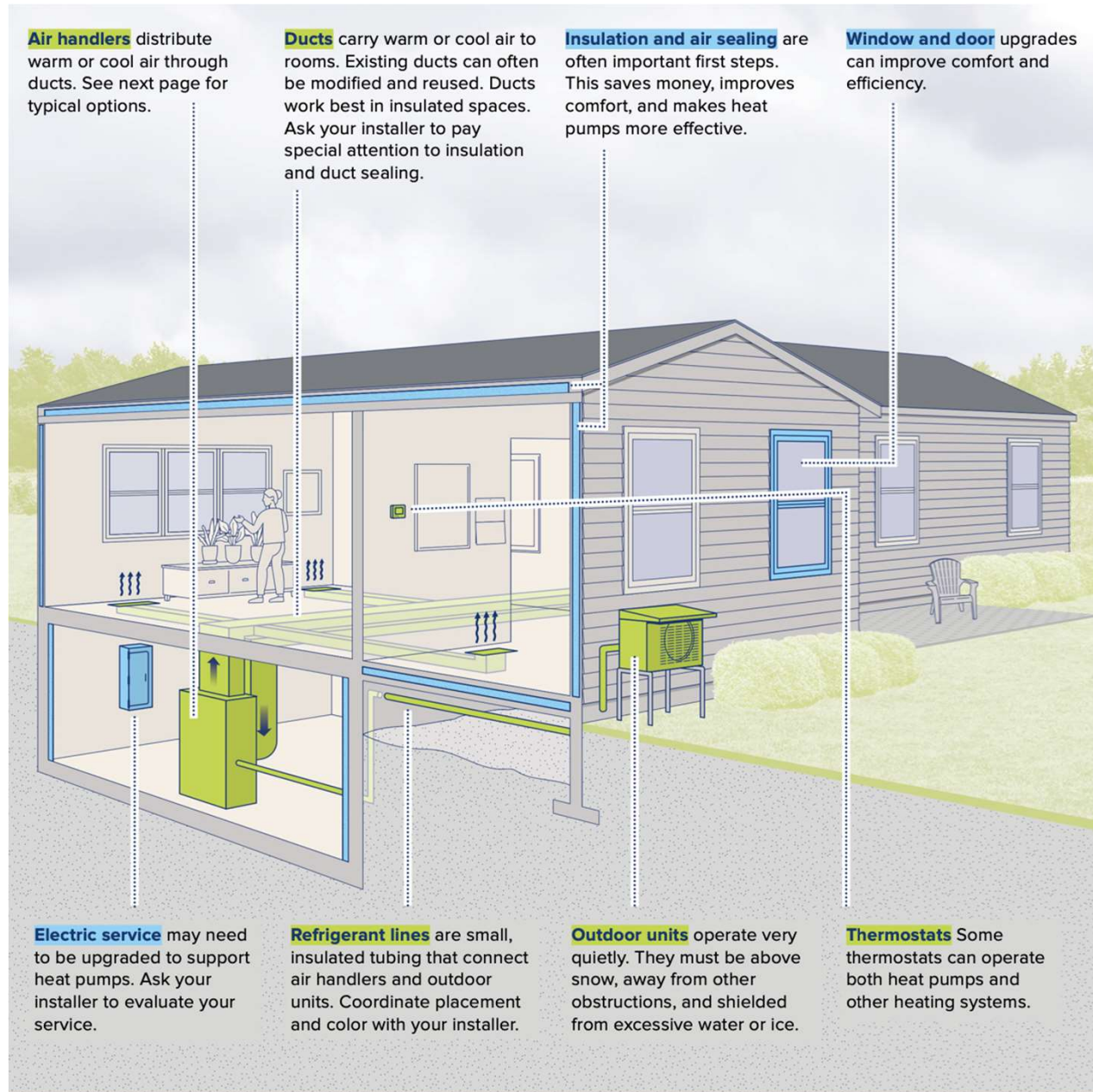
# Ducted Heat Pump

**Air handlers** distribute warm or cool air through ducts. See next page for typical options.

**Ducts** carry warm or cool air to rooms. Existing ducts can often be modified and reused. Ducts work best in insulated spaces. Ask your installer to pay special attention to insulation and duct sealing.

