

Expanded HEAT Loan Initiative

Mid-Program Review,
Analysis and Recommendations

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Expanded HEAT Loan Initiative Mid-Program Review

Introduction

The Commonwealth of Massachusetts is widely acknowledged as a national leader in residential energy efficiency implementation. The Mass Save® Home Energy Services Program is a highly successful and long-running initiative providing a wide range of energy efficiency services to help residents manage energy use and related costs.

Massachusetts has been faced with a “double” dilemma: 1) how to fill the gap when a homeowner’s desire to improve their home cannot be met by a standard program offering because characteristics of the home do not meet safety or infrastructure prerequisites; and 2) how to serve a small fraction of homes that, due to these characteristics and their need for extra attention, do not meet the program sponsors’ cost-effectiveness requirements?

The Expanded Energy Efficiency Financial Incentive (marketed as the Expanded HEAT Loan Initiative) was developed in 2014 to encourage residential energy efficient upgrades by expanding the existing residential loan program funded by Mass Save’s gas and electric utility and energy efficiency service provider Program Administrators (PAs). The Mass Save HEAT Loan Program is a 0% financing program for energy efficiency improvements that has been in operation since 2006.

The Expanded HEAT Loan Initiative’s main focus addresses several major barriers that exist in the Mass Save Home Energy Services Program for the installation of energy saving improvements such as heating systems and weatherization work. The Massachusetts Department of Energy Resources (DOER) requested a waiver from the U.S. Department of Energy (DOE) to fund this unique initiative to help Massachusetts resolve some specific barriers found in customer’s homes and to learn from the process of solving these problems while serving older housing stock.

The foundational Mass Save program provides generous resources to incentivize the installation of energy efficiency improvements in customer houses. This Expanded HEAT Loan Initiative helps the Mass Save program install more energy efficiency improvements in a difficult segment of the housing stock.

Given the ongoing success of the Mass Save HEAT Loan Program, this initiative leveraged the outreach and delivery infrastructure of the existing Mass Save Home Energy Services Program. The majority of the funds for this initiative are targeted to remove barriers to the installation of

*... Massachusetts
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energy efficient improvements caused by the presence of asbestos and/or knob and tube wiring in customers' homes.

Management and Funding

The Expanded HEAT Loan Initiative is managed by the Massachusetts Department of Energy Resources (DOER) distributed via the Massachusetts Clean Energy Center. Its primary source of funding originated as reprogrammed resources from the U.S. DOE / American Recovery and Reinvestment Act of 2009 (ARRA): \$3.8 million was dedicated for this program.

... remove barriers to the installation of energy efficient improvements caused by the presence of asbestos and/or knob and tube wiring.

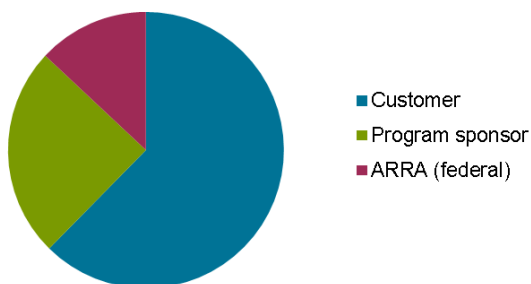
Analysis & Recommendations

This status report focuses on measure types new to Massachusetts energy efficiency programs such as barrier mitigation (knob and tube wiring removal, asbestos removal) and interest buy-down (biomass wood pellet boilers, deep energy retrofits, expanded 2-4 family loans). It includes analysis and lessons learned to date. Because it is a mid-program analysis, the report's recommendations center primarily around potential ongoing program scope improvements.

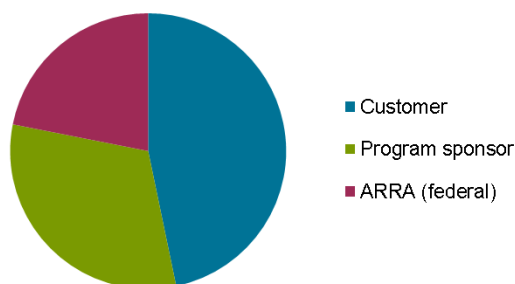
Impact

The power of leveraged funding combined with foundational program operations and technologies has made hundreds of positive outcomes possible in the Commonwealth of Massachusetts. In just 18 months, the Expanded HEAT Loan Initiative enabled 730 homeowners to improve the performance of their dwellings—all of which would not have been feasible without this initiative.

Avg. \$ Contribution: Asbestos
Abatement & EE Improvements Installed



Avg. \$ Contribution: Knob & Tube
Mitigation and EE Improvements Installed



Business Overview

The Massachusetts Department of Energy Resources leveraged the existing loan program infrastructure (the Mass Save® Residential HEAT Loan Program), and integrated the expanded program offerings into the existing program.

Energy Federation Inc. (EFI) is the contract holder for the Expanded HEAT Loan Initiative, managing and processing interest buy down payments to lending institutions and distributing barrier mitigation incentives to customers.

Conservation Services Group (CSG) was selected as subcontractor to assist in developing the scope of work, program forms and collateral, and to market the program to targeted consumers and contractors. The Mass Save Residential HEAT Loan administrators (CSG, RISE, and Unitil) have been subcontractors to EFI fulfilling the delivery of the Expanded HEAT Loan Initiative to customers. As of July 2015 the services performed by CSG are fulfilled by CLEAResult, following the company's acquisition of CSG's assets and brand.

Target Segments

The Expanded HEAT Loan Initiative is used to fund the energy efficiency projects described below. Funds can be used to buy down the interest on loans or to pay incentives for barrier mitigation.

