



Multi-State Residential Retrofit Project: Process Evaluation Executive Summary

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Executive Summary

Introduction

The Multi-State Residential Retrofit Project (Multi-State Project) is a residential energy-efficiency pilot program, funded by a competitive U.S. State Energy Program (SEP) award through the U.S. Department of Energy (DOE). The Multi-State Project operates under the auspices of the State Energy Offices in four states: Alabama, Massachusetts, Virginia, and Washington.¹ The states launched the three-year Multi-State Project in the fall of 2010, and contracted with the National Association of State Energy Officials (NASEO) to facilitate its steering committee and manage its process evaluation, conducted by Cadmus.

Operating in targeted communities in each state, the Multi-State Project sought to meet the following goals:

- Increase the number of home energy-efficiency retrofits.²
- Improve the conversion rates from home energy audits to retrofits.
- Increase the awareness and value of energy-efficient homes in the marketplace.
- Achieve deeper retrofits to maximize energy-saving opportunities per household.
- Develop self-sustaining markets for home energy retrofits.
- Create sustained market demand for energy-efficient homes.
- Identify successful strategies that other entities can adopt for similar program efforts.

The four states coordinating under this grant also chose to use the Energy Performance Score (EPS) auditing and home-energy scoring tool to achieve the following: make current energy use more transparent to homeowners; build trust in audit results; and present homeowners with compelling information about recommended energy-efficiency retrofits. As described in the state chapters, each state adapted the EPS, given local conditions and state-specific goals.

During the course of this three-year process evaluation, Cadmus worked closely with NASEO and the four states to collect information about the programs from many perspectives, including: State Energy Office staff, program implementers, homeowners,³ auditors/contractors, real estate professionals, appraisers, lenders, and utility staff. The body of this report discusses: the project's context; its goals; the evaluation approach and methods; cross-cutting evaluation results; and results specific to each of the four states.

¹ The four State Energy Offices are: Alabama Department of Economic and Community Affairs (ADECA); Massachusetts Department of Energy Resources (DOER); Virginia Department of Mines, Minerals and Energy (DMME); and Washington State Department of Commerce (Commerce).

² The term "retrofit" describes home energy-efficiency improvements or upgrades.

³ The report refers to homeowners who conducted audits but not retrofits as "partial participants" and to homeowners who conducted audits and retrofits as "full participants."

This Executive Summary provides an overview of each of the four state programs, describes key evaluation findings from the Multi-State Project, and presents overarching conclusions and recommendations, drawing upon results presented in Section 3, **Error! Reference source not found.**

Overview of State Programs

Alabama

Alabama Worthwhile Investments Save Energy (AlabamaWISE) is a residential retrofit program serving the Huntsville and Birmingham areas. The Energy Division of the ADECA partnered with Nexus Energy Center (Nexus) to implement the AlabamaWISE program.

Through AlabamaWISE, Nexus offered:

- Home energy audits.
- Energy performance scoring.
- Rebates for energy-efficiency retrofits.
- A network of contractors, certified by the Building Performance Institute, Inc., (BPI) as qualified to undertake the retrofit work.

In addition, Nexus partnered with Abundant Power to offer a low-interest loan with attractive financing for the energy-efficiency retrofit work. Other instrumental project and multi-state partners included Earth Advantage and the Southeast Energy Efficiency Alliance (SEEA).

The Alabama program sought to achieve the following key goals:

- Use the knowledge and experience of partner states to establish a sustainable retrofit market in Alabama.
- Elevate the state's current retrofit markets to build momentum to permanently and sustainably transform the market for home energy improvements.
- Retrofit 2% of the homes in the state's targeted markets by 2013, resulting in measurable energy savings that scale up and persist over time.
- Foster the development of community-based, public-private partnerships for program delivery, lasting throughout the grant period and beyond.
- Utilize experience obtained and lessons learned in the Huntsville community (where AlabamaWISE first rolled out) to implement a successful program in Birmingham.

The Cadmus evaluation produced the following key findings related to the Alabama program:

- Nexus successfully leveraged its status as a local nonprofit to establish credibility in Huntsville and Birmingham.
- AlabamaWISE achieved high satisfaction levels among auditors/contractors, with eight out of 12 interviewed very satisfied with their program participation. Eighty-seven percent of full participants (81 of 93) were very satisfied with the contractor's retrofit work, and 98% (89 of 91)

reported that the contractor retrofitting their home could answer all of their questions. Additionally, 84% of partial participants (48 of 57) were very satisfied with their auditor's work.

