



Rising Natural Gas Prices Boost Financial Benefits of Home Electrification in New Jersey

A Look at Annual Energy Costs to Homeowners
The Future is Electric: How the Average New Jersey Household Can Save by Electrifying

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In February of 2022, Acadia Center released a report commissioned by the New Jersey Conservation Foundation titled **The Future is Electric: Helping New Jersey Live in Cleaner, Healthier and More Affordable Homes**. Using the winter 2021-2022 energy rates, the report demonstrated the energy bill savings associated with New Jersey homeowners transitioning off fossil fuels to highly efficient and affordable electric appliances like heat pumps. Heat pumps are proven to work in cold climates and simultaneously reduce emissions, improve indoor and outdoor air quality, and reduce health disparities in overburdened and underserved communities and communities of color.¹

The Future is Electric report showed that when building electrification is paired with weatherization, the average household in New Jersey would see annual energy bill savings, with many households reducing energy bills more than 50%. **However, since the analysis in the report was completed, natural gas prices have soared. In New Jersey, the average residential natural gas rate this past winter was 31% above winter 2021-2022 levels and 51% above winter 2020-2021 levels.**² Simultaneously, average residential electricity prices have remained more stable with this past winter's rates rising only 3% above winter 2021-2022 levels and 5% above winter 2020-2021 levels.³

What are the implications of this recent rise in natural gas prices on annual energy bills for homes heated by natural gas versus homes that are fully electrified and weatherized? To answer this question, Acadia Center updated the analysis from the original The Future is Electric report to reflect the significantly higher gas rates and modestly higher electric rates of winter 2022-2023. Because both electric and gas rates vary significantly across utilities, Acadia Center honed in on households located within the service territory of three of New Jersey's natural gas utilities – Public Services Electric & Gas (PSE&G), New Jersey Natural Gas (NJNG), and South Jersey Gas (SJG).⁴

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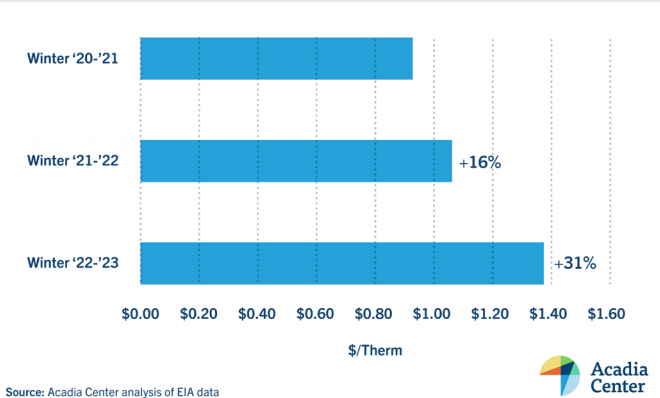


Heat Pumps Reduce Energy Bills Across New Jersey

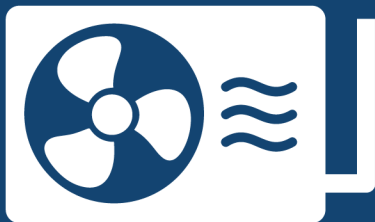
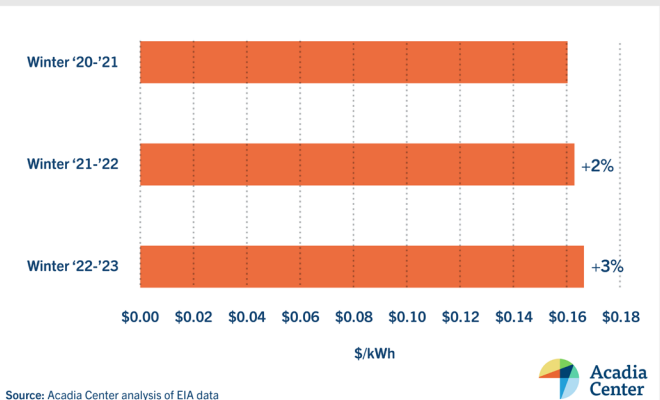
Within the service territory of those three gas utilities, switching to electric appliances such as heat pumps reduces energy bills. The annual energy bills savings for an average gas-heated home⁵ that electrified all appliances ranged from 4%-41%, depending on utility. If weatherization was also improved for the same electrified home, the annual utility bill savings would be even greater, ranging from 14%-47%, depending on utility. The annual energy bill reductions for drafty⁶ gas-heated homes that get weatherized are even more significant. **The annual energy bill savings for a drafty gas-heated home that fully electrified appliances and improved weatherization ranged from 47%-69%, depending on utility.** Across all utilities and all scenarios, the updated analysis using gas and electricity rates from the most recent winter shows an increase in energy bill savings associated with home electrification compared to the original analysis in the Future is Electric report.