Barrier mitigation

Two prevalent pre-existing conditions in older homes have been identified as barriers to getting major energy efficiency upgrades made in homes that have received Mass Save Home Energy Services Assessments. These barriers are *knob and tube (K & T) electrical wiring* and *asbestos insulation on old heating systems*.

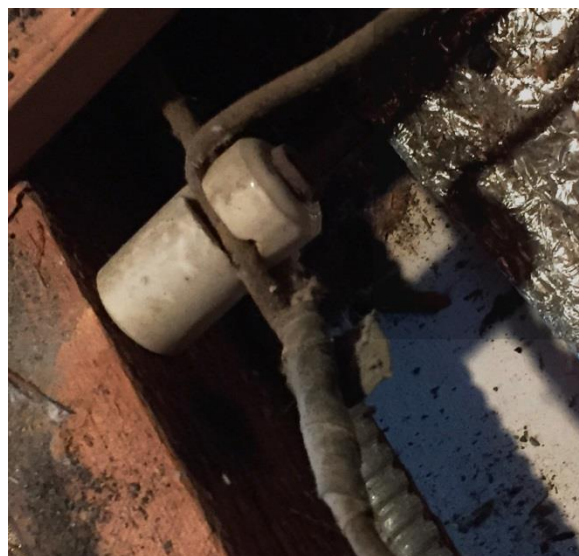
Knob and tube (K & T) electrical wiring

When knob and tube wiring is live, it presents a fire risk to installing wall and attic insulation. K & T wiring is a pre-1950 style of wiring that uses two separate strands of partially insulated wire. These wires are run through ceramic tubes

when passing through wood framing members and held by ceramic knobs when attached to house framing. When electricity passes through the wires, resistance builds up heat that is dissipated into the surrounding air.

The National Electric Code for fire safety forbids the installation of any type of insulation surrounding these wires that would prevent dissipation of this heat.

K & T wiring has to be removed by a licensed electrician prior to insulation or air sealing an area for energy efficiency improvements.



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



(left): Old and newer wiring often co-exist; (right): Location of the knobs in attic indicated by red arrows.

Asbestos insulation abatement

Asbestos insulation wrapping was used in the installation of heating equipment and associated pipework and ducts pre-1973. It requires safe removal by a qualified and licensed asbestos abatement contractor when boilers and furnaces are being replaced.



Examples of asbestos insulation wrapping boilers and associated pipe insulation encapsulation.

Asbestos is a naturally occurring fibrous mineral that was used in many building materials. When asbestos is broken down into powder it forms microscopic razor-sharp particles. When these particles are disturbed they can float in the air and be inhaled. The fibers are known to cause serious and sometimes fatal lung diseases. The Massachusetts Department of Environmental Protection licenses contractors and regulates the removal of asbestos in Massachusetts.

Process

The Expanded HEAT Loan Initiative assists customers participating in the HEAT Loan process by funding some costs of the pre-weatherization barrier mitigation work, so the relevant weatherization or heating system upgrade projects can be safely installed. In order to be eligible for pre-weatherization incentives, the customer must have a signed contractor quote for the mitigation work which will enable weatherization or replacement of a boiler and/or asbestos pipe insulation to be removed.

Customers are eligible for up to:

- \$3,000 for asbestos abatement (maximum incentive).
- \$3,000 for knob and tube (maximum incentive; recently increased from \$2,000).

Neither incentive can exceed 100% of the mitigation costs or 25% of the total project costs.



Other measures offering interest buy down to 0%

The primary goal for the Expanded HEAT Loan Initiative is barrier mitigation necessitated by the presence of knob and tube wiring and/or asbestos, but dialogue with the Massachusetts DOER during the program development stage led to the inclusion of additional energy saving improvements to address other identified needs.

The Initiative offers loans for three additional categories: *Deep Energy Retrofits (DER)*, *biomass wood pellet boilers*, and *2-4 family residences*.

Deep Energy Retrofit/Deeper Energy Savings

The Initiative offers loans for approved DER/DES participants. These programs are operated by the investor-owned utilities assisting customers to install deeper saving measures.

Loan size are net any incentives from the DER/DES initiative performance incentive award

criteria. The maximum loan amount under the program is \$50,000 at 0% interest for eligible homeowners. Measures need to be installed by qualified contractors in existing home renovation projects. Examples of eligible measures include the cost of materials and installation of exterior foam board insulation on walls and roofs, and spray foam insulation in attics.

This improvement category was added to the initiative because it is a leading-edge retrofit that moves the residential program implementation forward toward “zero-energy” houses.

Biomass Wood Pellet Boilers

Renewable energy systems such as clean biomass boilers are not currently incentivized by the Mass Save Home Energy Services Program. MA DOER has a goal of promoting this type of early stage renewable technology in the Commonwealth and recently piloted a rebate program for clean biomass wood pellet boilers.

To continue to support this type of technology, the Expanded HEAT Loan Initiative offers HEAT loans up to \$25,000 for qualified clean biomass boilers. Expanded HEAT Loan funds buy down the interest on these loans.

This category was added to the Initiative to help promote this new technology in Massachusetts.

2-4 Family Residences

The current Mass Save Residential HEAT Loan Program is available to owner-occupied buildings or to non-occupant landlords of 2-4 unit buildings. These funds cannot be used for properties owned by an LLC. Loans are limited to \$25,000 and a maximum term of 7 years.

The Expanded HEAT Loan Initiative doubles the current \$25,000 financing cap to \$50,000. Expanded HEAT Loan Initiative funds cover the incremental interest costs of loans for amounts exceeding \$25,000.

This measure—the Expanded 2-4 Family Loan—expands basic HEAT Loan financing for multi-unit properties. Offering this encourages reluctant landlords to install more energy saving improvements to their rental properties.