- Auditors/contractors served as primary drivers for generating homeowner interest in the program, followed closely by Nexus program staff and by word-of-mouth recommendations.
- Homeowner surveys revealed that: partial and full participants had higher incomes than the general population in the target areas; participants most commonly pursued energy audits and retrofits to save money; and rebates served as critical drivers for the program.
- Alabama achieved considerable success in generating interest from real estate professionals for energy-efficiency training; and ADECA committed additional funding to hold these trainings in other parts of the state. Real estate professionals and appraisers, however, continue to wait for the energy-efficiency market to grow before they will actively promote it.

Nexus will continue to operate following the grant period, relying on a mix of revenue sources, including administrative fees from loans offered to program participants, foundation funding, and contractor fees.

Massachusetts

Home MPG is the residential-retrofit initiative offered by the Massachusetts DOER through the Multi-State Project. Home MPG operated in eight Western Massachusetts communities: the cities and towns of Belchertown, East Longmeadow, Hampden, Longmeadow, Monson, Springfield, Palmer, and Wilbraham. The initiative builds on the existing utility-sponsored residential-retrofit program, Mass Save®, which has successfully operated across the state for a number of years.

Home MPG uses the same basic program structure as Mass Save, including the following program elements: no-cost home energy audits; retrofits performed by qualified contractors; and financial incentives, rebates, and financing for energy-efficiency retrofits.

The initiative also includes the following new program components:

- Energy performance scoring, provided through home energy assessments and following completion of energy-efficiency retrofit work.
- Strategic marketing and outreach, including outreach to homeowners in the Home MPG area at numerous local events and targeted direct-mail campaigns.
- Use of thermal imaging on 40,000 homes to help homeowners “see” their home’s inefficiencies and understand their energy use and potential cost-effective efficiency improvements.
- Increased incentive amounts for insulation and increased rebate amounts for selected high-efficiency heating, ventilation, and air conditioning (HVAC) and water heater technologies.
- Concierge service to provide homeowners with in-depth assistance when considering and selecting a new HVAC system.

The program was largely implemented by the two Mass Save implementation vendors, Conservation Services Group (CSG) and Honeywell, that conducted energy audits. DOER also hired the Pioneer Valley

Planning Commission (PVPC), based in the pilot area, to use its existing relationships with local organizations and municipalities to promote the Home MPG initiative through local events.

In addition to the program components listed above, Home MPG provided training for real estate professionals and appraisers to help them understand “energy performance” and how it can be integrated into the home sales and appraisal processes. Trainings included: background on Home MPG, asset ratings, legislation and policies designed to promote adoption of residential energy-efficient technologies, the energy performance score, building science, and high-performance homes. The Leading Edge Academy, a Massachusetts-based broker education school, conducted courses for real estate professionals; Earth Advantage conducted the appraiser trainings. Real estate professionals and appraisers who completed the training earned continuing education units for their participation. A subset of the appraisers attended an additional day of training and became the first “green” certified appraisers in Massachusetts.

The Home MPG initiative sought to achieve the following key goals:

- Achieve “more and deeper” retrofits than Mass Save has historically achieved in the pilot area.
- Promote consumer awareness of home energy performance in the pilot area by providing energy performance scores at home energy assessments and again after implementation of retrofits.
- By providing homeowners with better information and better access to information, improve the audit-to-retrofit conversion rate and persuade homeowners to implement more substantial retrofits than those historically completed through Mass Save.
- Through education and training for real estate professionals and appraisers, support a residential real estate market that appropriately values energy performance.

The Cadmus evaluation resulted in the following key findings for Massachusetts:

- Adding new energy scoring software to an existing program—Mass Save—presented early challenges, such that auditors had to duplicate much of their data entry, decreasing their productivity. Eventually, the two lead utility energy-efficiency program vendors integrated energy scoring into their existing auditing process.
- Participants reported that information on the scorecard helped them decide to make energy-saving improvements to their homes (39 of 58, or 67% found the information very useful).
- A minority of Home MPG participants knew the initiative offered exterior thermal images of their homes, and very few viewed their homes’ images. Due to lack of data, Cadmus’ evaluation could not analyze the effectiveness of thermal imaging in achieving “more and deeper” retrofits.
- Roughly 87% (61 of 70) of full participant homeowners said they increased their knowledge about how to save energy through their participation in Home MPG.
- Seventy-four percent (43 of 58) of full participant homeowners thought it would be useful to access an energy performance scorecard for homes they might purchase.

