Building Electrification in New Jersey

Acadia Center

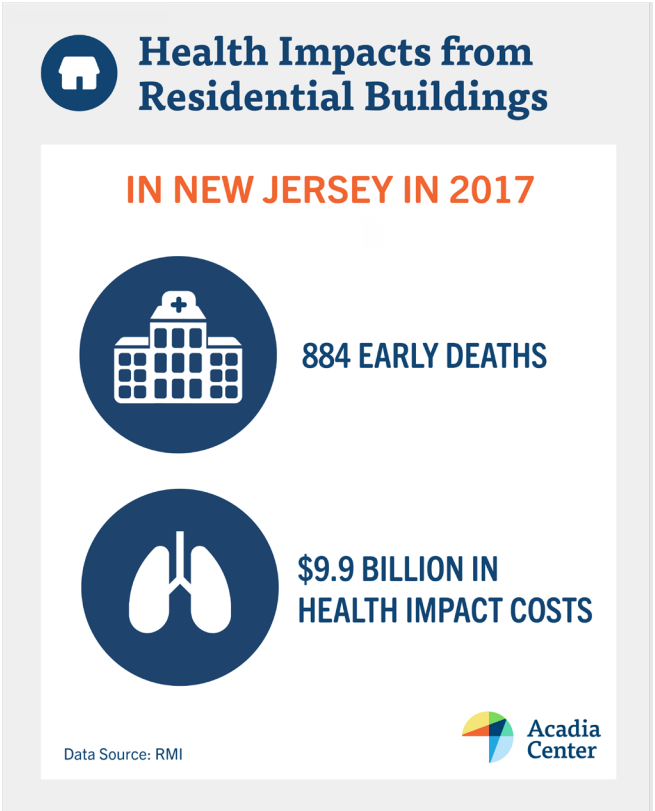
How to help New Jersey families save on energy bills, increase comfort and improve health

Heat Pumps Improve Comfort, Health and Reduce Energy Bills in New Jersey

FOSSIL FUELS IN HOMES IMPACT AIR QUALITY AND HEALTH

In New Jersey, over 82% of homes rely on fossil fuels for heating – nearly 73% of homes rely on natural gas and 9% rely on either heating oil or propane.[1] Continuing to rely on fossil fuels for residential heating presents several risks – energy security, price volatility, indoor air pollution and associated health impacts. Burning fossil fuels for cooking and heating produces pollution that harms New Jerseyans, especially children, the elderly, people of color, and low-income households. On-site air pollution from appliances is linked to asthma, cardiovascular disease, and birth defects. In New Jersey, air pollution from burning fossil fuels in homes led to an estimated **884 early deaths and $9.9 billion in health impact costs** in 2017 alone.

Combusting fossil fuels in commercial and residential buildings accounts for over 25% of greenhouse gas (GHG) emissions in the state.[2] Continued reliance on fossil fuels for heating is not compatible with the Global Warming Response Act (GWRA) requirement of reducing statewide GHG emissions 80% below 2006 levels by 2050.



THE ALTERNATIVE: WHAT ARE HEAT PUMPS?

Fortunately, electric heat pumps are a superior option that are more efficient, provide greater comfort, and can save residents money on energy bills. A heat pump is a dual electric heating and cooling technology for buildings that pumps heat indoors to keep buildings warm in the winter and pumps heat outdoors to keep buildings cool in the summer. Because heat pumps move heat rather than generate heat, they are highly efficient – **more than three times as efficient** as the best natural gas furnaces and boilers at producing the same amount of heat. In addition, they use **29% less electricity** compared to a central air conditioning unit, lowering a household's energy use year round.

Households throughout the northeast are choosing heat pumps to reduce drafty cold rooms in winter and provide cooling during summer months. During winter, a typical fossil fuel furnace will cycle on, blast hot air (typically around 125°F) for a short period of time, and then cycles off. This pattern causes noticeable swings in temperature over time. By contrast, a heat pump pushes a greater volume of lower temperature air (typically around 95°F) into living spaces for longer periods of time. As a result, heat pumps provide higher levels of occupant comfort by limiting dramatic fluctuations in indoor temperature over time.