Enacted Marketing Strategies

Customers who have had a Mass Save Home Energy Assessment are key targets to receive promotion of barrier mitigation measures; contractors are the primary vehicle for promoting the Initiative's other measures to their customer base.

For examples of marketing materials used, see the Appendix.

Knob & Tube wiring barrier mitigation

The Mass Save Home Energy Assessment visit provides an invaluable opportunity to identify candidates for participation.

- When Energy Specialists find K & T wiring present during the Home Energy Assessment, they educate the customer about the barrier and provide a K & T Intake form.
- Follow-up targeted direct mailings promote the Expanded HEAT Loan Initiative opportunity to customers who were observed to have the K & T barrier.
- Customer email addresses are also leveraged to support outreach efforts, and provide a second touch point to reach target customers.

Asbestos barrier mitigation

The asbestos insulation abatement incentive is promoted in multiple ways:

- Through marketing collateral distributed to inform consumers about the Early Boiler Replacement (EBR) Rebate initiative of the Mass Save Home Energy Services Program.
- Via a direct mailing to heating contractors participating in the Mass Save Residential HEAT Loan Program.
- When Energy Specialists find what appears to be asbestos material on the heating system or pipes as part of the Home Energy Assessment visit, they

discuss the barrier with customers and provide them with an asbestos barrier mitigation intake form.

- Follow-up targeted direct mailings promote the Expanded HEAT Loan Initiative opportunity to customers who were observed to have the barrier.

DER/DES retrofit

- The Deep Energy Retrofit/Deep Energy Savings measure is promoted through the Mass Save Home Energy Services Program contractor base.
- A flier and intake form was developed for contractors to share with their customers.

Biomass wood pellet boilers

Potential customers for this measure are located in specific geographic areas.

- Outreach was conducted to contractors who sell and install these biomass boilers, encouraging them to promote this Expanded HEAT Loan Initiative offer.
- An intake form, flier, and direct mail piece were developed to enable contractors to market this measure to customers.

Expanded 2-4 Family Loan

The Expanded HEAT Loan Initiative assists landlords to complete all work needed on their properties with one loan. (The interest buy down on the initial \$25,000 is paid from the Mass Save Residential HEAT Loan Program. Any additional interest buy down funding for loans from \$25,000 to \$50,000 is provided through the Expanded Heat Loan Initiative).

- Promotion of this measure is done principally by Mass Save Energy Specialists when conducting Home Energy Assessments at 2-4 unit properties.
- The Energy Specialist is provided with a marketing flier to help explain the measure.

- Community groups including Renew Boston promote the program to landlords/owners of 2-4 unit properties in the Boston area.

Results: Barrier Mitigation

The Expanded HEAT Loan Initiative is forecasted to assist over 1400 residential Massachusetts customers with removal of barriers to installing new high efficiency heating systems and completing weatherization work.

Table 1 shows the number of completed barrier mitigations through October 2015.

Table 1. Number of Completed Barrier Removals

	Total
Asbestos	328
Knob & Tube	345

The volume of asbestos abatement jobs has exceeded original projections, which can be attributed to the high volume of heating system replacements stimulated by substantial rebates offered through the Mass Save Early Boiler Replacement Program.

The volume of knob and tube completions has fallen short of original targets. One possible reason is the incentive level was not high enough to motivate customers on more expensive knob and tube wiring mitigation.

Table 2. Barrier Mitigation Total Costs (through September 2015)

	Total	Av. Costs	Range
Asbestos	\$689,404	\$2,290	\$500-11,048
Knob & Tube	\$1,762,297	\$5,398	\$200-27K

The average job costs for asbestos abatement was in the expected range and comparable to the results that the Mass Save HEAT Loan Program has seen in the past. The knob and tube average cost was slightly higher than expected. This higher average cost is probably due to the fact that 17% of the jobs included mitigation in both attic and wall areas.

Table 3. Incentive Total Paid to Customer

	Total	Av. Costs
Asbestos	\$593,913	\$1,973
Knob & Tube	\$551,212	\$1,722

Actual average costs for both incentives were lower than original budget projections: Asbestos mitigation was lower by \$504 and knob and tube was lower by \$301. This situation contributed to the lower spending total for incentives by the Expanded HEAT Loan Initiative to date.

The average asbestos incentive paid to customers was 67% of the maximum incentive they could receive, while the average knob and tube incentive paid out was 85% of the maximum incentive. The actual average barrier incentives came in much lower than the maximum (25% of the total project costs) allowed for both mitigation barriers. The asbestos actual average incentive paid to customers was 16%, while the knob and tube incentive paid to customers was 18% of the total energy efficiency project costs.

The asbestos incentive leveraged \$7 of private investment in energy efficiency related work for every \$1 spent on ARRA incentives. The knob and tube incentive leveraged \$5 for every \$1 spent on incentives.

Tables 4 & 4a. Leveraged Funds (through September 2015)

Asbestos	
\$14,038	Av. customer investment in heating system and other EE improvements
\$3,727	Av. utility investments provided by incentives
\$1,973	Av. public ARRA funds provided as incentives
Knob and Tube	
\$3,676	Av. customer investment in all EE upgrades
\$2,467	Av. utility investments provided by incentives
\$1,722	Av. public ARRA funds provided as incentives

Note: Incentives = buy down if one used on a loan and rebates given by utility.

Table 5. Total Energy Efficiency Project Costs (through September 2015)

	Total	Av. Costs
Asbestos	\$4,141,210	\$14,038
Knob & Tube	\$3,309,797	\$10,441

The total project cost for asbestos barrier mitigation includes heating and hot water equipment installed costs, costs for any other efficiency measures eligible for the HEAT Loan, and the entire mitigation cost.