Massachusetts communities outside of the Home MPG area expressed interest in participating in the Home MPG initiative. The streamlined energy scoring process produced during the Multi-State Project will help facilitate future expansion, including the potential to create a statewide residential energy scoring program as part of Mass Save.

Virginia

DMME, in collaboration with its partners, oversaw the Virginia Residential Retrofit Pilot Project. Three non-profit organizations, known as Regional Energy Alliances (REAs), implemented the pilot:

- Community Alliance for Energy Efficiency (cafe²) works in the City of Roanoke and the Town of Blacksburg.
- Local Energy Alliance Program (LEAP) works in Charlottesville and Arlington County in Northern Virginia (NOVA).
- Richmond Region Energy Alliance (RREA) works in the Richmond metropolitan area.

DMME partnered with SEEA to provide project management services to the REAs.

Virginia's program focused on developing the capacity of community-based REAs to pilot home energy labels, delivered through energy audits, and to: provide an innovative suite of financing options; facilitate retrofit adoption by participating homeowners; train the implementation workforce; measure and verify the results of installed home retrofit measures; and work with policy makers, utilities, and other stakeholders to support and ultimately grow the energy-efficiency industry in Virginia.

The REAs offered rebates for home energy audits, energy performance scoring, rebates for energy-efficiency retrofits, and a network of contractors certified by BPI to undertake the retrofit work. Earth Advantage trained auditors/contractors on the use of EPS software and trained real estate professionals and appraisers on the value of energy audits and energy-efficiency retrofits. Advanced Energy (AE) trained contractors on techniques and best practices for making energy-efficiency retrofits to homes.

The program implementers also offered financing mechanisms through local credit unions or other participating lenders, and established loan loss reserves. LEAP and RREA delivered retrofits under the federal Home Performance with ENERGY STAR (HPwES) retrofit model.

Additionally, while all REA programs included similar elements (such as partnerships and outreach to market actors, and homeowner financing and rebates for retrofits), their deployment approaches, experience levels, and target markets differed significantly.

The Virginia programs sought to achieve the following key goals:

- Increase retrofits to a 2% penetration rate in the target market areas during 2013.
- Permanently and sustainably transform the home energy improvement market by building capacity where retrofit markets were weak and by strengthening capacity where retrofits already were taking place.

- Develop a skilled network of auditors/contractors to adopt and implement standardized construction techniques and metrics.
- Foster self-sustaining, community-based, public-private partnerships (between the REAs and other organizations) to deliver the program during and beyond the grant period.
- Develop regulatory guidance to support a sustainable retrofit environment in Virginia.
- Establish a model that could be replicated by other Virginia communities to increase retrofits, create jobs, save energy, and reduce greenhouse gas emissions.

The Cadmus evaluation produced the following key findings related to the Virginia program:

- Established contractors, who expressed satisfaction with other home assessment software tools they had successfully used, showed greater resistance to using the EPS software than did newer contractors. Some auditors/contractors reported, however, that the EPS software helped them sell jobs.
- All programs increased business for auditors/contractors, but some auditors/contractors said more program marketing was needed.
- Many participants found the EPS Energy Analysis Report and scorecard useful and easy to understand.
- Among homeowners conducting an audit but not a retrofit (partial participants), cost presented the most-cited obstacle to making the recommended improvements to their homes.
- Partial and full participants were very satisfied with the performance and knowledge of the auditors/contractors they worked with through the program. The majority of full participants (45 of 55, or 82%) were very satisfied with the contractor services they received.
- Loans made a meaningful contribution to retrofit activity in some program areas. One-third of full participants (12 of 36) said the availability of program loans influenced their decision to complete a home retrofit.
- SEP funding increased the profile and level of local energy-efficiency activities. Two new REAs formed and may well continue to operate in regions where none previously existed. During the course of this project, the REAs were instrumental in forming the Virginia Energy Efficiency Council (VAEEC), a non-profit with a mission “to assess and support programs, innovation, best practices and policies which grow Virginia’s energy efficiency industry and to provide a forum for stakeholder interaction.”

Washington

RePower Kitsap, an energy-efficiency retrofit program covering large portions of Kitsap County, targeted single-family homes in the region. The Washington State Department of Commerce’s (Commerce) SEP grant provided most of the program funding. RePower Kitsap also relied on infrastructure developed with funding from another DOE American Recovery and Reinvestment Act (ARRA) grant to Kitsap County. Commerce and the Washington State University Energy Program (WSU Energy Program) jointly oversaw the RePower Kitsap program.

