

August 23, 2021

Department of Energy and Environmental Protection
Bureau of Energy and Technology Policy
Connecticut Energy Efficiency Board
10 Franklin Square
New Britain, CT 06051

Connecticut 2022-2024 Conservation and Load Management (C&LM) Plan

To Whom It May Concern:

Acadia Center appreciates the opportunity to submit written comments on Connecticut's 2022-2024 Conservation and Load Management (C&LM) Plan.

[Acadia Center](#) is a non-profit research and advocacy organization committed to advancing the clean energy future by offering real-world solutions to the climate crisis. Acadia Center tackles complex problems, identifies clear recommendations for reforms, and advocates for policy changes that support a low-carbon economy across the Northeast. Acadia Center identifies regional, state, and local improvements that will dramatically reduce carbon pollution and improve quality of life throughout the Northeast.

Acadia Center respectfully submits the following comments:

- The decline of claimable savings from lighting and other low-touch measures is an opportunity for program administrators (PAs) to develop innovative new programs that drive deeper savings in Connecticut.
- Acadia Center's [Next Generation Energy Efficiency](#) seeks to elevate the role of energy efficiency in improving housing quality, drive down emissions, and align efficiency and electrification. These principles should guide energy efficiency programs in Connecticut.
- Heat pumps and weatherization—both cost-effective efficiency measures—must be included as top-line goals for the 2022-2024 C&LM Plan.
- Weatherization can compound savings from electrification of space heating equipment.
- Program administrators must address inequitable access to efficiency services.
- The next C&LM Plan can increase savings and align more closely with state climate commitments at the same time by orienting programs more explicitly toward reducing emissions.

The Value of Energy Efficiency to Connecticut's Economy

Energy efficiency is an inexpensive and climate-friendly way for Connecticut to conserve resources and create local jobs. As a state with historically successful and well-regarded energy efficiency programs, Connecticut also has an opportunity to demonstrate the persistent value of energy efficiency investments.

Acadia Center looks forward to continued engagement with the Department of Energy and Environmental Protection (DEEP) and Connecticut’s energy efficiency PAs to ensure that the 2022-2024 C&LM Plan features the state’s most aggressive savings goals to date. Unfortunately, math errors in the draft Plan tables pertaining to planned electric and gas savings prevent a close analysis of the Plan’s ambitions. Acadia Center eagerly awaits any additional empirical information about the 2022-2024 C&LM Plan’s planned savings and expenditures by initiative that the PAs can provide.

Programs must evolve to capture deeper savings

Energy efficiency programs are evolving, in Connecticut and across the Northeast. For years, lighting measures have played an outsized role in programs. Because lighting is a low-cost, easy-to-deliver efficiency measure with historically high savings potential, it has undergirded a substantial amount of program activity, particularly in the Residential Retail Products, Home Energy Solutions (HES), and Home Energy Solutions – Income Eligible (HES-IE) initiatives.

However, because federal regulations have effectively banned the sale of most incandescent light bulbs, and because the programs have already replaced a high percentage of bulbs with CFLs and LEDs, the available savings from lighting measures have declined. Connecticut now has an opportunity to refocus on achieving deeper savings—a strategy that is critical to achieving Connecticut’s climate commitments and results in substantial energy bill savings for program participants.

The process of identifying and investing in efficiency opportunities that show a high potential for cost-effective savings is captured in Acadia Center’s Next Generation Energy Efficiency principles.

Next Generation Energy Efficiency

Connecticut is a national leader in energy efficiency, with some of the highest per capita investments in energy efficiency and among the most ambitious energy savings goals. Thousands of homes and businesses have received efficiency services, which have reduced energy bills, generated billions of dollars in lifetime benefits, and improved public health.