As with the Future is Electric Report, the annual energy bills numbers contained in this memo were generated using Acadia Center's PowerHouse model. PowerHouse uses data about New Jersey housing stock, weather and utility rates and calculates energy consumption and energy costs based on an average level of building weatherization. An "electrified" home was defined as a home where all household appliances that commonly use natural gas are replaced with an efficient electric equivalent – these appliances provide space heating, air conditioning, water heating, cooking, and clothes drying services to residents. The following section takes a closer look at the utility-by-utility modeled energy bills savings generated in PowerHouse.

 Average New Jersey Residential Gas Price: Comparing Past Three Winters



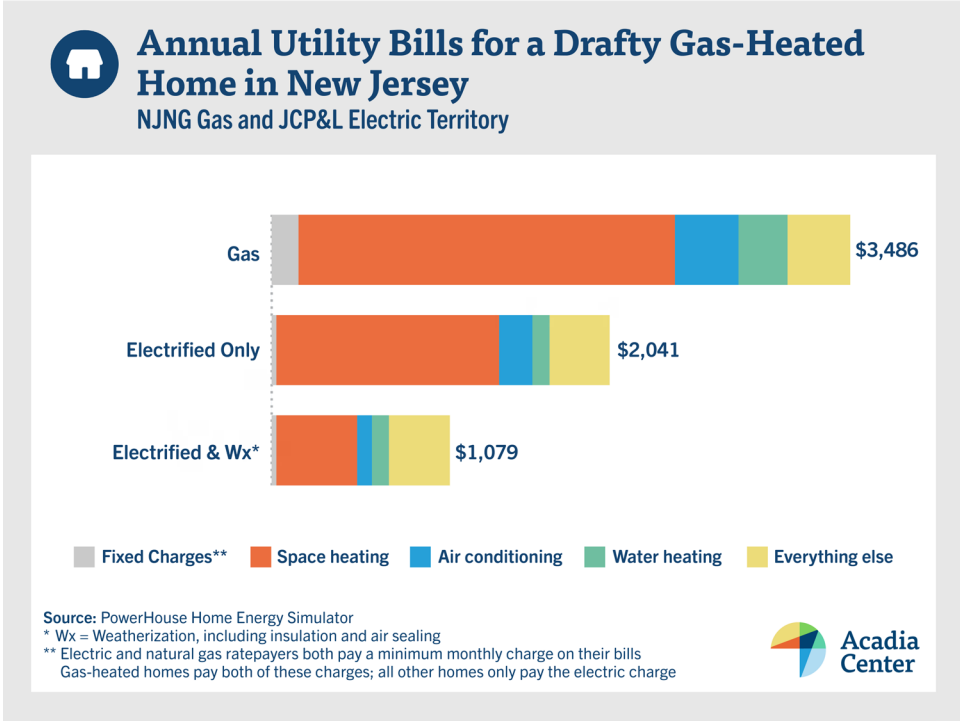
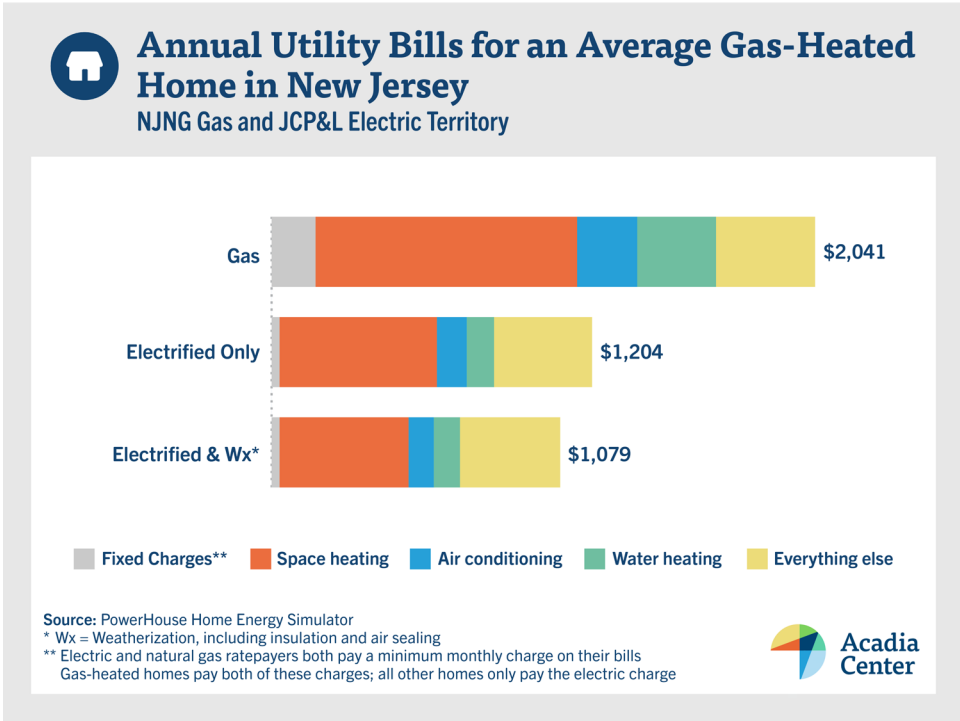
 Average New Jersey Residential Electricity Price: Comparing Past Three Winters