RePower Kitsap coordinated with similar efforts in the area, RePower Bainbridge Island (BI) and RePower Bremerton. The RePower Kitsap program contracted with CSG (which won the federal grant for the RePower BI and RePower Bremerton programs) to oversee energy auditor and contractor coordination, program marketing, and implementation for RePower Kitsap.

As all three programs operated similarly, and many market actors participated in more than one RePower program, RePower Kitsap's effects were intertwined with the other two programs. During the course of the project, Commerce and WSU Energy Program realigned RePower Kitsap to better coordinate with RePower Bainbridge Island and to ensure the programs addressed unique—rather than overlapping—target markets.

The redesigned RePower Kitsap program offered the following features:

- *For-fee home energy assessments or referrals to a free home energy assessment.* Homeowners could obtain a thorough home energy assessment with EPS (for a reduced fee) or a free HomePrint™ assessment through a referral to Puget Sound Energy.
- *Trained trade allies.* RePower trade allies had to be licensed, insured, and trained to ensure they offered high-quality energy-efficiency services. Trade allies offering home energy assessments had to have a BPI-certified building analyst oversee each assessment and attend training and certification on the EPS audit tool delivered by the RePower program.
- *Incentives for energy-efficiency improvements.* Improvements eligible for RePower Kitsap incentives included: weatherization (e.g., air-sealing, insulation, duct sealing); and energy-efficient water heaters and HVAC systems. Homeowners with natural gas, electric, oil, propane, and wood heating systems were eligible for RePower Kitsap incentives. This differed from the local electric and gas utilities' programs, which offered incentives to customers with natural gas or electric heat, but not to the roughly 10% of Kitsap County customers heating their homes with oil, propane, or wood. In addition to focusing on gaps in utility incentives, RePower Kitsap's incentive structures encouraged deeper, multi-measure upgrades, serving as an alternative to standard utility practices of offering rebates for specific measures.
- *Energy-efficiency loans.* RePower Kitsap set up loan loss reserves to encourage two local credit unions—Kitsap Credit Union (KCU) and Puget Sound Cooperative Credit Union (PSCCU)—to offer homeowners loans for energy-efficiency improvements.

RePower Kitsap sought to achieve the following key goals:

- Achieve a retrofit rate of 2% of homes in the target area, equivalent to roughly 1,000 homes, by the program's third year of operation.
- Perform comprehensive whole-house upgrades in participating homes, reducing their energy consumption by an average of at least 20%.
- Create a knowledgeable and skilled retrofit workforce through training programs.
- Increase consumer demand for energy-efficient homes by educating real estate appraisers on the value of energy efficiency.

- Facilitate development of energy-efficiency financing programs.
- Engage with policy makers to create a regulatory environment that facilitated retrofits.
- Create a more sustainable county.

The Cadmus evaluation produced the following key findings related to the Washington program:

- RePower Kitsap’s establishment of a local infrastructure enabling whole house retrofits, with local contractors teaming to install multiple types of measures, served as one of the program’s greatest accomplishments. Program data indicated upgrades receiving Repower Kitsap incentives were more comprehensive than contractor or utility-supported upgrades not receiving RePower Kitsap incentives.
- RePower Kitsap influenced the local utility to adopt air-sealing measures as part of its eligible program measures, and air-sealing became standard practice for weatherization retrofits in the region.
- Contractors reported RePower positively affected their businesses, despite the economic downturn, as they added or retained staff, gained additional certifications, and/or added new service offerings.
- Auditors and contractors found EPS a good, descriptive benchmarking tool and reported customers found it helpful. Additionally, WSU Energy Program staff utilized EPS data to identify the most prevalent energy-efficiency issues and to restructure the program and its incentives to better address those issues.
- While local utilities ran several energy-efficiency programs prior to RePower’s start, Repower filled a gap and realized the goals of: including oil- and propane-heated homes in its pool of eligible participants; and encouraging more comprehensive upgrades.
- Lenders reported the program’s loan loss reserve motivated them to offer more attractive loan products than they would have otherwise. One lender offered lower starting interest rates and a less stringent credit review for its energy loan product.
- The RePower program-sponsored training offered the first exposure appraisers in the region had to green labels and energy-efficient homes.