Despite this success, significant potential savings still exist in Connecticut—especially among environmental justice¹ communities, who have not benefited from the same level of access to efficiency upgrades as other populations in Connecticut. far more must be done to improve the efficiency of Connecticut’s homes and businesses and to ensure that all overburdened and underserved communities reap the full benefits of efficiency offerings. Programs have not delivered services adequately across all income levels and communities. According to the PAs, many consumers face unequal access to benefits under existing efficiency programs, and underserved communities that face the worst impacts of climate change and poor housing quality have not been able to take full advantage of efficiency programs. Twenty-three percent of energy audits in low-income homes are rejected because of health and safety barriers that

¹ “Environmental justice community” may refer to a community that is disproportionately low- or moderate-income, language-isolated, or non-White. According to the U.S. Census, these communities are more likely than others to rent their homes and more likely to live in older housing that has not been renovated.

make retrofits more expensive.² The occupants of these units are the least likely to have the resources to remediate asbestos and other health threats on their own, despite occupying homes that, frequently, are prime targets for efficiency upgrades due to their drafty and uninsulated building shells.

Additionally, supporting the acceleration of clean energy resources and the transition away from fossil fuels requires that the programs prioritize clean electric heating and whole-house electrification. Achieving better alignment between the energy efficiency Plan and state climate goals will require reforming how the Plans are designed and delivered, while recognizing that traditional energy efficiency investments remain a core energy resource in Connecticut's Integrated Resource Plan.

Acadia Center's [Next Generation Energy Efficiency](#) initiative seeks to tackle these challenges through a new approach—one that focuses on energy savings as a core consumer and energy system resource, but is also centered around meeting climate, environmental justice, and electrification goals. The four pillars of Next Generation Energy Efficiency are to:

- Strengthen the role of efficiency in improving housing quality;
- Address climate mitigation and GHG reductions through energy efficiency;
- Better align energy efficiency and electrification; and
- Sustain investments in energy efficiency as a leading energy resource.

By incorporating Next Generation Energy Efficiency principles into the 2022-2024 C&LM plan, PAs can more effectively reach underserved communities, drive down emissions, and maximize savings for customers.

Electrification and Weatherization

Heat pumps and weatherization should be top-line plan goals

Energy efficiency programs in Connecticut are designed to capture energy savings. Though Connecticut's programs are nominally fuel-blind, these savings have historically been achieved within fuel silos—in other words, by installing a more efficient version of something that already exists in the building. Optimizing whole-building savings, however—from an energy as well as a greenhouse gas perspective—often entails some amount of fuel switching, because heat pump equipment is so much more efficient than fuel-fired equipment.

Orienting the programs more explicitly toward this type of energy efficiency will require changes to how C&LM goals are set and enforced. Specifically, top-line goals should be augmented to include metrics that track fossil fuel displacement through electrification and weatherization. Additional terms that measure progress toward fossil fuel displacement might include the number of cold-climate air-source heat pumps (ccASHP) installed, the number of buildings weatherized, net MMBtu reduction across all fuels, or similar metrics. These would allow DEEP and other stakeholders to track the state's progress on measure categories that are crucially important to both the future of the programs and the state's ability to meet its climate commitments.

² Energize Connecticut and Eversource. Home Energy Solutions: Market Rate/Income Eligible presentation. November 2020

