Driving Demand

for Home Energy Improvements:

Motivating residential customers to invest in comprehensive upgrades that eliminate energy waste, avoid high bills, and spur the economy

September 2010

Environmental Energy Technologies Division
Lawrence Berkeley National Laboratory

BERKELEY LAB

LBNL-3960E

Driving Demand
for Home Energy Improvements:

Motivating residential customers to invest in comprehensive upgrades that eliminate energy waste, avoid high bills, and spur the economy

September 2010

Principal Authors:

Merrian C. Fuller*, Cathy Kunkel, Mark Zimring, Ian Hoffman, Katie Lindgren Soroye**, and Charles Goldman

With Contributions From:

INSTITUTE FOR Sustainable Communities

www.iscvt.org

GREEN FOR ALL

www.greenforall.org

Environmental Energy Technologies Division

Lawrence Berkeley National Laboratory

BERKELEY LAB

LBNL-3960E

The work described in this report was funded by the Department of Energy Office of Energy Efficiency and Renewable Energy, Weatherization and Intergovernmental Program under Contract No. DE-AC02-05CH11232.

*Communications can be sent to mcfuller@lbl.gov

**Katie Lindgren Soroye was a consultant on this project. She currently works for Pacific Gas & Electric (PG&E).

Acknowledgments

The work described in this report was funded by the Department of Energy Office of Energy Efficiency and Renewable Energy (DOE EERE), Weatherization and Intergovernmental Program under Contract No. DE-AC02-05CH11231.

We would like to thank Mark Bailey and Marion Lunn (DOE EERE) for their support of this project. We would also like to thank the staff at Institute for Sustainable Communities (ISC) and Green for All (G4A); especially Sarah McKearnan (consultant to ISC), Tom Wilson (ISC), and Elaine Wang (ISC) and Ladan Sobhani (G4A); who wrote several of the case studies and reviewed the report. We would like to thank the industry experts who we interviewed, and to Efficiency First for giving us access to your members for our contractor survey. Special thanks to Anthony Ma for the graphic design of this report.

We would also like to thank the following individuals for providing thoughtful comments and input on a review draft of this report: Alan Sanstad (Lawrence Berkeley National Laboratory), Andrew McAllister (Center for Sustainable Energy), Annika Todd (Precourt Energy Efficiency Center, Stanford University), Carl Nelson (Center for Energy & Environment), Chris Granda (Grasteu Associates), David Gershon (Empowerment Institute), Dorian Dale (Long Island Green Homes), Elizabeth Stewart (DC Project), Emmaia Gelman (Center for Working Families), Eric Hirst, Erin Jackson (DOE), Greg Thomas (Performance Systems Development), Hannah Wood (Sentech), Kat Donnelly (EMpower Devices), Linda Schuck (California Institute for Energy and Environment), Marion Lunn (DOE), Matt Golden (Recurve), Mike Rogers (GreenHomes America), Nancy Wasserman (Sleeping Lion Associates), Richard Faesy (Energy Futures Group), Rick Diamond (LBNL), Sam Borgeson (Energy & Resources Group, UC Berkeley), Steve Morgan (Clean Energy Solutions), and Will Byrne (DC Project).

While we benefitted immensely from the wisdom of the many people who gave feedback on this report, all mistakes are our own.

Disclaimer

This document was prepared as an account of work sponsored by the United States Government. While this document is believed to contain correct information, neither the United States Government nor any agency thereof, nor The Regents of the University of California, nor any of their employees, makes any warranty, express or implied, or assumes any legal responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by its trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or simply its endorsement, recommendation, or favoring by the United States Government or any agency thereof, or The Regents of the University of California. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof or The Regents of the University of California.

Ernest Orlando Lawrence Berkeley National Laboratory is an equal opportunity employer.

Table of Contents

Executive Summary 1
Key Lessons for Program Designers 5
1. Introduction 7
2. Case Study Summaries 10
3. Lessons from Past Programs 18
4. Why "Retrofits" are a Tough Sell 22
5. Success Requires a Holistic Approach 25
6. Lessons from Behavioral Research 28
7. Identify Your Target Audience 36
8. Sell Something People Want 43
9. Language Matters 48
10. Engage Trusted Messengers 50
11. Work Closely With Contractors 55
12. One Touch Is Not Enough 60
13. Design and Evaluate Programs to Learn What Works 63
14. Conclusion 67
References and Resources 68
Appendix A—Case Studies 76
Appendix B—Contractor Survey Methodology 130
Appendix C—Acronyms 132

Executive Summary

Policy makers and program designers in the U.S. and abroad are deeply concerned with the question of how to scale up energy efficiency to a level that is commensurate both to the energy and climate challenges we face, and to the potential for energy savings that has been touted for decades. When policy makers ask what energy efficiency can do, the answers usually revolve around the technical and economic potential of energy efficiency—they rarely hone in on the element of energy demand that matters most for changing energy usage in existing homes: the consumer. A growing literature is concerned with the behavioral underpinnings of energy consumption. We examine a narrower, related subject: How can millions of Americans be persuaded to divert valued time and resources into upgrading their homes to eliminate energy waste, avoid high utility bills, and spur the economy?

How can millions of Americans be persuaded to divert valued time and resources into upgrading their homes?

With hundreds of millions of public dollars[1] flowing into incentives, workforce training, and other initiatives to support comprehensive home energy improvements[2], it makes sense to review the history of these programs and begin gleaning best practices for encouraging comprehensive home energy improvements. Looking across 30 years of energy efficiency programs that targeted the residential market, many of the same issues that confronted past program administrators are relevant today: How do we cost-effectively motivate customers to take action? Who can we partner with to increase program participation? How do we get residential efficiency programs to scale?

While there is no proven formula—and only limited success to date with reliably motivating large numbers of Americans to invest in **comprehensive** home energy improvements, especially if they are being asked to pay for a majority of the improvement costs—there is a rich and varied history of experiences that new programs can draw upon. Our primary audiences are policy makers and program designers—especially those that are relatively new to the field, such as the over 2,000 towns, cities, states, and regions who are recipients of American Reinvestment and Recovery Act funds for clean energy programs. This report synthesizes lessons from first generation programs, highlights emerging best practices, and suggests methods and approaches to use in designing, implementing, and evaluating these programs. We examined 14 residential energy efficiency programs, conducted an extensive literature review, interviewed industry experts, and surveyed residential contractors to draw out these lessons.

---

[1]Public funds supporting home energy improvements include those provided by the American Recovery and Reinvestment Act, ratepayer funds collected in many states to support energy efficiency, and RD&D and implementation activities supported and funded by Department of Energy, the Environmental Protection Agency and local and state entities such as State Energy Offices.

[2]These improvements are known by many names, including residential energy efficiency retrofits or home performance retrofits. We use the terms "home energy improvements" or "home energy upgrade" throughout this report because we believe it is less confusing and has more positive connotations for homeowners new to this topic than other names used. We also use the term "energy assessment" instead of "energy audit."

Marketing and Outreach Lessons

- **It is not enough to provide information; programs must sell something people want**—High home energy use is not currently a pressing issue for many people; find a more appealing draw such as health, comfort, energy security, competition, or community engagement to attract interest.

While there is no proven formula, there is a rich and varied history of experiences that new programs can draw upon.

- **Time spent studying the target population is important**—A blanket marketing campaign to reach everyone will likely be ineffective and expensive, especially at the start of a program. Find and target early adopters. Tailor messages to this audience. Demographics can help segment the market and select optimal strategies, but you can also segment the market by personal values, interest in hot issues such as health concerns, or likelihood of getting savings.

- **Partner with trusted messengers**—Larger subsidies and more voluminous mailings don't necessarily win over more customers. Programs can and should have a local face, with buy-in from community leaders. Tapping trusted parties, such as local leaders and local organizations, builds upon existing relationships and networks.

- **Language is powerful**—Avoid meaningless or negatively-associated words like "retrofit" and "audit". Use words and ways of communicating that tap into customers' existing mental frames. Encourage program staff and contractors to use specific vivid examples, personalize the material wherever possible, frame statements in terms of loss rather than gain, and induce a public commitment from the homeowners.

- **Contractors are program ambassadors**—Contractors, more than any other party, are the people sitting across the kitchen counter making the final sales pitch to a homeowner—contractors are often the public face and primary sales force for the program. Most programs that succeed in performing a significant number of energy upgrades have worked closely with contractors. Conversely, poor first impressions or shoddy work by contractors can reflect poorly on the program.

- **One touch is not enough**—The advertising industry's "three-times convincer" concept means that the majority of people need to be exposed to a product message at least three times before they buy into it. Energy efficiency is an especially tough product—it can be expensive and can't be readily touched, tasted, or seen—and that calls for a layered marketing and outreach approach that achieves multiple touches on potential participants.

Program Design and Implementation Lessons

- **Make it easy, make it fast**—Offer seamless, streamlined services—package incentives, minimize paperwork, and pre-approve contractors—give people fewer reasons to decide against home improvements by making it simple.
- **Contractors should be full partners**—Contractors are the key point of sale for home energy improvements. They already understand the traditional renovation and home improvement market, and have access to customers who may initially want to replace a furnace but may be open to other improvements. It's imperative to design a program that contractors want to sell—and convince them that the opportunity is worth the time and money to get the appropriate training and equipment.
- **Rebates, financing and other incentives do matter**—Program experience shows that incentives do motivate the choice to do home upgrades, and can be extremely important to get a program off the ground.
- **A well-qualified workforce and trustworthy work are vital**—Promoting a program aggressively before contractors can handle the workload can lead to disgruntled customers. Solid performance builds trust with customers by reliably producing energy savings, as well as the health, safety, and comfort benefits of home energy improvements.
- **Persistence and consistency are valuable**—It takes time for partnerships to take root, for word to reach consumers, and for contractors to respond to the opportunity. Consistent programs that last for more than a year or two can create a more robust market for home energy improvements; ephemeral programs can undermine trust.
- **Know success and failure by measuring it, and experiment to figure out what works**—Designing for data collection and evaluation at the start allows for mid-stream adjustments, better selection among strategies, and knowing success when it arrives. It is important to pilot strategies before launching full-scale programs and to test a variety of strategies to learn what works.

In retrospect, many of these lessons seem obvious: Forge strong local partnerships. Find out what people care about. Speak their language. Sell something people want. Be trustworthy. But our case studies, interviews, and literature review also reflect an increasingly nuanced evolution in understanding how behavioral and marketing insights can be applied to reduce energy use in

Success will require multifaceted approaches that acknowledge a deeper understanding of what motivates homeowners and contractors.

the residential market.Success will require multifaceted approaches that acknowledge a deeper understanding of what motivates homeowners and contractors. Effective programs will tend to be tailored to the location, thoughtfully researched and piloted, personalized to the target audience, and more labor-intensive than simple incentive programs. Just as there is no single, monolithic customer, there is no silver bullet for driving demand for home energy improvements—but past experience and research offer policy makers and program designers a strong foundation on which to build.

Key Lessons for Program Designers

"Retrofits" are a Tough Sell

- Programs must make an appealing case to potential customers, many of whom are not currently interested in upgrading their homes.
- Demands on homeowners, particularly around time and effort, must be minimized. Try to consolidate the number of steps required. Participants drop out with each additional step and with each time delay.

Success Requires a Holistic Approach

- A comprehensive approach to energy efficiency market development is required. This will require the long-term commitment of funding and effort by program funders and implementers.

Lessons from Behavioral Research

- Behavioral science research and practical application confirm that simply providing information and financing is insufficient to incentivize widespread energy improvements.
- Social norms, competition, public commitment and feedback may all be useful tools to guide program design.
- Programs that opt for a small concessions approach need to make sure that the participant understands upfront that this is just the first step—and the fewer steps the better.

Identify the Target Audience

- Use focus groups and market segmentation research to identify the target audience; understand the specific barriers and effective messages to reach this audience.
- Focus on the early adopters in the beginning stages of a program.
- Identify and recruit the opinion leaders in the community to model the program's benefits.

Sell Something People Want

- Selling something the customer wants is vital to program success. Messages about home comfort, cost and energy savings, health, and community pride may be effective in engaging potential customers.
- Programs should consider creative uses of incentive funds—what will get the target audience's attention?

Language Matters

- Words have power—programs should choose the language they use carefully. The terms “audit” and “retrofit” are not effective.
- Communication style matters, and this can require training to get right. Programs should consider using vivid examples, personalizing information, using statements of loss rather than gain, and inducing a commitment from the homeowners.

Engage Trusted Messengers

- Encourage peer-to-peer conversations to generate “buzz” going within the community.
- Ask for the support of local organizations, especially nonprofits.
- Allow the local community to have ownership of the program.

Work Closely With Contractors

- Contractors need to buy into the program—they are often the primary sales force for home energy improvements, and should be prepared to sustain the market if public support ramps down.
- Leveraging contractors’ existing relationships to deliver program messages can be a cost-effective way to increase demand for comprehensive energy upgrades.
- Quality assurance is vital—customers are likely to view private contractors as extensions of the program, and the quality of the contractors’ work will significantly impact program success.

One Touch Is Not Enough

- Outreach campaigns need to repeatedly “touch” potential participants.
- Programs should take steps to ensure residents are receiving consistent messages, especially if there are multiple program messengers.

Design and Evaluate Programs to Learn What Works

- Collect data on the effectiveness of different marketing and outreach approaches. Incorporate processes for evaluating these metrics into program design, and use this information to adjust program delivery.
- Look at the **all in** costs of the program—including all direct and indirect staff time, incentives, marketing materials, etc—and come up with a cost per home upgraded. How does this return on investment compare to other strategies available?

1. Introduction

With hundreds of millions of public dollars[3] funding incentives, financing programs, workforce training, and other initiatives to support comprehensive home energy improvements[4], it is instructive to step back and review the history and try to glean best practices for encouraging these improvements at scale. What knowledge exists that might improve programs' ability to encourage millions of Americans to upgrade their homes to eliminate energy waste, avoid high utility bills, and spur the economy? Through our research, we aim to better understand effective approaches to creating demand for home energy upgrades so that we can inform program designers as they innovate in this space.

The bad news is that there is limited program experience with reliably motivating large numbers of Americans to invest in comprehensive home energy improvements, especially if they are being asked to pay for a majority of the improvement costs. Thus far programs have not succeeded in delivering these investments at a scale commensurate with either a) the energy and climate challenges, or b) the potential for savings in the residential sector that has been touted for decades. However, the good news is that there are many lessons from past experience and from social science research that provide a strong foundation for new programs.

The bad news is that there is limited program experience with reliably motivating large numbers of Americans to invest in comprehensive ***home energy improvements, especially if they are being asked to pay for a majority of the improvement costs.***

[3]Public funds supporting home energy improvements include those provided by the American Recovery and Reinvestment Act, ratepayer funds collected in many states to support energy efficiency, and RD&D and implementation activities supported and funded by Department of Energy, the Environmental Protection Agency and local and state entities such as State Energy Offices.

[4]These improvements are known by many names, including residential energy efficiency retrofits or home performance retrofits. We use the terms "home energy improvements" or "home energy upgrade" throughout this report because we believe it is less confusing and has more positive connotations for homeowners new to this topic than other names used. We also use the term "energy assessment" instead of "energy audit".

Research Scope

The good news is that there are many lessons from past experience and from social science research that provide a strong foundation for new programs.

The objective of this report is to provide program designers and policy makers with insights to increase the number of comprehensive home energy improvements—for the purposes of this report, these are defined as energy efficiency-focused upgrades to residential buildings that cumulatively save greater than 15% of annual energy use[5]. These improvements might include some combination of air sealing, insulation, lighting replacement, window replacement or enhancement, duct sealing, furnace or heat pump replacement, water heater replacement, air conditioner replacement, solar thermal water heating, etc. We are interested in informing programs that require participants to pay for a substantial share of the cost, where more compelling marketing is required.

Onsite renewable energy generation (e.g., solar photovoltaic systems, small scale wind, or geothermal) are also within the realm of "home energy improvements" but are not the main focus of this report. However, we do touch on using renewable energy installations as a "hook" to drive demand for energy efficiency improvements. We also do not focus on single-measure equipment upgrades or changing citizens' daily habits. However, this report does draw insights from programs aimed at installing single-measures, changing consumer behavior, and installing renewables—in so far as they inform the primary interest in how to motivate demand for comprehensive home energy improvements.

Specifically, we focus on how programs effectively inform and persuade citizens to investment in a home energy upgrade. Although not part of this report's scope, there are other program elements that are critical to effectively creating a market for home energy improvements—such as incentives, financing, workforce development, industry standards, public policies, and market transformation initiatives. We briefly discuss these elements in Chapter 5.

The insights and findings in this report come from four main sources:

1. Detailed cases studies of 14 residential energy efficiency programs, and a review of many additional programs. Insights from these cases are included throughout this report; see Appendix A for the full case studies. In selecting case studies we looked for a diversity of marketing strategies, programs that achieved significant market penetration, a focus on comprehensive improvements, and geographic diversity. It was extremely difficult to find programs that met all these criteria; we focused on selecting programs that could provide a range of examples that would be most instructive to the new Recovery Act-funded programs currently under development.

---

[5]The 15% savings level is somewhat arbitrary. The EPA has established a 20% saving threshold for a Home Performance with Energy Star (HPwES) upgrade, but ~15% was the maximum average savings per home found among our case studies that had done formal evaluations. We are interested in installing a suite of home energy improvements that can make a substantial impact on home energy use, beyond lighting replacements or small changes in behavior.

2. A review of relevant reports and presentations, including program evaluations, social science research, marketing reports, conference presentations, and other resources produced over the last 25 years. We include many of these resources in the bibliography with web links, where available.

3. A phone survey of 30 home performance contractors, randomly selected from the membership list of Efficiency First, the trade association for contractors and other firms providing home energy improvement products and services[6].

4. Additional interviews with experts who have experience relevant to the issues explored in this report.

What This Report Covers

This paper explores the strategies that can be used to increase demand for comprehensive home energy improvements, specifically in residential, single-family, owner-occupied buildings—though the implications of this research may be applicable more widely. It is important to note that the strategies discussed in this report, although generally supported by social science research and our case studies, have often not been rigorously evaluated in practical application. Thus, the strategies profiled should be taken as suggestions of what might work, with the understanding that different techniques will be more or less applicable in different communities. This report emphasizes the need for better research, including controlled experiments, to understand which marketing and outreach strategies are most effective.

Chapter 2 includes summaries of the 14 programs examined in detail and compares key program design elements and success metrics. **Chapter 3** reviews lessons from past programs. **Chapter 4** discusses why it has been difficult to motivate homeowners to pursue home energy improvements. **Chapter 5** describes the range of elements important to make programs successful, beyond effective marketing and outreach. **Chapter 6** draws on relevant lessons from social science research that informs our analysis of effective marketing and outreach strategies. **Chapters 7, 8 and 9** describe the importance of understanding the customer, how to "sell" energy improvements, and why terminology and language matter. **Chapter 10** highlights the importance of using trusted messengers. **Chapter 11** emphasizes the value of working closely with contractors to increase program participation. **Chapter 12** describes the importance of multiple "touches" with a potential participant. **Chapter 13** emphasizes the need to better understand the effectiveness of these techniques and provides some suggestions on effective experimental design and program evaluation. The appendices include the full case studies, a list of acronyms, and our contractor survey instrument.

[6]Additional details about our survey instrument can be found in Appendix B.

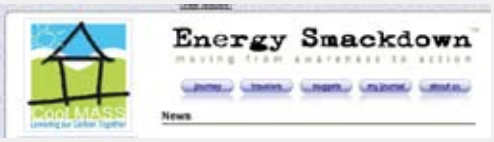
2. Case Study Summaries

A summary of our case studies and tables comparing key program elements are below. Full case studies can be found in Appendix A. Not every program collected all the data necessary to make a full comparison of the case studies, but we included the information we could gather through interviews and program documents.

Bonneville Power Administration – Pacific Northwest, US

Over more than a decade (1980 to 1992), Bonneville Power Administration (BPA) weatherization programs completed approximately 900,000 home energy improvements in the Pacific Northwest, reaching more than half of eligible customers. Bonneville launched its program in an era of rising electricity prices and mounting federal interest in energy efficiency. BPA funded the programs; local utilities that received power from BPA administered the programs. Program participation rates varied among utilities, and the most successful utilities upgraded more than half of eligible properties. Participating homeowners received free energy assessments and paid as little as 15% of the total upgrade cost (i.e., the energy assessment and balance of the cost of the retrofit were funded by BPA). The best-performing utilities curried participant trust by helping homeowners choose a contractor and performing rigorous inspections to ensure that that the measures were properly installed.

Energy Smackdown – Boston, MA



Energy Smackdown pits neighborhood teams against one another in a competition to reduce greenhouse gas emissions. In its most recent pilot, Energy Smackdown used a leadership council of prominent local members to bring together three teams, totaling 100 households, from metropolitan Boston neighborhoods. By translating the often ambiguous notion of energy efficiency into something quantifiable—e.g. “I can earn X points for my team by insulating my attic”—the program makes energy savings easier to understand and guides people to smart energy choices. Utilities have been key supporters of Energy Smackdown, offering free home energy assessments, prizes and other incentives. The initiative works to complement home energy upgrades with a new outlook on energy consumption across the neighborhood. Energy Smackdown also organizes challenge events to be highly public in an attempt to introduce the program to a wider audience.

Hood River Conservation Project – Hood River, OR

The Hood River Conservation Project (HRCP), a $20 million program in the early 1980s, tested the limits of the cost effectiveness of a residential energy improvement program in the Pacific Northwest. HRCP installed, for free, any weatherization

measures that a household energy assessment showed were within a prescribed cost threshold per unit of energy saved. HRCP's marketing was based on social science research that analyzed the social networks within the community. Most customers learned of the program through word-of-mouth. The program achieved a high response rate for home energy assessments (91% of all eligible participants) and for the subsequent implementation of conservation measures (85% of all eligible participants).

Houston's Residential Energy Efficiency Program – Houston, Texas

The City of Houston's Residential Energy Efficiency Program (REEP) targets low income residents by neighborhood, offering them free weatherization services. REEP engages civic and religious leaders to build trust in the program. REEP also uses creative outreach tactics such as neighborhood block parties and tabling at local communities centers to get residents to participate. The program's goal is to weatherize over half of eligible homes in target neighborhoods. In one neighborhood so far, participation reached 95% of eligible homes.

