



Empowering you to make
smart energy choices

Overcoming Weatherization Barriers

An overview of programs working to mitigate barriers to home weatherization projects

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CT Weatherization Barriers Workshop, November 18, 2020

What is “weatherization”?

- This is not the state’s official definition of “weatherized”, which is a different statutory issue
- Wikipedia:
 - Weatherization is the practice of protecting a building and its interior from the elements
- Upgrading the energy performance of buildings through measures such as:
 - Air-sealing
 - Insulation
 - Window treatments or replacement
 - Duct sealing
 - Tuning and repairing HVAC

What are the benefits of weatherization?

- Saves energy
- Saves money on bills
- Makes a home more comfortable
- Reduces wear and tear on HVAC equipment
- Environmentally friendly
- Keeps occupants healthier
- Increases a home's value
- Supports the local economy

What are weatherization barriers?

- Weatherization barriers preclude upgrading the energy efficiency of buildings due to health, safety and structural concerns
- Common barriers include:
 - Asbestos
 - Knob and tube wiring
 - Vermiculite insulation
 - Mold
 - Lead
 - Structural concerns
 - Venting and combustion safety
 - Gas leaks
 - Carbon monoxide

Asbestos, Knob and Tube Wiring



Boiler wrapped in asbestos insulation
Picture from *Expanded HEAT Loan Initiative Report*,
December 2015, E4TheFuture.



Close-up of typical ceramic "knob" circa 1925.

Picture from *Expanded HEAT Loan Initiative Report*, December 2015, E4TheFuture.

Vermiculite Attic Insulation



<https://www.zonoliteatticinsulation.com/S/Photos>

Mold, Lead Paint



<https://blackmoldcontrol.com/basement/>



<https://tristatecontractingsolutions.com/lead-paint-removal/>

Structural Concerns, Combustion Venting



<http://ctcoastalconstruction.com/services/sillrepair/>



<https://www.startribune.com/water-heater-backdrafting-how-to-test-for-proper-draft/571757672/>

Carbon Monoxide, Gas Leaks



<https://www.news-medical.net/health/Carbon-Monoxide-Poisoning.aspx>



<https://diy.stackexchange.com/>

Weatherization Barrier Costs

Barrier	Number of Homes	Cost Range	Average
Asbestos	17	\$4,299 - \$31,908	\$14,721
Mold	13	\$11,305 - \$35,575	\$23,886
Vermiculite	10	\$3,318 - \$38,114	\$20,167
Asbestos/Mold	4	\$10,917 - \$58,670	\$35,237
Asbestos/Mold/Pests	1	\$40,426	\$40,426
Vermiculite/Mold	2	\$13,997 - \$15,910	\$14,954
Asbestos/Pests	2	\$16,025 - \$30,042	\$23,034
Mold/Pests	1	\$25,729	\$25,729
Total	50	\$3,318 - \$58,670	\$20,910

Data Source: 2016 - 2019 Clean Energy Healthy Homes Initiative Projects that have been completed for remediation.

Prior CT Efforts & Opportunities

- Northeast Utilities-NSTAR merger funds (\$1.5 million)
 - “Clean Energy Healthy Homes Initiative”
- ARRA funds (\$3 million)
 - CT Energy and Healthy Homes Initiative (CT Children’s Medical Center & Utilities)
- Green & Healthy Homes Initiative (CT Green Bank)
- Dept. of Economic Community Development
- Operation Fuel’s Home Systems Repair and Replacement Program
- DSS/LIHEAP
- Weatherization Assistance Program
- Etc.



Deferral Rates for CT Weatherization Work

- Barriers result in home weatherization deferrals
- Homes barred from weatherization in CT (2017-2019):
 - 9% of Home Energy Solutions (HES)
 - 23% of HES-Income Eligible (IE)
- Of CT's 1.38 million housing units:
 - 21% (or 290,000 homes) are IE-Eligible
 - 67,000 barred homes
 - 79% (or 1.09 million homes) are market-rate
 - 98,000 barred homes
 - ***Total of 165,000 barred homes in CT that will need help***

CT Utility Weatherization Program Plans

- HES & HES-IE in 2021: **42,656** homes will be served

2021	Eversource	United Illuminating	Total
HES	18,676	3,194	21,870
HES-IE	17,958	2,828	20,786
Total	36,634	6,022	42,656

Connecticut Programs

- CT Green Bank
 - Smart E-Loan
 - Energize CT Health & Safety Revolving Loan Fund
 - Loans Improving Multifamily Efficiency (LIME) Loan
 - Navigator Pre-Development Loan
- Home Energy Solutions- Income Eligible (HES-IE)
- Connecticut Children's Hospital Healthy Homes
- One Touch Referral Tool