The knob and tube barrier mitigation total project cost includes air sealing and insulation installation costs, any other efficiency measures eligible for HEAT Loan, and the entire mitigation cost.

The asbestos average project cost is higher than the knob and tube because more customers were replacing the larger ticket items (heating system and domestic hot water) with the asbestos mitigation work. The knob and tube mitigation projects mostly focused on the remediation, plus installing insulation and air sealing after the barrier was removed.

Table 6. Number of Barrier Mitigations also using HEAT Loan Financing (through September 2015)

	Volume	Saturation
Asbestos	244	81%
Knob & Tube	120	36%

Note: "Saturation" refers to saturation of incentives processed or installed.

The Mass Save program provides information about barrier mitigation measures to customers using the Early Boiler/Furnace rebate forms, as well as information presented by Energy Specialists as part of the Home Assessment. In addition, Mass Save HEAT Loan staff discuss the program with customers during the standard HEAT Loan application process. This connection allows customers to seamlessly take part in both programs.

The higher percentage of participation in asbestos mitigation jobs within the Mass Save HEAT Loan program can be attributed to more customers financing the costlier heating system work and to interest being stimulated by the substantial Early Boiler/Furnace rebate offer. The lower percentage of participation in knob and tube mitigation jobs within the Mass Save

HEAT Loan program may be at least partially attributable to the significant rebate available for insulation (75% up to \$2,000) and free air sealing offered by the Mass Save program, which results in a small co-pay amount for most customers.

Table 7 shows that the majority of the mitigation involved boilers and their joining distribution system. Fifty-one percent of the jobs had asbestos material remediated from both the boiler and distribution pipes or furnace and their duct systems.

Table 7. Asbestos Abatement Location (through September 2015)

	Occurrence	Frequency
Boiler	221	73%
Distribution Pipe	210	70%
Furnace	33	11%
Duct Work	30	10%

Unsurprisingly, most mitigation work was completed in attic and wall locations. The percentage of walls treated was higher than expected compared with that of attics.

Table 8. Knob and Tube Wiring Removal Location (through September 2015)

	Occurrence	Frequency
Attic	242	75%
Walls	257	80%
Basement	160	50%
Other	36	11%

Seventeen percent of the knob and tube mitigation projects included work in both attic and walls. Basement saturation rate (50%) was not a surprise as knob and tube wiring tends to be prevalent in basements.

Challenges Encountered: Knob and Tube

Knob and tube mitigation can be challenging for electricians to implement, due to specific difficulties in removing old wiring and replacing it with new wire. Often these challenges are not evident until the project is under way. In attics, the electrician might have to deal with insulation that is feet-deep, and/or navigate through awkward spaces caused by low roof pitches, framing members, nailed flooring, and HVAC systems' distribution ductwork.

In wall assemblies, an electrician can face even greater challenges. These often center on lack

of accessibility to existing wires, and whether new wire can be snaked up the walls without obstruction. Blocks and barriers in the wall are often encountered. Holes typically have to be cut into the walls and then repaired after the rewiring is completed.

A knob and tube mitigation project can be an expensive and daunting project for homeowners, since it is hard for electricians to give a firm price estimate in advance due to the unknowns. Also, the mitigation project can require a costly upgrade to the home's electrical panel if the panel does not meet current code requirements.

Top 21 Towns Ranked by Volume of Barriers Mitigated

In Tables 9 and 10 below, 21 towns in Massachusetts with the highest level of participation are listed by volume of mitigation for both asbestos abatement and knob and tube wiring removal. The towns with asbestos barriers generally were the towns with older housing stock. These were dispersed throughout different parts of the Commonwealth. These top 21 towns had a higher concentration of asbestos abatement projects comprising 63% of the total number completed in the time period. This concentration could be due to the fact that these towns were also receiving active gas conversion marketing and the offer of the substantial rebates from the Early Boiler/Furnace Replacement Initiative.

The top 21 towns with knob and tube wiring removal were generally towns with older housing stock and the majority of them were located in eastern Massachusetts. Forty-eight percent of the total knob and tube projects were completed in eastern towns. So the majority of the knob and tube projects were not concentrated in certain towns but were more dispersed geographically.

Table 9 results indicate that 63% of total asbestos barriers removed were located in the top 21 towns.

Table 9. Asbestos Abatement (through September 2015)

Ranking	City/Town	#
1	Boston	35
2	Worcester	22
3	Arlington	19
4	Medford	14
5	Newton	12
6	Malden	9
7	Springfield	8
8	Cambridge	7
9	Belmont	6
10	Waltham	6
11	Watertown	6
12	Melrose	6
13	Quincy	6
14	Fitchburg	5
15	Somerville	5
16	Milton	5
17	Lowell	4
18	Northhampton	4
19	Salem	4
20	Clinton	4
21	Florence	4
	Total top 21	191

Table 10 results indicate that 48% of total Knob & Tube barriers removed were located in the top 21 towns.

Table 10. Knob & Tube Wiring Removal (through September 2015)

Ranking	City/Town	#
1	Boston	16
2	Worcester	14
3	Newton	14
4	Melrose	12
5	Arlington	9
6	Medford	8
7	Somerville	7
8	Lowell	6
9	Maynard	6
10	Natick	6
11	Acton	6
12	Quincy	6
13	Gloucester	5
14	Dedham	5
15	Beverly	5
16	Lynn	5
17	Malden	5
18	Marlborough	5
19	Milton	5
20	Plymouth	5
21	Winthrop	5
	Total top 21	155

Top 15 Contractors Ranked by Volume of Barriers Mitigated

The asbestos project volume by contractors was more concentrated than for knob and tube projects.