Jasper Energy Efficiency Program – Jasper, Alberta, Canada

In the early 1990s, the Canadian Rockies town of Jasper, reduced residential peak electricity demand by more than 20%. Alberta Power, the local utility, aggressively promoted energy efficiency under the hypothesis (which proved true) that efficiency would be cheaper than constructing new electricity generation or transmission. The Jasper Energy Efficiency Program (JEEP) reached out to the town through many channels and actively sought local feedback and guidance in running the program. JEEP focused on installing such measures as compact fluorescent lighting and hot water tank conversions, not comprehensive home energy improvements. In essence, the program was a turn-key operation delivered in a home visit that minimized transaction costs for the homeowner. About 70% of Jasper households were reached through the program.

Keystone Home Energy Loan Program – Pennsylvania

The Keystone Home Energy Loan Program (HELP) focuses on "reactive" customers who have already made the decision to make an energy-related investment (usually because an old piece of equipment has broken). Keystone HELP's contractors then promote more energy efficient options and more comprehensive home energy improvements, each accompanied by attractive financing. In four years, the program has originated 5,500 loans totaling almost $40 million in total funding. Thus far, only about 10% of these loans (about 550 loans) have been for comprehensive home energy improvements, the rest are largely for single measure replacements. The program is noteworthy for the simplicity of the application process and for its network of contractors trained to use the program as a marketing tool and to perform high-quality home energy improvements.

Long Island Green Homes – Babylon, NY

Operated by the Town of Babylon, Long Island Green Homes (LIGH) provides financing for comprehensive energy efficiency and renewable energy improvements. Since its launch in late 2008, the program has persuaded more than

70% of homeowners who had an energy assessment to invest in comprehensive home energy improvements, with LIGH financing $3 million of improvements for more than 350 homes. The program's outreach strategy is designed to harness Babylon's existing resources without adding significant cost to either program participants or the town itself (LIGH's outreach cost per home upgraded is $39). Messaging has shifted since inception to brand LIGH as a program that educates residents about energy efficiency first, and provides a tool for paying for these improvements second. LIGH has recently recruited participants as spokespeople to sell the program to their peers.

Marshfield Energy Challenge – Marshfield, MA

The Marshfield Energy Challenge (MEC), a two-year pilot program, reduced the town's peak electricity use by bundling energy efficiency, solar photovoltaics (PV), and direct load control initiatives. The utility-led program made its offerings seamless and straightforward and then recruited local leaders as ambassadors. These leaders—selected from local schools, elected office, churches, and business—set the standard for energy improvements in their own homes and talked to townspeople about the program, both selling it and listening for feedback. Marshfield is an affluent town, and the program translated its message of using less energy into one of increasing property values. The MEC also used targeted direct mail to reach key households and businesses on a constrained electrical circuit. Over two years, the Marshfield Energy Challenge reduced the town's peak electricity demand by over 1.2 MW. Two-thirds of this reduction was from the residential sector. Almost 1,300 homeowners received energy assessments, and 90% installed at least one energy efficiency measure.

New London Resource Project – New London, WI

The New London Resource Project (NLRP), a three year program in New London, WI, used on-bill financing of energy-efficiency measures tailored so that energy bill savings exceeded loan payments. Two utilities and two public-power associations joined with a third-party efficiency administrator to sponsor the program. An advisory group of influential local leaders helped design and champion the program among fellow townspeople. NLRP subsidized home visits where program staff conducted an energy assessment, talked to the homeowner about efficiency and on-bill financing and directly installed initial efficiency measures. If desired, staff selected a contractor for more comprehensive home energy improvements at pre-negotiated prices. Almost 750 residential customers (about 25% of total customers) got energy assessments, and the project delivered 2.5 million kWh of annual savings of which almost 500,000 kWh came from the residential sector.

NYSERDA's Home Performance with ENERGY STAR Program – New York

The Home Performance with ENERGY STAR (HPwES) program, run by the New York State Energy Research and Development Authority (NYSERDA), created a statewide network of key partners—contractors, local groups, retailers, and manufacturers—to offer energy-efficiency education, products, and financing for New Yorkers.

HPwES supports the comprehensive home energy improvement market with both supply- and demand-side initiatives. The program is notable paying a portion of contractors' marketing costs for energy improvements. NYSERDA has leveraged $3.5 million of cooperative marketing funds with over $10 million of total contractor marketing expenditures, and 33,000 homes have been upgraded through the program since 2001.

Take Charge Challenge – Kansas

The Take Charge Challenge was a year-long energy use reduction competition between towns sponsored by a regional nonprofit in Kansas. In six towns, leadership teams were recruited among respected town leaders who communicated the benefits of the program to different constituencies within each town and played up the competition. The initiative led to savings of more than 6 million kWh during the program's single year. The installation of permanent energy-saving measures, such as interruptible thermostats and more efficient air conditioning, as a result of the Challenge also locked in more than 7 million kWh annual savings. The combination of local leadership with the incentive of competition resulted in higher levels of participation than organizers initially envisioned.

Twin Cities One Stop Program – Minneapolis and Saint Paul, MN

Minneapolis and Saint Paul have developed a model for delivering home energy improvement services that reduces marketing costs for programs and transaction costs for homeowners. By delivering energy efficiency education, subsidized energy assessments, and home energy improvement services to many homes in a single neighborhood at once, the Twin Cities One Stop Program reduces barriers that have led to low participation in residential programs. The program's coalition of cities, nonprofits, and utilities works from the notion that homeowners are more likely to make a major investment if they have been directly involved in learning and taking a few small steps first. The program's Home Energy Squads have visited 1,800 homes and typically achieve 10% to 15% energy-use reductions in each home. All participating homes are served at a cost of ~$600, of which the homeowner pays $30. The pilot is collecting information about what motivates homeowners to invest in energy efficiency, who should sit at the kitchen counter to "seal the deal," and how to reduce overall program costs.

Vermont Community Energy Mobilization Project – Vermont

Vermont's energy efficiency utility, Efficiency Vermont (EVT), designed the Vermont Community Energy Mobilization (VCEM) Pilot Project to test whether local volunteers could cost-effectively increase home-energy savings. The VCEM Pilot Project ran for five months in 2009 and included nine competitively-selected towns with active volunteer groups. The local volunteers made "home energy visits" that combined "kitchen table discussions" about energy-saving opportunities with on-the-spot water- and energy-efficiency improvements. These ranged widely from installing CFLs and water-heater wraps to low-flow shower heads and programmable thermostats. Over 700 homes participated, and the levelized cost of energy savings over the life of the measures installed is 3.5 cents/KWh, not including thermal savings from reductions in heating fuel use. Efficiency

Vermont had hoped this program would lead to more comprehensive home energy improvements. While 20% of the participants surveyed said they planned to have an energy assessment done, only 11 of the 576 single family homes (2%) got an energy assessment as of September 2009. EVT is looking at re-designing the program to encourage post-home visit actions such as comprehensive home energy improvements.

Weatherize DC – Washington, DC

WeatherizeDC is the anchor initiative of the DC Project, a nonprofit in Washington, DC. WeatherizeDC applies political campaign organizing tools and tactics to generate demand for home energy improvements. WeatherizeDC targets homes based on demographic information and housing stock characteristics (e.g., household income and age of home) and reaches out to them in various ways, including door-to-door canvassing, to bring onboard participants, supporters, and volunteers. The program applies data tools such as outreach micro-targeting and tracks program metrics and best practices in real time through web-based platforms accessible to volunteers, field staff, and contractors. The program delivers a triple bottom-line message as volunteers engage homeowners in deeper conversations about energy efficiency: weatherization will (1) create high-quality jobs in DC's underserved communities, (2) result in energy savings and more comfortable homes, and (3) have positive environmental impacts. The DC Project anticipates that home-energy improvements from the initial pilot will mobilize $300,000 to $600,000 of private investment in energy efficiency, and project staff plan on launching programs across the US.

The follow three tables look at the case studies in terms of duration, location, eligible population, incentives, costs, savings, and market penetration. This data was collected through interviews and by reviewing program information and evaluations. Not all information was available for each program; missing information was either not available or not applicable to the program. Also, the programs' assumptions varied about how to measure savings and what costs are counted as "direct costs" and "administrative & other costs". As a result, some of these numbers are not directly comparable. There is a strong need for a standardized way to account for these program performance indicators.

Table 1. Comparison of Residential Sector Programs: Location, Target Population, and Incentives

Program Name & Duration	Program Location & Target Population	Incentive Available	Financing Available
Bonneville Power Administration (BPA) Weatherization Programs 1980–1992 (12 yrs)	**Pacific NW** Approximately 1.6 million electrically heated homes	Free assessment plus rebates capped at 85% of weatherization costs	Zero-interest loans during the pilot only
Energy Smackdown Pilot May 2008–May 2009 (1 yr)	**3 Massachusetts neighborhoods** Single family homeowners in targeted neighborhoods	Free energy assessments, some utility rebates	Utility-sponsored financing program available
Hood River Conservation Project (HRCP) 1983–1985 (3 yrs)	**Hood River, OR** 3,500 electrically-heated homes and apartments	All measures are free	Not needed
Houston's Residential Energy Efficiency Program (REEP) 2006 –present (4 yrs)	**Houston, TX** ~30,000 low-income homes in 12 targeted neighborhoods	All measures are free	Not needed
Jasper Energy Efficiency Project (JEEP) Sept 1992–Feb 1993 (6 months)	**Jasper, Canada** All 1,296 households in Jasper	Rebates up to 80% of measure costs	Not needed
Keystone Home Energy Loan (HELP) 2006–present (4 yrs)	**Pennsylvania** All single family homes and duplexes	Below market rate financing	Low-interest loans; better rates for more comprehensive work
Long Island Green Homes (LIGH) Oct 2008–present (almost 2 yrs)	**Babylon, NY** 60,000 single-family homeowners	$250 audit cost deducted from upgrade cost for program participants, below market rate financing	Financing at 3% interest
Marshfield Energy Challenge Dec 2007–Sept 2009 (18 months)	**Marshfield, MA** All households and businesses in Marshfield eligible; residents on a capacity-constrained electricity line targeted	Free CFLs, a $150 refrigerator rebate, no-cost air sealing and insulation, a free HVAC equipment tune-up, and solar PV at one-third market value	Utility-sponsored financing program available
New London Resource Project (NLRP) 1992 to 1995 (3 yrs)	**New London, WI** All ~3,000 households in New London	Subsidized assessments and rebates available	Onbill financing available
NYSERDA's Home Performance with ENERGY STAR Program 2001–present (9 yrs)	**New York** Households in NYSERDA's Systems Benefit Charge/ Energy Efficiency Portfolio	Participants can choose between rebates or subsidized financing	Utility-sponsored financing program available
Take Charge Challenge Pilot Apr 2009–Mar 2010 (12 months)	**6 towns in Kansas** All households in targeted towns; total population of ~70,000 people	Various utility programs; subsidized CFLs	none
Twin Cities One Stop Program Jun 2009–present (1 yr)	**30 neighborhoods in Minneapolis and St. Paul, MN**. Single family homeowners in targeted neighborhoods	Subsidized home energy assessments ($30 for a visit valued at $400)	4.99% loan offer by program administrator
Vermont Community Energy Mobilization (VCEM) Project Pilot Jan–May 2009 (5 months)	**9 towns in Vermont** About 18,000 homes in participating towns	Free "home energy visits" that included installation of CFLs, pipe insulation, insulated tank wraps, low-flow showerheads, faucet aerators and programmable thermostats	EE utility-sponsored financing program available
WeatherizeDC Pilot Sept 2009–Mar 2010 (6 months)	**Washington, DC** Moderate and upper income households with access to capital (no financing available for pilot) in targeted neighborhoods	~25% discount on improvements for program participants	none

Table 2. Comparison of Residential Sector Programs: Costs and Savings*

Program Name & Duration	Average Direct Upgrade Costs Per Home Upgraded	Administrative & Other Costs Per Home Upgraded	Average Savings Reported; Lifecycle Cost of Savings
Bonneville Power Administration (BPA) Weatherization Programs 1980–1992 (12 yrs)	$1,500–$3,000 per home	$200–$400 per home	~13% average annual electricity savings per home. Estimated lifecycle cost is between 1.8¢ and 5.2¢ per kWh (assuming 20-year lifetime of measures)
Energy Smackdown Pilot May 2008–May 2009 (1 yr)	N/A	$670 per participant in pilot, primary goal was not a home energy upgrade	Estimated 17% reduction in heating fuel use and 14% reduction in electricity use during the pilot period
Hood River Conservation Project (HRCP) 1983–1985 (3 yrs)	~$4,000 per home	~$600 per home for marketing, administration, computer system; does not include research and evaluation costs	~14% average reduction of electricity use. Estimated lifecycle cost is 7.1¢ per kWh (assuming 44-year lifetime of measures)
Houston's Residential Energy Efficiency Program (REEP) 2006 –present (4 yrs)	$3,000 - $3,500 per home	~$1,100 per home, Marketing costs are ~2.5% of total budget	12–15% average reduction of electricity use
Jasper Energy Efficiency Project (JEEP) Sept 1992–Feb 1993 (6 months)	N/A	$200 Canadian	22% PEAK electricity savings in residential sector. Estimated lifecycle cost is 1.4¢ per kWh (Canadian$; assuming 20-year lifetime)
Keystone Home Energy Loan (HELP) 2006–present (4 yrs)	~$15,000 for a comprehensive home energy upgrade, less for single measure equipment replacements	3.99% spread on loans for admin; this is about ~$300 per loan on average for the whole portfolio	N/A
Long Island Green Homes (LIGH) Oct 2008–present (almost 2 yrs)	~$7,500 per home	~$40 per home upgraded in marketing costs; staff and other admin costs are additional	Reduced air infiltration by 20–30% on average based on a blower door test
Marshfield Energy Challenge Dec 2007–Sept 2009 (18 months)	N/A	N/A	N/A
New London Resource Project (NLRP) 1992 to 1995 (3 yrs)	N/A	N/A	N/A
NYSERDA's Home Performance with ENERGY STAR Program 2001–present (9 yrs)	$7,700 per home	N/A	N/A
Take Charge Challenge Pilot Apr 2009–Mar 2010 (12 months)	N/A	N/A	N/A
Twin Cities One Stop Program Jun 2009–present (1 yr)	N/A	$500–$600 per home for marketing, workshops, assessment, low cost measures, feedback reports, ongoing assistance, and contractor coordination	N/A
Vermont Community Energy Mobilization (VCEM) Project Pilot Jan–May 2009 (5 months)	N/A	$123 per home, including products installed during home visit	Estimated lifecycle cost is 3.5¢ per kWh (assuming 10-year lifetime of measures)
WeatherizeDC Pilot Sept 2009–Mar 2010 (6 months)	$2,000–$4,000 per home	N/A	Reduced air infiltration by 20–30% on average based on a blower door test

*The dollar amounts used are not inflation-adjusted

Table 3. Comparison of Residential Sector Programs: Market Penetration

Program Name & Duration	# of Homes Contacted & % (#) of Eligible Homes Contacted	Cost of Assessment, # of Assessments Completed & % of Homes Contacted	# of Upgrades Completed & % of Homes Assessed*	% of Contacted Homes Upgraded, % of Eligible Homes Upgraded & (% Upgraded Per Year on Average)
Bonneville Power Administration (BPA) Weatherization Programs 1980–1992 (12 yrs)	N/A	**Free** assessment	**~900,000** homes upgraded; **~60%** of homes assessed did an upgrade during the BPA Interim Program	900,000 of 1.6M households is **~56%** of eligible homes upgraded (**4-5%** per year)
Energy Smackdown Pilot May 2008–May 2009 (1 yr)	N/A	**Free** assessment; **100** homes assessed	N/A	All 100 homes in pilot made some improvments
Hood River Conservation Project (HRCP) 1983–1985 (3 yrs)	**93%** (3,249) contacted	**Free** assessment; **3,189** homes assessed; **98%** of homes contacted	**2,989** homes upgraded; **91%** of home assessed	2,989 of 3,500 households is **92%** of contacted homes upgraded; **85%** of eligible homes upgraded (**~28%** per year)
Houston's Residential Energy Efficiency Program (REEP) 2006 –present (4 yrs)	N/A	**Free** assessment	**8,400** homes upgraded	8,400 of ~23,000 households is **~36%** of eligible homes upgraded (**~7%** per year on average)
Jasper Energy Efficiency Project (JEEP) Sept 1992–Feb 1993 (6 months)	N/A	N/A	**891** homes upgraded to some degree	891 of 1,296 households is **69%** of eligible homes upgraded
Keystone Home Energy Loan (HELP) 2006–present (4 yrs)	N/A	N/A	**5,500** loans; about 10% of these for comprehensive home energy improvements	5,500 of 3.3 million households in PA is **0.15%** of eligible homes upgraded (**0.05%** per year on average)
Long Island Green Homes (LIGH) Oct 2008–present (almost 2 yrs)	N/A	**$250** for assessment; **525** homes assessed	**366** homes upgraded; **~70%** of homes assessed	366 of 60,000 households is **0.6%** of eligible homes upgraded (**0.3%** per year on average)
Marshfield Energy Challenge Dec 2007–Sept 2009 (18 months)	N/A	**Free** assessment; **~1,300** homes assessed	**280** homes upgraded to some degree; **~22%** of homes assessed	280 of 9,100 households is **3.1%** of eligible homes upgraded (**2.1%** per year on average)
New London Resource Project (NLRP) 1992 to 1995 (3 yrs)	N/A	**$35** for the assessment; **750** homes assessed	N/A	N/A
NYSERDA's Home Performance with ENERGY STAR Program 2001–present (9 yrs)	N/A	N/A	**33,000** homes upgraded	33,000 of 4.1 million eligible households is **0.8%** of eligible homes upgraded (**0.09%** per year on average)
Take Charge Challenge Pilot Apr 2009–Mar 2010 (12 months)	N/A	N/A	N/A	N/A
Twin Cities One Stop Program Jun 2009–present (1 yr)	N/A	**$30** for assessment; **1,800** homes assessed	N/A	N/A
Vermont Community Energy Mobilization (VCEM) Project Pilot Jan–May 2009 (5 months)	N/A	**Free** home visit **709** homes visited	**~2%** of the 576 single family homes visited have done more comprehenisve work	N/A
WeatherizeDC Pilot Sept 2009–Mar 2010 (6 months)	**2,124** homes contacted through neighborhood canvassing for the pilot	**$400** for assessment; **74** homes assessed; **3.5%** of homes contacted	**20** homes upgraded; **27%** of homes assessed	20 of 2,214 homes contacted is **0.9%** of contacted homes upgraded

*Definition of "upgraded" varied between programs. See Appendix A for more detail.

3. Lessons from Past Programs

In the United States, the residential building sector accounts for about 20% of greenhouse gas emissions (EPA 2010) and about 20% of energy consumption (EIA 2008). Although building codes continue to improve energy efficiency, they largely impact new buildings, and buildings that exist today will likely be over half of the nation's building stock in 2050. Meeting broad goals of reducing greenhouse gas emissions by more than 80% by 2050, or state goals like California's commitment to reduce energy use in existing homes 40% by 2020 (CPUC 2008), will require a concentrated effort to reduce the energy use of our existing building stock.

Past programs that encouraged home energy improvements have a lot to teach today's program designers and policy makers, but they do not offer repeatable examples of how to get to scale without paying for most of the improvement costs. One of the nation's early federal efforts to encourage home energy improvements at scale, the Residential Conservation Service (RCS) established in 1978, required gas and electric utilities to provide free energy assessments to homeowners. In some communities, homeowners were also offered zero- or low-interest loans and were provided a list of local contractors. The program led to the installation of basic energy efficiency measures by less than 3% of the eligible households, reducing participating household energy use by only 2-3% (Hirst et al. 1981; Hirst 1984). Low participation rates have not been uncommon over the years; one study found that many energy efficiency financing programs reached less than 0.1% of their eligible customers each year (Fuller 2008).

However, there have been many lessons learned from the experiences of the last 30 years that offer some direction as we pour unprecedented resources into catalyzing home energy improvements. One of the most successful programs in terms of market penetration is the residential weatherization program run by Bonneville Power Administration[7] (BPA), which improved the efficiency of approximately 900,000 of 1.6 million eligible homes (56%) from 1980 to 1992. **Table 4** shows the results from BPA's Interim Weatherization Program—in 20 months, all the participating utilities were able to reach over 5% of eligible customers and over 50% of all homes that got an energy assessment did an energy upgrade. Electricity savings per home averaged 13% (Hirst 1986b). BPA provided free energy assessments and rebates that covered up to 85% of the cost of the recommended measures. The BPA

[7]BPA actually ran a series of weatherization programs over 12 years—the Pilot Program, the Interim Program, and the Long Term Program. We talk here about these three together, but the BPA program table in this section refers only to the Interim Program.

program was further boosted by a period of rapidly increasing electricity prices in the Pacific Northwest, which motivated customers to pursue home energy improvements.

Participation in the Bonneville Power Administration's Interim Residential Weatherization Program

Utility Company	Eligible Residential Customers	Audits per Eligible Home (%/yr.)	Homes Weatherized per Audit (%)	Homes Weatherized per Eligible Home (%/yr.)
A	62,047	11.8	61.0	7.3
B	5,056	14.2	82.9	11.8
C	99,994	23.2	57.9	13.3
D	3,500	23.1	83.4	19.3
E	2,853	1.6 *	90.9	1.4*
F	10,865	12.1	83.7	10.2
G	267,000	2.4 *	77.2	1.9*
Total or average	433,115 (audit) 445,479 (retrofit)	9.1 *	59.6	5.3*
Range (highest/lowest)		14.5:1	1.6:1	13.8:1

Source: Lerman and Bronfman (1984).

Note: The Bonneville Power Administration Interim Residential Weatherization Program offered a grant to participating homes based on expected energy savings and amounting, on the average, to 93% of the cost of installed weatherization measures. The data cover 20 months in 1982-1983.

*Under previous programs, Utilities E and G had audited 400 and 17,800 homes, respectively, and had weatherized 354 and 5,482, respectively. The noted calculations are based on appropriately reduced figures for the eligible populations.

Table 4. The Impact of BPA's Interim Weatherization Program varied greatly across utility territories (Source: Stern et al. 1985)

Other programs that have achieved relatively high participation include:

- The Sacramento Municipal Utility District's residential efficiency financing program served 3,200 households in 2007 (less than 1% of its customers), however, over 135,000 loans in total have been disbursed since its inception in 1977. This program offers near market rate financing and modest incentives; the program's performance is an example of what a program can accomplish over time with consistent support for efficiency (Fuller 2008).
- The Hood River Conservation Project (HRCP) achieved a remarkable response rate for home energy assessments (91% of all eligible participants) as well as for the subsequent implementation of conservation measures (85% of all eligible participants) over 3 years. Energy assessments and measures were largely free to participants.