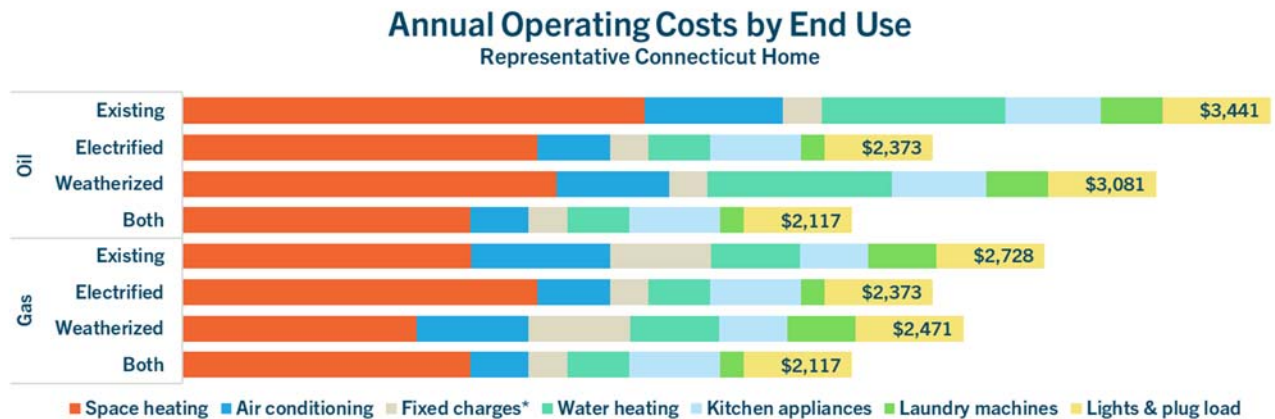
Acadia Center analysis shows that air-source heat pumps can reduce a representative home's net energy consumption up to 58.1 MMBtu per year, or up to 62.6 MMBtu per year if the home also receives insulation and air sealing improvements.

Space Heating and Air Conditioning Energy Savings due to Air Source Heat Pump (ASHP) Installation – With and Without Weatherization (Wx)³

Upgrade	Fossil Fuel	Heat Pump		Net MMBTU Savings
	MMBTU	kWh	MMBTU	
Gas-to-ASHP	74.4	-5,294	-18.1	56.3
With Wx	74.4	-3,972	-13.6	60.8
Oil-to-ASHP	76.2	-5,294	-18.1	58.1
With Wx	76.2	-3,972	-13.6	62.6

Heat pumps are a cost-effective efficiency measure

According to Connecticut's 2015 Single-Family Weatherization Baseline Study, more than 40% of single-family homes in Connecticut have central air conditioning.⁴ No similar data exists for multifamily units in Connecticut, but the EIA's Residential Energy Consumption Survey (RECS) shows that nearly all homes without central air conditioning in New England use window units—two of them, on average. Because air-source heat pumps provide both heating and cooling, it is important to account for both of these end uses when assessing savings. Acadia Center analysis demonstrates that whole-home heat pump installations can save energy and money regardless of fuel, especially when paired with common-sense weatherization improvements.