Table 11. Contractors Ranked by Volume: Asbestos (through September 2015)

Ranking	Asbestos Abatement	#
1	Dudley Services	49
2	S & S Abatement	35
3	Walsh Environmental Service	27
4	Nealcass Inc	18
5	Asbestos Free	13
6	ABIDE	12
7	Clean Air Environmental	12
8	New England Surface Maint.	10
9	National Abatement	8
10	Commercial Energy Inc	8
11	Asbestos Man Removal Co	7
12	Accutech	7
13	A & E Environmental	7
14	WS Hancock Co	5
15	William Scott	5
	Total	223

Table 12. Asbestos Abatements (through September 2015)

Group	Number of Jobs	Saturation of Total Jobs	Average Completions/ Contractor
Top 15 contractors	223	74%	15
Top 5 contractors	142	47%	28
Total	301		

The top 15 contractors completed 74% of the completed asbestos projects and averaged 15 projects per contractor. The top five completed 47% of the total asbestos mitigation projects. Asbestos abatement work is regulated and overseen by the Massachusetts Department of Environmental Protection. Contractors have to be trained and licensed, and follow strict regulations during abatement project work and disposal of asbestos. As a result there is a smaller pool of contractors for customers to choose from to perform the abatement.

Table 13. Contractors Ranked by Volume: K&T

Ranking	Knob & Tube Wiring Removal	#
1	JP OBrien Electrical LLP	6
2	Northern Lights Electric Inc	5
3	Wade Clement Electric	4
4	Castle Electric Inc	4
5	CRE Tsolias Electric	4
6	Steven Beckwith Electric	3
7	S Keyes Electric Inc	3
8	Lee Edelberg Electrician	3
9	Jan Bialach	3
10	Hillcrest Electric Corp	3
11	Gibbons Electric	3
12	Fred Borges Electric Inc	3
13	Anthony Berry	3
14	Adams Electric	3
15	Casello Electric Corp	3
	Total	53

Table 14. Knob & Tube Volume Summary (through September 2015)

Group	Number of Jobs	Saturation of Total Jobs	Average Completions / Contractor
Top 15	53	17%	3.53
Top 5	23	7%	4.6
Total	240	100%	1.33

Knob and tube project volume by contractors is the “opposite” compared with the asbestos mitigation: Only 17% of the completions were done by the top 15 contractors who average 3.5 jobs per contractor. The wide disbursement of the completed projects can be attributed to the fact that customers generally choose electricians

that they have worked with previously, or are referred by a friend—and electricians working in the geographic area in proximity to their property.

A typical example of one contractor’s experience with the initiative is that of James R. Prescott of Castle Electric. Prescott says:

We get called on a regular basis from people looking to confirm whether knob and tube wiring is present, we quote the job and fill out the Mass Save paperwork. [I have] no thoughts of anything being done differently. It’s a good thing they are pushing to get rid of the knob and tube, which is well past its shelf life. [The program is] certainly beneficial for us, we’ve done a lot of work out of it.

Results: Other Measures

Table 15 shows the completions and pipeline for non-barrier mitigation energy efficient measures in the Expanded HEAT Loan Initiative. The volume of Deep Energy Retrofit projects is, as expected, light. The pool of customers motivated to undertake DER projects is small and the projects are also complicated, expensive, take a long time to complete and can have very extended paybacks.

Table 15. Other Energy Efficient Improvements Using Interest Buy down on a HEAT Loan

Improvement	Completed Projects	Av. Buy Down Cost	In Pipeline; Authorized, not completed
Deep Energy Retrofit	3	\$7,616	3
Biomass Wood Pellet Boilers	22	\$3,567	4
Expanded 2-4 Family Loans	30	\$2,119	26

Biomass wood pellet boilers have achieved about 50% of the original goal. More are expected to be completed with the new heating season. The customer market for these boilers is much more targeted with a very small pool of contractors doing these installations.

The volume of the Expanded 2-4 Family Loan has achieved 100% of the original target for this initiative.

Mitigation of Barriers by the Low Income Weatherization Programs in Massachusetts

Within low income programs operated in the Commonwealth of Massachusetts, when asbestos abatement is required as part of the process of replacing old boilers the costs are paid with Federal HEART WAP (Weatherization Assistance Program) funds. These funds are provided to the state and local Community Action Program (CAP) agencies. The associated guidelines call for a maximum of \$1,800 to be paid for asbestos abatement on a project. All asbestos abatement work is put out to bid to help encourage the lowest price. Action for Boston Community Development (ABCD), a large CAP agency in Massachusetts, reports that 8% of their HEART WAP jobs generally require asbestos abatement.

The federal Weatherization Assistance Program (WAP) handles knob and tube barriers differently. If the mitigation cost is under \$500, program funds can cover it under repair funds. The amount that can be devoted to knob and tube barrier mitigation is constrained by cost benefit requirements of the programs. The mitigation estimates generally range from \$5,000 to \$15,000 per dwelling for these houses. If the mitigation costs are above \$500 (true in almost all cases), then the WAP agency places the project on hold. The owner may be referred to organizations for assistance such as Catholic Charities, Boston Home Center, Senior Home Repair, and United Way. Whether the customer can obtain assistance from such an agency depends on whether the agency has available resources.

Once the mitigation is complete the WAP program will install the eligible and free insulation and air sealing to the customer's house. ABCD delays or foregoes undertaking 24-36 projects annually due to knob and tube mitigation issues.

Recommendations and Lessons Learned

In summer 2015 the recommendation was made (and approved) to expand the asbestos abatement barrier category to include the barrier caused by the presence of vermiculite insulation in older houses. Vermiculite insulation is a barrier to upgrading the insulation in attics because it might contain possible asbestos fibers.