- Manitoba Hydro's residential efficiency financing program served 8,100 households in 2007 (2% of its customers), and 41,000 loans in total have been disbursed since 2001. While Manitoba has relatively low residential electricity prices (5-6 cents/ kWh), which makes efficiency improvements less financially attractive, the program pays for a substantial portion of the improvements and offers financing for the balance (Fuller 2008).
- Pacific Gas & Electric's Zero Interest Program (ZIP) weatherized more than 260,000 homes in Northern California between 1981 and 1984. The program offered free energy assessments and zero-interest loans (Andrews 1984).

Drawing Lessons from Past Experience

Despite these successes, extracting transferable lessons from past programs can be difficult because there are many differences between these programs and the recent vintages of energy efficiency programs, such as the stimulus-funded BetterBuildings[8] program. Three important differences are:

1. Large-scale residential retrofit programs in the 1980s often offered free energy assessments, paid a significant fraction of the cost of improvements, and/or offered extremely attractive financing (e.g. zero-interest loans). Beyond weatherization programs for low income families, programs today do not currently have sufficient funding to provide this level of financial incentives to customers over a long period, especially given the ambitious savings goals of many new programs. As might be expected, the BPA evaluators found that the program's generous rebates were a significant driver of the program's success.[9]
2. Many past programs achieved low savings rates per home, in part because they did not require the "comprehensive" improvements sought by many programs today, but instead either only offered energy assessments or offered financial incentives for a limited set of measures.
3. The mix of technical opportunities and strategies is different today in some areas. The first generation retrofit programs often focused on insulation of attics and floors and caulking/weatherstripping; market penetration of these measures is much higher today so comprehensive retrofit programs need to go after a different mix of measures. The opportunities may also be different today because of technological advances, including those in diagnostics, air sealing, insulation, and other materials.

---

[8]The Department of Energy has granted $485 million to 35 communities through the BetterBuildings program (formerly called Retrofit Ramp Up), which is designed to pilot scalable models for increasing the adoption of home energy improvements. See: http://www.eere.energy.gov/betterbuildings/

[9]E. Hirst, personal communication, April 2, 2z010.

Larger incentives may increase participation in programs, but marketing and implementation may be even more important than the size of the incentive.

Given these important differences, what lessons from past experience are useful to new programs?

First, significant resources and creativity need to go into promoting home energy improvements to increase participation rates. If home energy improvements were difficult to sell when 85% of the cost was covered, imagine the hurdles programs face when they offer modest rebates and market rate financing. Programs must alter their marketing and outreach efforts in a major way, learn from social science and professional marketing research, and apply any lessons available from past experience. This report aims to help in this effort. Program managers must also be aware that while increasing focus on marketing and outreach efforts may get them part of the way there, additional incentives and other public policy may be needed to scale the adoption of home energy improvements.[10]

Second, past programs provide evidence that how programs are marketed and who promotes them matters. BPA's experience provided a natural experiment. Because BPA is a wholesale power provider, its weatherization program was marketed through 96 participating utilities and the effectiveness of the program in reaching consumers varied significantly by utility, even though each utility offered the same financial incentives. The utility-run programs varied in the level of effort put into operating the program, and some contracted with local groups to implement and market the initiative. Another example is the RCS program in Minnesota. An evaluation found that programs run by private companies were more effective than those run by the utility, and those run by a community group were more effective than a private company. The community groups' audits "were of higher quality as judged by state inspectors, cost one-third as much per audit as the use of a [utility's] company's own employees, and reached 15% of eligible homes," versus 4% for the utilities and 6% for the private companies (Stern 1986).

Stern et al. (1985) found that larger incentives may increase participation in programs, but marketing and implementation may be even more important than the size of the incentive. The more successful programs were operated by trusted local organizations and marketed by word-of-mouth and other aggressive, direct methods (Stern et al. 1985). This is in line with other research showing that it is more effective to use direct, personalized information provided by relevant role models, direct contact with consumers, and outreach through local networks (Lutzenhiser 1993, Harrigan 1991).

[10]Additional discussion on what is needed beyond effective marketing and outreach is included in Chapter 5.

4. Why "Retrofits" Are a Tough Sell

There are many reasons that people don't sign up for retrofits in hordes. Imagine an "average" American home owner. She pays about $150 in monthly energy costs[11]—less than 3% of annual household income[12]. She probably has never heard of a "retrofit"—it doesn't sound appealing or like something she would seek out to spend money on. Neighbors might have told her about their beautiful granite counter tops, their bathroom remodel that left her thinking about how she wants a Jacuzzi tub too, and maybe they even pointed proudly to the shiny solar panels they just put on their roof —but a ***RETROFIT****? What does that even mean?*

To further compound the problem, even if she is convinced that home energy improvements are worth looking into, a poorly-run home energy improvement program might look something like this:

- She receives a utility bill insert asking her to sign up for an energy assessment.
- She goes online to apply for the assessment, and four weeks later a program representative calls to set up an appointment. The assessment takes 3-6 hours and can only be done on weekdays, so she takes a half day off work six weeks from now when there is an opening in her schedule.
- The program sends an assessor, who rushes around the house taking measurements and generally ignores her. He leaves, saying to look for the assessment report in the mail in a few weeks.
- After another five weeks the report arrives and is nearly unintelligible. It includes a lot of numbers, cryptic charts, terms that she has never heard, and no sense of the priority of the improvements suggested. The report also says to contact a local contractor to make these improvements, but provides no list of contractors or other guidance.
- She defies the odds and locates three contractors and asks them for bids. However, the contractors say

---

[11]According to the 2005 Residential Energy Consumption Survey by the Department of Energy, average household fuel and electricity expenditure (not including transportation fuels) was $151 per month per household in 2005. http://www.eia.doe.gov/emeu/recs/recs2005/c&e/detailed_tables2005c&e.html

[12]While energy bills are a small fraction of costs for moderate and upper income families, it is important to note that for lower income families utility costs can be quite burdensome.

they don't trust the program's energy assessment—they have specially trained staff and need to do the assessment themselves, which costs $300.

- Somehow, she decides to continue on. She selects a contractor, takes more time off work for the second energy assessment, and gets a new report saying the improvements will cost $5,000 to $15,000[13]. The contractor offers her a financing product through his industry association, but it is a 3-year, 14% interest loan—there is no way the improvements will "pay for themselves" over this period and at this rate.

- Despite the cost, she decides to take the plunge. She secures a bank loan, or prepares her credit card or bank account to cover the expense. The contractor says that he can do the work next month, the first opening he has. This requires her to take more time off work to let the workers into the house and oversee the improvements, but finally, at long last, the job is complete!

- Then, four months later, a program representative calls and says there is a quality assurance program and the program will need to do a "test out" of the work to make sure it was installed properly. While she appreciates the oversight, this requires another home visit and it turns out the contractor use the wrong type of sealing tape for the duct work. The contractor comes back a few weeks later to remedy this mistake—and the work is finally complete.

From the customer's perspective,
few programs make an appealing case for home energy improvements.

It is now ten months later, the homeowner still does not understand the full range of benefits from the improvements, has taken multiple days off work, and has paid $7,000—what does she tell her neighbors about this experience?

The simple fact is that, from the customer's perspective, few programs make an appealing case for home energy improvements. At any of these points, homeowners may simply decide that it is too expensive or too much hassle to continue.

Of course, well designed programs can intervene strategically at key decision points to help the homeowner through the process—and make the process itself much simpler. As Sammy Chu, Program Director of Long Island Green Homes says, "Success is when participants become proselytizers." Program designers need to think through the program from the customer's perspective and make it easy and attractive at every step—and ideally have fewer steps.

---

[13]These improvements might include some combination of air sealing, insulation, lighting replacement, window replacement or addition, duct sealing, furnace or heat pump replacement, water heater replacement, air conditioner replacement, solar thermal water heating, etc.

Some key concerns from a customer's perspective include:

- Why should the customer be interested in home energy improvements?
- How much time and effort will it take?
- How much will it cost, and is there affordable financing if the customer doesn't have the cash?
- Is the contractor trust worthy? How will the customer know if the contractor does a good job?

Program managers should ask themselves these questions as they design their programs. The case studies highlighted in this report provide examples of ways to address many of these questions; this study focuses on the first question—how to get customers interested in the first place.

KEY LESSONS

- Programs must make an appealing case to potential customers, many of whom are not currently interested in upgrading their homes
- Demands on homeowners, particularly around time and effort, must be minimized. Programs should try to consolidate the number of steps required. Participants drop out with each additional step and with each time delay.

5. Success Requires a Holistic Approach

Before getting into specifics related to marketing and outreach, we must emphasize that marketing and outreach cannot be successful in a vacuum—a suite of elements must be in place for programs to have significant impact. Successful programs will require a holistic approach and a long term vision that will ideally consider all of the following factors[14].

Marketing and outreach cannot be successful in a vacuum—a suite of elements must be in place for programs to have significant impact.

- Substantial long-term funding or supportive regulatory and legislative policies are needed; both are ideal. As an example, the most successful ratepayer[15] efficiency programs have substantial funding commitments. Leading ratepayer-funded programs have made an investment of $20 to $40 per capita per year to achieve annual savings of 1% to 2% of total retail electricity sales (ACEEE 2009). For a city of 1 million people, that would translate to spending levels of $20 to $40 million per year.
- Programs must be in it for the long haul. Overcoming the barriers to success for comprehensive residential energy upgrade programs will likely require a sustained effort over many years, perhaps a decade. Program consistency and persistence are important for both contractors and customers; as Mike Rogers of GreenHomes America explains: "Many programs don't last long enough for the public to understand what is offered, or for the contractors to take advantage. It's important to recognize the investment hurdles contractors face. Without a sufficient time horizon, most contractors will simply be unwilling or unable to make the infrastructure investments needed"

---

[14]A few of these are paraphrased from *Scaling Up Building Energy Retrofitting in U.S. Cities: A Resource Guide for Local Leaders*, published by Living Cities and the Institute for Sustainable Communities (ISC), and worth reading in its entirety. This report is available here: http://greenbootcamp.livingcities.org/

[15]Ratepayer funds are collected by utilities, either through a tariff approved by the state regulatory commission or through a public benefit charge authorized via legislation. The funds are used for energy efficiency programs implemented by utilities, state governments, or third parties. See Barbose et al. (2009) for an overview of ratepayer funded programs in the United States, available here: http://eetd.lbl.gov/ea/ems/reports/lbnl-2258e.pdf

- The program must be seamless for customers. As discussed in Chapter 3, there are many good reasons that homeowners don't participate in existing programs—the process should be streamlined to reduce the hassle for the homeowner and reduce the likelihood that the homeowner will opt out at different decision points. Some examples from existing programs: Long Island Green Homes provides a list of well-trained, screened contractors, and has each contractor do the energy assessment and the improvements, with a third party review of the work at the end of the process; the "Together We Save" pilot in Milwaukee provides an "energy advocate" whose role is to walk the participant through the program; and the New London Resource Project helped customers who were uncomfortable choosing a contractor by randomly choosing contractors off their pre-approved list, having them give bids to the customer, and helping customers interpret these bids if needed.

- A well-trained workforce and quality assurance are vital. There must be a large enough skilled workforce to meet demand as it grows. This requires widely available and affordable training programs, standardized certifications for workers, and quality assurance to make sure the jobs are done to a high standard of performance. This is important for building trust with customers and reliably producing the energy savings, health, safety, and comfort benefits of home energy improvements.

- Incentives and financing are necessary—at least in the short term. Customers will likely need to be motivated by more than just appealing messages, at least until the market develops, and direct incentives have been effective at increasing customer interest. As an example, The Eugene Water & Electric Board (EWEB) in Oregon started running residential weatherization programs before BPA offered its incentive program in the region. At that time, getting customers to even do energy assessments was "pulling teeth," according to EWEB's Energy Management Programs Supervisor Kathy Grey.[16] However, once BPA's incentives became available, EWEB had a huge surge in demand for weatherization—the program quickly generated a backlog of 8,000 customers. Access to financing will also always be necessary to overcome the upfront cost barrier for households that aren't able (or don't want) to pay cash.

- Evaluate impacts, and evolve the program based on new information. Without a plan in place from the beginning to collect data and measure and evaluate impacts, it is impossible to gauge the success of the program, to adjust the program to increase its effectiveness, and to understand which aspects of the program may provide valuable lessons for other programs. Controlled experiments can play an important role in helping to evaluate what actually works. Some key questions include: How many households did the program reach? Which outreach strategies were most effective? How many got an energy assessment and followed through with a home energy improvement? How much energy was actually saved?

---

[16]Personal communication, K. Grey, April 16, 2010.

- Market transformation is the ultimate goal. A comprehensive approach to program design should ultimately strive for market transformation. Market transformation is defined as "long-lasting sustainable changes in the structure or functioning of a market achieved by reducing barriers to the adoption of energy efficiency measures to the point where further publicly-funded intervention is no longer appropriate in that specific market" (Rosenberg and Hoefgen 2009). In other words, the goal of publicly-funded programs should be to transform the market so that it can sustain itself without additional public funding. In the context of home energy improvements, this means building up customer interest, workforce skills, private financing tools, and contractor networks such that, over time, the home energy improvement market can support viable business models without significant financial subsidies.

In addition to the holistic approach outlined above, programs must get customers interested in the first place, and motivate them to invest in home energy improvements; this issue is the subject of the following chapters.

KEY LESSON

- A comprehensive approach to energy efficiency is required. This will require the long-term commitment of funding and effort by program funders and implementers—with the ultimate goal being market transformation.

6. Lessons From Behavioral Research

There is a substantial body of research on what motivates human choices that can be applied to the question of how to spur interest in home energy improvements. This research comes from social psychology and behavioral science research, marketing analyses, public health studies, and evaluations of past programs. Based on a review of this research, this section describes two common techniques that—in isolation—appear to be **in***effective at encouraging home energy improvements at scale, and then highlights lessons from behavioral research that shed light on what might improve program performance.*

Information and Access to Capital are Not Enough

Many programs have been designed around two assumptions about what motivates consumers to make home energy upgrades—in isolation these are not enough to make a significant impact:

1. **MYTH: If people are "informed" they will make different choices.**

   Many programs focus on information-based campaigns that are intended to increase the understanding of the target audience or influence attitudes. While providing information may sway a few people, it does NOT necessarily translate into action. As outlined by Doug McKenzie-Mohr in *Fostering Sustainable Behavior* (1999)[17] and a host of other researchers (Geller 1981; Midden 1983; Harrigan 1991; etc), providing only information often has little to no effect on behavior. This has been documented in studies on topics ranging from energy efficiency to water efficiency to littering. The puzzling fact that people who are strongly supportive of energy conservation are no more likely than the average person to actually conserve energy is known as the "attitude-behavior gap."

2. **MYTH: If people have access to capital they will make energy improvements.**

   Much of the research on energy efficiency has focused on the economic potential of energy efficiency, with the implicit assumption that people will act according to their financial self-interest; e.g. if you give someone a loan for an upgrade that will "pay for itself" within the term of the loan, they will choose the upgrade.

---

[17]Doug MacKenzie-Mohr's *Fostering Sustainable Behavior* is worth reading in full, available here: http://www.cbsm.com/public/images/FosteringSustainableBehavior.pdf

Behavioral economics and social psychology research shows that people are far more interesting and complex (Stern 1986; Sullivan 2009). A more accurate model of decision making includes tendencies such as social preferences and habit formation. As a result, it is often not enough to provide financing and prove to people that it is in their economic interest to make home energy improvements.

Behavioral science literature confirms the conclusion that simply providing information and financing is insufficient, and it also offers clues on other ways of motivating consumer choices.

Insights from Behavioral Research

Behavioral economics and social psychology research provide a number of explanations for why people may not respond to information or take action when it is in their economic self-interest to do so. For example:

- People are **more sensitive to losses than to gains**, and hence more concerned about what they may lose from a decision (e.g. upfront cost) than by what they might gain (e.g. future reductions in energy bills) (Stern 1986, Kahneman and Tversky 1981, McNeil et al. 1982).
- People tend to be **biased towards maintaining the status quo** (Thaler and Sunstein 2008, McCalley 2006, Madrian and Shea 2001) and they tend to **discount future benefits of taking action** (Thaler 1981, Loewenstein and Thaler 1992). Some programs are moving towards an "opt-out" policy to address these issues, where the default is participation in the "optimal" choice.
- People often feel **overloaded by having too many choices**; thus, presenting homeowners with a long list of recommended energy efficiency measures may result in them being less likely to implement any of them (Iyengar and Lepper 2000; Simon 1991; Schwartz 2004; Madrian and Shea 2001). Recognizing that too many recommendations can be overwhelming to homeowners, Twin Cities' One Stop Program gives just three suggestions for high impact energy efficiency improvements.
- People are simply not used to making conscious decisions about energy. Most daily decisions about energy use are **governed by unconscious habit**, implying that people are relatively unaware of their practices that may waste a lot of energy (Lutzenhiser 1993). **Household energy consumption is based on "non-decisions"**; people do not decide to consume a certain amount of energy, but rather they engage in behaviors and activities for other ends that have the side effect of consuming energy (Sovacool 2009).
- In addition, many **people often assume they are performing better than the average** person (Hoorens 1993) or that **they are already doing all that they can** (Opinion Dynamic 2009a).

Behavioral science literature confirms the conclusion that simply providing information and financing is insufficient, but it also offers clues on other ways of motivating consumer choices. Many of these insights are reviewed in a paper from the Consortium for Energy Efficiency (Ashby et al. 2010) and summarized by researchers at Stanford's Precourt Energy Efficiency Center[18]. A few of the insights most relevant to selling home energy improvements are summarized below, with examples of how the programs we examined use them.

Social Norms

People are influenced by their peers to a far greater degree than they consciously recognize. In one experiment, people were asked to rank their motivations for saving energy; they reported that "because other people are doing it" was the least important reason. But researchers found that in reality, actual energy saving efforts were most strongly correlated with the belief that other people were conserving energy than with any of the other motivators that people said were more important (Cialdini 2005). Appealing to social norms may involve several different strategies, including:

- Modeling success. The stories—told both in person and through marketing media—of early adopters who have successfully gone through the program can be used to market to others (Wilson and Dowlatabadi 2007; Bandura 1989). The Jasper Energy Efficiency Program (JEEP) used peer validation by highlighting the experiences of homeowners who had already participated in the program in its advertising campaign.
- Engaging community leaders. Involving local community leaders to promote a program takes advantage of existing social relationships and networks (Dietz and Stern 2002; Lutzenhiser 1993). When Long Island Green Homes (LIGH) was initially launched in Babylon, NY, staff members made frequent presentations to Babylon's civic and community groups. A number of local opinion leaders were among the first to participate, and the program is now training several of these leaders to make presentations on behalf of LIGH. The program director has found that testimonials from these leaders are often the best way to sell the program. Engaging trusted messengers is discussed further in Chapter 10.
- Using normative messaging. Messaging can appeal directly to social norms; for example, an experiment found that people were more likely to re-use their towels in a hotel when given the message that other guests reused their towels rather than a message about the environmental benefits (Goldstein et al. 2008). For an example of a program that uses social norms to engage whole neighborhoods, see the SustainableWorks program sidebar.

---

[18]A "List of Behavioral Economics Principles that can Inform Energy Policy," compiled by Annika Todd and Sebastien Houde from the Precourt Energy Efficiency Center, is available here:
http://www.stanford.edu/~annitodd/List_of_Behavioral_Economics_for_Energy_Programs.pdf

Everyone Is Doing It...

Recognizing the importance of social norms, SustainableWorks[19] engages existing community organizations in the State of Washington to encourage neighborhoods to act together in pursuing home energy improvements. The program launched in October 2009 and is working in four neighborhoods in Seattle and Spokane. SustainableWorks recruits volunteers to serve as Block Captains. The program trains these volunteers in door-to-door canvassing and holding house meetings; to encourage their neighbors to sign up for energy assessments. Block Captains do multiple canvasses and follow-up with phone calls to attempt to reach all homeowners. Energy assessments are conducted by two employees of SustainableWorks. An energy consultant from Sustainable Works meets with the homeowner to review results and discuss the scope of work. Once a sufficient number of homeowners elect to invest in energy improvements, SustainbleWorks bundles these jobs into groups of 10-20 and solicits bids from its contractor network.[20]

According to SustainableWorks Outreach & Marketing Manager Kellie Stickney, "people want to do [home energy assessments] but don't know exactly how; this program makes it safe for them." The program designers assert that as nonprofits with a local presence, SustainbleWorks and its partners engender trust, and that participants are more comfortable because they are acting together with their neighbors. While it is too early to evaluate energy savings, the program had about 500 homeowners sign up for an energy assessment in the first 7 months, close to its pilot goal of 10% of eligible homeowners in the targeted neighborhoods. Over 85% of home owners who signed up for an assessment end up scheduling one, and roughly 2/3 of homes that get an assessment have made improvements to date. The program budget is $3.8 million for 2 years (including staffing, marketing and outreach, and subsidized energy assessments), and the program has 2 fulltime staff devoted to marketing and outreach.

- Encouraging personal contact with peers. Person-to-person communication with peers can be one of the more effective ways to motivate action, especially if the "messenger" is someone the potential participant knows and trusts (Harrigan 1991, Stern 1985).

Competition

Competitions between groups of households or between towns can create the sense that many people are working together to conserve energy, and tap into individuals' competitive spirit. One example is the Energy Smackdown,

[19]Information available here: http://www.sustainableworks.com

[20]Contractors must meet certain requirements regarding wages, apprenticeship utilization, registration, liability insurance, local hiring, and other standards.

which pits neighborhood teams against one another in a competition to reduce CO_2 emissions. Donald Kelley, Executive Director of the BrainShift Foundation, conceived the initiative as a way of using play and friendly competition to encourage energy reduction measures and behavior change. "We call this a competition, but it's really a 'competition,' wink wink," says Kelley, "Setting it up in a fun way is the key to helping people make changes." The basic concept is simple: bringing people together to play a game is more likely to encourage meaningful action than simply making energy efficiency information available. Energy Smackdown's pilot included 100 homes that, on average, reduced heating fuel use by 17% and reduced electricity use by 14% during the pilot.