The annual energy bills savings for an average gas-heated home that electrified all appliances ranged from 4%-41%, depending on utility. If weatherization was also improved for the same electrified home, the annual utility bill savings would be even greater, ranging from 14%-47%, depending on utility.

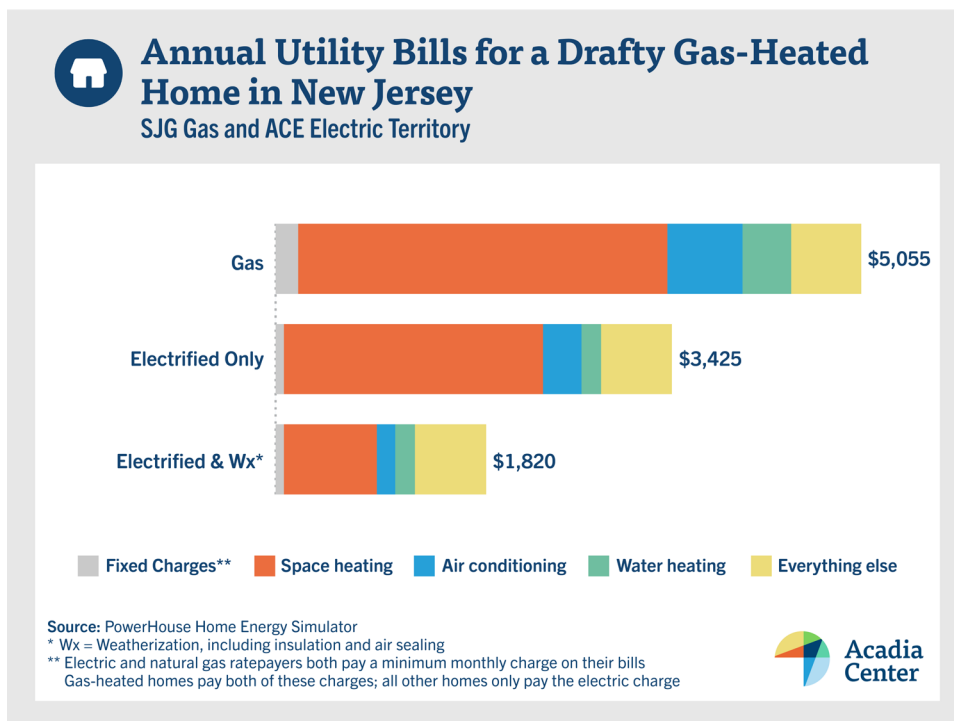
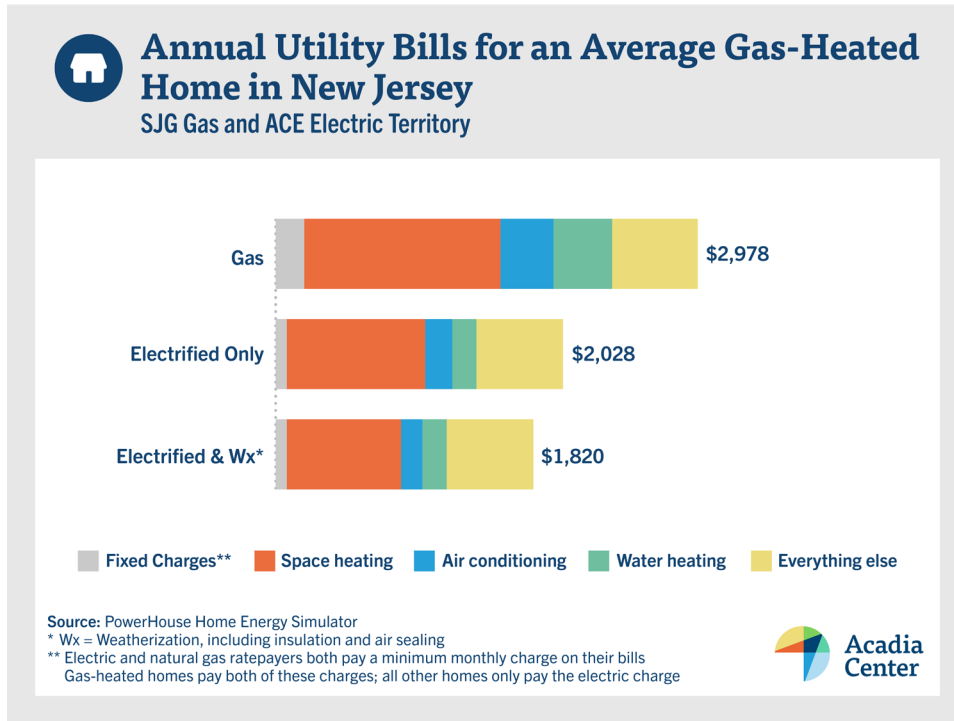
Closer Look at Energy Savings in NJNG Territory

