

Accelerating Energy Justice in Building Decarbonization

Retrofitting Energy-Intense Housing

June 2022



Introduction

Nearly all Northeastern states have set ambitious greenhouse gas reduction goals for 2030. Aggressive policies and programs targeting every sector of the economy will be necessary to achieve these goals.

In the residential sector, the leakiest 25% of housing units in New England produce more than half of emissions attributable to housing.¹ Typically, these super-emitting housing units are located in lower-income communities and communities of color and include residents who speak languages other than English. By reforming programs in recognition of these conditions, states have an opportunity to accelerate progress towards reaching their greenhouse gas reduction targets while reducing energy burdens and fostering energy justice.

Retrofitting these homes would significantly reduce energy bills for many vulnerable households in the region, improve indoor air quality, and cut residential sector emissions by more than half. Acadia Center is investigating a suite of reforms to building codes and energy efficiency program rules that would remove existing barriers and allow states to target these super-emitting homes for comprehensive retrofits.

An Opportunity to Accelerate Emissions Reductions Equitably

The Northeast must seize the opportunity to dramatically reduce residential emissions and advance energy justice goals. The reason is simple: the 25% highest-emitting homes account for more than half of residential emissions in every New England state.

There are 5,750,722 homes in New England, but the reduction in residential sector emissions that each state must reach to remain in line with state laws and IPCC recommendations by 2030 can be achieved by prioritizing 160,000 homes regionally per year.

This 25% of homes emits so much because the buildings' shells are drafty and uninsulated—often, the product of years of neglect. Building shell inefficiency leads not only to higher emissions, but also to higher energy bills for residents—not just relative to household income, but in absolute terms.

While states like Maine and Massachusetts have made significant progress on electrifying and weatherizing their housing stock, the characteristics of these high-emitting homes signal a need to reform existing weatherization and efficiency programs so barriers to retrofits are removed and homes (and the residents living in them) that will benefit the most from clean heating and energy efficiency upgrades are properly treated.

Characteristics of High Emitters

In the cold Northeast, space heating can sometimes account for 80% of total annual energy use for a given home.² The amount of energy a home needs to keep warm is determined partially by the efficiency of its heating

¹ U.S. Energy Information Administration. 2015 Residential Energy Consumption Survey (RECS).

² U.S. Energy Information Administration. RECS <https://www.eia.gov/consumption/residential/data/2015/c&e/pdf/ce4.7.pdf>

equipment, but mostly by the efficiency of its building envelope. Poor insulation of walls, attics, and joists allows warm air to escape faster from the living space. Tiny cracks in myriad places around a home create drafts, which let in the cold.

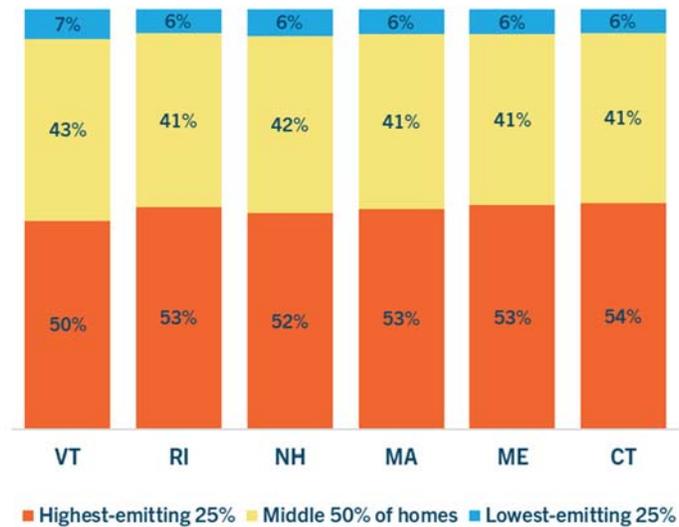
Adding insulation and sealing air leaks can substantially reduce energy use and utility bills. [These upgrades are collectively called “weatherization.”](#) The highest-emitting 25% of homes use so much fuel—and emit so much—largely because their building envelopes are poorly weatherized.

Data from the U.S. Energy Information Agency shows:

- The households that occupy the highest-emitting homes are disproportionately low-income—73% of the highest-emitting homes are low-income, compared to 36% of the lowest-emitting homes.
- Rentals are more likely to be included among these homes—regionally, more than half of the highest-emitting homes are rentals. The occupants of these homes cannot make energy efficiency improvements without the approval of a landlord.
- Two-thirds (66%) of the highest-emitting homes in the region heat with fuel oil, and about one-third (30%) heat with gas.