By joining the competition, participants try to reduce their own energy consumption, and help members of their communities do the same. Tracking the different ways people use energy compared with their neighbors helps guide participants in that process. The game, in other words, operates both at the individual and the public levels, as participants perform energy saving actions in their homes, and engage others on the issues of energy use and climate change. Another case study featuring the use of competition, the Take Charge Challenge in Kansas, is also included in Appendix A. However, as explained in a NEEA (2010) report, "competitions run the risk of being event-based, and can yield a perception that the behavior promoted is "extreme" or for a defined period of time, rather than long-term persistent change." It is important to consider how to move people beyond minor energy improvements and changes in habit to more comprehensive energy improvements—competitions might be a first step to get people interested.

Pledging to Save Energy

Using local organizations to encourage residents to make energy saving pledges appears to be an effective strategy for delivering energy savings in Baltimore. The Baltimore Neighborhood Energy Challenge (BNEC) works with neighborhood associations in eight neighborhoods of varying income levels to recruit and train volunteer Neighborhood Energy Captains (NECs). The Captains conduct outreach through door-to-door canvassing and by speaking at public events. Instead of pushing a particular message, the program trains Captains in canvassing and encourages them to customize the script to emphasize the elements of the program that they are most passionate about. These volunteers ask their neighbors to pledge to save energy and give them Energy Pledge Kits that include a free CFL, information on energy saving measures, resources available through utilities and social service organizations, and local businesses that provide energy services. Over the past 9 months, about 750 households have taken the pledge and 10-20 volunteers per neighborhood have been engaged.BNEC evaluates the program by looking at the year-to-year difference in winter energy consumption for homes that take the pledge and those that do not. Program participants have achieved electricity savings of 2–13%, but the gas savings are much less clear and generally not statistically significant, possibly because of the unusually cold winter in Baltimore during the pilot.

Commitment

People are more likely to follow through with an action if they have made a commitment to do it, especially a public commitment (McKenzie-Mohr 1999; Harrigan 1991). Public pledges activate social norms because people want to live up to others' expectations and follow through on their commitments. In one experiment, people who made a public commitment conserved more energy relative to those who made a private commitment or no commitment (Abrahamse et al. 2005). WeatherizeDC found it was important to ask people to commit to something specific and tangible in person when volunteers canvass a neighborhood. Field director Sam Witherbee explains that "at first we would just canvass to gauge interest, and then call back later to ask them to attend an informational meeting. We found it is much more effective to ask them at the door to attend an already scheduled meeting in their neighborhood, in fact we often knock on doors around the house where the next community meeting is scheduled."

Feedback

Providing information about how a household's energy use compares to others, and how energy use changes over time as a result of actions taken, can influence behavior—the first type of feedback taps into social norms, and the second provides a stronger association between an action and its consequences. Several studies have found that in-home energy monitors can induce occupants to reduce energy consumption, at least during a short pilot period (Darby 2006; Carroll et al. 2009). However, experiments suggest that energy savings may not persist after the feedback is withdrawn (Abrahamse et al. 2005), and the impact over the long run is unproven.

Also, feedback may have the undesired effect of increasing consumption among low energy users, especially if the feedback includes a comparison to the average household's energy use without additional encouragement. Schultz et al. (2007) conducted a study where half of the households received feedback telling them how much energy they had consumed in the previous week, the average household energy consumption in their neighborhood, and suggestions for energy conservation. The other households received the same information but also a happy face (if the home consumed less energy than the average home) or a sad face[21] (if it consumed more). The effectiveness of these treatments was determined by comparing the energy used by each house after the treatment to its energy consumption before the treatment. The households that did not receive a happy or sad face were found to move towards the average; that is, households with above average energy consumption reduced usage, but those with below average energy consumption increased usage. But when low energy consuming households received a happy face, they did not significantly increase their energy consumption in response to the feedback.

The Energy Smackdown and the Take Charge Challenge both use information about energy usage levels to support their competitions, and the Twin Cities One Stop Program sends a bi-monthly Home Energy Progress report to

[21]It is worth mentioning that the sad face was discontinued—participants felt they were being judged and complained to the program administrator.

encourage homeowners to continue improving their energy consumption habits. This type of information is important to counteract peoples' unconscious choices about energy and to encourage progress, but it is just one small part of what is needed to sell home energy improvements and will have little impact if used in isolation.

Small Concessions vs. Single Action Bias

Some program designers, recognizing that not everyone is equally interested in or comfortable with the idea of major home energy upgrades, recommend a "small concessions" approach. This approach seeks to engage people in the community with actions that are easier (which may be as simple as changing a light bulb) and then, through additional program contact, encourage them to make larger changes. There is research that shows a big commitment is more likely after a small commitment (McKenzie-Mohr 1999), and that making small efficiency improvements can encourage people to view themselves as more energy efficient individuals, which may make them more likely to choose a comprehensive upgrade in the future (Cialdini 2001).

While this approach has some merit, there is also research showing a "single action bias" where people respond to a call to action by taking one small step. This single step is often enough to reduce their concern and guilt, at which point they are unlikely to take additional actions (Weber 2007). This suggests starting with comprehensive improvements as the main push, and not warming people up to the idea through a series of other actions. There is not agreement in the research about the best approach to this issue. It is important that programs which opt for a small concessions approach make sure that the participant understands upfront that this is just one in a series of steps—and the fewer steps the better.

The Twin Cities' One Stop Program tries to address both of these approaches. A central element of the Twin Cities pilot program is a home visit conducted by a "home energy squad." The squads are designed to provide homeowners with new information and the chance to make small energy improvements during the home visit. They try to do as much of the basic efficiency work in "one stop," understanding that it is cheaper to visit a home only once and it is never certain that a second visit is possible. While a squad member performs a blower door test to determine the necessity of major air sealing and insulation work, the rest of the squad does a home walk-through with the homeowners, showing them what they can do to save energy. Some improvements are made on the spot, like replacing light bulbs, wrapping water heaters, and weather-stripping doors. The homeowners learn by doing, feel positive about taking initial action, and are educated about specific next steps they can take in the future.

Table 5 identifies the behavioral techniques used by the 14 case studies examined in this report and the two additional programs described in Chapter 6 sidebars. Engaging community leaders and peer contact are the most commonly used techniques. These appear to be important program elements, and are discussed further in Chapter 10.

Program Name	Modeling Success	Engaging Community Leaders	Peer Contact	Competition	Commitment	Feedback	Small Concessions
Baltimore Neighborhood Energy Challenge		●	●		●		●
Energy Smackdown		●	●	●		●	●
Hood River Conservation Project (HRCP)	●	●	●				●
Houston's Residential Energy Efficiency Program (REEP)	●	●	●				
Jasper Energy Efficiency Project (JEEP)	●	●	●				●
Keystone Home Energy Loan Program (HELP)							●
Long Island Green Homes (LIGH)	●	●	●				
Marshfield Energy Challenge		●	●				●
New London Resource Project (NLRP)	●	●	●				●
NYSERDA's Home Performance with ENERGY STAR Program	●	●	●	●		●	●
Sustainable Works		●	●		●		
Take Charge Challenge	●	●	●	●		●	●
Twin Cities One Stop Program		●	●	●	●	●	●
Vermont Community Energy Mobilization (VCEM) Project		●	●				●
Weatherize DC	●	●	●		●		

Table 5. Behavioral techniques employed by programs

KEY LESSONS

- Behavioral science research and practical application confirm that simply providing information and financing is insufficient to incentivize widespread energy improvements.
- Social norms, competition, public commitment and feedback may all be useful tools to guide program design.
- Programs that opt for a small concessions approach need to make sure that the participant understands upfront that this is just the first step—and the fewer steps needed to complete a compreshensive home energy upgrade the better.

7. Identify the Target Audience

It is important to carefully consider who the program is trying to reach, and what outreach strategies will engage that particular audience. Many home energy upgrade programs assume that a blanket outreach strategy will motivate everyone to invest in energy efficiency. This approach is likely to be ineffective and prohibitively expensive.

Target Early Adopters

One of the most widely cited sources on how new technologies and ideas spread is Everett Rogers, who looked at hundreds of innovations and their path toward adoption. He developed a graph to show the diffusion of innovations into the market. His analysis divides the population into Innovators, Early Adopters, the Early Majority, the Late Majority, and Laggards (Rogers 1983, 5th ed). In **Figure 1**, groups of consumers adopting a technology are represented by the solid blue line, and the total market share of the innovation is represented by the dashed purple line—reaching the Early Majority is key to widespread (>50%) adoption.

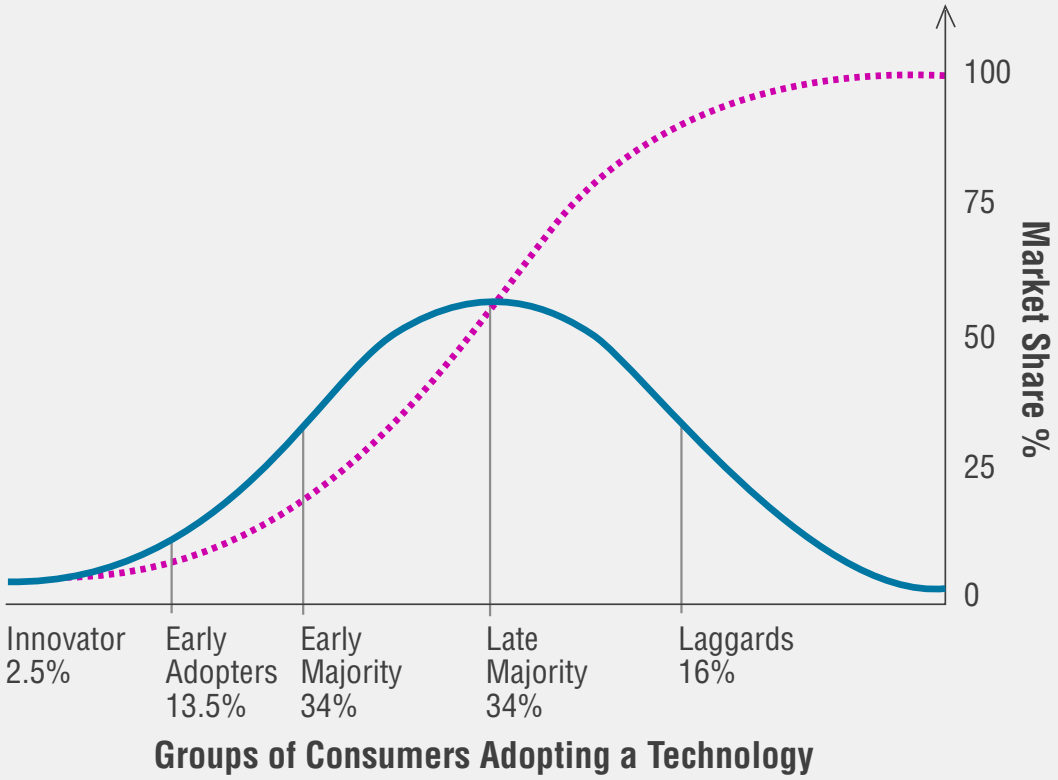


Figure 1. The diffusion of innovations according to Rogers (Image created by Tungsten, Wikimedia Commons)

Carefully consider who the program is trying to reach, and what outreach strategies will engage that particular audience.

According to Rogers, the adoption of an innovation starts in the first group and only spreads if the first group has a positive experience and that is communicated to the next group. The Innovators (2.5% of the population) are most willing to take risks and try new things, and they can usually afford to have the innovation fail. The Early Adopters (13.5% of the population) tend to be opinion leaders in the community, and enter the market once the Innovators have tried the early prototypes. There can be a tipping point in which the Early and then the Late Majorities recognize and adopt the innovation—but, only after it has been tested and affirmed by the opinion leaders. It is critical that the first 15% of a population have a positive experience with the innovation.

This process of innovation adoption suggests that a blanket marketing campaign may lead to disappointing results, and will likely be expensive per person influenced if one is promoting a new idea. Targeting the Innovators and Early Adopters in a community and ensuring they have a positive experience is a cost-effective way to begin market penetration. As author and social change agent David Gershon describes, "This strategy boils down to the analogy of preaching to the choir, asking the choir to sing loud enough to get people into the church, and then encouraging and supporting these new churchgoers to become evangelists" (Gershon 2009). This also confirms the behavioral research insight that modeling of actions by peers is an effective way to encourage that action more widely. Finding local opinion leaders, getting them to promote the idea, and then highlighting them as local champions is a strategy that has been successfully used by many programs featured in our cases studies (see Chapter 10).

Different Responses to the Same Information

Another reason for targeted campaigns is that people have different values, different perceptions, and different barriers to action—it is important to target efforts and tailor messages where possible. One example of this is a recent study that showed that program participants with different values may respond very differently to the same information. The Sacramento Municipal Utility District (SMUD) in California worked with OPOWER, an energy efficiency software company, to provide energy consumption feedback to randomly selected households in the SMUD territory. This feedback presented a report that showed the participant's energy consumption compared to that of neighbors living in similar homes and that of their most "efficient" neighbors and made recommendations for energy saving improvements. **Figure 2** shows one element of this report. With 35,000 households in the treatment group and 49,000 in the control group, OPOWER found that, on average, households that received the feedback reduced electricity consumption by about 2% relative to those that did not receive feedback—an example of how social norms and feedback can be used to encourage energy conservation.

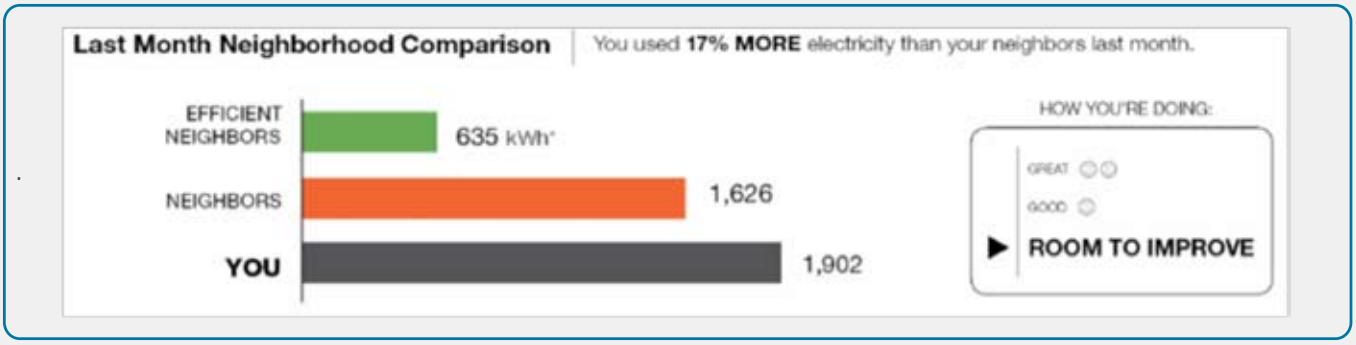


Figure 2. Sample Home Electricity Report [22]

"This strategy boils down to the analogy of preaching to the choir, asking the choir to sing loud enough to get people into the church, and then encouraging and supporting these new churchgoers to become evangelists." (Gershon 2009)

A study by Costa and Kahn (2010) broke down the impact of this feedback on a smaller subset of households based on whether they had "environmentalist" values. The authors found that "environmentalist" households (e.g., those that characterize themselves as politically liberal, purchase energy from renewable resources, donate to environmental causes, and live in a "liberal neighborhood") reduced electricity use by approximately 3% in response to the feedback. In contrast, households that did not have these environmentalist characteristics actually **increased** electricity use by almost 1% in response to the feedback. While it is uncertain if similar results might be found elsewhere, this study does suggest that messaging and feedback must be done in a way that resonates with the target audience's dominant values in order to be effective—and these personal values may vary widely within a single geographic region.

Segmenting the Market

There are, of course, some outreach strategies that have broader resonance than others—other sections of this report try to identify strategies and messages that are likely to be widely appealing. But focusing program resources on certain populations that are more likely to respond is a much more effective use of limited funds than pouring effort into those who will not be interested until energy efficiency improvements have become the norm.

[22]Source: Residential Energy Use Behavior Change Pilot, OPOWER white paper, http://www.opower.com/LinkClick.aspx?fileticket=cLLj7p8LwGU%3d&tabid=76, also in Costa and Kahn 2010.

To learn about which segments of a market will be most interested, and what outreach strategies may work best, most marketing professionals start with surveys and focus groups. It is always important to test and refine outreach strategies and messages through these vehicles, and through piloting, before launching a full program (see Chapter 13 for more on this topic). A good introduction to methods for phone surveys and focus groups is available in McKenzie-Moore's *Fostering Sustainable Behavior*. Lutzenhiser et al. (2009) also offers a good discussion of some of the segmentation methods and the problems that can arise.[23]

Here are a few examples of some recent findings of market segmentation on energy efficiency; links to the full text of these reports are available in the bibliography:

- In Oregon, 900 residents across the state were interviewed as part of a market segmentation analysis conducted for the Energy Trust of Oregon; these results informed the categorization and analysis of six market segments presented in **Figure 3** according to their receptiveness to Energy Trust of Oregon programs (Peters et al. 2009). The "Willing and Able" and "Main Street Oregonians" were identified as the most attractive targets because they are high energy users, have attitudinal readiness, and possess financial capacity to pay for improvements.

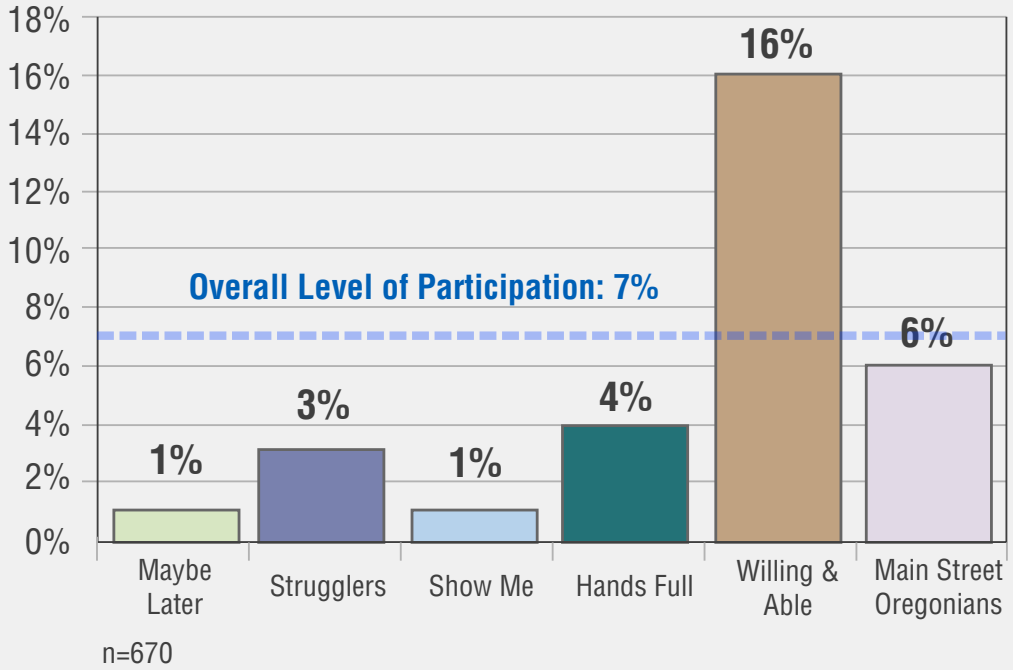


Figure 3. Oregon Program Participation by Market Segment (Source: Peters et al. 2009)

- The California Public Utilities Commission (CPUC) recently funded a number of market research studies, including a segmentation study that identified 5 distinct audiences within the California market for energy efficiency (Opinion Dynamics 2009b). These segments are described in **Figure 4**. Each of

[23]See page 51: http://uc-ciee.org/energyeff/documents/ba_ee_res_wp.pdf

these market segments has different values and characteristics, and "The Leading Achiever" and "The Practical Spender" have been identified as the key primary targets (Fogel 2010).

Segments	The Leading Achiever	The Striving Believer	The Practical Spender	The Thrifty Conserver	The Disconnected
% Pop/Sample	20%	24%	18%	21%	17%
Efficiency Practices	**High**	Low	**High**	Low	Low
Conservation Practices	Low	**High**	Low	**High**	Low
Concern for Convenience & Comfort	Lower	Lower	**Higher**	**Higher**	**Higher**
Age	35–64	25–54	55+	25–34 & 65+	18–34
Income	$75k+	$50k–$100k	$30k–$75k	< $50k	< $50k
Owner/Renter	**Owner**	Renter	**Owner**	Renter	Renter
%Ethnicity per Segment	White 76%	61%	54%	49%	29%
	Hispanic 13%	18%	29%	35%	50%
	African American 3%	8%	6%	4%	14%
	Asian 5%	11%	10%	11%	8%
	Other 2%	2%	2%	1%	3%

Figure 4. California Market Segmentation for Smart Energy Practices (Chart adapted from Fogel 2010; data from Opinion Dynamics 2009b)

- Another recent study looked specifically at how to increase homeowner participation in home energy improvement programs. It found that the most receptive audiences had the following characteristics: older individuals, higher incomes, older homes, and those with no children at home (Action Research 2010).

Many of these studies find that older, wealthier, and less diverse populations are "more likely" to participate—which raises the question of equity. Individual programs will need to balance the goal of rapid energy savings with "easy to reach" populations with the goal of reaching those households most in need of public support for energy improvements.

Also, while these studies demonstrate some traditional ways of segmenting a market, often based on extensive surveys that identify key demographics for each segment, there are many different ways to narrow down the target audience for home energy improvements. For example, programs might target their outreach efforts based on:

- Demographics: Focus efforts on demographic groups that research shows correlate with interest in home energy improvements, similar to the studies described above.
- Values: For example, target those who have expressed interest in community economic development or environmental stewardship, or the importance of home energy improvements as a way to create new jobs, reduce pollution, or increase national security—the message can vary depending on who you are trying to reach.
- Hot issues: For example, Recurve, a home energy improvement company based in California, found that a certain percent of its customers are primarily motivated by health issues, due to mold allergies or having a child with asthma.[24]
- Likelihood of having significant energy savings due to building type, age, existing equipment, or climate: As an example, one study found that the loss of conditioned air (heated or cooled) in older homes account for 70% of the savings opportunities in the residential sector in Wisconsin (ECW 2000).
- Entry point. For example, target those who plan to replace their furnace this year or who are already doing remodeling, and encourage energy improvements as add-ons.