United States

- Zonolite Attic Insulation Trust
- Low-Income Home Energy Assistance Program (LIHEAP)
 - Administered by CT Dept. of Social Services (DSS)
- Weatherization Assistance Program (WAP)
 - Administered by CT DEEP

Other State Weatherization Barrier Efforts

- Delaware
 - Pre-Weatherization Program
- Massachusetts
 - Mass Save LEAN
 - HEAT Loan
 - Barrier Mitigation Grant
 - Home Energy Assessment
- Rhode Island
 - Double Green Loan
 - HEAT Loan
 - Weatherization Barrier Incentive
- New York
 - EmPower New York
 - Assisted Home Performance with ENERGY STAR
 - Green Jobs Green NY
 - Healthy Homes Pilots
- Vermont
 - Home Energy Loan
 - Healthy Homes Pilots
 - One Touch Referral Program

Lessons Learned

- A huge potential for collaboration exists between weatherization efforts and medical community
- LIHEAP funds (DSS) generally have greater flexibility than WAP funds when addressing weatherization barriers
 - Flexibility varies significantly depending on how the state agency administering LIHEAP develops the LIHEAP State Plan
- There are many available resources but an overall lack of coordination
 - How can we streamline and coordinate all available resources for contractors and households to take advantage of them?



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Appendix / Details

Connecticut Programs

- Smart E-Loan
- Energize CT Health & Safety Revolving Loan Fund
- LIME Loan
- Navigator Pre-Development Loan
- Home Energy Solutions- Income Eligible (HES-IE)
- Connecticut Children's Hospital Healthy Homes
- One Touch Referral Program

Connecticut: Smart-E Loan

Provides financing for home energy improvements

- **Barriers/ Amount Covered:** 25% can go to lead removal, knob and tube wiring, electric upgrades; Up to \$25,000 can go to asbestos or mold remediation
- **Eligibility:** Must be owner-occupied; Must be a 1- to 4- unit residential building
- **Program administrator:** Administered by CT Green Bank in partnership with Energize CT

Energize CT Health & Safety Revolving Loan Fund

Allows owners of multifamily housing, primarily low-income residents, to remediate health and safety issues that will enable energy improvements

- **Amount:** Loans from \$10,000 to \$300,000
- **Eligibility:** Multifamily properties (5+ units); At least 60% of the units serve low-income residents (households with incomes at 80% of AMI or less)
- **Program administrator:** Administered by Inclusive Property on behalf of CT Green Bank in partnership with Energize CT
- **Barriers covered:** Most all energy-related health and safety measures

Connecticut: Loans Improving Multifamily Efficiency (LIME) Loan

Enables multifamily buildings with 5+ units to make energy improvements

- **Amount:** 25% can go to barrier mitigation
- **Eligibility:** Multifamily properties (5+ units); at least 60% of the units serve low-income residents (households with incomes at 80% of AMI or less)
- **Program administrator:** Administered by CT Green Bank in partnership with Capital for Change
- **Barriers covered:** Most all energy-related health and safety measures

Connecticut: Navigator Pre-Development Loan

Allows for customized analysis and design of energy improvements for multifamily properties

- **Amount:** Up to \$250,000
- **Eligibility:** Multifamily properties (5+ units)
- **Program administrator:** Administered by CT Green Bank in partnership with Energize CT
- **Barriers covered:** Identification of project health and safety needs

Connecticut: Home Energy Solutions- Income Eligible (HES-IE)

HES-IE is a program offered for income-eligible customers that provides both gas and electric measures for single-family and 1-4-unit buildings

- **Amount:** No specific amount of funding; Utilities ask vendors to submit the cost of weatherization barriers with their add-on measure proposals if cost effective
- **Eligibility:** Must meet income eligibility requirements
- **Program administrator:** Eversource CT and United Illuminating
- **Barriers covered:** Minor fixes such as knob-and-tube wiring and ventilation

Connecticut Children's Hospital Healthy Homes

Provides energy assessment and remediation of lead hazards and other health and safety hazards for income-qualified homes

- **Amount:** \$5,000 available to make homes safe & healthy
 - Funding for lead hazards: sliding scale
- **Eligibility:** Must be private property owner
 - HUD funding- 80% of AMI
 - DOH funding- 120% poverty line
- **Program administrator:** Connecticut Children's Hospital
- **Barriers covered:** Most health and safety measures covered (a focus on lead hazards)

Connecticut: One Touch Referral Program

Available statewide in Vermont; now being used in Hartford, CT and Waterbury, CT. Connects HES-IE households with resources and services to help them address issues preventing energy work