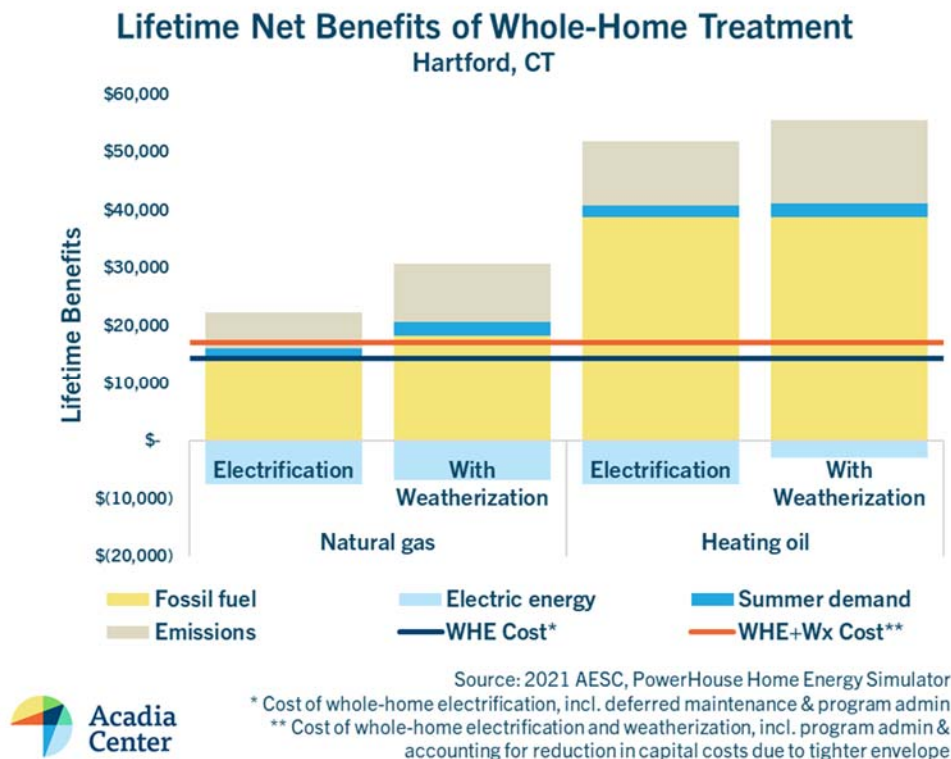


Source: PowerHouse Home Energy Simulator
* Electric and natural gas ratepayers pay a fixed monthly charge. Gas-heated homes pay both of these charges; all other homes only pay the gas charge.

³ These savings estimates depict the annual impacts of a properly installed, whole-home air-source heat pump, with and without weatherization measures like insulation and air sealing. The electric savings columns account for savings at the air conditioning end use—the amount of additional kilowatt-hours used for heating in the winter will therefore exceed the values given in the “kWh” column of this table.

⁴ NMR Group, Inc. “[Single-Family Weatherization Baseline Assessment](#).” June 3, 2014. Page 79.

The experience of energy efficiency incentive programs in other Northeast states—including Maine, Vermont, and Massachusetts—has demonstrated the savings potential of heat pump measures. Based in part on that experience, Acadia Center analysis has shown that whole-home electrification can be a cost-effective efficiency measure for Connecticut, especially when accounting for the avoided cost of greenhouse gas emissions. As the chart below demonstrates, the net lifetime benefits of whole-home electrification and weatherization exceed the costs of these upgrades, even when accounting for program overhead.



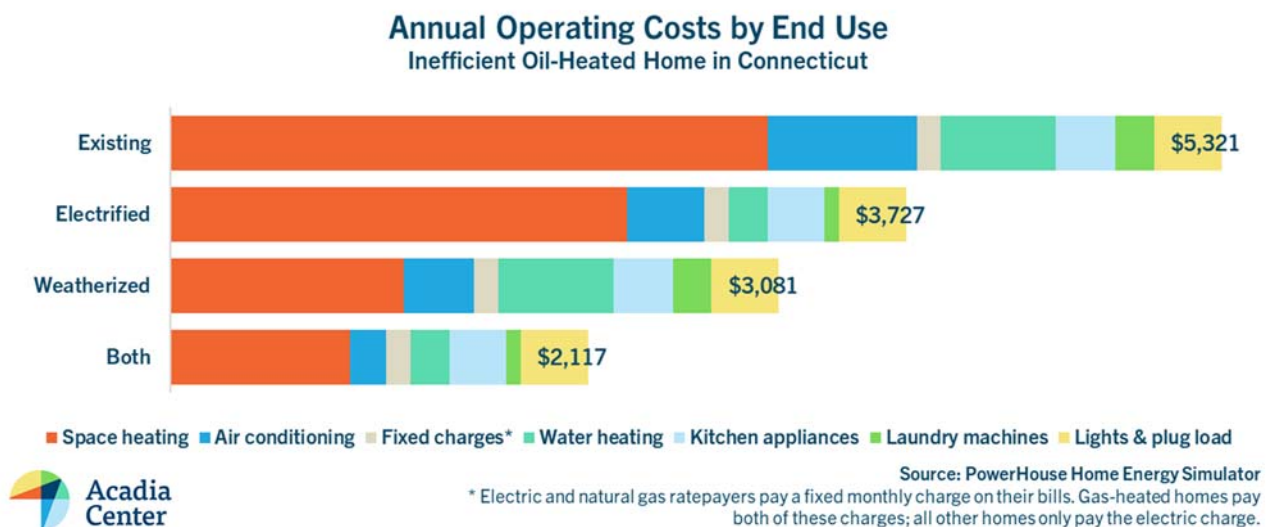
In Connecticut, the primary cost-effectiveness test is the Utility Cost Test (UCT). This test does not account for environmental benefits, nor does it account for oil or propane savings, in addition to a number of other significant omissions. The C&LM Plan has the potential to deliver significant greenhouse gas reductions in accordance with Connecticut's climate commitments, but by continuing to use the UCT as the programs' determinative test, Connecticut's PAs, DEEP, and PURA are making it harder to achieve this alignment. Because energy efficiency is one of the least expensive ways to reduce emissions, failing to account for emissions in the test may also increase the cost of complying with the state's own climate goals.