Identifying the ideal target audience is not always easy and will depend on the program's goals, the makeup of the community, its building stock, the local climate, the existing home energy improvement market, and what you learn through market research. There is not a single right answer, but here are some additional examples to consider from our case studies:

Targeted demographic data. WeatherizeDC targets outreach based on demographic information and employs a variety of engagement methods to motivate potential program participants, supporters, and volunteers. For example, the WeatherizeDC pilot targeted homes using two main criteria (1) Date of construction and (2) household income. First, targeting older buildings increased the chances of connecting with homeowners whose houses needed the most improvement. Second, targeting households with higher-than-median income increased the chances of connecting with homeowners who could actually afford to invest in improvements. As one of the early drivers of the home energy industry in the District of Columbia, the grassroots pilot did not have access to financing or incentives, which made it imperative that targeted homeowners had the ability to make the upfront investment. This targeting resulted in approximately an 8% conversion rate between those signing up for an energy assessment and those actually following through with the work.

[24]Personal communication, M. Golden, April 7, 2010.

Foster early adopters. The Hood River Conservation Project (HRCP) hired a sociologist who conducted a community assessment; one of the key outcomes was the creation of the Community Advisory Committee of local opinion leaders. Throughout the duration of the program, the Community Advisory Committee provided an important communications channel between the Hood River community and program staff. In addition, approximately 10% of Hood River households were recruited for participation in a variety of pre-program studies, such as end-use monitoring of homes, and their one-on-one contact with program staff helped to increase awareness of HRCP. Participants in these pre-program studies became enthusiastic champions of HRCP, creating a group of early adopters (Hirst 1987). As "community insiders" they were trusted messengers who helped to drive fellow community members to participate in the program. Within the first 6 months of the program's launch, 55% of eligible homes (1,950 homes) requested a home energy assessment (Phillips et al. 1986).

Screening for success. Long Island Green Homes (LIGH) has been extremely successful in converting energy assessments into energy upgrades; over 70% of LIGH applicants that get an energy assessment make improvements to their home. This high conversion rate is partially a function of the program's applicant pre-screening for energy usage patterns and pre-existing conditions that suggest an applicant will significantly benefit from the improvements. LIGH further winnows applicants by charging $250 for the energy assessment to separate "serious candidates from tire-kickers," according to Program Director Sammy Chu.

KEY LESSONS

- Use focus groups and market segmentation studies to identify the target audience(s); understand the specific barriers and effective messages that achieve your goals and reach these audience(s).
- Focus on the early adopters in the first few years of a program; one way to find early adopters is to investigate who in the community has already done home energy improvements.
- Identify and recruit the opinion leaders in the community to model the program's benefits.

8. Sell Something People Want

Few middle and upper-income people spend their days wondering how to save $50 a month on their utility bill[25]. Saving energy and lowering utility bills is something people value, but it is unlikely to be the ***primary driver*** *that motivates most people to make home energy improvements. For many people, energy is a small portion of their annual costs, and sometimes providing more information about these costs can actually de-motivate people. A recent study confirmed that energy is usually a "small portion of overall spending" and, importantly, found that the "majority of households felt that they were 'doing everything that they can' within the realm of their control" to reduce energy use (Opinion Dynamics 2009a).*

High energy use is not a problem that most people are actively looking to solve. Instead, identify a problem the customer actually has.

In other words, high energy use is not a problem that most people are actively looking to solve. As Mike Rogers of GreenHomes America suggests, "Identify a problem the customer actually has. Hit a touch point they are thinking about already, i.e. your daughter's bedroom is too cold. We can address that AND we can save you some energy too." To motivate most people to make home energy improvements, there must be more than saving energy on the table, though lower bills are an important additional benefit. Here are a few marketing messages that might be appealing, depending on the target audience:

- Comfort: Increase your family's comfort and wellbeing.
- Practical Investment/Security: Make an investment to protect and maintain your most valuable asset.
- Self-Reliance: Become a self-reliant American—reduce your energy dependence.
- Social Norm: All of your neighbors are making home energy improvements.

[25]According to the 2005 Residential Energy Consumption Survey by the Department of Energy, average household fuel and electricity expenditure (not including transportation fuels) was $151 per month per household in 2005. This is about 3% of the average annual household income.

- Health: Protect your family from mold allergies and asthma.
- Community: Join your neighbors in supporting local prosperity, reducing energy waste, and protecting the environment for future generations.

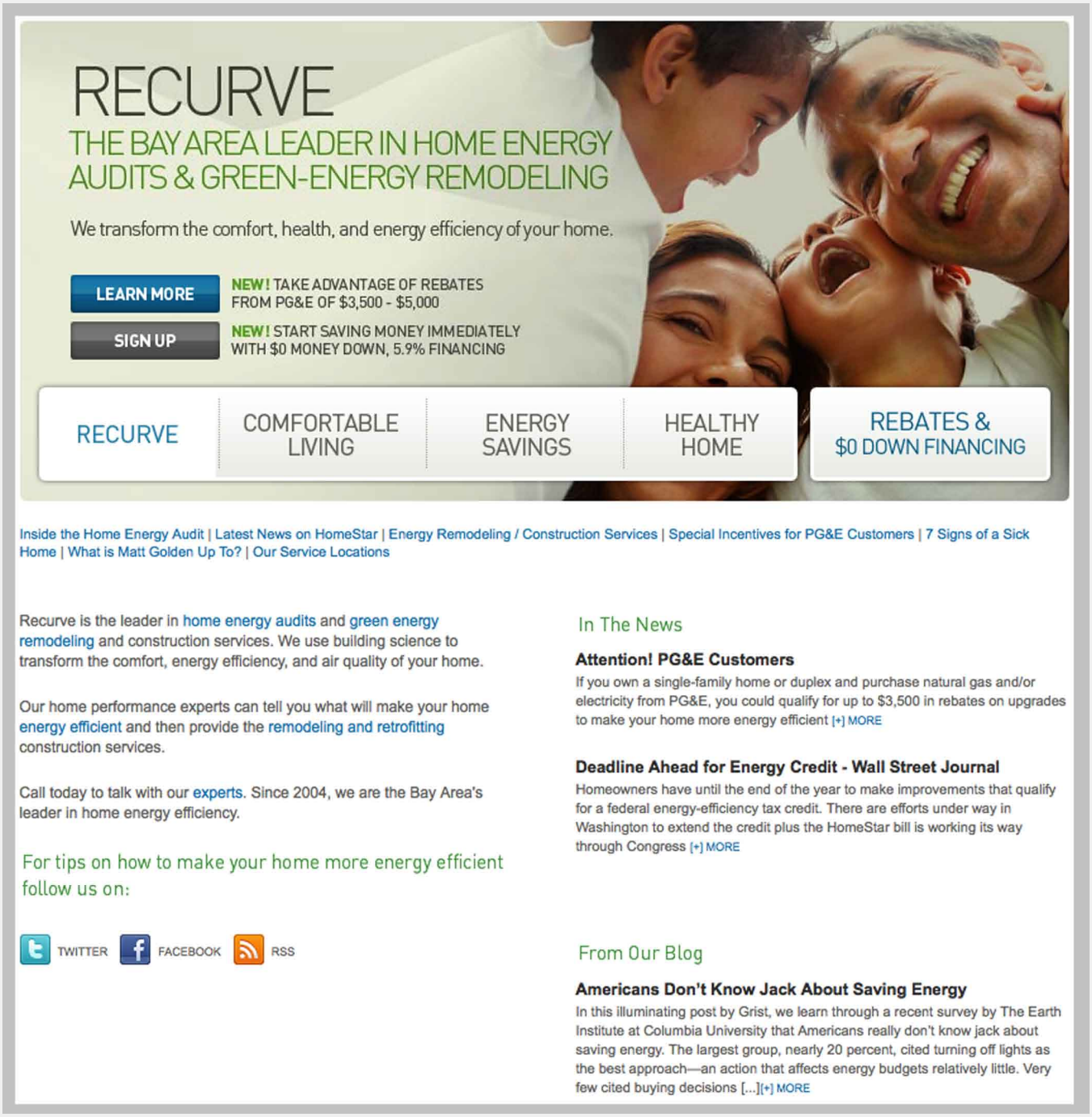
Different messages could be used with different market segments. Programs may want to use "saving money" as the common message that is paired with a targeted message depending on the audience.

In our interviews with contractors, they said the top reasons for making home energy improvements are saving money and increasing comfort. For one contractor, "(selling a job) is simply about saving money. If I can demonstrate this—and delivering low-rate, long-term financing helps—I can sell the job." For another respondent, comfort is a key driver: "Marketing specific solutions to customer problems is really important. If people are uncomfortable in their homes, they'll pay whatever it takes to get (the problem) fixed." Only 10% of surveyed contractors felt that environmental awareness and climate change are important factors in client decisions to invest in home energy improvements, despite the fact that this is often a primary motivation of publicly-funded programs.

It is also informative to look at the marketing materials of some of the larger home energy contracting firms in the country. Below are website screen shots of GreenHomes America, Recurve, and WellHome. They tend to highlight comfort, health, convenience, and public incentives, in addition to saving energy. They use phrases like "Green Home Remodeling," "A comfortable, energy efficient home guaranteed," "Healthy Home," "Comfortable Living," "We solve all common household problems," "Hurry, while rebates last!" and "All-in-One Solution: Make one call and we handle the rest."

This report's case studies also offer a few lessons about what messages work:

- While the **Take Charge Challenge** in Kansas included energy savings, money savings, and competition in its messaging; according to program director Nancy Jackson, "It was the contest and the community pride and community spirit that really drove this."
- For the **Marshfield Energy Challenge** the key message was, "It's all about where we live, work, and play."According to Kathleen De Vito, a contractor responsible for much of the initiative's outreach strategy, while the program didn't ignore environmental messaging, it focused on communicating that "You live here; this is the biggest investment you have; and we want to help improve the return on your investment. Energy efficiency and a greener tomorrow are just additional perks."
- Prior to launching **WeatherizeDC**, The DC Project conducted focus groups that suggested the top three messages homeowners responded to were: 1) energy cost savings, 2) benefits to the environment, and 3) local job creation. "However, with experience we discovered that the number one reason people were choosing to weatherize their homes was actually increased comfort, a message not included in the original focus group testing," says John Lauer, DC Project Program Director.



There are also examples outside this report's cases where something more attractive is paired with efficiency. Some people are more attracted to renewable energy, like shiny new solar panels, than to efficiency improvements, which are usually difficult to understand and hard to show off to neighbors. Some programs use solar panels to drive demand, but require that participants invest in home energy upgrades before, or in conjunction with, investing in renewable energy. An added benefit of this strategy is that it enhances the economics of renewable investments because residents can install smaller renewable installations if they have invested in energy efficiency.

Paying attention to selling something customers want can also be applied in the way some programs spend incentive funds. An example is buying down the interest rates on a home energy loan—programs sometimes spend upwards of $1,000 per loan to reduce interest rates. Programs should consider offering customers something more tangible—like a shiny, brand new ENERGY STAR refrigerator. Offers like this might be more appealing than a 4% reduction in the interest rate on a loan. It would also give them something to point to and talk about with their friends. To take it a step further, Program Director Sammy Chu suggested that, "If we were able to offer a free trip to Disneyland, now THAT would get families in Babylon in the door."

Programs should consider offering customers something more tangible—like a shiny, brand new EnergySTAR refrigerator. Offers like this might be more appealing than a 4% reduction in the interest rate on a loan. It would also give them something to point to and talk about with their friends.

KEY LESSONS

- Selling something the customer wants is vital to program success.
- Messages about home comfort, cost and energy savings, health, and community pride seem to be effective in engaging potential customers.
- Programs should consider creative program designs and uses of incentive funds—what will get the target audience's attention?

9. Language Matters

Everyone has unconscious networks of association to words and experiences, and cognitive scientists have discovered that these "frames" powerfully influence our perceptions and choices (Weston 1999; Lakoff 2004). Marketing professionals know that language has power, and carefully choose the language for print ads and commercials. Programs managers need to do the same to promote home energy improvements.

Marketing professionals know that language has power, and carefully choose the language for print ads and commercials. Programs need to do the same to promote home energy improvements.

Which Words Work?

The most glaring example of poor language is in the common use of the words "audit" and "retrofit." Who would willingly undergo (and pay for!) an audit—isn't that what the IRS forces upon tax evaders? And the term "retrofit" has very little meaning for most people, and perhaps some association with the past through "retro". These are not terms that inspire, motivate, or have positive connotations. This report uses the terms "energy assessment" and "home energy improvement," not because there has been rigorous testing to show these words work, but they are more descriptive and presumably more appealing. Programs in California will be using the term "Energy Upgrades," along with a coordinated branding effort across the state.

Marcia Kadanoff, Vice President of Marketing at Recurve, has found that people do not respond to many commonly used concepts in this industry, such as: Retrofits, Home Performance, Whole House, and House as a System (Kadnoff 2010). Potential customers do not have any experience that would help them understand and value these concepts. Instead, she suggests grounding people in concepts that they are already familiar with, such as:

- What's the MPG (miles per gallon) for your home?
- Home Performance specialists are mechanics for your home
- Connecting the work to "remodeling" or "construction services"

No one has found the silver bullet for the best language to use in the home performance improvement industry, but this is an important element for programs to be aware of and experiment with.

Effective Communication

In addition to the words used, how the message is communicated matters. An experiment conducted for Pacific Gas & Electric (PG&E) highlights the importance of effective communication with homeowners. In the 1980s, PG&E offered free home energy assessments and zero-interest loans for home energy improvements. The company found that less than 20% of households requesting energy assessments actually followed through on the assessors' recommendations. A group of social psychologists accompanying the assessors on some home visits found that the assessors were not trained in effective communication and merely provided homeowners with dispassionate, factual information based on the assessment results.

The psychologists trained a group of assessors in effective communication techniques using insights from social psychology and behavioral economics on the importance of commitment, vivid examples, and loss aversion. These assessors were taught to "use specific vivid examples, personalize the material wherever possible, frame statements in terms of loss rather than gain, and induce a commitment from the homeowners." For example, rather than merely pointing out the cracks around a door, assessors were instructed to use a more vivid image and point out that all the cracks around all the doors added up to a hole in the wall about the size of a basketball.

Use specific vivid examples, personalize the material wherever possible, frame statements in terms of loss rather than gain, and induce a commitment from the homeowners.

Framing energy efficiency in terms of loss rather than gain meant training assessors to use phrases like, "until you get the flue fixed, your hard-earned cash is flying right up that chimney." Assessors were encouraged to personally engage homeowners by having homeowners follow them through the assessment and be active participants in the process. Assessors who went through this training were able to persuade 60% of their customers to follow their recommendations, more than three times the previous average (Aronson 1990).

KEY LESSONS

- Words have power—programs should choose the language they use carefully. The terms "audit" and "retrofit" are likely not that effective.
- Communication style matters, and this can require training to get right. Programs should consider using vivid examples, personalizing information, using statements of loss rather than gain, and inducing a commitment from the homeowners.

10. Engage Trusted Messengers

There is a wealth of research that emphasizes the importance of using trusted messengers to move people to action (Stern 1985; Lutzenhiser 1993; Dietz and Stern 2002; Gershon 2009). People seem to respond best when approached by a peer, somebody they trust and can relate to, especially someone viewed as a leader in the community (Rogers 1983). This ties in closely with the behavioral research showing the impact of social norms, and some of the techniques that come out of that concept as described in Chapter 3: engaging community leaders, personal contact with peers, modeling success, and normative messaging.

People seem to respond best when approached by a peer, somebody they trust and can relate to, especially someone viewed as a leader in the community.

This report's case studies provide several examples of engaging trusted messengers:

- Program Ambassadors in Marshfield, MA: During initial planning, the Marshfield Energy Challenge hosted a two-day community meeting and planning workshop and found strong support for the program from community leaders and residents. The organizers capitalized on this meeting by selecting twelve program ambassadors—school representatives, politicians, religious leaders, and businesspeople. Not only would these ambassadors lead by example by upgrading their homes and businesses, but they would explain how the program worked to other community members and serve as the program's eyes and ears in Marshfield, delivering timely feedback to program managers.
- Churches and Community Centers in Houston, TX: The program found that reaching out to churches and getting church leaders on board is a very effective trust-building tool: "If they [church leaders] trust us, the rest of the community will too," according to program manager Gavin Dillingham. The program also partners with three multi-service community centers in the city and staffs tables at these centers on a weekly basis. Program representatives call people who live near the centers and have submitted incomplete weatherization applications and tell them they can come by the center to get help finishing the application.

- Leadership Teams in Kansas: The Climate and Energy Project created Leadership Teams in each town. They realized that "there is no such thing as the public"—they needed to market the program to many audiences, and so they found leaders from each of these target audiences. These included schools, low income neighborhoods, Chambers of Commerce, agricultural interests, religious communities, etc. The community leaders were the face of the program in each town; according to program director Nancy Jackson, "we [the Climate and Energy Project] were visible to the members of the Leadership Teams but not to the towns themselves." The Climate and Energy Project also worked closely with local media to spread the word. In one town, a member of the Leadership Team owned six local radio stations that recorded and played public service announcements (PSAs) throughout the Challenge. These PSAs showcased members of the Leadership Team explaining why the competition was valuable to different segments of the community. Local media often showcased personal stories of how much energy people were saving; in one town, and the first home energy assessment completed by the local utility received news coverage. According to Nancy Jackson, "Peer to peer communication is critical to the success of the program," and it is vital to identify "credible messengers and credible messages."

- Neighborhood Groups in Twin Cities, MN: The Twin Cities coalition has designed its model to allow for flexible outreach approaches. "The core strategy is connecting with neighborhood leaders, and getting those people behind you," says Anne Kraft, a Product Developer at Xcel Energy who is working with the coalition. "The strategy for exactly how to do that looks a little different for each neighborhood." In Minneapolis, the Center for Energy and Environment (CEE) issued a Request for Proposals to locate prospective community partners. "The RFP asked 'What are you willing to do?" says Program Manager Carl Nelson, "We [CEE] can organize the first workshop, train volunteers, develop marketing materials, deliver the program…What can you bring? We are mainly looking for organizations that want to work with us to deliver people to that first workshop. We train volunteers recruited by those organizations, and they go door to door signing people up."

- Community Leaders in Boston Area, MA: Energy Smackdown has involved a wide variety of community stakeholders in the competitions. The program begins each new pilot phase by forming a leadership council in each community, often comprised of the mayor, other elected officials, volunteer team captains, and representatives of community organizations. The leadership councils identify and recruit participants, guide challenge events, and provide teams with support ranging from public meeting space to publicity and outreach. This kind of engagement allows local officials to lead in ways that that are beyond the traditional scope of government. "We can't have town managers harassing citizens to turn down their thermostats," says Arlington Selectman Annie Lacourt, "but we can do something personally, and use our platform to get others involved."

Neighbor-to-Neighbor Recruitment

The Empowerment Institute has run a number of programs over the last 30 years that use neighbor-to-neighbor recruitment and a peer support system to motivate behavioral change, which in many cases have led to significant energy use reductions (>15%) and comprehensive home energy improvements even though this is not the primary purpose of the programs. Their programs, such as "Green Living" and "Low Carbon Diet" have engaged more than 20,000 people, and offer a well-tested model that could be applied to encouraging home energy improvements. They recruit community leaders who knock on the doors of their own neighbors to ask if they want to join an "EcoTeam"—a commitment of either seven or four meetings depending on the program, every other week, in a neighbor's home. Through experimentation they found a script that works best for recruitment:

"Hi, I am your neighbor from up the street. I would like to invite you to my home to hear about a new program sponsored by (city's name). Its purpose is to help us better conserve our environment's natural resources for the sake of our children, to get to know each other better as neighbors, and make our neighborhood a healthier and safer place to live. The meeting is at (location, date, time). Can you make it?"

David Gershon, founder of the Empowerment Institute, believes that this particular language is powerful because it touches on deep values and asks for a specific public commitment. He has also found that it is getting know ones' neighbors and improving the neighborhood that is most appealing to the community members he has worked with. These techniques reliably get about 25% of the people they approach to participate in the program. Once EcoTeam members are signed up, they have meetings guided by a detailed handbook to walk them through the program's process. They learn together and report back to the group what they have accomplished since the last meeting. There have been a number of studies on the Green Living program, and the results show significant savings in energy use, water use, solid waste, and carbon emissions[26].

Several themes emerge from these case studies that are consistent with findings in the literature, such as:

- Have local opinion leaders promote the program
- Encourage peer-to-peer conversations to generate "buzz" going within the community
- Ask for the support of local organizations, especially nonprofits
- Allow the local community to have some ownership of the program

[26]For more information, please see (Gershon 2009) or visit: www.empowermentinstitute.net

Partnering with Community Organizations

Though still early in its pilot phase, the Massachusetts Green Justice Coalition's Community Mobilization Initiative (CMI) offers a promising approach to weatherization in low income neighborhoods and communities of color. The program has partnered with existing local organizations who will lead canvassing efforts to sign up neighbors for home retrofits. For example, in Boston's Chinatown, traditionally a very hard to reach population for weatherization programs because of language barriers and a high concentration of renters, CMI has partnered with the Chinese Progressive Association (CPA), which has over 30 years experience working with the Chinatown community and a membership of 2,000 local families. CPA and a local union are also launching a workforce development program to provide weatherization training and English language lessons; program graduates will be eligible for hire as union members to work on weatherization projects in their neighborhood.

Energy Advocates

Some programs make use of an "energy advocate" or "energy concierge" in an attempt to provide a trusted messenger for the program. The energy advocate walks the participant through the program and acts as an intermediary between homeowners and contractors. Among others, this approach is used by both Clean Energy Works Portland and the Together We Save program in Milwaukee[27]. In the Milwaukee program, the energy advocate tells the customer about program requirements and benefits, provides information on energy conservation, and is often present during the energy assessment. The energy advocate helps the customer interpret the assessment results and encourages them to follow through with recommended energy improvements. The energy advocate also assists with paperwork and provides language translation to non-English speaking households. Similarly, in Portland, an energy advocate acts as a source of information about the program, including financing options, and helps the homeowner interpret the technical assessment results and recommendations.

An evaluation of the Milwaukee program, which targeted low to moderate income residents, found that the energy advocate model effectively reduces some barriers to program entry by making sure the homeowner is aware of program expectations and benefits from the start, providing language translation, and helping with paperwork

[27]These are not included as full case studies, although information about Together We Save can be found at (http://www.focusonenergy.com/files/Document_Management_System/Evaluation/togetherwesaveidianddbmemo_evaluationreport.pdf), and information about Clean Energy Works can be found at (http://www.cleanenergyworksportland.org/) and here (http://www.hprcenter.org/publications/best_practices_case_study_portland.pdf).