An average gas-heated home in NJNG gas territory and Jersey Central Power & Light (JCP&L) electric territory would have reduced its energy bills by about 41% from fully electrifying all appliances. If weatherization was also improved for that same electrified home, the annual utility bill savings would have been even greater, about 47% below an average gas-heated home. A typical drafty gas-heated home in NJNG and JCP&L territory with improved weatherization and electric appliances could have reduced its bills from about \$3,490 per year to about \$1,080 per year, a savings of 69%. Of the three service territories analyzed, NJNG shows the highest level of annual bill savings from electrification.



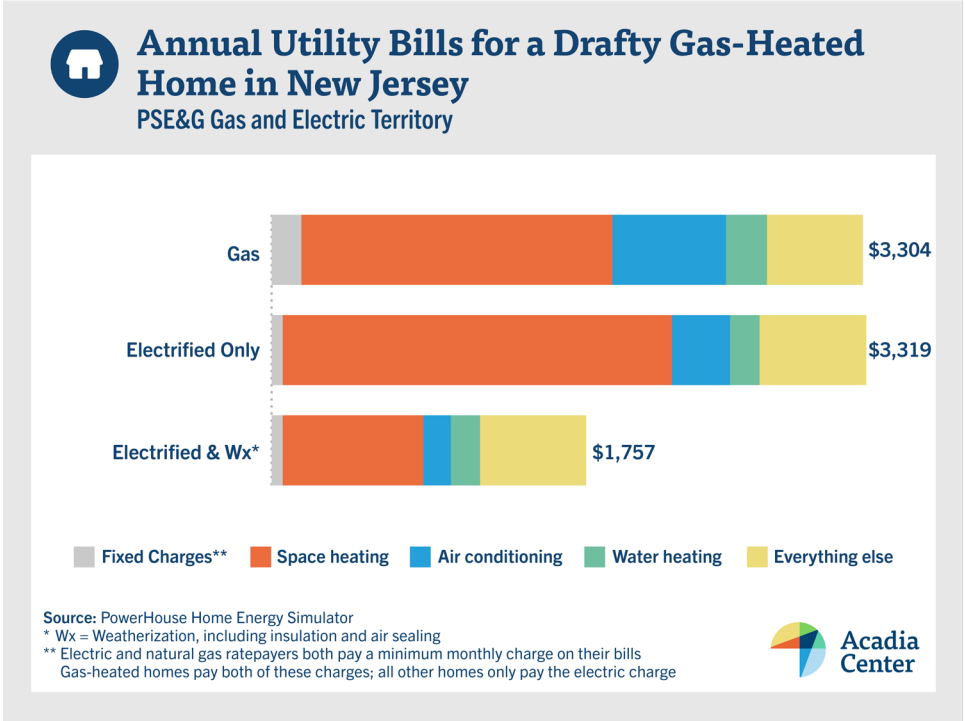
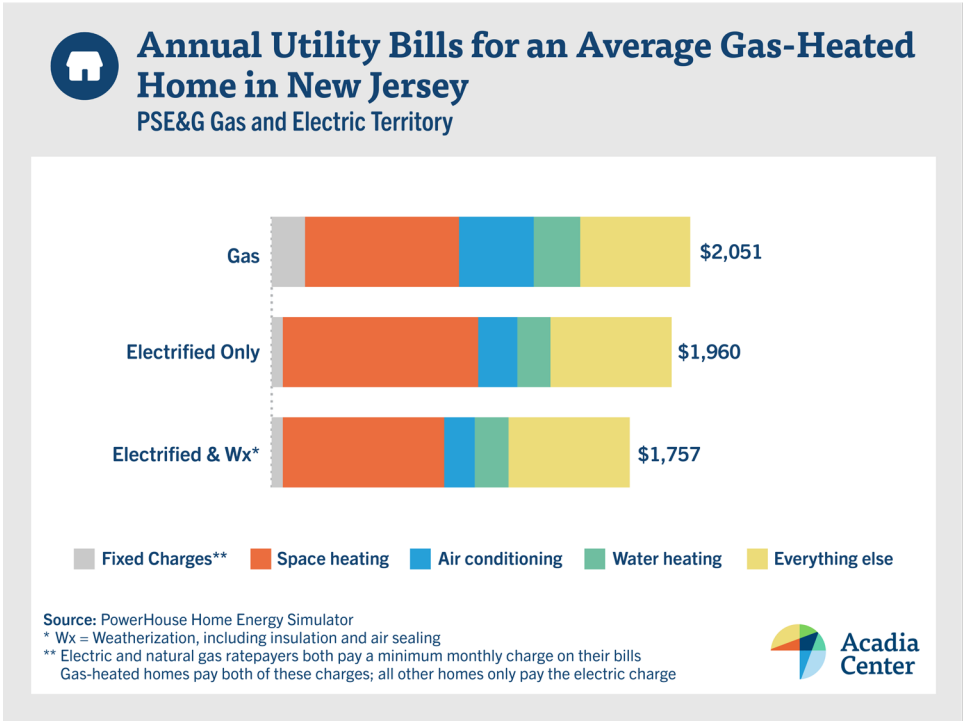
Closer Look at Energy Savings in SJG Territory

An average gas-heated home in SJG gas territory and Atlantic City Electric (ACE) territory would have reduced its energy bills by about 32% from fully electrifying all appliances. If weatherization was also improved for that same electrified home, the annual utility bill savings would have been even greater, about 39% below an average gas-heated home. A typical drafty gas-heated home in SJG and ACE territory with improved weatherization and electric appliances would have reduced its bills from about \$5,060 per year to about \$1,820 per year, a savings of about 64%. Of the three service territories analyzed, SJG shows the second highest percentage annual bill savings from electrification.



Closer Look at Energy Savings in PSE&G Territory