Effective October 1, 2015 customers with vermiculite insulation in their attic can use the asbestos incentive to help pay for its mitigation. Once the vermiculite insulation is removed then the attic can be air sealed and the insulation upgraded to current standards. This enhancement to the Expanded HEAT Loan Initiative will allow an estimated 6-8% of the customers participating in the Mass Save Home Energy Services program to receive assistance removing a barrier to having insulation upgraded in their home.

Another recommendation made and approved last summer was to increase the maximum incentive available for knob and tube wiring mitigation from \$2,000 to \$3,000. There were two reasons for this change. The first was based on an analysis performed on the pipeline projects that found 47% were languishing due in part to being larger and costlier mitigation jobs. Customers were unwilling to outlay the capital to have the work done. Secondly, 48% of the completed knob and tube barrier projects could have been eligible for a higher incentive at the average of \$721 per project if the maximum was increased. We believe increasing the maximum incentive will help motivate customers that have large mitigation jobs to take advantage of the Expanded HEAT Loan program funding to make insulation upgrades.

It is possible some customers might find it a difficult hurdle to locate and contract with a good electrician to do the knob and tube mitigation work. A contractor arranging system could be set up to identify and "vet" electricians in the state to perform this work. A list of these contractors could be provided to customers or the program could assign contractors on a rotational basis within territories. To implement this option, discussion among the Mass Save

Home Energy Services sponsors and audit vendors will be needed.

During the research phase of this report we discovered that the low income programs have limitations on resources they can spend removing knob and tube barriers. E4TheFuture recommends that the program be expanded to allow owners of low income properties participating through agencies in the Weatherization Assistance Program (WAP) to access knob and tube barrier incentives from the Expanded HEAT Loan Initiative.

Conclusion

Expanded HEAT Loan Initiative funds helped motivated customers remove barriers to installing energy efficient improvements. The majority of customers installed at least two measures after barriers were removed.

The incentive for knob and tube mitigation helped the majority of the customers remove the wiring in attic and walls in their home which provided the opportunity to install more insulation upgrades. The knob and tube mitigation work was dispersed over a large group of electricians.

The incentives provided in the form of interest buy down on a loan assisted customers in investing in wood pellet boilers and assisted landlords in installing more efficiency upgrades to their properties.

The incentives provided by this Expanded HEAT Loan Initiative helped customers leverage the Mass Save program incentives for installing energy upgrades that improve the performance and comfort of their homes. It also provided customers the opportunity to invest their own capital in energy saving improvements that generate long term savings.

Overall, in just 18 months the Expanded HEAT Loan Initiative led to 730 homes being substantially improved, with more than 50 additional homes in the pipeline.

And although difficult to quantify precisely, substantial non-energy benefits worth noting are improvements in the health and safety for occupants of the homes serviced, particularly with regard to both knob and tube wiring and

asbestos. Removal of safety hazards (preventing fires and safeguarding pulmonary health) are definitely a benefit above and beyond the energy savings.

Energy efficiency programs in general create non-energy benefits (NEBs), so the ability of homeowners to access the Mass Save efficiency program measures following removal of barriers addressed by the Expanded HEAT Loan Initiative serves as a multiplier for NEBs. These include utility NEBs, societal benefits, and participant NEBs. Participant NEBs (households and landlords) are estimated to be 144% of the value of household bill savings.*



E4TheFuture applauds the work that has been accomplished thus far in the Expanded HEAT Loan Initiative and will continue advocating for additional program improvements.

**Lisa A. Skumatz, Ph.D. prepared testimony for the New York Public Service Commission on behalf of E4TheFuture regarding non-energy benefits for whole-home single and multifamily energy efficiency programs, demonstrating relevance for New York. We invite you to [download the testimony](#).*

Expanded HEAT Loan Initiative

Marketing/Outreach Samples and Forms

The following samples represent examples of the materials used in the Expanded HEAT Loan Initiative. This set is not comprehensive or all-inclusive.



Up to \$2000 GRANT for Re-Wiring Knob & Tube

<Date>

Dear

During your Mass Save® Home Energy Assessment, we discovered the presence of knob & tube (K&T) wiring. This can often prevent moving forward with the installation of recommended weatherization upgrades. Fortunately, for a limited time, **grants of up to \$2,000** are available to assist you with the cost of removing this barrier.

This offer is brought to you by the Massachusetts Department of Energy Resources with a grant from the U.S. Department of Energy. These limited funds are available to help pay for a qualified electrician to replace K&T wiring, so that insulation can be installed through the Mass Save program. If you are interested in applying for this grant, please act quickly! The program has been extended into 2015, but funding is available on a first-come, first-served basis.

Applications for the grant are administered through an expansion to the Mass Save HEAT Loan Program. Please note; you are not required to take out a HEAT Loan to receive a grant. To get started, complete the enclosed Intake form and obtain an electrician's estimate. For more information, contact the HEAT Loan Service Department at **1-800-696-8077** and we will explain the process.

Remember; this incentive is only available while funding lasts!

Sincerely,

The Mass Save HEAT Loan Customer Service Team

ACT NOW! FUNDS ARE LIMITED.
Increase the comfort of your home and maximize your savings.
Call **1-800-696-8077** or email **mahtloan@csgrp.com**

Please Note: Conservation Services Group (CSG) is the administrator for Eversource and National Grid for the Mass Save 0% HEAT Loan program and is also an administrator of the Expanded HEAT Loan Initiative for DOER. Any retroactive installations are not eligible for a HEAT Loan or the Expanded HEAT Loan Initiative. An owner or co-owner of a limited liability corporation is not eligible to participate. Additional information about the Expanded HEAT Loan Initiative is available at "masssave.com/residential/expanded-heat-loan" masssave.com/residential/expanded-heat-loan. Expanded HEAT Loan Initiative funding is available for a limited time, while funds remain.