Encourage peer-to-peer conversations to generate "buzz" going within the community; ask for the support of local organizations, especially nonprofits.

(WPSC 2010). Energy advocates were also helpful in persuading homeowners to follow through on making improvements after getting an assessment, and appeared to increase participants' comfort with the process and confidence in the energy saving recommendations.

However, energy advocates have a few draw backs. Contractors are not always enthusiastic about the use of energy advocates. For contractors that are experienced with customer relationships and selling both assessments and home energy improvements, energy advocates may interfere with their business model. As several contractors in our survey emphasized, they don't like programs "that get between the customer and contractor." One contractor noted, "An integrated business model matters for momentum in the sales process, versus a program [assessment] by one contractor then a return to contractor pool for the [home energy improvement] with no established relationship." These firms often excel at educating customers, and their sales process is based on a close relationship with the homeowner. Thus, the use of energy advocates may not be appropriate in all regions or with all target populations. Moreover, the use of energy advocates can also be expensive. In Portland, the energy advocate model cost approximately $300 per home in the pilot phase. This cost is covered by public funds in Oregon, but this may not be feasible or sustainable elsewhere.

KEY LESSONS

- Have local opinion leaders promote the program.
- Encourage peer-to-peer conversations to generate "buzz" within the community.
- Ask for the support of local organizations, especially nonprofits.
- Allow the local community to have some ownership of the program.
- Energy advocates may be appropriate and effective in some but not all situations; e.g. energy advocates may be most helpful with groups of customers who do not have a high degree of trust in the program implementer.

11. Work Closely With Contractors

Contractors, more than any other party, are the people sitting across the kitchen table making the final sales pitch to a homeowner. Many programs that succeed in performing a significant number of energy upgrades use contractors as the program's main sales force (Fuller 2008). In addition, public funding will not last forever, and in a self-sustaining market contractors will need to be the primary agents promoting and delivering energy efficiency—so the end game for market transformation must empower them.

Many programs that succeed in performing a significant number of energy upgrades use contractors as the program's main sales force.

Design a Program That Contractors Want to Sell

Understanding the perspective of contractors is essential to designing programs that work. Program managers should leverage contractors' years of on-the-ground experience, and make sure that they create a program that contractors believe will increase their business. Just as delivering seamless offers is important to getting homeowners to invest in energy efficiency, so too is delivering a program that is easy for contractors to participate in. Surveyed contractors noted the importance of things like program simplicity, program consistency so they know what to expect, streamlined paperwork, and a fast contractor payment processes—particularly for small contractors with limited ability to dedicate time to administrative tasks or to cover the upfront cost of the upgrades they perform.

Several successful energy upgrade programs also offer training sessions that show contractors how to effectively use programs to convert leads into sales. Experienced contractors note that programs often spend a lot of time on technical training but not nearly enough time on showing contractors how to make a living performing home energy improvements. Comprehensive energy upgrade programs typically add overhead costs to businesses, and contractors must be able to educate homeowners and communicate the benefits of a comprehensive approach to home efficiency in order to beat their business-as-usual competitors.

As part of its Home Performance with ENERGY STAR (HPwES) initiative, NYSERDA operates a one-day sales and marketing training program that teaches contractors skills for communicating the importance of HPwES and a comprehensive approach to energy efficiency. This training focuses on the customer experience and addresses

some of the key hurdles to converting leads into home energy improvements. Similarly, Keystone HELP works with contractors to assist them with integrating the program into their marketing approach and sales pitch; the program has 4 full-time sales staff working directly with contractors. These staff members do frequent webinar trainings for contractors and have a website with sales tools and advertising templates.

Programs often spend a lot of time on technical training but not nearly enough time on showing contractors how to make a living performing home energy improvements.

It is also important to note that not all contractors have the same business model—contractors that currently offer a single measure (e.g. insulation or equipment replacement) may not fit well into the comprehensive home improvement framework. In terms of getting contractor feedback and buy in, program designers may want to start by working with a smaller group of innovative contractors and design a program that encourages single measure contractors to move towards a more comprehensive model, or to partner with others to create full-service offerings. Programs that solely target reactive customers who want to replace their furnace and nothing else may have an easy time getting participation initially, but without some additional push from the program, there will be few comprehensive upgrades. Keystone HELP provides technical training and financial incentives for contractors to encourage them to move from single-measure replacements to more substantial upgrades.

Cooperative Marketing

NYSERDA couples its traditional Home Performance with ENERGY STAR (HPwES) marketing with cooperative advertising incentives that reimburse contractors for a portion of their own advertising expenses. The reimbursement rates and caps are a function of the number of retrofits a contractor completes to reward productivity, and range from 25% to 50% of a given advertising expense up to a maximum of $150,000 annually per contractor. Importantly, these incentives help contractors attract consumers to do comprehensive upgrades where contractor capacity exists. Mike Rogers of GreenHomes America points out that, "Program-wide marketing alone runs the risk of giving a message that the market infrastructure may not be ready to receive. Programs spend a lot of money getting homeowners to pick up the phone, but if qualified contractors aren't there to provide services, you end up with a frustrated homeowner. If you frustrate a homeowner on the first call, getting them to make energy improvements in the future becomes a much more difficult task." NYSERDA's HPwES program also offers a range of additional incentives, and most of these are performance-based, which allows the program to encourage scale, reward performance, and maximize its resources.

The Role of Contractors in Program Delivery

As discussed previously, home energy efficiency is not a concept familiar to many Americans. Contractors often find that customer trust is crucial to overcoming this information gap and converting customer outreach into jobs. Leveraging contractors' existing relationships to deliver program messages can be a cost-effective way to increase demand for comprehensive home energy improvements. Houston's Residential Energy Efficiency Program (REEP) weatherization program has found that using contractors to market the program while they are working in a neighborhood is a very effective outreach technique. When the contractors weatherize a home, they visit neighboring homes and talk to residents or leave door hangers. These residents can then reach out to talk to their neighbor who just got her home weatherized to confirm that they had a positive experience.

A program's focus on using contractors to sell energy improvements will depend, in part, on the target audience and target energy upgrades. Pennsylvania's Keystone HELP, which targets reactive customers (e.g., a customer whose furnace breaks in the middle of winter), uses contractors as its primary marketing resource. While the program does limited outreach to communities, it has chosen to develop a network of contractors and train them to sell the program because contractors have the power to influence consumers at the point when they are making a major purchase or renovation decision. Several programs that are more focused on proactive customers and more comprehensive improvements, like NYSERDA's HPwES, do more extensive marketing to build program recognition while relying on contractors as the key point of customer contact.

Program	How Programs Connect Contractors and Customers
Hood River Conservation Project (HRCP)	Program-approved contractors assigned to homes.
Houston's Residential Energy Efficiency Program (REEP)	Program selects contractors; each is given a geographic territory in Houston.
Keystone Home Energy Loan Program (HELP)	Households select their own contractors; Keystone HELP provides a contractor database.
Long Island Green Homes (LIGH)	Households can choose from a list of BPI-accredited contractors, or the program will assign one.
Marshfield Energy Challenge	Program-approved contractors assigned to homes.
New London Resource Project (NLRP)	Program offered to assign contractors, or participants could choose their own.
NYSERDA's Home Performance with ENERGY STAR Program	Households choose from a list of BPI-accredited contractors.
Sustainable Works	10–20 homes are bundled and bid out to approved contractors.
Twin Cities One Stop Program	Households choose their own contractors.
WeatherizeDC	A single BPI-certified contractor selected for the pilot; contractor signed a Community Workforce Agreement to participate.

Table 6. How programs connect contractors and customers

Leveraging contractors' existing relationships to deliver program messages can be a cost-effective way to increase demand for comprehensive home energy improvements.

Programs may choose models that do not use contractors as their primary salespeople. Portland Clean EnergyWorks[28] and the Twin City One Stop Shop program, for example, rely on program staff and community nonprofits to do energy efficiency outreach and education. These two programs then connect homeowners with qualified contractors, who complete the sale and perform the energy efficiency upgrades. While contractors aren't the primary program marketers, programs like these must make extra efforts to coordinate with contractors to create a seamless customer experience and to ensure that contractors are motivated to complete sales and perform quality work.

Align Contractor Incentives with Program Goals

It is important to align contractor motives with program goals because customers are likely to view private contractors as extensions of the program. The Hood River Conservation Project conducted interviews with community residents to monitor attitudes toward the program as well as any misperceptions about it. One insight from these monitoring reports was that customers see the contractors themselves as ambassadors of the program. When the quality of some contractors' work did not pass inspection, it produced negative attitudes about the program in those particular cases.

Programs should establish robust quality assurance procedures that hold contractors accountable for their work through appropriate incentives and penalties. Additionally, a program's financial incentives for contractors can be structured to achieve program goals—such as high job volumes, upgrades for targeted populations, and comprehensive retrofits. In contrast, penalties for poor quality work may include a probationary period after an initial offense, followed by a disqualification from program participation upon further sub-standard work.

Government-funded energy efficiency programs are often short-lived and programs that only last several years may not provide enough time for customers to fully understand a program's opportunities or for contractors to take advantage of them. Getting additional licenses and certifications can be expensive and time-consuming for contractors struggling to stay afloat in a difficult economic environment. Several surveyed contractors expressed fear about the sustainability of public programs: "Programs are a huge driver of [home energy improvement] work…it's challenging because the money is here today, gone tomorrow, making it hard for contractors to make long-term investments in their businesses."

NYSERDA encourages contractors to participate in its Home Performance with ENERGY STAR (HPwES) program by offering discounts on Building Performance Institute (BPI) certification and subsidies for diagnostic equipment.

---

[28] A case study on Portland's Clean EnergyWorks program can be found here: http://www.hprcenter.org/publications/best_practices_case_study_portland.pdf

NYSERDA's extensive HPwES advertising campaign also reinforces contractor confidence in the organization's long-term commitment to HPwES and helps convince contractors that the time and expense required to get BPI certified and make investments in diagnostic equipment are worth it. Programs that include increasing the number of qualified contractors should also take steps to ensure that there is sufficient customer demand to meet this increased supply. One contractor noted that the local public energy upgrade program, "just keeps training contractors despite no demand growth and now contractors who have invested significant capital can't find work in this space and aren't getting a return on their investment—training without demand is a bad idea."

KEY LESSONS

- Contractors need to buy into the program—they are the primary sales force for home energy improvements, and should be prepared to sustain the market after public support ends.
- Leveraging contractors' existing relationships to deliver program messages can be a cost-effective way to increase demand for comprehensive energy upgrades.
- Quality assurance is vital—customers are likely to view private contractors as extensions of the program, and the quality of the contractors' work will significantly impact program success.

12. One Touch Is Not Enough

Energy efficiency is a complex "ask". Past programs that covered a majority of homeowner costs often struggled to generate customer demand for home energy improvements. As residential energy efficiency programs enter an era of more modest rebates and market-rate financing, marketing efforts have to be increased considerably. Outreach campaigns must repeatedly "touch" potential participants to motivate them to act.

The majority of people need to be exposed to a product message at least three times (on separate occasions) to buy into it.

Advertising professionals frequently cite the "three-times convincer" concept, which claims that the majority of people need to be exposed to a product message at least three times (on separate occasions) to buy into it[29]. The task for energy efficiency marketing is even more challenging because it is a capital-intensive "product" that is unfamiliar to many homeowners and that can't be readily touched, seen, or tasted. While traditional marketing and outreach tools (i.e. bill stuffers, print and television advertising, etc.) may be effective in building general program awareness, it's clear that in isolation these techniques are not up to the task of motivating target populations.

Getting Messages Into the Community

Programs have used creative approaches to spread their messages in target communities, and to leverage that attention into energy efficiency upgrades. It is important to layer traditional and non-traditional marketing and outreach strategies to deliver multiple customer touches in a complementary way that builds program awareness and drives residents towards investing in home energy improvements.

- Marshfield Energy Challenge (MEC) used a number of non-traditional outreach tools to get its message into the community including e-mail updates, telephone follow-ups, an energy lecture series, breakfast meetings, and activities at schools, concerts, fairs, and on election day. It did not use online social

[29]The "three-times convincer" concept is the result of broader research on the subject of "effective frequency." More information on effective frequency can be found at: http://uts.cc.utexas.edu/~tecas/syllabi2/adv382jfall2002/readings/JonesJAR.pdf

It is important to layer traditional and non-traditional marketing and outreach strategies to deliver multiple customer touches in a complementary way that builds program awareness and drives residents towards investing in home energy improvements.

outreach tools like Facebook and Twitter (although it did host a website and blog). Knowing how prevalent these online social media tools are today, program managers mentioned they would make a much stronger online effort if they had to do it again. The program also took a two-tiered traditional advertising approach. It conducted an umbrella advertising campaign focused on community-wide energy reduction using conventional media outlets (weekly newspaper and radio) and direct mail. The MEC followed this with targeted direct mail advertising that included special offers to reach households and businesses that were contributing to peak demand on a constrained electrical circuit. While direct mail had the highest response rates of the traditional marketing, program managers felt that the umbrella advertising was essential for branding and creating awareness of the program.

- New London Resource Project (NLRP) also ran an in-depth outreach campaign. NLRP hosted two community-wide energy fairs, the first of which attracted almost a thousand attendees in a town of about 3,000 households, to launch the program and develop "buzz". Program managers note that these energy fairs were essential to building community awareness. NLRP also developed a conservation education curriculum for local schools and assisted retailers with energy efficiency product stocking and employee training. The project also used a number of traditional marketing approaches including radio and newspaper advertising to reach out to residents. NLRP offered subsidized home energy assessments, and in an attempt to increase the efficiency of program delivery, direct mail was sent to targeted neighborhoods a few weeks before the assessor visited, followed by door hangers the day before work began in that neighborhood. In addition, when residents had assessments completed on their homes, they were given a "Pass It On" card to give to a friend or neighbor.

- Houston's Residential Energy Efficiency Program (REEP) program also used traditional and non-traditional outreach techniques to get multiple touches on potential participants. REEP organized block parties that attract several hundred residents each, conducted door-to-door canvassing, and placed advertisements in community newspapers, radio, television, and in the city's public transit system. The program used to send a letter to every household in their target neighborhoods, but they have stopped doing this because the response rate was low. According to program manager Gavin Dillingham, successful outreach is "a matter of trying a variety of marketing methods and seeing what works in your particular context."

Ensuring Message Consistency

One of the challenges faced by programs, particularly those using “armies of community advertisers,” is maintaining message discipline so that consistent messages are delivered to potential program participants. Several programs have developed methods to encourage message consistency:

- For its cooperative advertising incentives initiative, NYSERDA requires that contractor advertising materials be pre-approved and include specific mention and visual placement of program-supported messages and brands. By requiring contractors to get materials pre-approved, the incentives allow the Home Performance with Energy Star (HPwES) program to coordinate contractor messaging with its broader marketing campaign. This messaging consistency is important to avoid consumer confusion.
- The Marshfield Energy Challenge distributed a laminated "answer card" to all of the attendees of its two-day community meeting and planning workshop. The card included details of how the program operated, which ensured that MEC advocates were accurately communicating program information to potential participants.

KEY LESSONS

- Outreach campaigns need to repeatedly “touch” potential participants; combining traditional marketing tactics with creative, grassroots approaches appears to be effective.
- Programs should take steps to ensure residents are receiving consistent messages, especially if there are multiple program messengers.

13. Design and Evaluate Programs to Learn What Works

The unparalleled federal funding for home energy improvements offers a unique opportunity to learn what works to increase the number of upgrades by households each year and the level of savings per home. Programs need to incorporate processes for evaluating the impact of their strategies, and use this information to adjust program delivery in real time. It is also important that the broader community of program designers learns about the effectiveness of different marketing, outreach, and technical assistance approaches.

Program Design Steps

This report has profiled a number of strategies that may be effective in driving demand for energy efficiency. As mentioned earlier, many of these tools have not been rigorously evaluated in experimental settings, and many of the programs featured in the case studies are in their pilot phase. There remains much to be learned, and program designers should consider following the work of Doug McKenzie-Mohr, which lays out a five-step process for program design:

1. Select targeted behaviors the program seeks to change: Specifically want do you want people to do?
2. Identify the barriers and benefits: Program managers should identify internal and external barriers to widespread residential investment in energy efficiency upgrades in the community. For example, internal barriers may include lack of building science expertise among contractor staff or lack of trust in the potential program administrator. External barriers may include prohibitive up-front costs or an insufficient number of certified contractors to perform the upgrade work. Program managers should also identify benefits, and look for ways to increase the benefits of the program.
3. Develop strategies to address barriers and increase benefits: The next step is deciding which outreach strategies, technical assistance, workforce training and and other program elements are necessary to address the barriers and benefits that have been identified in the community. Focus groups may be conducted to gauge community reaction to the proposed program. At this stage it is also important to analyze predicted costs and impacts of the various strategies available.
4. Pilot Project: The pilot is a test run of the program with a small segment of the target community. Ideally, the pilot should include a control group that receives no intervention, so that it is clear whether changes are due to the program or due to other events in the community occurring at the same time. McKenzie-Mohr cautions,

"It is tempting when a pilot is ineffective to assume that you know what went wrong and move directly to community-wide implementation. Keep in mind that pilots can often be conducted very quickly. Take the time to run another pilot to confirm that you are able to change behavior before you implement across a community" (McKenzie-Mohr 1999).

5. Implementation and Evaluation: Programs should be designed with enough flexibility to allow for strategy adjustment based on interim results. A plan for program evaluation should be built into program implementation so managers are clear on the goals of the program and on what data must be collected.

Programs should be designed with enough flexibility to allow for strategy adjustment based on interim results.

Experimental Design

It is clear that there is a lot to learn about catalyzing home performance markets in the United States. Including controlled experiments in program design will help program managers evaluate the effectiveness of specific outreach strategies locally, and inform the development of national best practices. The first step in experimental design is deciding what an experiment is meant to test. An experiment can be designed to test any of the strategies profiled in this report, such as the use of energy advocates or making public commitments. Programs should develop a plan for collecting data and analyzing results before they begin the experiment. Statistical tools should be used to control for variables—such as income and age of home—that may also influence homeowners' investment decisions.

Experiments should include a control group that receives no treatment for purposes of comparison. Several program elements can be tested by creating multiple groups that are each given different treatments. For example, "you may wish to have one group receive a commitment strategy, a second receive feedback, a third receive a combination of the two, and a fourth act as a control" (McKenzie-Mohr 1999). Ideally, these groups should consist of large, randomly assigned, samples from the community. For an experiment examining investment in home energy improvements, a sample size of a few hundred is probably necessary to achieve statistically valid results. In practice, it may be difficult to get a completely random sample because people may not want to participate in the study.

Many programs do not have the luxury of operating in an ideal experimental setting, making it difficult to isolate the key outreach techniques that are motivating homeowners to do energy upgrades. The Hood River Conservation Project (HRCP) designers recognized that the use of broad marketing communications tactics like billboards and radio spots as well as word-of-mouth information made it nearly impossible to exclude and/or control who receives information about the program. As a result, it was not practical to isolate a random sample of households within the community to assess program efficacy. So instead of selecting a control group within Hood River, the program

identified two comparison communities with similar electricity rates, populations, locations, economies, and climates. In addition, a random sampling of the sponsoring utility's customers across the region was identified to provide an additional comparison group. The program used these comparison groups to identify a savings of approximately 14% of electricity use attributable to the program (Hirst 1989).

The organizers of the Take Charge Challenge saw that evaluating electricity savings would be difficult because of the lack of a suitable baseline for direct comparison.Because of the economic downturn, comparing to the previous year would have overestimated the savings attributable to the Challenge. Instead, savings from each participating town were calculated by comparing it to a nearby town or region with similar demographics. The winning town reduced energy consumption by 5.5% relative to its comparison town.

Examples of Experiments

Several past studies provide lessons on setting up high quality experiments. Although not all of these experiments involved residential energy efficiency programs, all tested different marketing and outreach techniques that motivate behavioral change.

- Trusted Messenger: Craig and McCann (1978) tested whether different messengers delivering the same message would lead to different results. They randomly assigned 1,000 utility customers in New York City (chosen based on their higher than average electricity consumption) to four treatment groups and one control group. Two of the treatment groups received a letter in their bill from the utility asking them to return a prepaid postcard if they wanted to receive a booklet from the utility about reducing their electricity bills; the other two treatment groups received the exact same letter but from the state government. Two of the treatment groups received this letter once, and the other two received it twice. They found that a significantly higher percentage of residents returned the postcard when it was from the government rather than the utility. There was no statistically significant difference from sending the letter more than once. This is not to imply that local or state governments are always more trusted than utilities—sometimes it is the reverse—but an experimental design like this can identify what messenger or message might be effective in a given region.

- Social Norms: Cialdini (2003) conducted an experiment to illustrate the importance of social norms in environmental behavior. When experimental subjects were confronted with a handbill that they found on their car windshields, they were more likely to discard it into an already-littered environment and even more likely to litter if they saw a passer-by (who was a researcher in the experiment) drop trash into that environment. They were least likely to litter if the passer-by dropped trash into the clean environment because their attention was drawn to the fact that people do not normally litter there.

- Homeowner engagement: Aronson (1990) provides an example of a quasi-experiment in which PG&E auditors were trained in effective communication skills. The trained auditors were much more successful

in convincing their customers to undertake energy efficiency measures than the untrained auditors. Unfortunately, this experiment had a small sample size (18 auditors, half of whom received training and half of whom were a control group). Due to time constraints, the researchers were not able to test the effectiveness of different communication strategies, but rather the treatment group was trained in many new techniques. Although this made it impossible to isolate the effectiveness of particular customer tools, the experiment nevertheless supported the importance of training auditors in communications methods grounded in social psychology.

Measuring Impacts

There is a long list of metrics that programs can collect to gauge success, and the most appropriate and informative metrics will vary based on the program's design and goals. It is important to take time to think through these metrics **before** launching the program. As a starting place, programs seeking scale in the residential market need to collect the number of participants in each stage of the program and the conversion rate between stages (e.g. # attending a community meeting $\rightarrow$ # completed assessment $\rightarrow$ # completed upgrade), the number of homes participating as a percent of the target audience, and some measure of the "depth" of the improvements (e.g. **estimated** % of energy usage saved, **actual** % of energy use saved, # of measures installed).[30]

It is also extremely important to compare the impacts of the program to the cost of achieving the impacts. Program managers should look at the all in costs of the programs—including all direct and indirect staff time, incentives, marketing materials, etc—and come up with a cost per home upgraded. How does this return on investment compare to other strategies available? How might these cost decrease as the program scales up?