Acadia Center recommends that state agencies and efficiency PAs instead adopt the Total Resource Cost Test (TRC)—already in use as a secondary test in Connecticut—as the programs' primary cost-effectiveness test, and account for the social cost of carbon in the test.

Weatherization can compound energy savings

Weatherization upgrades like insulation and air sealing are crucial to Connecticut’s ability to meet its greenhouse gas reduction commitments. Not only does weatherization conserve energy in its own right, but it also makes building electrification easier and less expensive. These building upgrades fit comfortably within Connecticut’s existing programs. Doubling down on them will pay dividends for the programs during the 2022-24 Plan term.

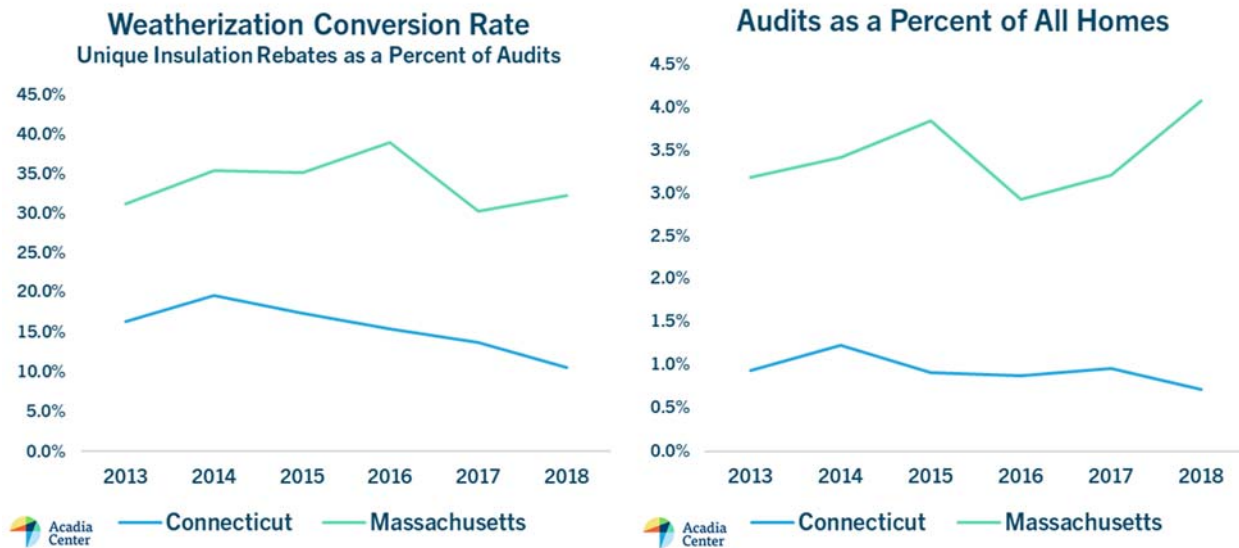
Not every home is the same: EIA data shows that less than a quarter of residences in New England generate half the region’s residential emissions.⁵ Segmenting and targeting these super-emitting homes represents an opportunity for Connecticut to attain near-term greenhouse gas emissions reduction in the residential sector while increasing savings, benefits, and participant bill reductions immediately, as the chart below demonstrates.



