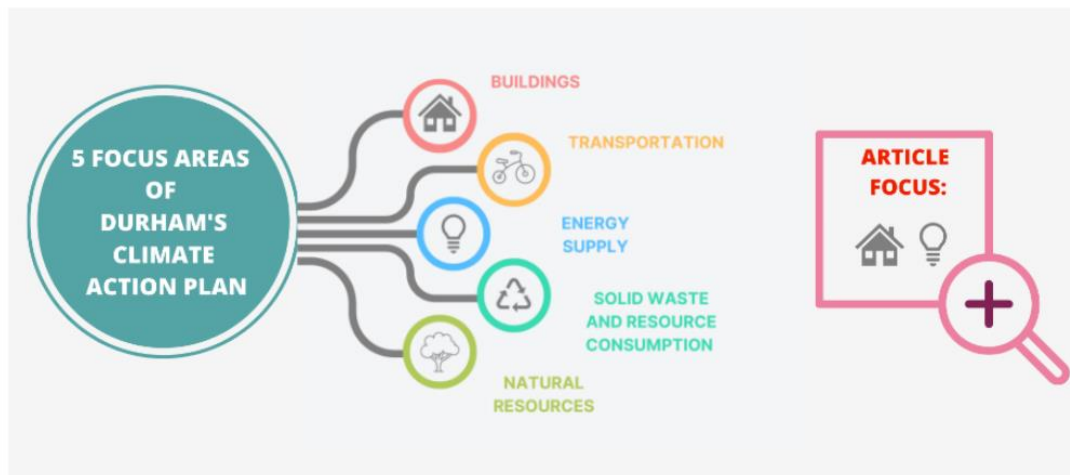




WHY YOU MIGHT BE MISSING OUT IF YOU HAVEN'T SWITCHED TO HEAT PUMPS

By: Rafidah Rahman, UNH Sustainability Fellow, Town of Durham



Durham is a proud member of the Global Covenant of Mayors, focused on addressing the challenge of climate change. As part of that commitment, the Town has a new proposed climate action plan (CAP). The plan is organized into five focus areas, each specifying actions for reducing emissions and/or enhancing resilience to climate change.

92.7% of Durham's emissions come from the built environment and transportation, and one of the most significant actions in the CAP is to increase energy efficiency in homes and businesses. This depends on leadership and action from Durham. This is the first in a series of articles based on our educational campaign to engage citizens in climate change action.

Our first article focuses on heat pumps, which are a wonderfully energy-efficient and cost-effective option for home heating and cooling in New Hampshire.

HEAT PUMPS FREQUENTLY ASKED QUESTIONS

01

How efficient are heat pumps?

Heat pumps are 3-4 times more efficient than fossil fuels or electric systems - and can be more than 300% efficient in winter.



02

Are heat pumps cost-effective?

Your heating bill can be cut by 15% if you use oil, 50% if you use propane, and 75% if you use electric.



03

How do heat pumps work in the winter?

Many systems still maintain high efficiencies and output in temperatures as low as 17 degrees below zero (-17°F).



04

Is there a financing option for heat pumps?

YES! Up to \$15,000 on qualified heat pumps.



05

Do heat pumps qualify for rebates?

YES! A good amount of rebates can be earned on heat pumps, as outlined in this article..



Source: The New Hampshire Electric Co-op



WHY HEAT PUMPS ARE A WORTHY FINANCIAL INVESTMENT

Roger Stephenson, a seacoast New Hampshire resident and the Northeast Regional Advocacy Director at the Union of Concerned Scientists, spoke about how heat pumps have been a worthwhile investment for his family. As a result of using heat pumps since 2019, they have been able to **save about \$2500**. They use a Mitsubishi model, which was installed by Revision Energy. Some of the attributes they love the most about their heat pumps are:

1. The possibility of timing them, especially when electricity is expensive.
2. The option to adjust or activate/deactivate them via a cell phone (an app is available through the manufacturer or installer).
3. The heat pumps are equipped with an electric eye that detects people and automatically adjusts the temperature
4. New technology allows simultaneous heating and cooling of different rooms
5. Two for the price of one-heats in winter and cools in summer

However, heat pumps, Stephenson cautions, can also be expensive up front, and it is important to weatherize your house before installing one.