KEY LESSONS

- Collect data on the effectiveness of different marketing and outreach approaches. Incorporate processes for evaluating these metrics into program design, and use this information to adjust program delivery.
- Look at the all in costs of the program—including all direct and indirect staff time, incentives, marketing materials, etc—and come up with a cost per home upgraded. How does this return on investment compare to other strategies available?

[30]For an example of a program with well-documented program evaluation, see NYSERDA's Energy $mart program: http://www.nyserda.org/energy_information/evaluation.asp and http://www.nyserda.org/Energy_Information/SBC/sbceval.html. Years of program evaluations from California can be found here: www.calmac.org.

14. Conclusion

This paper draws on case studies, interviews, and a review of the literature to better understand how behavioral and marketing insights can be applied to reduce energy use in the residential market. Success will require multifaceted approaches that acknowledge a deeper understanding of what motivates homeowners and contractors. Effective programs will tend to be tailored to the location, thoughtfully researched and piloted, personalized to the target audience, and more labor-intensive than simple incentive programs. Just as there is no single, monolithic customer, there is no silver bullet answer to driving demand for home energy improvements—but past experience and research offer policy makers and program designers a strong foundation on which to build.

References and Resources

Abrahamse, W., L. Steg, C. Vlek, T. Rothengatter. 2005. "A Review of Intervention Studies Aimed at Household Energy Conservation." *Journal of Environmental Psychology*. 25: 273-291.

ACEEE (American Council for an Energy-Efficient Economy). 2009. *State Energy Efficiency Scorecard.* LINK

Action Research. 2010. "Community-Based Social Marketing to Inform Homeowner Participation in California Energy-Efficient Home Improvement Programs." Prepared for Build It Green. LINK

Andrews, E.R. 1984. "Residential weatherization through zero interest financing: The PG&E experience." American Council for an Energy-Efficient Economy (ACEEE) 1984 Summer Study on Energy Efficiency in Buildings.

Aronson, Elliot. 1990. "Applying Social Psychology to Desegregation and Energy Conservation." *Personality and Social Psychology Bulletin* 16: 118-132. LINK

Ashby, K. V., M. Nevius, M. Walton, and B. Ceniceros. 2010. "Behaving Ourselves: How Behavior Change Insights Are Being Applied to Energy Efficiency Programs." American Council for an Energy-Efficient Economy (ACEEE) 2010 Summer Study on Energy Efficiency in Buildings.

Bandura, A. 1989. "Social Cognitive Theory." In R. Vasta (Ed.), *Annals of child development. Vol. 6. Six theories of child development.* Greenwich, CT: JAI Press. 1-60. LINK

Brown, M., K. Welks and P. Krajsa. 2010. *EECBG Pennsylvania Keystone HELP Program Webcast.* U.S. Department of Energy: Energy Efficiency and Renewable Energy. LINK

Brown, M.A. and D. White, 1992. *Evaluation of Bonneville's 1988 and 1989 Residential Weatherization Program: A Northwest Study of Program Dynamics*. Oak Ridge, TN. Oak Ridge National Laboratory. LINK

Brown, M.H. and B. Conover. 2009. *Recent Innovations in Financing for Clean Energy.* Prepared for the Southwest Energy Efficiency Project. Boulder, CO. LINK

CPUC (California Public Utilities Commission). 2009. *Marketing, Education and Outreach Workshop.* California Public Utilities Commission. LINK

Carroll, E., E. Hatton and M. Brown, 2009. *Residential Energy Use Behavior Change Pilot*, Franklin Energy. LINK

Cialdini, R.B. 2001. *Influence: Science and Practice*. Needham Heights, MA: Allyn & Bacon.

Cialdini, R.B. 2003. "Crafting normative messages to protect the environment. *Current Directions in Psychological Science*. 12(4): 105-109.

Cialdini, R. B. 2005. "Basic Social Influence is Underestimated." *Psychological Inquiry* 16: 158-161.

Cialdini, R.B. 2007. *Influence: The Psychology of Persuasion*. New York, NY. Harper Collins.

Cialdini, R.B. 2007. "Descriptive Social Norms as Underappreciated Sources of Social Control." *Psychometrika.* Richmond, VA. Psychometric Society. 72: 263-268.

Clean Energy Works Portland. 2009. *Frequently Asked Questions.* Portland, OR. Clean Energy Works Portland, City of Portland Bureau of Planning and Sustainability. LINK

Costa, D.L. and M.E. Kahn. 2010. *Energy Conservation 'Nudges' and Environmentalist Ideology: Evidence from a randomized residential electricity field experiment.* NBER Working Paper 15939. Cambridge, MA. National Bureau of Economic Research. LINK

Craig, C.S. and J.M. McCann. 1978. "Assessing Communication Effects on Energy Conservation." *The Journal of Consumer Research.* 5(2): 82-88.

Darby, S. 2006. "The Effectiveness of Feedback on Energy Consumption: A Review for DEFRA of the literature on metering, billing and direct displays." Environmental Change Institute, University of Oxford. LINK

Dietz, T. and P. Stern. 2002. *New Tools for Environmental Protection.* National Research Council. Washington, DC. National Academy Press. LINK

Eckman, T. 2010. Personal Communication, April 2, 2010.

ECW (Energy Center of Wisconsin). 2000. "Energy and Housing in Wisconsin: A Study of Single-Family Owner-Occupied Homes." November 2000.

EERE (Energy Efficiency and Renewable Energy). 2008. *Energy Efficiency Trends in Residential and Commercial Buildings*. U.S. Department of Energy. LINK

Engels, D., S. Kaplon, and H. G. Peach. 1985. *Marketing and Promotional Plan,* Final Report, Hood River Conservation Project, DOE/BP-11287-9.

Flynn, C. B. 1983. *Community Assessment.* Prepared by Social Impact Research, Inc. for the Hood River Conservation Project, DOE/BP-11287-15.

Flynn, C. B. 1983. *Process Evaluation.* Final Report, Hood River Conservation Project, DOE/BP-11287-6.

Fogel, C. 2010. "2020 Vision: A new norm of energy behavior – Smart Energy Living," Presentation at HERCC Meeting, April 28, 2010.

Fuller, M. 2008. *Enabling Investments in Energy Efficiency: A study of programs that eliminate first cost barriers for the residential sector.* Burlington, VT. Efficiency Vermont. LINK

Geller, E.S. 1981. "Evaluating energy conservation programs: Is verbal report enough?" *Journal of Consumer Research.* Chicago, IL. The University of Chicago Press. 8: 331-335.

Goeltz, R. and E. Hirst. 1986. *Residential Retrofit Measures: Recommendations, Installations, and Barriers.* Final Report, Hood River Conservation Project. Oak Ridge, TN. Oak Ridge National Laboratory. DOE/BP-11287.

Goldman, C. 1986. "Measured results of energy conservation retrofits in residential buildings," *ASHRAE Transactions*, 92:1.

Goldman, C. and R. Ritschard ,1986. "Energy conservation in public housing: a case study of the San Francisco Housing Authority," *Energy and Buildings*, 9:1, 89-98, February-May.

Goldman, C. 1985 "Measured energy savings from residential retrofits," *Energy and Buildings*, 8:2, 137-155.

Goldstein, N., R. B. Cialdini, V. Griskevicius. 2008. "A room with a viewpoint: Using norm-based appeals to motivate conservation behaviors in hotels." *Journal of Consumer Research.* Chicago, IL. The University of Chicago Press. 35: 472-482. LINK

Grey, K. 2010. Personal Communication. April 16, 2010.

Harrigan, M. 1991. *Moving Consumers to Choose Energy Efficiency.* Washington, DC. The Alliance to Save Energy.

Hewitt, D. et al. 2005. *Recommendations for Community-Based Energy Program Strategies, Final Report*. Developed for the Energy Trust of Oregon. LINK

Hirst, E., L. Berry, and J. Soderstrom, 1981. "Review of Utility Home Energy Assessment Programs." *Energy.* 6(7): 621-630. LINK

Hirst, E., L. Berry, B. Bronfman, K.E. Johnson, R. Tepel, J.L. Trimble, 1982. *Evaluation Plan for the Bonneville Power Administration Residential Energy Conservation Programs*, Oak Ridge, TN. Oakridge National Laboratory.

Hirst, E. 1984. “Evaluation of Utility Home Energy Assessment (RCS) Programs.” American Council for an Energy-Efficient Economy (ACEEE) 1984 Summer Study on Energy Efficiency in Buildings.

Hirst, E., 1984. “Household Energy Conservation: A review of the Federal Residential Conservation Service.”*Public Administration Review.* 44: 421-430.

Hirst, E, 1986a. “Actual energy savings after retrofit: Electrically heated homes in the Pacific Northwest.” *Energy.* 11(3): 299-308. LINK

Hirst, E. 1986b. “Electricity Savings One, Two, and Three Years After Participation in the BPA Residential Weatherization Pilot Program.” *Energy and Buildings* 9: 45-53.

Hirst, E. 1987a. *Cooperation and Community Conservation*, Final Report, Hood River Conservation Project. Oak Ridge, TN. Oak Ridge National Laboratory. DOE/BP-11287-18.

Hirst, E. 1987b. “Energy and economic effects of utility financial incentive programs: The BPA Residential Weatherization Program.” *The Energy Journal.* 8(2): 97-110.

Hirst, E., R. Goeltz, and D. Trumble. 1987c. *Electricity Use and Savings*. Final Report, Hood River Conservation Project. Oak Ridge, TN. Oak Ridge National Laboratory. ORNL/CON-231, DOE/BP-11287-16.

Hirst, E. 1989. “Reaching for 100% participation in a utility conservation programme: The Hood River project*” Energy Policy.* 17(2): 155-164. ISSN 0301-4215, DOI: 10.1016/0301-4215(89)90097-9. LINK

Hirst, E. 1989. “The Hood River Conservation Project: A unique research and demonstration effort.” *Energy and Buildings*. 13(1): 3-9, ISSN 0378-7788, DOI: 10.1016/0378-7788(89)90012-1. LINK

Hirst, E., R. Goeltz, and D. Trumble. 1989. “Effects of the Hood River Conservation Project on Electricity Use.” *Energy and Buildings* 13:19-30.

Hirst, E. 2010. Personal Communication. May 21, 2010.

Hoorens, V. 1993. "Self-enhancement and superiority biases in social comparison." *European Review of Social Psychology*. Psychology Press. 4.

Hussen, A.M. 2003. *Principles of Environmental Economics: Economics, Ecology, & Public Policy*. New York. Routledge.

Kahneman, D., and A. Tversky. 1979. “Prospect theory: An analysis of decision under risk.” *Econometrica: Journal of the Econometric Society.* 263-291. LINK

Keating, K. 2010. Personal Communication. April 8, 2010 and June 14, 2010.

Lakoff, George. 2004. *Don't Think of an Elephant: Know Your Values and Frame the Debate.* White River Junction, VT. Chelsea Green Publishing.

Living Cities and the Institute for Sustainable Communities. 2009. *Scaling Up Building Energy Retrofitting in U.S. Cities: A Resource Guide for Local Leaders.* LINK

Loewenstein, G., and D. Prelec. 1992. “Anomalies: Intertemporal Choice.” *Quarterly Journal of Economics* 107: 573-597. LINK

Lutzenhiser, L. 1993. “Social and Behavioral Aspects of Energy Use.” *Annual Reviews*. 18: 247-89.

Lutzenhiser, L., L. Cesafsky, H. Chappells, M. Gossard, M. Moezzi, D. Moran, J. Peters, M. Spahic, P. Stern, E. Simmons, and H. Wilhite. 2009. *Behavioral Assumptions Underlying California Residential Sector Energy Efficiency Programs.* Oakland, CA. California Institute for Energy and Environment. LINK

Madrian, B. C. and D. F. Shea. 2001. “The Power of Suggestion: Inertia in 401 (k) Participation and Savings Behavior.” *Quarterly Journal of Economics* 116(4): 1149-1187.

McCalley, L. T. 2006. “For motivation and cognition theories to everyday applications and back again: the case of product-integrated information and feedback.” *Energy Policy.* 34(2): 129-137. LINK

McKenzie-Mohr, D. and W. Smith. 1999. *Fostering Sustainable Behavior*. Gabriola Island, BC: New Society Publishers. LINK

McNeil, B. J., S. G. Pauker, H. C. Sox, and A. Tversky. 1982. “On the elicitation of preferences for alternative therapies.” *The New England Journal of Medicine.* 305: 982-987. LINK

Midden, C. J., Meter, J. E., Weenig, M. H., & Zieverink, H. J. 1983. “Using feedback, reinforcement and information to reduce energy consumption in households: A field-experiment.” *Journal of Economic Psychology.* 3(1): 65-86. LINK

NEEA (Northwest Energy Efficiency Alliance). 2010. “Evaluation of Consumer Behavioral Research.” Final Report submitted by Summit Blue Consulting on April 6, 2010. Primary authors Jan Harris, Jane Hummer, Kevin Cooney. LINK

Opinion Dynamics. 2009a. *Market Segmentation Findings.* Memorandum prepared for the California Public Utilities Commission. LINK

Opinion Dynamics Corporation. 2009b. *Ethnographic Research Findings.* Primary Authors are J. Mitchell-Jackson and A. Dougherty, A. LINK

PA Consulting Group, Inc. 2010. *Together We Save: Process Evaluation Report.* Prepared for the Public Service Commission of Wisconsin. Madison, WI. State of Wisconsin. LINK

Peach, H. G., F. Keast, K. M. Keating, and M. Warwick 1983. *Research Plan: Hood River Project Evaluation.* Final Report, Hood River Conservation Project, DOE/BP-11287-11.

Peach, H. G. 2010. Personal Communication. April 30, 2010.

Peters, J. S., Suzuki, J. and Spahic, M. 2009. *2009 Oregon Residential Awareness and Perception Study.* Research Into Action, Inc. LINK

Philips, M., S. French, D. Quinn, and H. G. Peach. 1986. *Field Weatherization Logistics.* Final Report, Hood River Conservation Project. DOE/BP-11287-5.

Philips, M., M. Khawaja, D. Engels, and H. G. Peach. 1987. *Cost Analysis.* Final Report, Hood River Conservation Project, DOE/BP-11287-8.

Rogers, E.M. 1983. *Diffusion of Innovations.* New York, NY. Free Press.

Rosenberg, M. and L. Hoefgen, 2009. *Market effects and market transformation: Their role in energy efficiency program design and evaluation*. California Institute for Energy and Environment. LINK

S. S. Iyengar and M. R. Lepper. 2000. "When choice is demotivating: Can one desire too much of a good thing?" *Journal of personality and social psychology* 79, no. 6 (2000): 995-1006.

Schoch, K. 1987. *Two Year Analysis of Electricity Use and Savings for the Hood River Conservation Project.* Final Report, Hood River Conservation Project, DOE/BP-11287-20.

Schoch-McDaniel, K. 1990. *Third Year Analysis of Electricity Use and Savings for the Hood River Conservation Project.* Final Report, Hood River Conservation Project, DOE/BP-11287-24.

Schultz, P. Wesley, Jessica M. Nolan, Robert B. Cialdini, Noah J. Goldstein, and Grskevicius Vladas. 2007. "The constructive, destructive, and reconstructive power of social norms." *Psychological Science* 18:429-439.

Schwartz, B. 2004. *The Paradox of Choice*. New York: HarperCollins.

Simon, H. 1991. "Bounded Rationality and Organizational Learning." *Organizational Science* 2: 125-134.

Sovacool, B. 2009. “The cultural barriers to renewable energy and energy efficiency in the United States.” *Technology in Society* 31(4): 365-373.

Stern, P. 1986. “Blind Spots in Policy Analysis: What economics doesn’t say about energy use.” *Journal of Policy Analysis and Management*. 5(2): 200-227.

Stern, P., E. Aronson, J. Darley, D. Hill, E. Hirst, W. Kempton, and T. Wilbanks. 1985. “The Effectiveness of Incentives for Residential Energy Conservation.” *Evaluation Review* (10): 147-176. LINK

Sullivan, Michael. 2009. *Behavioral Assumptions Underlying Energy Efficiency Programs for Businesses*. California Institute for Energy and Environment. LINK

Thaler, R. H. 1981. Some Empirical Evidence on Dynamic Inconsistency. *Economic Letters.* 8(3): 201-207. LINK

Thaler, R.H. and C.R. Sunstein. 2008. *Nudge: Improving Decisions About Health, Wealth, and Happiness*. New Haven, CT. Yale University Press.

The Results Center. 1996. *Alberta Power Limited – Jasper Energy Efficiency Project, Profile #107*. Jasper, Alberta. The Results Center. LINK

Todd, Annika and S. Houde. 2010. "List of Behavioral Economics Principles That Can Inform Energy Policy." *Work in Progress*.

U.S. Environmental Protection Agency (EPA). 2010. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2008.* Washington, DC. U.S. EPA # 430-R-10-006. LINK

U.S. General Accounting Office (GAO). 2004. *Bonneville Power Administration: Better Management of BPA’s Obligation to Provide Power Is Needed to Control Future Costs*. Washington, DC. GAO-04-694. LINK

Wall, L., C. Goldman, A. Rosenfeld and G. Dutt, 1983."Building energy use compilation and analysis (BECA) part B: Retrofit of existing North American residential buildings," *Energy and Buildings*, 5, 151-170.

Weber, E. 1997. "Perception and Expectation of Climate Change: Precondition for Economic and Technological Adaptation." *Psychological and Ethnical Perspectives to Environmental and Ethical Issues in Management*, edited by M. H. Bazerman, D. M. Messick, A. E. Tenbrusel, and K. A. Wade-Benzoni. San Francisco: Jossey-Bass.

Weston, A. 1999. "The scientific status of unconscious processes: is Freud really dead?" *Journal of the American Psychoanalytic Association.* 47: 1061-1106. LINK

White, D.L. and M.A. Brown, 1990. “Electricity Savings among Participants Three Years After Weatherization in Bonneville’s 1986 Residential Weatherization Program.” Oak Ridge, TN. Oak Ridge National Laboratory.

Wilson, C., and H. Dowlatabadi. 2007. "Models of Decision Making and Residential Energy Use." *Annual Review of Environment & Resources* 32: 2.1-2.35.

Appendix A – Case Studies

In selecting case studies we looked for a diversity of marketing strategies, indicators of program success in terms of market penetration, a focus on comprehensive improvements, and geographic diversity. However, we choose to prioritize covering a diversity of strategies to provide a range of examples for program designers to draw from. It is important to note that several of these cases are pilots, and their impact has yet to be proven.

1. Bonneville Power Administration (BPA) Weatherization Programs (page 77)
2. Energy Smackdown (page 81)
3. Hood River Conservation Project (HRCP) (page 87)
4. Houston's Residential Energy Efficiency Program (REEP) (page 94)
5. Jasper Energy Efficiency Project (JEEP) (page 97)
6. Keystone Home Energy Loan Program (HELP) (page 100)
7. Long Island Green Homes (LIGH) (page 103)
8. Marshfield Energy Challenge (page 106)
9. New London Resource Project (NLRP) (page 110)
10. NYSERDA's Home Performance with ENERGY STAR Program (page 113)
11. Take Charge Challenge (page 116)
12. Twin Cities One Stop Program (page 119)
13. Vermont Community Energy Mobilization (VCEM) Project (page 125)
14. WeatherizeDC (page 127)

Bonneville Power Administration

A History of Home Energy Improvements in the Pacific Northwest

Over more than a decade, Bonneville Power Administration (BPA) weatherization programs completed approximately 900,000 home energy improvements in the Pacific Northwest, reaching more than half of eligible customers. Bonneville launched its program in an era of rising electricity prices and mounting federal interest in energy efficiency. BPA funded the programs; local utilities in its service area administered them. Program participation rates varied, and the most successful utilities upgraded more than half of eligible properties. Participating homeowners received free energy assessments and paid between as little as 15% of the total upgrade cost (the energy assessment and balance of the cost were funded by BPA). The best-performing utilities curried participant trust by helping homeowners choose a contractor and performing rigorous inspections to ensure that that the measures were properly installed.

Background

In the 1980s and 1990s, Bonneville Power Administration (BPA), a federally-managed electricity wholesaler in the Pacific Northwest, ran a series of residential weatherization programs. BPA's Weatherization Pilot Program ran from 1980-1982 and engaged 11 utilities; the Interim Residential Weatherization Program ran from 1981-1983; and the Long-Term Weatherization Program ran from 1983 through the mid-1990s. By the time the long-term program started, 96 utilities were involved. These programs were driven by federal interest in energy efficiency in the late 1970s and by the Pacific Northwest Electric Power Planning and Conservation Act, passed by Congress in1980.

The act required BPA to acquire power in a manner consistent with a regional plan to be developed by the Northwest Power Planning Council (NPPC), and instructed NPPC to favor cost-effective efficiency and renewables in developing this plan (Hirst et al 1982). The Northwest Power Planning Act also gave BPA $1.2 billion in borrowing authority from the federal treasury to pay for the upfront cost of efficiency programs, which would be paid off over time by wholesale power sales. The director of BPA was interested in finding out whether or not energy efficiency was a reliable resource, so planners put emphasis on evaluating the impacts of the weatherization projects (E. Hirst, personal communication, April 2, 2010).

Another driver of BPA weatherization programs was the increased cost of retail electricity in the late 1970s and early 1980s. In the early 1970s, BPA entered into financing agreements to purchase electricity from three nuclear power plants. Two of these plants never became operational due to cost overruns and lower-than-estimated electricity demand, but BPA was still responsible for paying off debt for all three plants. From 1979-1983, BPA's wholesale power rates increased by about a factor of three (GAO 2004). Utilities wanted to appear responsive to their customers and became interested in promoting weatherization programs. The Pacific Northwest was considered well-suited to weatherization as there were many poorly insulated homes as a result of historically low electricity costs (Hirst et al 1982).

Program Basics

BPA's weatherization programs targeted electrically heated residences, and the vast majority of participants were single-family homeowners. Eligible measures included: ceiling insulation, floor insulation, unfinished exterior wall insulation, cold- and hot-water pipe insulation, dehumidifiers, programmable thermostats, and heating duct insulation. Houses that met the program's indoor air-quality criteria were also eligible for storm windows, storm doors, caulking, weather stripping, and outlet gaskets (Hirst 1987b).