Kitsap County staff and RePower stakeholders are actively planning the program’s next stage, and WSU Energy Program has committed to providing interim operational services during the program transition and planning processes.

Cross-Cutting Lessons

This process evaluation also examined cross-cutting lessons drawn from the evaluation findings that are somewhat consistent across at least several of the four states.

All of the programs involved many stakeholders, including representatives from State Energy Offices, program implementers, DOE, auditors and contractors, and, in some cases, regional energy-efficiency organizations or other state agencies. The programs’ start-up, implementation, and progress depended

on the strong coordination and regular communication among these entities, but establishing relationships, common viewpoints, and communication channels among these stakeholders took time and effort.

The states used the EPS auditing and home-energy scoring tool to help homeowners better understand and trust audit information and recommendations for energy-efficiency retrofits.⁴ While the EPS scorecard and report received fairly strong ratings from participants, the results also suggested the scorecard versions the project used in each state could be improved.

Evaluation findings confirmed that trained and engaged auditors and contractors proved important to the programs' success, and knowing the programs worked with trained professionals motivated homeowners to pursue audits and retrofits. Roughly 85% of participant homeowners in Alabama, Virginia, and Washington stated that were "very satisfied" with the contractor services they received.⁵ Market actors and positive word-of-mouth presented two primary ways that homeowners learned of programs. For example, in Alabama and Virginia, 71% and 57% of full participants, respectively, learned of the program through market actors or word-of-mouth.

Homeowner survey results revealed that participants had notably higher education and income levels than the general population in almost all program target areas. Homeowners expressed high satisfaction levels with their participation in the programs, with the proportion of full participants saying they were "very likely" to recommend the program to others ranging from 77% to 90%. This likely contributed to positive word-of-mouth marketing for the programs.

Participants in all four states cited saving money as their primary reason for pursuing energy audits and retrofits: 38% to 76% of full participant survey respondents reported saving money as the main reason they pursued a retrofit. Rebates served as a critical driver for many program participants: 42% to 71% of full participants said rebates were "very important" in their decision to undertake a retrofit, and RePower Kitsap observed that targeted incentives yielded more comprehensive upgrades. Most homeowners, however, did not install all recommended measures. They commonly selected a subset of recommended measures to do "enough" to save on their energy bills and, in some cases, to take the easiest actions.

Each state successfully integrated real estate professional and appraiser training into their programs. Overall, real estate professionals and appraisers reported positive experiences with the training and supported energy efficiency. Most training participants, however, were unlikely to actively promote energy efficiency unless they saw broader market trends to support it.

⁴ Massachusetts' approach to the energy scorecard evolved over the course of the project, largely due to existing auditing software used by the utilities' energy-efficiency program vendors. See Section 6 for greater detail.

⁵ The Massachusetts participant survey did not include comparable questions.

All of the programs sought to build demand for energy-efficient homes and to foster a sustainable retrofit workforce. In doing so, the states tailored their approaches to local conditions and employed a mix of strategies. In a number of the states, several positive indicators for sustainability have emerged, including: an expanded, networked, and able energy-efficiency work force, with improved skills and tools; an increased profile and level of energy efficiency in targeted communities; and greater efforts to work closely with other local organizations to attain funding and leverage resources.

Conclusions and Recommendations

Setting Program Goals

Conclusion: *Program Targets Were Challenging to Meet.* Despite making considerable progress, most of the programs (all except for Home MPG in Massachusetts) faced unrealistic audit and retrofit targets, given: their target audiences; innovative approaches; existing energy-efficiency infrastructures and experience; the challenging national economy; and a short, three-year time frame. Further complicating program start-up and implementation, programs that received funding from multiple sources were required to produce reports and respond to data requests from multiple entities. Designing and implementing a new energy-efficiency program is a challenging and time-consuming effort that involves many elements to work together. Even when start-up barriers, such as having a pool of trained auditors and contractors, are reduced, evaluations of pilot programs consistently find that program planners tend to overestimate the ability of pilot programs to meet ambitious goals within one-to-three year time frames.

Recommendation: When developing goals and timelines for a new program, program implementers should account for: the awareness, knowledge, interest, and capabilities of target audiences and market actors; the existing energy efficiency infrastructure (e.g., auditors and contractors); the implementers' capacity; the likelihood of collaborative partnerships in the community; and existing economic conditions. Additionally, program implementers should understand and plan for infrastructure that remains to be developed, and their program goals and timelines should reflect these conditions. With a new program or approach, for example, program implementers should build in a significant amount of time for establishing relationships and conducting stakeholder outreach before rolling out retrofit activities. The program timeline and targets should reflect potential hurdles, set reasonable targets, and track meaningful milestones other than retrofits and energy savings (e.g., changes in program awareness, expanded service provider networks, interest in energy efficiency, and faster uptake over time).