- **Service:** Electronic referral program that connects health, energy, and housing home visiting and repair programs
- **Eligibility:** HES-IE households
- **Program administrator:** Tohn Environmental Strategies LLC
- **Barriers covered:** Most health and safety measures covered

Delaware

Pre-Weatherization Program helps low-income families prepare their homes to meet the requirements of the State of Delaware's Weatherization Assistance Program

- **Amount:** Covers cost of barrier removal
- **Eligibility:** Low-income households deferred from state weatherization assistance program
- **Program administrator:** Energize Delaware
- **Barriers covered:** Structural: loose flooring, roof leaks, doors and windows, faulty wiring

Massachusetts

- Mass Save LEAN
- HEAT Loan
- Barrier Mitigation Grant
- Home Energy Assessment

Mass Save Low-Income Energy Affordability Network (LEAN)

Addresses all structural and weatherization barriers in homes. LEAN is the association of the Massachusetts non-profit agencies that deliver the WAP program

- **Amount:** Covers the cost of barrier mitigation
- **Eligibility:** Low-income households
- **Program administrator:** Mass Save
- **Barriers covered:** All weatherization barriers

Mass Save HEAT Loan

Mass Save HEAT loans are no-interest loans are available for home energy efficiency improvements

- **Amount/ Barriers covered:**
 - Knob and tube wiring; Vermiculite- up to \$10,000
 - Mold abatement- up to \$4,000
 - Structural concerns; Combustion safety- up to \$1,000
- **Eligibility:** Must be accompanied by weatherization work
- **Program administrator:** Mass Save

Mass Save Barrier Mitigation Grant

Grants for moderate-income customers of Mass Save who have barriers to completing weatherization or heating upgrades

- **Amount/Barriers covered:**
 - Knob and tube wiring; Vermiculite- up to \$7,000
 - Asbestos- up to \$4,000
- **Eligibility:** Moderate-income customers (must be income verified by their local CAP)
- **Program administrator:** Mass Save

Mass Save Home Energy Assessment

Home energy audits for homeowners, which includes referrals for weatherization barriers.

- **Service:** Home assessment + referral program
- **Eligibility:** Customers must live in a 1-4-unit home
- **Program administrator:** Mass Save
- **Barriers covered:** Combustion safety and knob and tube wiring

New York

- EmPower New York
- Assisted Home Performance with ENERGY STAR
- Green Jobs Green NY
- Healthy Homes Pilots

EmPower New York

Provides no-cost energy efficiency solutions to low-income households

- **Service:** Home energy assessment and measure installations; covers costs of service
- **Eligibility:** Available to households <60% AMI, includes homeowners and renters.
- **Program administrator:** NYSERDA
- **Barriers covered:** Health and safety measures, including combustion safety testing, bathroom venting, bath fans, dryer vents, chimney liners, moisture barriers, and others on case-by-case basis

New York: Assisted Home Performance with ENERGY STAR

Provides a discount to the cost of home energy efficiency improvements to those who qualify

- **Amount:** Discount covering 50% of energy efficiency improvement costs up to \$5,000 for single-family and up to \$10,000 for 2-4-unit residential homes
- **Eligibility:** Available to <60-80% AMI households
- **Program administrator:** NYSERDA
- **Barriers covered:** Combustion safety testing, bathroom venting required during shell improvement

Green Jobs Green NY Loan Fund

Finances energy audits and energy efficiency retrofits or improvements for owners of residential 1-4 family buildings

- **Amount:** Loans allow for up to 50% of ancillary health and safety measures
- **Eligibility:** Owners of residential 1-4 family buildings
- **Program administrator:** NYSERDA
- **Barriers covered:** Health and safety measures, including asbestos removal, roof repair, and venting

New York: Healthy Homes Value-Based Payment Pilot

Combines energy efficiency/weatherization measures with in-unit measures aimed at addressing respiratory conditions and home injury hazards

- **Service:** Managed care organizations fund residential healthy home interventions. This includes home assessment and measure installation
- **Eligibility:** Medicaid members residing in high asthma burden region of New York State; at least one resident age 0-17 with poorly-controlled asthma
- **Program administrator:** NYSERDA
- **Barriers covered:** Health and safety repairs

Rhode Island

- Double Green Loan
- HEAT Loan
- Weatherization Barrier Incentive

Rhode Island: Double Green Loan

Helps to finance measures that make homes more energy-efficient and safe. Also available in Massachusetts

- **Amount:** Loans range from \$500 to \$25,000
- **Eligibility:** Serves moderate-to-middle income homeowners with less-than-perfect credit
- **Program administrator:** Capital Good Fund in partnership with National Grid
- **Barriers covered:** Removal of knob-and-tube wiring