Durham households can save money by using Cold Climate Air Source Heat Pumps (CCASHPs) in place of fossil fuels. Over two-thirds of Durham homes currently use heating oil with forced hot water heating; for those homes, operational cost-savings for switching to heat pumps will be pronounced. With lower energy costs, a homeowner can recoup the upfront cost of installing a CCASHP over time.

“HEAT PUMPS ARE A NO-BRAINER FOR PEOPLE WHO WANT TO REDUCE EMISSIONS AND REPLACE OIL BURNERS.” - Roger Stephenson

Investing in insulation and weatherization can reduce both CCASHP size and upfront costs. When relying on the load and sizing calculations of heating, ventilation, and air conditioning (HVAC) vendors, it is imperative to obtain multiple quotes.



The payback period for installing a heat pump will vary depending on the cost of your current heating fuel and of electricity. As Figure 1, below, demonstrates: at the current rate of home heating oil (around \$5.75/gallon) and electricity (around \$0.32/kWh), the payback period would be around nine years for an average 2,000 square foot home currently heating with oil. That is without factoring in available rebates, which would make the payback period lower. If home heating oil prices are above \$7/gallon, as they are expected to be this winter, for example, **the payback would be shorter...as little as 6 years at the current rate of electricity.** Given that the life of a heat pump system is 10-15 years, the bottom line is that they are likely to be a good economic investment for most homeowners.

(Remember, every home is different, and you should analyze the costs based on your specific situation and your expectations for future energy costs.)

Figure 1: Hypothetical Payback Period (Years) on 4 Ton System Providing 120 MBTU per Year

Heating Oil Cost Per Gallon	Electricity Cost Per KWH							
	\$0.20	\$0.22	\$0.24	\$0.26	\$0.28	\$0.30	\$0.32	\$0.34
\$4.00	11.8	13.5	15.8	19.1				
\$4.50	9.2	10.2	11.5	13.1	15.2	18.2	22.6	
\$5.00	7.5	8.2	9.0	9.9	11.1	12.7	14.6	17.4
\$5.50	6.4	6.8	7.4	8.0	8.8	9.7	10.8	12.3
\$6.00	5.5	5.9	6.3	6.7	7.2	7.9	8.6	9.5
\$6.50	4.9	5.1	5.4	5.8	6.2	6.6	7.1	7.7
\$7.00	4.4	4.6	4.8	5.1	5.4	5.7	6.1	6.5
\$7.50	3.9	4.1	4.3	4.5	4.8	5.0	5.3	5.6

Notes: NH Heat Pump Coefficient of Performance is 2.5
Oil Furnace Efficiency is 75%

FINANCING AND REBATES FOR HEAT PUMPS

- The NHSaves utility partners are making the purchase and installation of energy-efficient heat pumps affordable for New Hampshire residents. Save up to \$1,250 on the purchase and installation of a new heat pump. Visit [this page](#) to check this out.
- If you are interested in installing a heat pump, start with [Home Performance with ENERGY STAR®](#) to have your home evaluated.
- New Hampshire Electric Cooperative members should visit [this page](#) for heat pump rebates.
- For more heat pump information, visit [this page](#).



TO SUM IT ALL UP

A switch from fossil fuel-based furnaces and boilers, to an efficient electric heat pump, is a step towards becoming carbon-neutral. Heat pumps, as mentioned above, are three to four times more efficient than fossil fuels and traditional electric baseboard heating. As a result, they are also likely to emit less CO₂ directly into the atmosphere. Single family homes in Durham predominately use oil or natural gas for heating. Converting a heating system from oil to a heat pump in the average home would reduce carbon emissions by more than 10 metric tons each year. Converting from natural gas would result in a 6 metric ton reduction. **Our collective CO₂ reduction would exceed over 17,000 metric tons each year if every homeowner in Durham converted to heat pumps – that's over 37 million pounds!**

Additionally, heat pumps not only reduce carbon emissions but also save money. A well-known McKinsey & Company study shows in Figure 2 that policies such as building insulation and improved energy efficiency can reduce costs. As a result, these policies would save money regardless of CO₂ emissions. It is therefore beneficial to invest in energy efficiency even if we did not care about climate change.

So, for better comfort, energy and cost savings, and to be environmentally responsible, install a heat pump. With economic and environmental benefits, heat pumps are a win-win for Durham homeowners.

But, **WEATHERIZE** your home first!

Figure 2: Global Greenhouse Gas Abatement Cost Curve for 2030, Adapted from McKinsey & Company, 2009.