An average gas-heated home in PSE&G gas and PSE&G electric territory would have reduced its energy bills by about 4% from fully electrifying all appliances. If weatherization was also improved for that same electrified home, the annual utility bill savings would have been even greater, about 14% below an average gas-heated home. A typical drafty gas-heated home in PSE&G territory with improved weatherization and electric appliances could have reduced its bills from about \$3,300 per year to about \$1,760 per year, a savings of 47%. Of the three service territories analyzed, PSE&G shows the lowest level of annual bill savings from electrification.



Conclusion and Recommendations

In addition to providing utility bill savings to New Jerseyans, building electrification paired with weatherization is central to the state achieving its ambitious greenhouse gas (GHG) reduction goals, improving air quality, and reducing health disparities. Buildings remain the second largest source of greenhouse gas emissions in New Jersey⁷ and aggressively reducing emissions from buildings will be instrumental in achieving the Global Warming Response Act's target of an 80% reduction in emissions by 2050. That is why New Jersey's 2019 Energy Master Plan's least cost scenario calls for converting at least 90% of residential and commercial buildings from natural gas to electric appliances by 2050.⁸

Transitioning off fossil fuels to highly efficient and affordable electric appliances like heat pumps will reduce emissions, improve indoor and outdoor air quality, reduce health disparities in overburdened and underserved communities and communities of color⁹, and help New Jerseyans reduce their energy bills, as demonstrated in the above analysis.