The Plan draft identifies pre-weatherization barriers like asbestos, mold, and carbon monoxide as an impediment to the state’s ability to meet its 80% weatherization target by 2030, noting that “more than 165,000 of the 1.38 million single-family and multifamily housing units in Connecticut are considered barriered.” This is indeed a difficult problem which the programs will do well to remediate.

However, weatherization barriers do not exist in Connecticut to a greater degree than they exist elsewhere. Massachusetts—a neighboring state that even shares a PA utility working on energy efficiency with Connecticut—has achieved far greater success in weatherizing its housing stock.

⁵ U.S. Energy Information Administration. 2015 Residential Energy Consumption Survey (RECS).



Between 2013 and 2018, Massachusetts PAs weatherized about 7% of homes in the state. In the same period, Connecticut insulated just 0.9% of its homes. In the 2022-24 Plan term, Connecticut PAs have an opportunity to refocus on this crucial energy conservation and greenhouse gas mitigation measure category.

While pre-weatherization barriers are a serious problem, they do not explain Connecticut’s low rate of uptake for weatherization measures. Acadia Center recommends that the PAs assess the reasons for this shortfall and invest meaningfully in ramping up the program’s conversion rate for insulation measures.

Environmental Justice and Equal Access

PAs must address inequitable access to efficiency services

Energy efficiency programs in Connecticut have not delivered services adequately across all income levels and communities. People living in low- and moderate-income (LMI) communities and those living in environmental justice communities face the worst impacts of climate change and poor housing quality but face unequal access to benefits under existing efficiency programs. The fact that a significant portion of home energy audits are rejected because of health and safety barriers means that those who need energy efficiency services the most are not those who actually receive them.

In 2020, the Massachusetts energy efficiency PAs commissioned several non-participant studies, which highlighted the disparities in access to efficiency services.⁶ Although similar studies have not yet been completed for Connecticut, we can still draw lessons from the Massachusetts studies that are relevant for Connecticut. The studies found that

⁶ See *Residential Nonparticipant Customer Profile Study*, DNV GL (February 2020), https://ma-eeac.org/wp-content/uploads/MA19X06-B-RESNONPART_Report_FINAL_v20200228.pdf and *Residential Nonparticipant Market Characterization and Barriers Study*, Navigant, Illume, and Cadeo (February 2020), https://ma-eeac.org/wp-content/uploads/MA19R04-A-NP-Nonpart-MarketBarriersStudy_Final.pdf

non-participant groups disproportionately include LMI households, renters, and limited English-speaking households.

Acadia Center recommends that PAs prioritize the treatment of buildings occupied by populations that are traditionally the most underserved (including rural, LMI, renters, and non-English speakers) and adopt new ways of engaging these households.

- **Expand public outreach efforts to make information more accessible.** Outreach materials should be in multiple languages and PAs should explore new channels to reach underserved customers. Increased and more targeted guidance from the Energy Efficiency Board (EEB), along with utilities, energy efficiency professionals, local governments, NGOs, and others can make energy efficiency improvements more understandable, accessible, and easily implemented by both homeowners and businesspeople. The EEB can be helpful for consumers working through the available information about upfront costs, how to choose a contractor, quotes and pricing, available incentives, and resulting energy cost savings. Acadia Center supports more marketing and education to consumers to help build a foundation of common knowledge that leads to greater public acceptance and adoption of energy efficiency programs. Broadly, Connecticut must make available new sources of funding for finding and engaging LMI households, rural households, renters, and households with limited English.
- **Expand program offerings to put greater emphasis on marginalized communities and whole-home customer residential measures.** PAs must develop, market, and implement programs that markedly reduce energy burdens and make Connecticut's housing more affordable, safe, and healthy for all people—especially LMI households and people living in environmental justice communities—through a comprehensive approach to new and existing homes. It is particularly important to dramatically accelerate low-income weatherization programs to tighten up leaky homes—which are also often unsafe and unhealthy—and reduce customers' energy burden by transitioning to clean, cost-effective heating and cooling systems that rely on renewable electricity.
- **Prioritize programs that deliver energy efficiency benefits to communities that face disproportionate environmental and energy burdens but have faced barriers in accessing programs to date.** LMI households, people of color, rural, and English-isolated families tend to live in older and draftier housing units with higher heating bills. These buildings have the greatest potential for energy bill savings and emissions reduction, but they are occupied by the people who can least afford to shoulder the cost of energy upgrades.
- **Reform cost-effectiveness tests to fully account for the health and safety benefits of energy efficiency.** Today, cost-effectiveness testing prioritizes energy efficiency investments that deliver nearer-term savings, limiting treatment of older buildings that are more expensive to retrofit. Current benefit-cost test methodologies must evolve in order to address deep building retrofits and to fully account for benefits including thermal comfort, health, safety, and emissions, in addition to bill savings. By doing so, efficiency programs can better address buildings in communities that have been underserved to date. Over 10% of adults and just under 10% of children in Connecticut have asthma, both higher than the