**Insulation and air sealing** are often important first steps. This saves money, improves comfort, and makes heat pumps more effective.

**Window and door** upgrades can improve comfort and efficiency.



**Electric service** may need to be upgraded to support heat pumps. Ask your installer to evaluate your service.

**Refrigerant lines** are small, insulated tubing that connect air handlers and outdoor units. Coordinate placement and color with your installer.

**Outdoor units** operate very quietly. They must be above snow, away from other obstructions, and shielded from excessive water or ice.

**Thermostats** Some thermostats can operate both heat pumps and other heating systems.

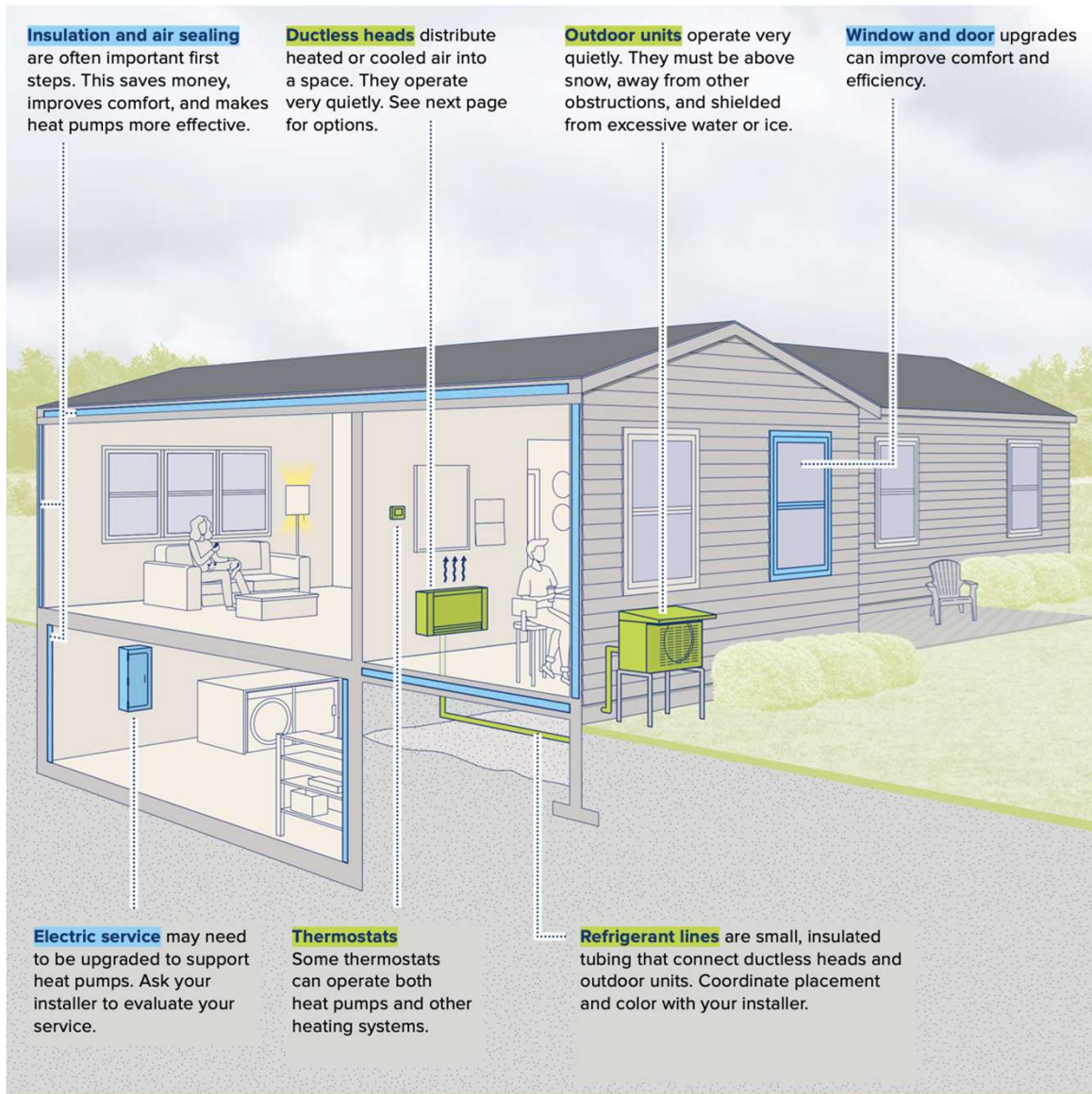


# Example





# Ductless Heat Pump



# Example



# The unsung hero: air source hot water heating!

Air Source Hot Water heaters can reduce energy consumption when compared to other units:

- Need to be in a conditioned space >40 F year round
- Can supply dehumidification in damp basements
- Need space around them (don't put them in a closet!)







# Heat Pump Water Heaters

- \* 2nd largest energy expense in US homes (14-18%)
- \* Uniformed Energy Factor (UEF) Rating over 3.0.
- \* Tanked water heaters have (UEF) ratings under 0.8, typically.
- \* Heat Pump are about 4-5 times more efficient.
- \* Can save up to \$300 a year on utility costs.



# Different way to use heat pumps

- Whole house using a ducted system
- Supplemental – use it in conjunction with current system
- Particular area – condition one area (family room, bedrooms, etc.)
- Heating and air conditioning and dehumidification
- Space heating and hot water heating



# Economics

- Incentives
- Cost of electricity vs cost of fuel
- Favorable cases:
  - Electric resistance homes
  - Ducted homes replacing AC
  - Partial home heating and cooling



# Not all heat pumps are created equal

Check with installer on eligibility for rebates

## Air Source Heat Pump Efficiency Requirements

Air Source Heat Pump	Efficiency Tiers	Minimum Efficiency Requirements		