New Jersey currently lacks electrification programs that align with New Jersey's 2019 Energy Master Plan, state climate law, or Governor Murphy's 2023 Executive Order 316 that requires the electrification of 400,000 homes and 20,000 businesses by 2030.

New programs are needed to make it easier for consumers to learn about the benefits of electric appliances, purchase appliances, and identify experienced installers. State actions to reduce market barriers, like those that helped establish the now booming market for electric vehicles, should be adopted to accelerate the transition to electric appliances.

IN PARTICULAR, NEW JERSEY POLICYMAKERS SHOULD ACT NOW TO:

1. Pass Senate Bill S3672. Require electric utilities to achieve greenhouse gas reduction targets by designing and implementing electrification programs to achieve those targets. These programs should be designed to achieve both the electrification targets in Executive Order 316 and the goals of the Energy Master Plan.
2. Fund an expanded Whole Home Program to serve low- and moderate-income (LMI) households. Direct the Board of Public Utilities to design and implement a permanent program based on a holistic approach to healthy housing. The program should incorporate energy efficiency improvements while simultaneously remediating health and safety hazards and enabling households to choose electric appliances.
3. Revise the Board of Public Utilities plan for new electrification programs. State-run energy efficiency programming should be designed to prioritize electrification and maximum utilization of federal funds.
4. Transition away from programs that currently use ratepayer dollars to fund new fossil fuel-fired equipment for non-LMI households.
5. Adopt stretch building codes, so that municipalities can choose stricter energy efficiency requirements.
6. Provide public education about the benefits of electric appliances.

For more information:

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Endnotes

- 1 Decarbonizing Homes: Improving Health in Low-Income Communities through Beneficial Electrification, RMI, 2021 <https://rmi.org/insight/decarbonizing-homes/>
- 2 Acadia Center analysis using raw data from EIA on the average price of natural gas delivered to residential consumers in New Jersey for the months of November – March for the three respective winters. <https://www.eia.gov/dnav/ng/hist/n3010nj3a.htm>
- 3 Acadia Center analysis using raw data from EIA on the average price of electricity delivered to residential customers in New Jersey for the months of November-March for the three respective winters. https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_5_6_a
- 4 Acadia Center reviewed tariffs for individual gas and electric utilities to determine the rates that actual New Jersey households located in these respective service territories pay to their distribution utilities. Rates can vary substantially between companies and from year to year.
- 5 All analysis presented in this memo assumes a 2,000 square foot, single-family home, as 63% of housing units in New Jersey are single-family. Acadia Center uses conservative assumptions to forecast the utility bill impacts of weatherization. Potential increases in insulation are limited by the framing depth of an average New Jersey home, which is shallower than what would be required under today's building energy code. Air sealing impacts are based on locations in a home where energy efficiency programs commonly obtain cost-effective reductions in air leakage, such as in attics, on foundation sills and rim joists, and around exterior doors.
- 6 A drafty home in this instance is defined as a home with an air infiltration rate of 20 air changes per hour at 50 pascals (20ACH50) pressure differential due to below-average levels of insulation in ceilings, walls, and rim joists. Air infiltration rates are 10 for the average home and 7 for the weatherized home, which is lower than current building codes that require 3ACH50.
- 7 Direct, on-site combustion of fossil fuels in buildings is the second largest source of GHG emissions in New Jersey (26% of GHG emissions) after transportation (42%). Space and water heating account for the majority of emissions from these sectors, with 87% of residential buildings and 82% of commercial buildings relying predominantly on natural gas. About 10% of residential households rely on fuel oil or propane.
- 8 2019 New Jersey Energy Master Plan: Pathway to 2050, Page 53 https://nj.gov/emp/docs/pdf/2020_NJBPU_EMP.pdf
- 9 Decarbonizing Homes: Improving Health in Low-Income Communities through Beneficial Electrification, RMI, Nov 2021 <https://rmi.org/insight/decarbonizing-homes/> a new facility will have a disproportionately negative impact on overburdened communities.