Conclusion: *Cross-State Comparisons Proved Difficult.* Making “apples-to-apples” comparisons across four state programs proved challenging given the many differences in program operations and elements. While sponsors typically, and desirably, tailor programs to their target areas and audiences, such tailoring can confound cross-state comparisons of some metrics. For example, because auditors and contractors took different approaches to reporting leads to the programs and to tracking completed audits and retrofits, the study could not compare audit-to-retrofit conversion rates across states. The different incentive levels, financing mechanisms, program designs, and marketing approaches used by

the programs also prevented meaningful comparisons of cross-state audit-to-retrofit rates and other metrics.

Recommendation: In initial meetings, sponsors should discuss and agree upon a small set of key performance metrics essential for comparisons across programs. Such discussions will require that sponsors understand each program’s assumptions, requirements, and unique characteristics, as well as the circumstances that would hinder comparisons—such as how auditors and contractors report leads, audits, and retrofits.

Stakeholder Coordination

Conclusion: *Strong State Energy Office/Implementer/Market Actor Partnerships Developed.* Although coordination among the many parties involved with the programs initially proved challenging, the strong State Energy Office/implementer/market actor partnerships that developed resulted in a shared sense of cause. These partnerships, along with the collaborative relationships some programs forged with local government agencies and utilities, should benefit future program efforts and collaborative endeavors.

Recommendation: Program implementers should continue to regularly communicate with each other and to investigate further opportunities for growing the energy-efficiency market within their regions. Where applicable, implementers should continue to leverage the useful connections they have made with regional utilities, government agencies, and market actor associations.

Conclusion: *Local Auditor/Contractor Networks Proved Essential to Success.* Strong and local auditor/contractor networks provided the most likely channel for full participants to enter the programs in these states. Homeowner surveys indicated that knowing auditors’/contractors’ affiliations with a local program and knowing auditors/contractors received special energy-efficiency training gave participants confidence to participate in the programs.

Recommendation: The programs should continue to build and support the contractor networks and to provide local endorsements and oversights. Strategies to maintain strong networks include: regularly informing contractors of program changes and opportunities, and providing opportunities for networking and feedback.

Conclusion: *Local Knowledge Proved Crucial.* Local implementers, engaging with their communities and understanding the characteristics of their target markets, served as key ingredients in the pilots’ success.

Recommendation: When developing and implementing new programs, implementers’ marketing and outreach materials should emphasize local connections by highlighting relationships with local organizations, spokespeople, localities, and market actors (e.g., auditors, contractors, real estate professionals, and appraisers).

Conclusion: *Programs Proved Vulnerable to Staff Turnover.* Relying on only a few staff members to fill all of the necessary program roles to run an audit and retrofit program—such as technical building science, marketing, and accounting knowledge—can leave the program vulnerable when staff leave the organization.

Recommendation: Program implementers should consider expanding staff levels and skills and/or networking and partnering with other organizations that can supply needed expertise. Organizations can share marketing, administrative, and financial services, as well as supplies, space, and other program support costs.

Market Actor Support and Training

Conclusion: *Program Staff Provided Strong Support to the Contractor Networks.* Auditors and contractors valued the accessibility of program staff to answer and resolve questions. The programs' contractor support, training, and networking opportunities succeeded in building skilled and collaborative residential energy-efficiency retrofit workforces in the targeted communities.

Recommendation: Program staff should continue to offer market actors technical and sales support and networking opportunities that encourage market actors to collaborate across their areas of expertise.

Conclusion: *While Contractors Increased Their Skills, Additional Training is Needed.* The programs made great strides in developing networks of skilled contractors. Some contractors, however, requested additional training on specific topics (e.g., sales training). In addition, there is room for quality improvements as contractor staff turns over and as program staff update retrofit and technical specifications.

Recommendation: Program staff should offer additional, in-person training sessions tailored to specific areas that auditors and contractors seek. Program implementers should solicit input from auditors and contractors about training topics, ensuring that trainings are well attended and continue to provide value. Trainings should also be designed to address quality assurance issues and provide updates about program changes. If quality assurance issues or program changes prove significant, the programs should consider training attendance as a requirement for program participation.