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HEAT PUMPS COST LESS TO OPERATE THAN GAS EQUIPMENT

As Acadia Center demonstrated in its **recent report**, residential natural gas rates in New Jersey have increased over 50% since the winter of 2020-2021 and the average gas-heated home in New Jersey that switches to all electric appliances can expect to save 4%-41% on their annual utility bill, depending on utility. The draftiest gas-heated homes can expect to save 47%-69% on annual utility bills by installing highly efficient electric appliances and improving weatherization.

Not surprisingly, the highest energy bills in New Jersey belong to households that heat with fuel oil and propane. A **2022 report** by Acadia Center, using relatively low fuel oil prices from winter 2020-2021, shows that an average New Jersey home using fuel oil or propane spent about $3,000 annually on energy bills and would have saved $1,250 each year, a savings of 58%, by switching to electric for space and water heating. In 2022-2023, households paying for fuel oil faced even higher energy bills, as the average cost of heating oil this past winter in New Jersey spiked to levels about 145% higher than natural gas.[3] Similarly, the average cost of propane was about 164% higher than natural gas this past winter in New Jersey.[4]

HEAT PUMPS ARE HIGHLY EFFECTIVE IN COLD CLIMATES

Modern "cold climate heat pumps" produce plenty of heat down to temperatures as cold as -15°F. Not only do they work in cold weather, Oxford University researchers found that air-source heat pumps (ASHPs) are **two to three times more efficient** than fossil fuel heating alternatives in winter weather (-10°F to 32°F) and are even 50% more efficient in temperatures as low as -22°F. To put that in context, in New Jersey, a temperature of 0°F is considered a 1-in-90 years event.[5] The bitterly cold state of Maine **recently blew past its goal** of installing 100,000 heat pumps by 2025, and states including **Maine** and **Massachusetts** have demonstrated that heat pumps can serve as the primary heating source in homes.

CONSUMERS CAN SWITCH TO HIGH EFFICIENCY ELECTRIC EQUIPMENT

Highly efficient heat pumps can be tailored to fit the needs of any type of home in New Jersey. In homes that have both a furnace and a traditional central AC, the time when the central AC reaches end of life **provides an excellent opportunity** to opt instead for a heat pump. That's because "central" heat pumps are available at a similar cost to central AC units and follow similar installation and electrical system demand requirements. Because heat pumps can be sized to provide ample heating without the need for a backup, homes can avoid the need to replace a gas furnace when it burns out, saving thousands of dollars on new equipment.

Many households in the Northeast have switched to ductless mini split heat pumps to provide a complete heating and cooling solution that improves comfort and lowers energy bills. These systems can provide all the heat needed, even during abnormally cold weather, if the mini split heat pumps are sized to match the heating needs of the home. It is common for homeowners to switch to heat pumps in steps, particularly for homes that lack air conditioning, only have window air conditioning units, or lack any ductwork because they obtain heat from hot water or steam radiators.

The first step may be to add a ductless mini split heat pump in a drafty room or primary living area. The heat pump provides both heating and cooling and the central furnace or boiler simply runs less often. Over time, mini split heat pumps can be added in other locations to fully eliminate the need for gas, propane or fuel oil and reduce energy bills.

Heat Pumps Are:

- Commercially available and widely used globally
- Effective even in cold New Jersey winters
- Cost effective, with the potential to save consumers hundreds of dollars annually
- Chimney-free with zero on-site emissions
- Able to efficiently heat and cool

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Endnotes

1 U.S. Energy Information Administration (EIA), New Jersey State Energy Profile, https://www.eia.gov/state/print.php?sid=NJ

2 New Jersey Greenhouse Gas Inventory: 2022 Mid-cycle Update Report https://dep.nj.gov/wp-content/uploads/ghg/2022-ghg-inventory-mcu_final.pdf

3 U.S. EIA Weekly New Jersey No.2 Heating Oil Residential Price https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=W_EPD2F_PRS_SNJ_DPG&f=W

4 U.S. EIA Weekly New Jersey Propane Residential Price https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=W_EPLLPA_PRS_SNJ_DPG&f=W

5 Final Report: Analysis of Natural Gas Capacity to Serve New Jersey Firm Customers Public Version, New Jersey Board of Public Utilities, https://nj.gov/bpu/pdf/boardorders/2021/20211215/9B%20LEI%20Final%20Gas%20Capacity%20Report%2011%2005%202021%20Public%20Redacted.pdf