Customer
Outreach:
Letter



c/o Conservation Services Group
Attn: HEAT Loan Department
50 Washington Street, Suite 3000
Westborough, MA 01581



**Customer
Outreach:
Envelope**

CLEAResult

**Up to \$2000 GRANT for
Re-Wiring Knob & Tube**



**Customer
Outreach:
Email**

Dear James,

During your Mass Save® Home Energy Assessment, we discovered the presence of knob & tube (K&T) wiring. This can often prevent moving forward with the installation of recommended weatherization upgrades. Fortunately, for a limited time, grants of up to \$2,000 are available to assist you with the cost of removing this barrier.

This offer is brought to you by the Massachusetts Department of Energy Resources with a grant from the U.S. Department of Energy. These limited funds are available to help pay for a qualified electrician to replace K&T wiring, so that insulation can be installed through the Mass Save program. If you are interested in applying for this grant, please act quickly, as funding is available on a first-come, first-served basis.

Applications for the grant are processed through an expansion to the Mass Save HEAT Loan Program. To get started, please contact the HEAT Loan Service Department at 1-800-696-8077, and we will explain the process. Remember, this incentive is only available while funding lasts!

Sincerely,

The Mass Save HEAT Loan Customer Service Team



June 18, 2014

Dear Homeowner,

Thank you for participating in the Mass Save® Home Energy Services Program. During your Home Energy Assessment, your heating equipment was deemed eligible for the Early Boiler Replacement Rebate; however, the Energy Specialist noted the presence of asbestos-like material on your heating equipment. We are writing to inform you that for a limited time, the Massachusetts Department of Energy Resources (DOER) is offering grants which can be used to assist with the cost of **asbestos removal**. The funding for this initiative is limited so we encourage you to act now.

This Expanded HEAT Loan Initiative provides a grant up to **\$3,000** towards any asbestos abatement that is required, in order to replace the existing boiler with new, high efficiency equipment. If you are interested in upgrading your heating equipment and have yet to begin the process of asbestos removal and equipment installation, please review the attached form as this opportunity may be right for you. The Intake Form for Asbestos Barrier Mitigation lists the steps and requirements to participate.

You may also be eligible to finance your new heating equipment at 0% through the Mass Save Heat Loan program. You are not required to take out a HEAT Loan to qualify for the grant, but the new system will need to meet the minimum efficiency standards of the HEAT Loan program. For more information on HEAT Loan financing and minimum efficiency standards, visit www.MassSave.com/Heat loan, or refer to the HEAT Loan package provided to you during your recent Home Energy Assessment.

If you are interested in taking advantage of this limited time asbestos abatement opportunity and upgrading your heating equipment, please call Mass Save's HEAT Loan department at **800-696-8077**, or email EHLoan@csggrp.com to learn more.

Regards,

The HEAT Loan Customer Service Team

Please Note: Conservation Services Group (CSG) is the administrator for National Grid, NSTAR, and Western Massachusetts Electric for the Mass Save 0% HEAT Loan program and is also an administrator of the Expanded HEAT Loan Initiative for DOER. Any retroactive installations are not eligible for a HEAT Loan or the Expanded HEAT Loan Initiative. An owner or co-owner of a limited liability corporation is not eligible to participate. Additional information about the Expanded HEAT Loan Initiative at: <http://www.masssave.com/residential/expanded-heat-loan>. Expanded HEAT Loan Initiative funding is limited and available for a limited time.

**Contractor
Outreach:
Email**

Dear _____ ,

Given _____'s participation in the Mass CEC's Commonwealth Small Pellet Boiler Program pilot, we'd like to inform you of a limited time offer to residents of the Commonwealth for a 0% loan to finance the installation of qualifying biomass wood pellet boilers. Funding is provided by the Massachusetts Department of Energy Resources, with a grant from the US Department of Energy. Qualifying customers can apply for financing of eligible wood pellet boiler installations through an Expanded HEAT Loan for up to \$25,000 (with terms up to 7 years) at **0% interest!**

We can supply you with flyers to inform your customers of this offer and the Expanded HEAT Loan Intake Forms that they will need to take advantage of this initiative. ***Just reply to this message*** with your name, the name of your company, a contact phone number and the mailing address. The materials will be supplied at no cost to you.

Please be advised that this 0% financing is only available while loan buy-down funding lasts. Qualifying wood pellet boilers must be installed in a 1-4 unit Massachusetts dwelling as a central heating system able to supply heat to an entire unit. The system must include a bulk storage bin of at least 2 tons, an automatic fuel conveyance capability and sufficient thermal storage. Additional specifications must also be met (all required specifications are detailed in the flyer mentioned above).

Please reply to this message or contact me at 508-365-3398 with any questions you might have.

Thanks in advance you for your participation in the Expanded HEAT Loan initiative!

Regards,

Bill

William J. Julio | Regional Project Manager

Expanded HEAT Loan Intake Form

Deep Energy Retrofit/Deeper Energy Savings
0% Interest Loan Up to \$50,000

Program
Form
(pg 1)

Homeowner and Site Information:

Homeowner Name: _____ Date of Application: _____
Service Address: _____ City: _____ Mass Save® Site ID _____
(if known): _____
Mailing Address: _____ City: _____ Zip: _____
(if different from above): _____
Email Address: _____ Phone Number: _____

Homeowner Instructions:

This is a limited time offer to finance the installation of insulation with a 0% loan. The amount financed is limited to the cost of insulation materials and labor when installed as part of either a National Grid Deep Energy Retrofit (DER) project or a Deeper Energy Savings (DES) project sponsored by a participating utility company. Qualifying applicants must participate in and adhere to all requirements of the associated DER or DES initiative. The cost of materials and labor to install non-insulation items such as exterior wall siding and roofing may not be financed. *Please refer to the back of this form for a full list of terms and conditions.*

Please follow the steps below to complete the application process:

Step 1. Obtain a signed proposal from a contractor authorized by the Deep Energy Retrofit initiative sponsored by National Grid and licensed in the Commonwealth of Massachusetts to perform the work.