		SEER	HSPF	Heating Capacity Ratio (17°/47°)
Centrally-Ducted Heat Pump	1	16	9.5	60%
	2	20	10	60%
Ducted or Ductless Heat Pump (Multi-Zone)	1	16	9.5	58%
	2	20	10	58%
Ductless Heat Pump (Single-Zone)	1	18	10	58%
	2	22	10	58%



# Incentives can help

<https://energizect.com/your-home/solutions-list/air-source-heat-pumps>

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Heat pump incentives for qualifying equipment:

- Up to \$500 per ton **instant discount when your contractor purchases equipment on your behalf.** Speak to your contractor to ensure your instant discount is being applied.
- Additional rebate up to \$1,000 per ton
  - Electrically-heated homes: customers may qualify for this additional incentive by participating in **Home Energy Solutions** prior to the installation of their heat pump system. The rebate application will be provided to you at your Home Energy Solutions visit.
  - Oil and propane-heated home: customers can join our Heat Pump Pilot and receive a rebate if they meet eligibility requirements. For more information, call 877-WISE-USE.

With combined incentives, the average Connecticut home is eligible to receive more than \$6,000 when upgrading to air source heat pumps.

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# Heat Pump Pilot - Oil Customers

Minimum Efficiency Levels / Incentive Schedules				
Air Source Heat Pump	Efficiency Tiers	Instant Discount**	Mail-in Rebate***	Total Incentive
Centrally-Ducted Heat Pump	1	\$250 / ton	\$1,000/ton	\$1,250/ton*
	2	\$500 / ton		\$1,500/ton*
Ducted or Ductless Heat Pump (Multi-Zone)	1	\$250 / ton	\$1,000/ton	\$1,250/ton*
	2	\$500 / ton		\$1,500/ton*
Ductless Heat Pump (Single-Zone)	1	\$250 / ton	\$1,000/ton	\$1,250/ton*
	2	\$500 / ton		\$1,500/ton*
Integrated Control (heat pump pilot only)			\$500 / unit	Up to \$1,500/home

\*Maximum eligible equipment cost is \$15,000. \*\*Instant discount is based on equipment cost. \*\*\*Mail-in rebate is based on equipment cost.





