

Blustery Cold Weather Heat Pump Mis-Information War?

Martin Wahl

A favorite trope of the fossil-fuel industry is that heat pumps do not work well in cold weather. Heat pump technology has improved significantly, as we will see later, and heat pumps are selling so well nationwide, including in New England, that oil and gas interests are beefing up their campaigns to promote their products and doubling down on sowing doubts about heat pumps.

So, Who's Behind This?

The Energy and Policy Institute (EPI) maintains a list of fossil fuel industry's front groups who "advocate on behalf of utility and fossil fuel interests, often by amplifying misinformation about distributed, renewable energy or electrification, while masking or obscuring the utility's involvement." The messages often emphasize the elimination of "choices" proposed by renewable energy advocates and associated increased costs. EPI also documents the membership, advertising spending, and political activities of these groups, most of which are non-profit trade-related associations that contribute to politicians opposing clean-energy efforts.

With environmentally friendly-sounding names, e.g.: Natural Allies for a Clean Energy Future, some sites purport to help consumers select heating solutions, often including heat pumps in the list, usually with a caveat about their not being able to handle cold weather and, for example, requiring a "backup heating system to supplement a heat pump system during Maine's harsh winters." Most heat pump systems come with an electric resistance heating element for just such a purpose, so a supplemental system would not be required. Heating oil blended with 2% to 20% biodiesel as Bioheat® is often promoted as an environmentally sound solution, and 2 to 20% of a low fossil-sourced carbon fuel is better than none. However, claims of around 80% reduction in greenhouse gas (GHG) emissions are misleading; studies show that biodiesel blended fuel can reduce sulfur oxide by large amounts, but not GHGs.



New technologies have increased heat pump effectiveness and efficiency providing benefits to cold-climate residents, and they can now operate with outdoor temperatures as low as -15°F. (tristate.coop)

Another common allegation concerning heat pumps is that they are only as environmentally beneficial as the source of the electricity to power them. A 2020 study by RMI found that replacing a gas furnace with a heat pump would reduce carbon emissions in all the lower 48 states given their sources of electric power, except for Wyoming and possibly Utah. Compared to heating oil, heat pumps are always a lower GHG-emitting solution.

How Do Heat Pumps Work in Cold Weather?

Heat pumps are more energy-efficient than gas or oil space heaters because they move heat from one place (outside air) to another (inside air) instead of creating heat by burning fuel. Like a refrigerator, heat pumps use electric power to transfer heat from a cool space to a warm space, making the cool space cooler and the warm space warmer.

Commercially available heat pump technology was originally developed early in the 20th century for refrigeration and air conditioning to cool spaces down, so it is not surprising that revising the technology to heat spaces up in cold climates took some time to achieve.

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The new technologies include:

- Cold climate heat pumps typically use variable speed compressors, versus on-off types, so they adjust their energy

use to meet varying heating requirements.

- Newer scroll compressors are more effective and efficient than piston type compressors and have reduced maintenance requirements.
- Refrigerants in newer cold weather heat pumps also have boiling points as low as -44°F, allowing the extraction of heat from very cold ambient air.

Just like fuel-burning heat sources, heat pumps do have to

work harder in cold weather, losing efficiency because they must extract heat from colder air. Almost all heat pump systems have an electric resistance or a gas-fired backup if the system needs a boost.

Another benefit of heat pumps, of course, is that they double as air conditioners, now more in demand in northern latitudes as the planet warms.

So, What to Do?

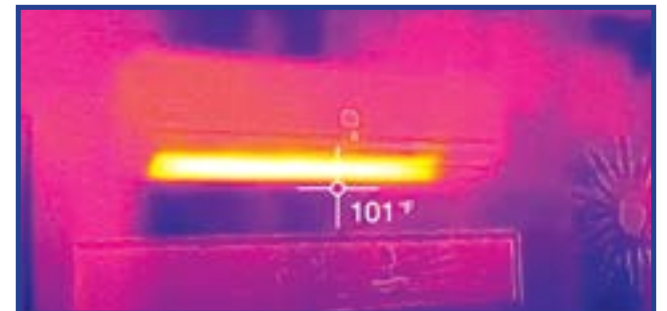
Whenever encountering a friendly-sounding source offering "facts" about fossil-fueled heating versus heat pumps, check out its background and funding to see whose

interests are being promoted.

In the *Green Energy Times* readership area (ME, NH, VT, and NY) check out these sites for more helpful information:

- **New York:** NYSDA Heat Pump Program (NYS Clean Heat),
- **Vermont:** Department of Public Service Vermont Energy Saver, and Efficiency Vermont,
- **New Hampshire:** Clean Energy New Hampshire,
- **Maine:** Maine Housing Heat Pump Program.

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An entertaining YouTube thermal imaging video of a heat pump working in -27 degrees F at a home in Minneapolis can be viewed at <https://www.youtube.com/watch=heat-pump>. The yellow-white shows heat and blue-purple parts indicate colder surfaces. This image shows 101°F indoor heat pump output while it's -27° outside.



NHEC Heat Pump Programs

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