The signed proposal must be on contractor letterhead or contract and include the following:

- | | |
|---|---|
| <input checked="" type="checkbox"/> Business name and address | <input checked="" type="checkbox"/> Description of the work being done |
| <input checked="" type="checkbox"/> Contractor's full name | <input checked="" type="checkbox"/> Total cost of the job |
| <input checked="" type="checkbox"/> Contractor's license number | <input checked="" type="checkbox"/> Installed cost for the insulation, itemized for roof, wall and basement work, as applicable |
| <input checked="" type="checkbox"/> Contractor's signature | |

Step 2. Submit an application with your utility sponsor for either a DER or DES rebate. (Refer to your utility company's website for participation instructions.)

Step 3. Sign this form below and submit it, a copy of the contractor's signed proposal and the Deep Energy Retrofit rebate authorization notification received from National Grid to the HEAT Loan Administrator by either:

email: EHLoan@csgrp.com (or) mail: CSG (or) fax: 508.836.3181
50 Washington Street, Suite 3000
Westborough, MA 01581

Step 4. If your application is approved, you will receive an Expanded HEAT Loan Authorization Form detailing the amount authorized for your loan.

Step 5. Take the Expanded HEAT Loan Authorization Form to a participating lending institution and apply for the loan. (Contact the Expanded HEAT loan Administrator listed above for a copy of the list of participating banks and credit unions.)

Step 6. Upon loan approval you will receive a two-party check from the lender (made out to you and the contractor).

Step 7. Upon completion of the installation, notify CSG to schedule a verification inspection.

Homeowner Acknowledgement:

I have read, understand and agree to the conditions detailed above and in the Terms and Conditions printed on the reverse side of this form. I certify that all information above is correct to my knowledge and that I own the 1-4 family residence referenced above as an individual and not as an owner or co-owner of a corporate entity organized under the laws of the Commonwealth of Massachusetts.

Homeowner Signature: _____ Date: _____

For inquiries related to this offer, please contact: CSG at 800.696.8077

Original - Customer Copy Yellow - HEAT Loan Administrator Copy

2230-DER-DES2-2/15

Terms and Conditions:

Applicant Acknowledgement:

I certify that I have read and understand all of the information presented on both sides of this form and that all information is correct.

I understand that my receipt and/or my submittal of this form as described herein does not obligate any other party to reimburse me for any of the costs associated with the work scopes.

I understand that only when I receive an Expanded HEAT Loan Authorization Form and I have successfully completed all steps as detailed on the reverse of this form, will an interest payment be made on my behalf to the lending institution.

I understand that I must contact a participating Lender directly in order to initiate the loan application process and that the Lender, not the HEAT Loan Administrator determines loan approval or denial.

I understand that in order for an interest payment to be made on my behalf to the lending institution referenced herein, I must allow for and hereby agree to facilitate a verification inspection of the specified installation in order to ensure compliance with program requirements.

Eligibility:

The premises in which installations occur must be comprised of 1, 2, 3 or 4 dwelling units. The participating homeowner referenced on this form must be able to provide proof of participation in the Deep Energy Retrofit initiative sponsored by National Grid.

No Warranties:

The Massachusetts Department of Energy Resources and HEAT Loan Administrators do not warranty the performance of any installed materials or equipment. The Massachusetts Department of Energy Resources, National Grid and HEAT Loan Administrators expressly disclaim any and all warranties or representations of any kind, whether oral, statutory, expressed or implied, including, without limitation, warranties of merchantability, usage, suitability or fitness for a particular purpose. The Massachusetts Department of Energy Resources and HEAT Loan Administrators do not make any representation of any kind regarding the results to be achieved by the installation of any energy efficiency improvement.

Limitation of Liability:

The Massachusetts Department of Energy Resources and HEAT Loan Administrator's liability is limited to the amount of the incentive. The Massachusetts Department of Energy Resources and HEAT Loan Administrators are not liable for any indirect or consequential damages or for any damages connected with or resulting from participation in this offer.

For a limited time only qualified Massachusetts eligible homeowners are being offered 0% interest to finance the installation of qualified insulation. Qualifying insulation work must meet the requirements of the Deep Energy Retrofit initiative and be installed in a 1-4 family residential building.

Work Completion:

Work must be completed and inspected within 90 days of the final loan fund disbursement

Post Installation Inspection:

Pre-installation, in-process and post-installation verification inspections are required to confirm compliance with program requirements. Any interest payment made on behalf of the applicant to the lending institution is subject to the successful completion of inspections and confirmation of compliance with program requirements.

Limited Time Offer:

This incentive is offered for a limited time and on a first-come, first-served basis, subject to funding availability.

Program terms and conditions are subject to change or cancellation without notice.



ENERGY

Promoting clean, efficient, safe solutions

ECONOMY

Growing a prosperous, low-carbon economy into the 22nd century

EQUITY

Empowering all Americans to run their homes with clean, efficient, affordable energy

ENVIRONMENT

Restoring healthy air, water and land



Contact us at: INFO@E4THEFUTURE.ORG

www.E4TheFuture.org