Rhode Island: HEAT Loan

HEAT Loan is designed to promote the installation of high efficiency improvements

- **Amount/ Barriers covered:**
 - Knob and tube wiring; vermiculite- up to \$10,000
 - Asbestos; mold abatement- up to \$4,000
 - Structural concerns; combustion safety- up to \$1,000
- **Eligibility:** Must be participating in National Grid's EnergyWise Home Energy Assessment Program and must be an owner of a 1-4 family home
- **Program administrator:** National Grid

Rhode Island: Weatherization Barrier Incentive

This incentive is offered to a customer if a weatherization barrier has been identified during a home assessment

- **Amount:** Up to \$250 is available for barrier mitigation
- **Eligibility:** Must be participating in National Grid's EnergyWise Home Energy Assessment Program and must be a resident or owner of a 1-4 family home
- **Program administrator:** National Grid
- **Barriers covered:** Knob and tube wiring, ventilation, mechanical systems (draft failure, carbon monoxide)

Vermont

- Home Energy Loan
- Healthy Homes Pilots
- One Touch Referral Program

Vermont: Home Energy Loan

Provides financing for home energy projects for low- and moderate- income Vermonters

- **Amount:** Loans up to \$40,000; health and safety repairs can be up to 50% of the total loan amount
- **Eligibility:** Low- and moderate- income households
- **Program administrator:** Efficiency VT
- **Barriers covered:** Health and safety measures

Vermont: Healthy Homes Pilots

Pilots aim to improve housing and indoor air quality for customers with health risks

- **Service:** Pilots are a combination of home repair measures and in-home patient education on energy and self-managed care practices
- **Eligibility:** Customers with respiratory illnesses or in-home fall hazards
- **Program administrator:** Efficiency Vermont
- **Barriers covered:** Health and safety repairs

Vermont: One Touch Referral Program

Also being used in Hartford, CT and Waterbury, CT. Connects low-income households with resources and services to help address issues preventing energy work

- **Service:** Electronic referral program that connects health, energy, and housing home visiting and repair programs
- **Eligibility:** All single-family low-income weatherization jobs use One Touch
- **Program administrator:** Tohn Environmental Strategies LLC
- **Barriers covered:** Most health and safety measures covered

United States

- Zonolite Attic Insulation Trust
- Low-Income Home Energy Assistance Program (LIHEAP)
- Weatherization Assistance Program (WAP)

Zonolite Attic Insulation Trust

Reimburses homeowners a portion of cost to remove or contain Zonolite brand of vermiculite attic insulation

- **Amount:** Provides a reimbursement contribution of up to 55% of the abatement cost
- **Eligibility:** Homeowners with Zonolite brand of vermiculite attic insulation
- **Program administrator:** Zonolite Attic Insulation Trust
- **Barriers covered:** Zonolite brand of vermiculite attic insulation

Low-Income Home Energy Assistance Program (LIHEAP)

Assists households with low incomes in meeting their immediate home energy needs

- **Amount:** States can allocate up to 15% of their LIHEAP grant to deliver weatherization services. Each state spends different amounts of their LIHEAP funds on weatherization assistance
- **Eligibility:** Low-income households; must qualify with local LIHEAP office
- **Program administrator:** US Department of Health and Human Services
- **Barriers covered:** Health and safety measures

Weatherization Assistance Program (WAP)

Provides low-income households with weatherization assistance

- **Amount:** Provides energy audit, scope of work, and weatherization work; covers cost of process
- **Eligibility:** Low-income households (DOE guidelines: at or below 200% poverty income guidelines)
- **Program administrator:** US Department of Energy
- **Barriers covered:** DOE WAP has specific guidelines for what is covered. Examples include combustion appliance safety testing, repair or replacement of vent systems, and evaluate mold and moisture hazards

Recommendations

- Increase availability of WAP funds beyond \$1,000 limit if utility or state funds are available to complete weatherization
- If WAP funds can be used for weatherization, use utility or public funds for barrier mitigation
- Cost effectiveness calculations should be allowed on a program or sector basis, not on a house-by-house or measure-by-measure basis
- When funds are shared for barrier mitigation, all programs should get credit for the savings

Recommendations (cont.)

- Health care institutions that treat patients with illnesses such as asthma or COPD should have an explicit referral system to weatherization programs to encourage building improvements
- Upon calculation of decreased admissions for those illnesses, health care industry should provide financial support for the work done in those homes
- Cost effectiveness calculations should include monetization of health benefits
 - Massachusetts includes a \$700 monetized benefit per low-income household that receives services
- Coordination across programs is critical in accessing and leveraging all possible resources in order to maximize weatherization efforts
- One possible solution may be the One Touch Referral Tool for energy and health and safety referrals