# Link Mechanical - Savings

- \* Information can be confusing online.
- \* Our website is a great resource.
- \* [www.justcalllink.com](http://www.justcalllink.com)
- \* Our Financing and Savings page has up-to-date information on rebates, tax credits, and financing.
- \* We have been a top EnergizeCT SmartE contractor since they've started the program.



# Financing Promotion - Heat Pumps

- \* Through SmartE (EnergizeCT)
- \* We make all financing and rebates easy.
- \* New promotion: 2.99% (1.99%) to fully finance a heat pump installation (including water heaters).
- \* Program length: 1-2 months
- \* Can finance electrical and other upgrades.

# 1.99% Eligibility (SmartE)

Household Size	100% State Median Income
1	\$65,045.24
2	\$85,059.16
3	\$105,073.08
4	\$125,087.00
5	\$145,100.92
6	\$165,114.84
7	\$168,867.45
8	\$172,620.06





# Here Today, Gone Tomorrow

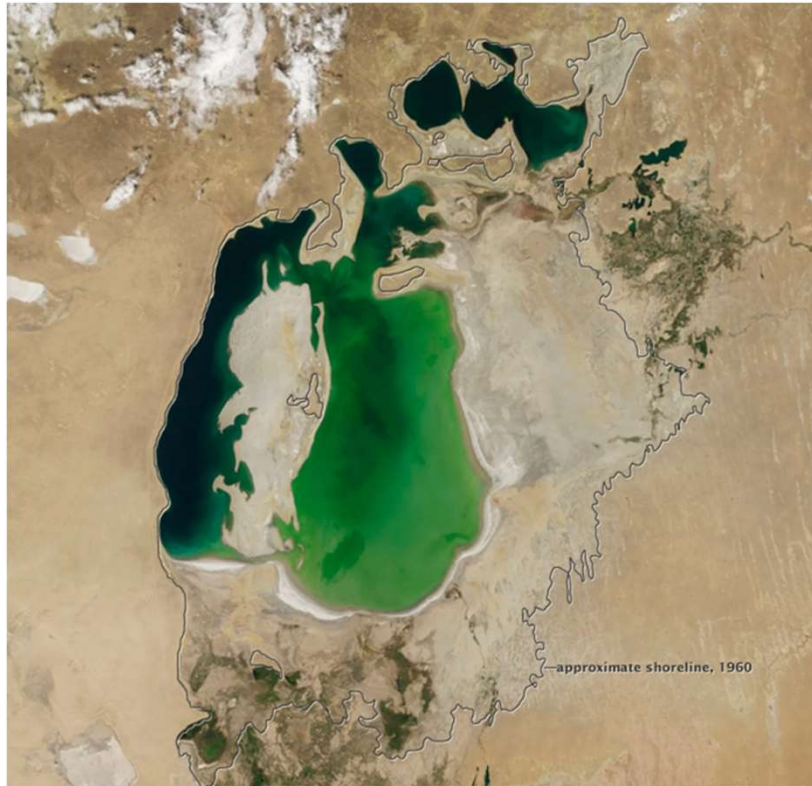
- \* **Electric and HES-IE** have options
- \* So many rebates and programs
- \* They can go away. Soon.
- \* Solar federal tax credit decreases from 26% to 22% next year. May expire in 2023.

# Vacations anyone?





# Aral Sea - Gone





# Quality and Expertise vs Cost



# Energy Star Website Warning



[Find Products](#)

[Save at Home](#)

[Ne](#)

[Home](#) » [Heating & Cooling](#) » [ENERGY STAR Verified HVAC Installation \(ESVI\)](#)

## ENERGY STAR Verified HVAC Installation (ESVI)

**NEARLY** Half of all HVAC systems are incorrectly installed.

Choose ENERGY STAR Verified HVAC Installation and be sure your new system is installed correctly.

# HVAC - Competitively Priced

Prices are not much different between the moonlighters and the top installers.