national average.⁷ Asthma is one of the main reasons for missing school and work, imposing significant health and lost productivity costs on Connecticut's residents. By valuing the non-energy benefits that energy efficiency provides and the role it can play in alleviating health and safety burdens, PAs can help Connecticut residents save money and improve the health and comfort of the state's most vulnerable citizens.

Aligning Efficiency with State Climate Commitments

Deeper Savings Mean More GHG Reduction

Fuel combustion in buildings accounts for nearly a third of Connecticut's annual emissions. Public Act 18-82 requires that by January 1, 2030, Connecticut will have reduced its greenhouse gas (GHG) emissions by 45% relative to 2001 levels. By 2050, the state must reduce GHG emissions to at least 80% below 2001 levels. Connecticut is a national leader in energy efficiency, but far more must be done to improve the efficiency of our homes and businesses and to ensure that all communities reap the full benefits of energy efficiency. The state has an opportunity to elevate energy efficiency programs as a key tool for reducing emissions, including through improved electrification efforts and more weatherization jobs.

Deep energy efficiency savings paired with beneficial electrification are critical to meeting Connecticut's climate goals. However, the lack of a direct link between the state's emission reduction goals and the energy savings goals outlined in the C&LM Plan hinders Connecticut's ability to achieve these goals. An increased focus on deep retrofits is necessary to significantly reduce energy consumption and associated emissions in line with state targets. As PAs transition toward a focus on non-lighting energy savings, a more robust focus on whole-home weatherization, appliance replacement, and efficient home and commercial heating and cooling options will be necessary to achieve the state's climate targets. Now is the time to provide support for measures that significantly increase ratepayer benefits and allow for whole-home treatment instead of siloed solutions.

C&LM Plan records show that the program only conducted 12,725 home energy audits in 2020, resulting in 1,764 rebates for insulation and 35 for window replacement.⁸ By contrast, there are 1.4 million housing units in Connecticut, more than 70% of which were built before the state adopted its first building energy code. At the current rate, it would take centuries to weatherize all the buildings in Connecticut that could benefit from weatherization. Acadia Center recommends a renewed focus on whole-home energy efficiency starting in the 2022-2024 C&LM Plan. This will not only save money for residents across the state and ultimately lower the cost of building electrification, but also result in substantial emissions reductions.

Equity Focus and Targeting the Least Efficient Homes Means More GHG Reduction

Marginalized communities including low- and moderate-income households, people of color, and English-isolated families tend to live in older and draftier housing units with higher heating bills. Both poor insulation and indoor pollution from heating and cooling systems negatively impact health, leaving residents, especially in poorly