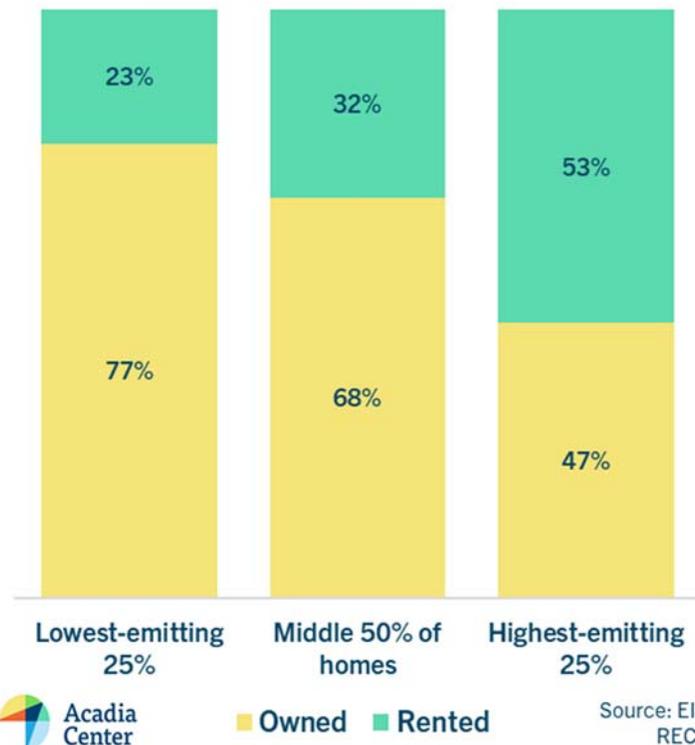
Targeting these homes for comprehensive retrofits will relieve the energy burden among low-income households and renters while substantially reducing emissions from the residential sector. States must take the initiative to harness this opportunity.

Contribution to New England States' Total Residential On-Site* Emissions



Source: EIA Residential Energy Consumption Survey
* On-site emissions include only those that take place at the home. They do not include power plant emissions.

New England Homes by Ownership Status and Emissions Level



■ Owned ■ Rented

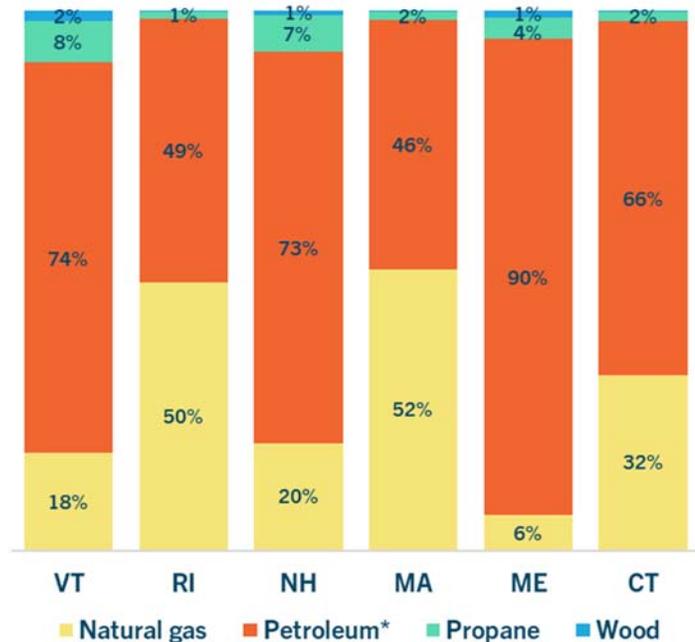
Source: EIA RECS

Impacts of Whole-Home Retrofits

Acadia Center’s [PowerHouse Home Energy Simulator](#) demonstrates just how expensive the highest-emitting homes in the region can be to live in. **For example, in Connecticut, one of the 25% highest-emitting homes would cost more than five times as much to heat each winter as a home built to that state’s current building energy code.** A similar home located further north would cost even more.

Low-income families living in these high-emitting housing units often simply cannot pay this much for energy. Instead, they are forced to keep their homes at uncomfortable—and often, unhealthy—temperatures. This is an injustice that truly cannot be overstated. Northeast states can, and must, leverage their wealth of clean energy and climate policies and programs to alleviate the energy burden of the families living in these homes. In doing so, they will also vastly reduce emissions and improve health outcomes.