<https://www.justcallink.com/webapp/p/1855/7questions>





# Link Mechanical Contact Info

**860-826-5880**



# HeatSmart Partners

## Meet Our HeatSmart Partners





# Air Source Heat Pump Buying Guide

<https://heatsmartct.org/heat-pumps/>



## Air Source Heat Pump Buying Guide

### Step 5: Checklist of important questions to ask a contractor

Keep the following checklist of questions on hand to help ensure your contractor is prepared to correctly design and install your system:

- Can you provide references from previous customers with similar systems?
- Have you participated in manufacturer training for the systems you would install?
- Do you know about available incentives or rebates, and will you provide assistance in applying for them?
- Do you use the [NEEP Sizing and Selecting Guide](#) and [Cold-Climate Installation Guide](#)<sup>10</sup> to inform your work?
- Will you choose equipment from the [NEEP cold-climate air-source heat pump list](#), and use the information in the listing to help size the system properly?
- Where will you mount the outdoor unit(s), and how? (Brackets bolted to an exterior wall may create unwanted noise in a sensitive area like a bedroom; ground-mounted units should always be on a stand to keep them above the normal snow line. Units should also be shielded from rain and snowmelt dripping off the roof.)
- If exterior "line sets" (piping) will be visible, where will they be placed?
- What type of indoor units are you recommending, where will they be located, and why?
- Do you recommend a wall-mounted thermostat or control? (This is needed for ducted systems. For ductless units serving larger spaces, it can enhance comfort by sensing the temperature in a central location.)
- Do you always perform a triple evacuation before charging the refrigerant lines?
- Will I need to hire my own electrician to provide the electrical work? Will I need any electrical service upgrade to accommodate the heat pumps? (This is not unusual in older houses.)
- Will you use any subcontractors in the process? If so, who are they and what jobs will they do?
- Will you provide training for me on how to properly operate and maintain the system?
- Do you provide a warranty for the systems you install, and how long is it?