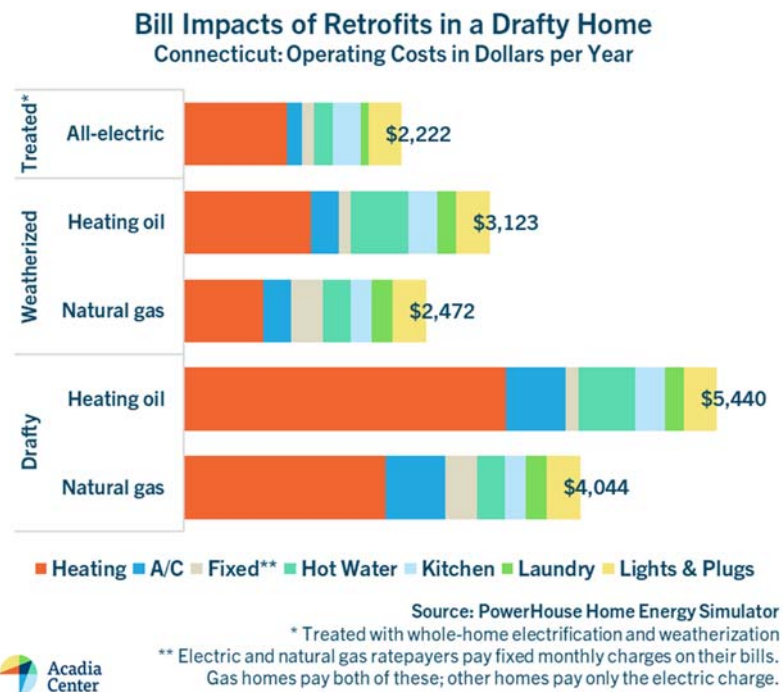
⁷ <https://portal.ct.gov/dph/Health-Education-Management--Surveillance/Asthma/Asthma-Program>

⁸ Connecticut Statewide Energy Efficiency Dashboard, <https://www.ctenergydashboard.com/Public/PublicHESActivity.aspx> (Accessed February 9, 2021).

ventilated buildings, vulnerable to toxic pollutants. These buildings have the greatest potential for energy bill savings, positive health impacts, and emissions reduction, but they are occupied by the people who can least afford to shoulder the cost of energy upgrades. A detailed on-site study of the energy impacts of efficiency upgrades in low-quality housing could reveal important information about efficiency challenges in this market segment, which would help the PAs claim greater savings commensurate with the greater difficulty of reaching and serving these ratepayers. As it pertains to buildings, a commitment to equity overlaps to a significant degree with a commitment to greenhouse gas mitigation. This is due to a confluence of factors related to the state's building stock and demographics:

- Connecticut's building stock is old. Nearly 70% of housing units in Connecticut were built before the 1970s when the first building energy code was adopted, and many have not been renovated since.
- Less affluent people are more likely to live in older units. About 78% of households that receive Medicaid or similar federal assistance live in a unit that was built before 1980, compared to 67% of households that do not receive assistance.
- Less affluent households pay more of their income toward housing costs. Rent represents, on average, 30% of household income for households receiving assistance, but just 7% for other households.
- People of color represent 21% of Connecticut's population but 38% of people living in rentals and 36% of people receiving assistance.

Targeting old, ultra-inefficient units for weatherization and electrification will lead to a huge reduction in emissions and energy burden. Slight revisions in the design of C&LM programs to segment out and pursue potential participants in these buildings could be accomplished within the existing program framework, to the benefit of both consumers and the programs themselves. Not all environmental justice communities live in substandard housing, and not all occupants of substandard housing are considered part of an environmental justice community. But for the 26% of people of color in Connecticut who both receive federal assistance and live in an old housing unit, the same efficiency measures can dramatically reduce both energy burden and emissions.



Acadia Center analysis shows that whole-home electrification and weatherization upgrades in older, draftier housing units can cut energy bills by up to 59% while reducing emissions by 75% or more. Meeting Connecticut's climate targets will undoubtedly require policies and programs that specifically target these units with increased attention and funding. Targeting electrification of housing in environmental justice communities will also protect those ratepayers from having to bear the substantial cost of stranded assets on the gas distribution system, in the event that rising demand for clean power leads to an exodus of gas customers.

Conclusion

Acadia Center thanks Connecticut's energy efficiency PAs for their work in delivering this crucially important resource, and we look forward to an opportunity to review additional Plan data.

Sincerely,

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