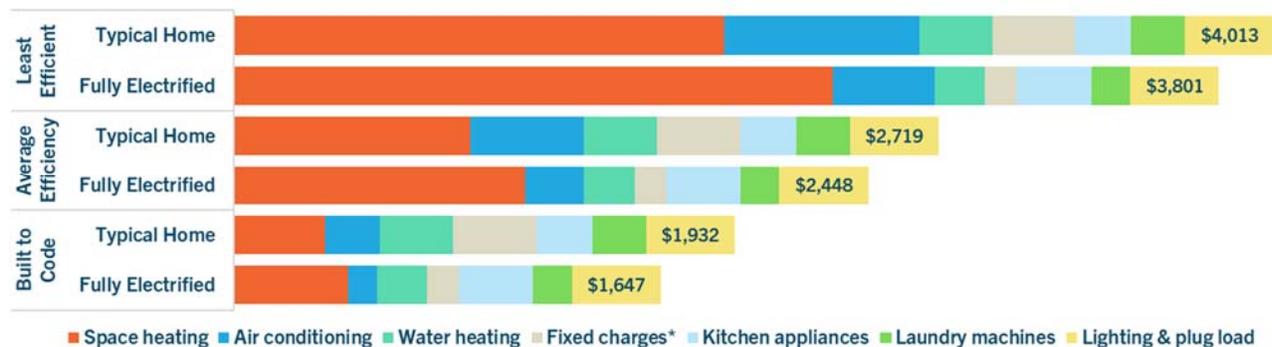
Primary Heating Fuel of the Highest-Emitting 25% of New England Homes



Source: EIA RECS
* Includes heating oil and a small amount of kerosene

Annual Operating Costs by Building Shell Efficiency Level

Hartford, CT



Source: PowerHouse Home Energy Simulator
* Electric and natural gas ratepayers all pay a minimum monthly bill, which is the same every month regardless of energy use. Homes with gas service pay both of these charges, while all other homes only pay the electric charge.

Recommended Actions

Most states in the Northeast have made a commitment to support and promote equity and environmental justice, as well as to decarbonize their economies. Acadia Center has identified specific actions that states can take in order to make meaningful progress on these goals.

- **Reform Existing Energy Efficiency Programs.** The Northeast's energy efficiency programs are some of the oldest and most successful in the nation in reducing wasteful energy use. However, studies demonstrate that many low-income and moderate-income families do not enjoy the same level of access to programs as do higher income households. Reforming the rules that govern efficiency programs to ensure that they proactively target high-emitting, lower-income homes would increase savings, bolster cost-effectiveness, reduce emissions, alleviate energy burden, and improve health among low-income and environmental justice communities. As states conduct planning for \$4 billion in programs across the region, Acadia Center is developing recommended reforms to energy efficiency program cost-effective tests and related rules that are barriers to retrofitting poorly weatherized residential units.
- **Set Enforceable Targets.** States assess the success of their clean heating and weatherization programs, for the most part, based on aggregate energy savings. It is beneficial and necessary for states to remain committed to strong economy-wide energy savings, and prioritizing the highest-emitting homes—which are more likely to house lower-income and other marginalized occupants—is a critical strategy for maximizing climate and equity benefits. Clear, enforceable, statewide targets for clean heating deployment and especially weatherization in lower-income homes can ensure that funding and attention are directed to the most impactful sectors.
- **Leverage Building Codes.** The building energy code currently only applies to new buildings and major renovations. Other parts of the building code, however—such as the health or sanitary code—apply to all buildings. Clean heating and weatherization improvements are directly relevant to tenant health, safety, and comfort. Treating energy performance as a core component of health and safety can be achieved by leveraging building codes to become much-needed sticks to the carrots offered by efficiency incentive programs, increasing overall impact and cost-effectiveness.

Conclusion

Northeast states deserve praise for all the work they have already done to decarbonize homes and businesses. However, energy justice requires real investment in real people who have been left behind up until now. As states confront fast-approaching emissions reduction deadlines under the law, **targeting the 25% most energy-intensive homes for comprehensive clean heating and weatherization upgrades represents a significant opportunity to fold equity and justice into existing policies and programs in a meaningful way.**

Acadia Center is committed to helping state governments and energy efficiency program administrators recognize this reality and harness its potential in the years to come.