Overcoming Weatherization Barriers
An overview of programs working to mitigate barriers to home weatherization projects

Richard Faesy
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

Before

After

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://diy.stackexchange.com/
## Weatherization Barrier Costs

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Number of Homes</th>
<th>Cost Range</th>
<th>Average</th>
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<tbody>
<tr>
<td>Asbestos</td>
<td>17</td>
<td>$4,299 - $31,908</td>
<td>$14,721</td>
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<tr>
<td>Mold</td>
<td>13</td>
<td>$11,305 - $35,575</td>
<td>$23,886</td>
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<tr>
<td>Vermiculite</td>
<td>10</td>
<td>$3,318 - $38,114</td>
<td>$20,167</td>
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<tr>
<td>Asbestos/Mold</td>
<td>4</td>
<td>$10,917 - $58,670</td>
<td>$35,237</td>
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<tr>
<td>Asbestos/Mold/Pests</td>
<td>1</td>
<td>$40,426</td>
<td>$40,426</td>
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<tr>
<td>Vermiculite/Mold</td>
<td>2</td>
<td>$13,997 - $15,910</td>
<td>$14,954</td>
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<tr>
<td>Asbestos/Pests</td>
<td>2</td>
<td>$16,025 - $30,042</td>
<td>$23,034</td>
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<tr>
<td>Mold/Pests</td>
<td>1</td>
<td>$25,729</td>
<td>$25,729</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>50</strong></td>
<td><strong>$3,318 - $58,670</strong></td>
<td><strong>$20,910</strong></td>
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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 barriered homes
  - 79% (or 1.09 million homes) are market-rate
    - 98,000 barriered homes
  - Total of 165,000 barriered homes in CT that will need help
CT Utility Weatherization Program Plans

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

<table>
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<tr>
<th></th>
<th>Eversource</th>
<th>United Illuminating</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>HES</td>
<td>18,676</td>
<td>3,194</td>
<td>21,870</td>
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<tr>
<td>HES-IE</td>
<td>17,958</td>
<td>2,828</td>
<td>20,786</td>
</tr>
<tr>
<td>Total</td>
<td>36,634</td>
<td>6,022</td>
<td>42,656</td>
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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?
Richard Faesy
PRINCIPAL

@ rfaesy@energyfuturesgroup.com
(802) 482-2812
energyfuturesgroup.com
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- 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
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