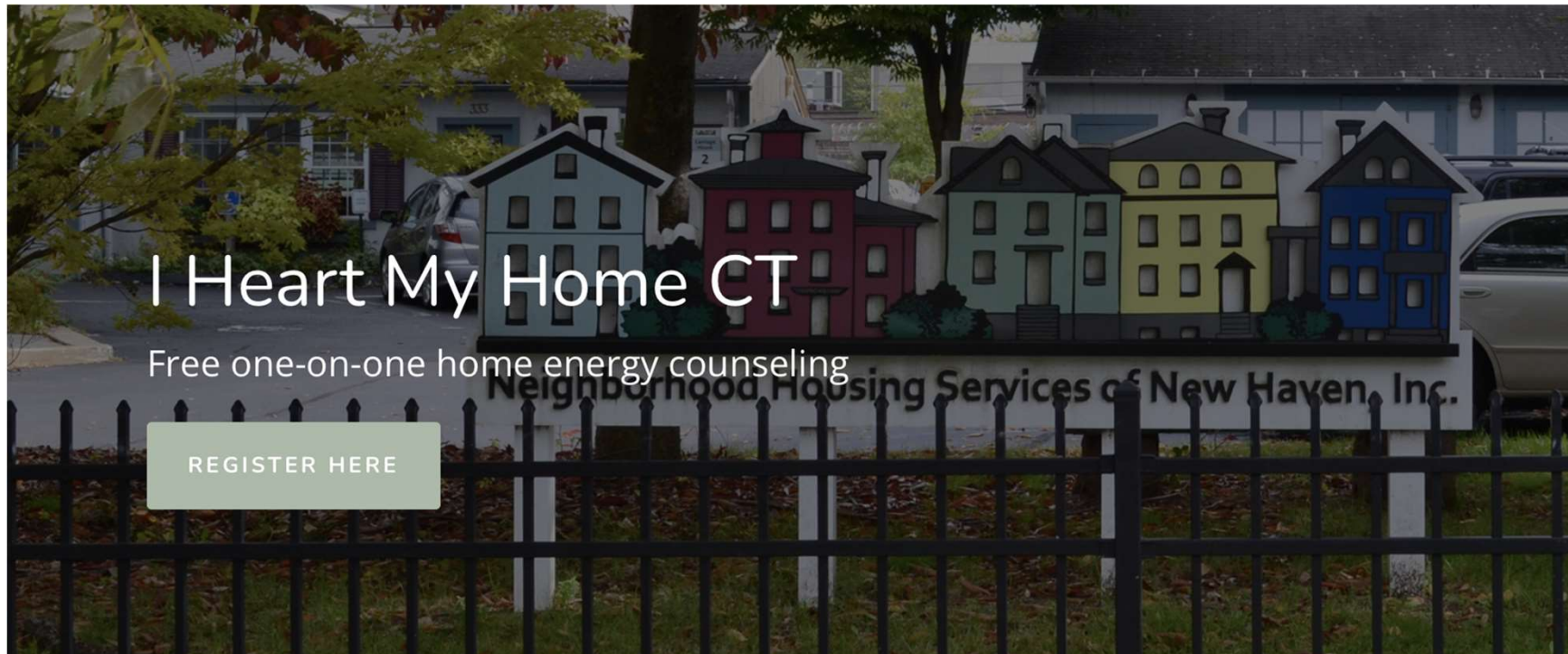


Always ask for a quote that details the equipment model numbers and itemizes any other parts and accessories that you'll be charged for. If possible, try to get options for two or three alternatives from the same contractor so you can consider a range of options, with some explanation of the differences and the benefits of the various options.



# You have an energy consultant!

<https://nhsofnewhaven.org/homeownership/i-heart-my-home-ct/>



I Heart My Home CT

Free one-on-one home energy counseling

Neighborhood Housing Services of New Haven, Inc.

REGISTER HERE

# EnergizeCT Offers Consultation on Heat Pump decisions!

<https://calendly.com/energize-ct-heat-pump-specialist/energize-ct-heat-pump-consultation?month=2022-06>



[In-Home Services](#) ▾ [Rebates & Technologies](#) ▾ [Financing](#) ▾ [Learn](#) ▾ [Find Electric Supplier Rates](#) ▾

✓ Heating & Cooling

Are you interested in upgrading or supplementing your home's heating or cooling system and want to explore clean, energy-efficient options? Consider a heat pump system.

Tens of thousands of Connecticut homes have had heat pumps installed because they are the most energy-efficient way to heat and cool. This clean technology is different from the conventional heating and air conditioning systems that you may be used to.

The Sponsors of Energize Connecticut<sup>SM</sup> are here to help provide technical guidance and support.

Schedule a no-cost consultation with a Heat Pump Specialist where you can get assistance with:

- Understanding how heat pumps work
- Rebates & incentives offered by the Sponsors of Energize CT
- Guidance on the best solution for your home
- Working with contractors
- Reviewing and comparing quotes

Our Heat Pump Specialists are building science and heating/cooling experts that can support customers at all stages of their project. To explore the advantages and considerations for your project, schedule a consultation:

[Energize CT Heat Pump Consultation](#)

[Additional Details](#)

Energize Connecticut

## Energize CT Heat Pump Consultation

🕒 45 min

Schedule a no-cost consultation with a Heat Pump Specialist where you can get assistance with:

- Understanding how heat pumps work
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### Select a Date & Time

July 2022

SUN	MON	TUE	WED	THU	FRI	SAT
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

🕒 Eastern Time - US & Canada (10:57am) ▾



# Resources

- The Fox and the Heat Pump:  
<https://youtu.be/9BEAhtpir5Q>
- If You Haven't Seen a Heat Pump Lately:  
<https://youtu.be/wxNjqcV2HwM>
- How a Heat Pump Works | This Old House:  
<https://youtu.be/-vU9x3dFMrU>
- <https://heatsmartct.org/heat-pumps/>
- Heat pump- Clean Heating and Cooling calculator:  
<https://tools.encyestimator.com/ct/renewableheatingcoolingtechnologiesroicalculator/home>

# What does “per ton” mean!

The term “ton” is a term of art meaning 12,000 British Thermal Units (BTUs). The tech will help decide what your home needs to do the cooling and heating in your home!