These services would ensure auditors and contractors receive complete and current program information and that the programs maintain their high-quality standards. They also would enable skill development, increase program buy-in, improve sales and depth of retrofits, and provide a networking forum.

Conclusion: *Real Estate Professionals Are Interested in Energy Efficiency.* The states included increasing the awareness and value of energy-efficient homes in the marketplace as long-term program goals. Real estate professional and appraiser training sessions provided an important first step in realizing this awareness goal, as the trainings introduced energy-efficiency topics to market actors influential in the home buying and selling processes. Almost all real estate professional and appraiser trainees spoke enthusiastically about their experiences and the potential applicability to their work. These market actors, however, do not yet actively use the knowledge gained from the training.

Recommendation: Program staff should explore options to build on their success in this area, perhaps through more targeted training or through practical steps to apply their knowledge, such as championing modifications to the MLS listings that recognize energy-efficient homes.

Conclusion: *The Programs Exhibited Differences in Deploying the EPS Software.* In Alabama, Virginia, and Washington, different program designs, incentive structures, and program implementer approaches led to variability in how auditors and contractors used EPS software. Earth Advantage worked with the programs to set up the EPS software, based on each state's unique delivery model. In Massachusetts, the utility program implementation vendors already had auditors on staff and existing auditing software in use prior to Home MPG's roll-out. Based on discussions with DOER, the implementation vendors eventually incorporated energy scorecard generation capabilities into their own auditing software and utilized it relatively consistently. Across the four states, contractors used a variety of methods to present retrofit proposals to interested homeowners. They also incorporated varying formats and levels of detail in their reporting to program staff.

Recommendation: To ensure consistent delivery of the program to all participants and to ease analysis of program data, standardized data collection practices should be established, as should reporting templates for completed assessments and retrofits. To minimize burdens on auditors and contractors, the templates only should require essential information that cannot be obtained elsewhere. Auditors and contractors should be asked to provide feedback on the templates before finalization to ensure buy-in and clarity. Once the templates have been finalized, training should be offered on their use so market actors become familiar with the templates and program expectations and can ask questions.

Conclusion: *Contractors Displayed Mixed Use of EPS Scorecards.* Though some auditors and contractors in Alabama, Virginia, and Washington initially had concerns about the EPS software and did not fully embrace it, most ultimately agreed to use EPS as a part of participating in their respective programs. During the course of the programs, the auditors and contractors became better acquainted with the EPS software and appreciated the software enhancements Earth Advantage implemented.

Recommendation: The selection of program audit software and homeowner engagement tools must balance administrative, homeowner, and contractor needs. That said, after ensuring audit software accuracy, the highest priority should be placed on developing mechanisms that most effectively persuade homeowners to take efficiency actions. Consumer research and/or pilots that test homeowner engagement tools, such as energy scorecards, would provide details about how tools can be enhanced. Sharing homeowner enthusiasm for the scorecards with auditors/contractors, demonstrated through evaluations (such as this one), and through evaluation efforts specifically focused on homeowner responsiveness to the tools, could help persuade auditors/contractors to make greater use of auditing software and energy scorecards. Additionally, the programs should seek feedback from market actors and program implementers to ensure that the auditing software and homeowner engagement tools desired by customers also meet market actors' needs.

Program Marketing, Outreach, and Implementation

Conclusion: *Program Marketing Strategies were Innovative and Effective.* Evaluation findings showed that, while the programs operated on limited budgets, all developed creative, compelling, locally focused marketing and outreach efforts that supported market actors and attracted consumer attention. In addition, most participants were very satisfied with the services they received. This in turn created strong word-of-mouth marketing for the programs.

Recommendation: Emphasizing a local presence, helping auditors and contractors market and sell effectively, and ensuring contractors provide the high-quality services that generate positive program responses should continue to be central to the marketing efforts.

Conclusion: *Financial Motivators Drove Homeowner Actions.* Participants reported that financial considerations primarily drove their decisions: saving money was the primary motivator for seeking an audit and retrofit, and cost was the most common reason for not pursuing a retrofit or all recommended efficiency improvements. Convincing homeowners of the value of whole-house or multi-measure retrofit often proved challenging for contractors. While money remained foremost on most people’s minds, other factors—such as improving home comfort, having more predictable energy bills, and ensuring energy for the future—influenced decisions.

Recommendation: Contractor training should address methods to sell whole-house retrofits. The training should help contractors explain the value proposition, both financial and non-financial (e.g., improved comfort in a drafty house) of whole-house retrofits to homeowners. In addition, since other factors sway customers, sales training should include elements that help contractors discover, through the sales process, the other “sweet spot” reasons (e.g., comfort, convenience, controlling utility bills, limiting waste) that persuade customers to take action.

Recommendation: Develop local testimonials and case studies, based on the experiences of satisfied participants, especially those whose homes have undergone “deep” retrofits, and use these materials as marketing collateral. Case studies should provide cost savings resulting from rebates, actual differences over time in participants’ pre- and post-retrofit utility bills, and participant testimonials about other benefits.

Conclusion: *Participating Homeowners Represented a Narrow Market Segment.* The evaluation found the programs generally appealed to a narrow band of homeowners—those with higher-than-average incomes and higher-than-average education levels. Messages focusing on making costs more predictable as energy prices rise, reducing waste, and highlighting the availability of rebates and loans to reduce first-costs may resonate more with middle-income homeowners. Continued messaging about the improved comfort of retrofitted homes and the health benefits for occupants will also likely be important.

Recommendation: As the programs mature, program staff will need to reach a broader spectrum of homeowners, who may utilize different decision criteria. This will require changes in program design, from rebate levels and financing products to program marketing messages and delivery. Further consumer research and/or controlled, evaluable, pilot efforts could be used to explore barriers and alternative program and marketing designs. Other relatively low-cost outreach methods that have been effectively used in similar programs include: incorporating participant testimonials in program literature; distributing program information at community events; offering do-it-yourself loaner kits; making program information available at local government offices (e.g., government permitting departments, libraries); and offering tours of homes that have completed energy-efficiency retrofits through the program.

Conclusion: Loans Enhanced the Programs' Credibility. The availability of program-sponsored loans enhanced the programs' credibility, influenced one-third to one-half of retrofit decisions, and, for some homeowners, made the difference as to whether or not they could retrofit their homes.

Recommendation: Sponsors should continue offering loan programs with actively engaged, supportive participating lenders. As the efficiency industry around the country is now paying greater attention to offering loan programs, sponsors should track developments regarding energy-efficiency financing to determine if these new options would fit their programs.

Conclusion: Scorecards Proved Helpful in Selling Energy Efficiency. Contractors generally found scorecards and energy reports helped them sell energy-efficiency retrofits to homeowners, and most homeowner participants considered the scorecards and reports useful in illustrating steps they could take to save energy. Data from the Washington program show participants undertook more extensive upgrades and had a higher audit-to-retrofit conversion rate than customers who retrofitted their homes through other programs that used different reporting tools and did not include an energy scorecard. Research currently underway in Massachusetts seeks to determine if use of the scorecard and reporting tools increased audit-to-retrofit conversion rates or led to deeper retrofits there. Nonetheless, customer ratings suggested the scorecard and reporting tools could be improved.

Recommendation: Additional research activities should be pursued to determine whether the auditing software and scorecard tools are as effective as possible. Findings from these analyses should be used to inform program modifications, such as: new outreach approaches and marketing messages, changes to market actor trainings, or enhancements to program tools.

Program Sustainability

Conclusion: Local Implementers Proved Important. The presence of local implementers proved vital to the programs' success. Going forward, local program sponsors with an understanding of their target populations and ties to local organizations (e.g., trade ally groups, utilities, government agencies, non-profit, and private businesses) will continue to play a critical role in ensuring the programs' long-term operations.

Recommendation: Program staff should draw upon their understanding of their target markets' demographics and their relationships with other local organizations to develop/update sustainability plans that include: second-phase goals and targets, partnership opportunities, outreach approaches, incentive levels, and offerings.

Conclusion: Program Funding and Rebates Were Critical to Inducing Participation. The programs increased the profile and level of energy-efficiency activities in the targeted areas. Rebates attracted the attention of auditors, contractors, and homeowners and induced participation. Reductions in rebate funding, especially for these relatively young programs, will likely increase the difficulty of retaining market actors, recruiting new market actors and new homeowners, and encouraging participant homeowners to undertake more extensive retrofits.

Recommendation: Cultivation of local partnerships should continue, and efforts to seek funding and support from public and private sources—local, regional, and national—should be aggressively expanded. Pursuit of relationships with regional utilities should continue. Program staff also should consider innovative funding mechanisms, such as assessing contractor fees, to generate revenues for programs and to help ensure their continued operations.