In order to participate in the program, a homeowner requested an energy assessment from the local utility. Once the free assessment was performed, the homeowner got bids from pre-approved contractors for the measures recommended by the assessment and sent these bids to the local utility. The utility then told the homeowner the rebate amount, and the homeowner authorized the work to be done. After the job was inspected by a third party assessor, the rebate was paid either to the homeowner or the contractor (Brown and White 1992). Quality assurance was an important part of BPA's program. In addition to certifying assessors and inspectors, BPA trained contractors using rigorous specifications for how measures were to be installed. Only approved contractors could perform energy upgrades.

Financing was another key component of BPA's programs. The original pilot program included both a zero-interest loan option and a direct rebate option, but the loan option was found to be less attractive so it was dropped in the interim program (Hirst 1987b). Assessments were free to homeowners, and the rebates covered a large fraction of the weatherization cost. In the Long-Term Weatherization program, rebates were capped at 85% of the cost of the measures (Hirst 1987b). Evaluators considered the strong financial incentive of the rebate a major factor in driving demand (E. Hirst, personal communication, April 2, 2010). Tom Eckman, Manager of Conservation Resources for the Northwest Power & Conservation Council, says at least 50% of the cost to consumers should be covered in order for a program to generate significant uptake (T. Eckman, personal communication, April 2, 2010).

The impact of BPA's program varied across the region, in part because utilities used different tactics to sell the program. Some utilities were more interested in the program than others. According to BPA evaluator Ken Keating, some utilities were still opposed to energy efficiency because it meant "telling people to use less of what you're selling them," even though they were encouraged to implement BPA programs (K. Keating, personal communication, April 8, 2010). In the Interim Weatherization Program, the fraction of eligible households that accepted a free assessment varied from 2% to 23% (average: 9%) across utility territories and the fraction of homes weatherized after an assessment varied from 58% to 91% (average: 60%) (Stern et al 1985).

Driving Demand

Because BPA was a power wholesaler and did not interact directly with customers, the agency had to rely on utilities to promote and market its weatherization programs. Eugene Water & Electric Board (EWEB) was one utility that performed well. From 1982-1995, EWEB weatherized 31,000 homes with an average reimbursement per residence of $1,250. This is more than half of the electrically-heated households in EWEB's service territory during that time period.

EWEB started running residential weatherization programs before BPA launched its incentive program. Eugene promoted its programs through tabling at malls, speaking with neighborhood groups, and cold-calling customers. Persuading customers to accept even free assessments was "pulling teeth," according to EWEB's Energy Management Programs Supervisor Kathy Grey. However, once BPA's incentives became available, EWEB had a huge surge in demand for weatherization –a backlog of 8,000 customers who wanted improvements.

The biggest lesson that EWEB staff say they drew was the importance of building trust with customers and contractors. EWEB made an effort to guide customers through the process. The utility provided a list of contractors who agreed to install measures according to BPA's specifications and abided by certain labor standards. For customers who did not feel comfortable picking a contractor, EWEB offered a bid-request service. Utility staff randomly chose three contractors off the list and had them give bids to the customer. EWEB also helped customers interpret the bids if customers brought them to EWEB's office. Utility staff say these services helped build the program's credibility. Once this credibility was established, word-of-mouth referrals worked well to generating demand. According to Kathy Grey, "one woman loved [her ductless heater] so much that everyone in her bridge group contacted us" (Grey, K. personal communication, 2010).

EWEB staff also spent a lot of time in the beginning of the program explaining BPA's specifications to contractors and inspecting contractors' work. EWEB created a failure-notification process that recorded the reason for installation failure and notified contractors when work was not installed to specifications; the notifications improved the quality of completed work and doubled as a training tool. EWEB had a complaint process that customers could go through if they had problems with contractors, and contractors were removed from the approved list if they received large numbers of complaints (Grey, K., personal communication, April 16, 2010).

Results

The pilot program improved 4,100 homes and the interim program improved 104,000 homes (Hirst 1986b; Hirst 1987b). The Interim program cost Bonneville $157 million over its two years of operation (Hirst 1987b), about $1,300 per home in 1983 dollars. The Interim program convinced BPA that residential weatherization was a cost-effective and reliable resource and led to the creation of the Long-Term Residential Weatherization Program, which was designed to reach 3-5% of the eligible homes in the region each year (White and Brown 1990). However,

funding for weatherization declined from $143 million in 1983 to $40 million in 1984 and $36 million in 1986. By 1986, a forecasted power surplus led BPA to scale back weatherization efforts even further (Brown and White 1992).

Households that participated in the Interim Weatherization Program saved an average of 3,300 kWh/year versus the baseline (non-participants reduced electricity consumption about 5%, presumably because real residential electricity prices increased 45% during the course of the program) (Hirst 1987b). However, at the individual household level, savings were highly variable. Actual electricity savings were within 50% of the assessment estimate for less than half of homes (Hirst 1987b)[1]. Savings per household (relative to non-participants) declined over the course of the Long-Term Weatherization Program, from 3,060 kWh/home in 1986 to 2,180 kWh/home in 1988 and 1,330 kWh/home in 1989 (Brown and White 1992; White and Brown 1990). In addition, the pre-upgrade energy consumption of participants declined from 1981 to 1989, perhaps implying that initial program participants were the “lowest-hanging fruit” – households with the highest energy consumption and biggest potential for savings (Brown and White 1992). Nevertheless, BPA evaluator Ken Keating estimates that by 1996, BPA’s weatherization programs had completed a total of about 900,000 weatherization jobs (which includes some repeat customers), surpassing BPA’s original goal of 300,000 homes (K. Keating, personal communication, April 8, 2010).

Despite the large volume of homes weatherized during the course of BPA’s weatherization programs, there is still significant demand for residential energy upgrades in the Pacific Northwest. Gas-heated homes were not eligible for the BPA’s weatherization programs. There is also energy efficiency potential in electrically-heated homes, even in ones that were reached in the 1980s; in such homes, the greatest potential today is in replacing storm windows with high-performance windows (T. Eckman, personal communication, April 2, 2010).

Lessons Learned

BPA took advantage of a unique situation in which steep price increases made consumers suddenly more aware of their electricity use. BPA offered consumers rebates that covered most of the weatherization costs. The average rebate in the interim program was $1,330 per home; total job cost was $1,560 per home (Brown and White 1992). In the Long-Term program, total job cost was $3,130 in 1986 and $2,310 in 1988. Yet Ken Keating points out that utilities need “to do more than just stand there with money,” outreach, marketing, and other aspects of program design are critical to success (K. Keating, personal communication, April 8, 2010). The example of Eugene Water and Electric Board indicates that building trust with the community by holding contractors to rigorous specifications and assisting consumers through the process of getting and interpreting bids is an important factor in achieving high program participation.

[1] Part of the reason for the wide variance between estimates and actual performance is that initially energy savings estimates were not calibrated to pre-retrofit baseline usage. There have been significant improvements in the estimation capabilities since the HRCP experience.

Energy Smackdown

Driving Participation through Friendly Competition

Energy Smackdown pits neighborhood teams against one another in a competition to reduce greenhouse gas emissions. In its most recent pilot, Energy Smackdown used a leadership council of prominent local members to bring together three teams, totaling 100 households, from metropolitan Boston neighborhoods. By translating the often ambiguous notion of energy efficiency into something quantifiable – e.g. "I can earn X points for my team by insulating my attic" – the program makes energy savings easier to understand and guides people to smart energy choices. Utilities have been key supporters of Energy Smackdown, offering free home energy assessments, prizes and other incentives. The initiative works to complement home energy upgrades with a new outlook on energy consumption across the neighborhood. Energy Smackdown also organizes challenge events to be highly public in an attempt to introduce the program to a wider audience.

Background

Energy Smackdown is a community-based program that pits neighborhood teams against one another in a competition to reduce CO_2 emissions. Donald Kelley, Executive Director of the BrainShift Foundation, conceived the initiative as a way of using play and friendly competition to encourage energy reduction measures and behavior change. "We call this a competition, but it's really a 'competition, wink wink,'" says Kelley. "Setting it up in a fun way is the key to helping people make changes."

The basic concept is simple: bringing people together to play a game is more likely to encourage meaningful action than simply making energy efficiency information available. By joining the competition, participants try to reduce their own energy consumption, and help members of their communities do the same. The idea is to help families and communities think about energy use holistically, taking into account both behavior and physical living space. Tracking the different ways people use energy compared with their neighbors helps guide participants in that process. The game, in other words, operates both at the individual and the public levels, as participants perform simple, energy-saving actions in their homes, and engage others on the issues of energy use and climate change.

In its most recent pilot phase, Energy Smackdown brought together three teams from the Boston-area neighborhoods of Arlington, Cambridge, and Medford. The teams each formed a leadership council and recruited a total of approximately 100 households. Each household received a free, professional energy usage and lifestyle assessment at the program's outset, provided by MassSave in cooperation with partner utilities, National Grid and NSTAR. The assessment gave teams a baseline of energy usage and helped the participants identify some energy saving ideas.

The teams engaged in two different types of year-long competitions, which combine to make up Energy Smackdown: the household challenge and the team challenge. In the household

challenge, the object of the game is to reduce CO_2 emissions as much as possible on a per person basis. Reductions were measured in six areas: electricity; heating fuel; pounds of landfill-bound waste (as opposed to compost or recycling); air travel; auto travel; and servings of meat (which is more carbon intensive than other food choices). The challenge also included increasingly difficult levels of emission targets for families to pursue—to reach the top level (Level 10) meant emitting less than 1,000 pounds of CO_2 emissions per person, per year.

In the broader team competition, the object of the game was to earn points, based on performing specific energy saving actions in homes—installing low-flow aerators on showerheads, for example. Teams also worked together during special "challenge events," such as replacing incandescent bulbs with CFLs throughout the community, to earn even more points. Each individual action, termed "nugget" in Energy Smackdown parlance, could then be recorded online, allowing participants to track their team's progress and the progress of their opponents.

"This is a proactive approach to energy conservation," said Cambridge Mayor Denise Simmons during her team's first meeting. "When we're finished we'll not only have done something fun, interesting, and important, but we will have brought a larger community into the conversation. What more can you ask for?"

Lessons for Increasing Participation

Energy Smackdown, though still in its formative stages, offers a number of lessons for motivating community participation and reducing energy consumption in the residential sector.

Friendly Competition

Turning energy reduction into a contest distinguishes Energy Smackdown from other residential efficiency programs. By translating the often ambiguous notion of energy efficiency into something quantifiable—I can earn X points for my team by insulating my attic, for example—Energy Smackdown makes energy savings easier to understand, and guides people to smart energy choices. "It really raises awareness among people who participate," says Annie Lacourt, a Selectman in Arlington. "All of a sudden people have solutions and action steps that make it easier to assess their lifestyle."

The competition model has also been cited by many participants as their primary motivation for joining Energy Smackdown. While other factors—such as free energy assessments and support—attract the relatively energy-savvy, creating a contest has a broader appeal, particularly among those who might not otherwise participate in energy efficiency programs. "Most people generally want to do something about climate change, but it doesn't sit in the front of their consciousness," says Lacourt. "Joining a contest gives them an excuse to make it a priority."

Sponsors have donated a number of awards and incentives—free dinners, bicycles, theater and sports tickets—which help reinforce the program's competitive approach. Organizers hope to offer bigger prizes as the program expands, but view the rewards as primarily a motivational tool. "The prizes are nice," says David Rabkin, captain of the Cambridge Team, "but the friendly competition is really what's important. We like to talk in team meetings about beating those damn Arlington folks, but the competition is really an excuse for us to try harder ourselves."

Building on Program Momentum to Increase Awareness

Energy Smackdown tries to use the excitement around the head-to-head competition to raise awareness about energy efficiency throughout the community.

Kelley sees television as one key strategy to engaging a wider audience. Energy Smackdown has produced a video series on each of the first two pilot phases, which aired in theaters and on local television in the target communities. The shows have also attracted thousands of viewers on the Energy Smackdown website and have drawn interest from other New England television stations.

Episodes profiled competitors, featured home energy assessments, and captured the festivities that are built into the year-long competitions. Citing the immense popularity of reality TV, Kelley believes that viewers can be drawn in by the excitement of competition, and learn from the steps that neighbors are taking to reduce their emissions. "People saving electricity in their home, that's like watching moss grow, but entire teams in head-to-head competition, now that is exciting television!" says Kelley.

Energy Smackdown also organized five challenge events that helped introduce the program to a wider audience. The challenges included a reality show-like Smart Transit Challenge, in which teams had to minimize CO_2 emissions while covering 25 miles and five checkpoints in four hours; a Light Bulb Challenge, where teams switched out nearly 1000 incandescent bulbs for CFLs in four hours; and a Localvore Banquet, where teams prepared and served full-course meals from local ingredients. "The challenge events were really important community learning experiences," says Rabkin. "Once you've helped people do the thinking on saving energy, it makes actually doing it seem much more accessible."

Engaging Stakeholders

Energy Smackdown has been successful because it has involved a wide variety of community stakeholders in the competitions. The program begins each new pilot phase by forming a leadership council in each community, often comprising the mayor, other elected officials, volunteer team captains, and representatives of community organizations. The leadership councils identify and recruit participants, guide challenge events, and provide teams with support ranging from public meeting space to publicity and outreach. This kind of engagement allows local officials to lead in ways that that are beyond the traditional scope of government.

“We can’t have town managers harassing citizens to turn down their thermostats,” says Lacourt, “but we can do something personally, and use our platform to get others involved.”

Utilities have also been key supporters of Energy Smackdown, offering free home energy assessments, data monitoring, prizes and incentives. The assessments, in particular, have been extremely popular with participants, and were a key factor in getting several families to join the program. Utility staff have also served as Energy Guides, educating participants about home energy upgrades and existing incentive programs. “One of the program’s strengths is that it put me in touch with people who think about this stuff all the time,” says Lacourt. “We’re thinking about installing solar panels now, and even financing them was something I didn’t know anything about before.”

Developing Community to Sustain Participation

Energy Smackdown works to complement physical home energy upgrades by developing a community that supports behavior change among participants. The program conducts social team events—kickoff, halftime, and finale celebrations, as well as the five community challenge events—to cultivate a community spirit of energy efficiency, which helps sustain energy savings beyond the competition. The next pilot phase will also include “buddy evaluations,” in which some participants will be trained to walk with teammates through their homes and help document next steps.

“What got us involved initially and what continues to hold us together is the community that was brought closer by Energy Smackdown,” says Rabkin. “Sharing ideas and teaching one another continues to be really satisfying.”

Since completing the competition, several families have hosted unofficial events, such as a combination barbecue and solar hot water demonstration in Arlington, that continue to reinforce energy reduction. Team members have also formed networks to help each other renovate their homes to be more energy efficient. “We want to have a program where there is support from fellow team members. They become each other’s biggest motivators,” says Kelley.

Impact and Evaluation

The operating budget for Energy Smackdown’s second pilot phase was roughly $200,000. The bulk of that funding came from the Kendall Foundation, and anonymous foundation, and the utilities National Grid, NSTAR, and Mirant Northeast. Organizers are hopeful that foundation and utility support will continue, and can be supplemented with public funds for future program phases.

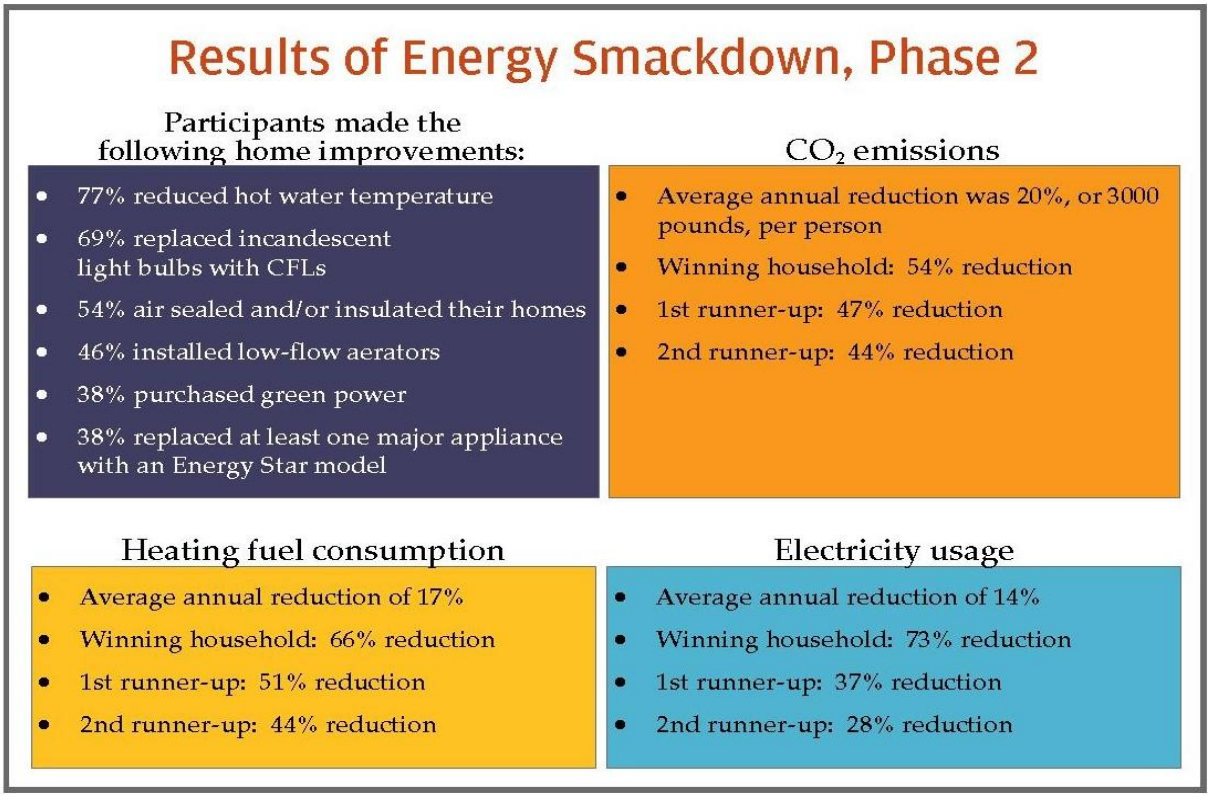
Challenges

Staffing levels, the team structure, and data management have all been challenging areas for Energy Smackdown. Kelley was the program’s only full-time employee, which meant that the

program relied heavily on volunteers. Because the number of competing households was higher than anticipated, the program was unable to provide as much support as was needed to participants, sponsors, and the media. The budget for the next pilot phase includes funding for six full-time positions.

Each team will also have a more formal governing structure, with captains and co-captains, supported by a paid staff member. Organizations will be called upon to help coordinate their members, and former competitors will help guide new participants in their neighborhoods, easing the workload for program staff and team leaders.

The program is also working on streamlining data collection, and improving the data entry process is one of the main goals of Energy Smackdown's third pilot phase. "Data entry was a pain," says Rabkin. "One of the reasons the Cambridge team lost is that we weren't good about entering our data." The program is creating a single web portal that will make data entry easier, and provide real-time feedback on individual and team results, as well as information about competitors' progress. The website will also feature a social networking component, helping to reinforce the community building that drives the program's sustainability.



Next Phase

Phase three of Energy Smackdown's pilot is set to begin by the fall of 2010. The competition will involve five communities, including Arlington, Cambridge, and Medford, with a minimum goal of 1000 competing households in each community. Competition requirements will be less stringent

in order to encourage wider participation. “If they want to come in and just simply replace some bulbs to help get points for their teams, they can play that way,” says Kelley.

Kelley has received nationwide requests from communities looking to start their own Energy Smackdown programs. Though he wants to refine the program model before rolling it out on a broader scale, he believes that it can be replicated in major cities, and even around the world.

“I’m very excited to ramp up. Eventually we want to be able to have a competition where we can look and say, ‘How are the Danes doing it? Versus how are the Bostonians doing it? Versus the Vermonters?’ Because this is real life drama we’re talking about. And what could be more dramatic than competing to save the planet?”

This case was prepared by the Institute for Sustainable Communities.

Hood River Conservation Project

An Experiment in Going Deep Community-wide

The Hood River Conservation Project (HRCP), a $20 million program in the early 1980s, tested the limits of the cost effectiveness of a residential energy improvement program. HRCP installed, for free, any weatherization measures that a household energy assessment showed were within a prescribed cost threshold per unit of energy saved. HRCP's marketing was based on social science research that analyzed the social networks within the community. Most customers learned of the program through word of mouth. The program achieved a high response rate for home energy assessments (91% of all eligible participants) and for the subsequent implementation of conservation measures (85% of all eligible participants).

Background

The 1970s oil embargo and the Three Mile Island nuclear accident generated significant interest in determining the extent to which efficiency programs could be relied upon as a resource to reduce energy use. At the suggestion of the National Resources Defense Council (NRDC), a federal power agency (BPA) and a utility (PP&L) developed HRCP to assess the practical limits of home energy-improvement programs in delivering cost-effective energy savings.[2] Many studies had shown the potential for energy efficiency measures to cost-effectively reduce demand. HRCP was intended to help resolve lingering uncertainty about the extent to which efficiency measures would prove to be more cost-effective in practice than traditional options, such as building power plants. "We were pioneers in the sense that just as you can measure the output of a power plant, you can also measure the 'output' of a weatherization program," noted evaluator Eric Hirst, who was part of the HRCP evaluation team (Hirst 2010). Bonneville Power Administration (BPA) provided the funding for the program, and Pacific Power and Light (PP&L) administered the program.

The HRCP focused primarily on residential buildings using electric heating and had established an allowable expenditure on installed measures of $1.15 per estimated first-year kWh saving, based on the avoided costs of building a new coal-fired base load power plant (Hirst 1987b). In comparison to previous programs, HRCP would implement for "free" any weatherization measures that were within the $1.15/kWh savings threshold to interested homeowners. Because HRCP was designed to test the limits of a residential weatherization program, it also included measures that were more aggressive than those typically found in conventional Pacific Northwest programs (e.g. triple glazed windows). HRCP included many measures, however, the program did not include the replacement of heating or water-heating equipment due to program cost thresholds. Through HRCP, two-thirds of the homes installed ceiling insulation, storm windows, caulking, door weather-stripping, and outlet gaskets (Hirst 1987b). In contrast, less

[2] The Pacific Northwest Electric Power and Planning and Conservation Act was passed by Congress in 1980 and it required the regional council to develop a long-term plan for how the region's long-term power needs will be met. Specifically, Bonneville Power was charged with first evaluating conservation and renewable co-generation options those that were cost-effective) before building new conventional generation plants.

than 15 percent of homes received duct insulation and thermal doors (Ibid). While many of these measures are standard today, at the time there was uncertainty about the cost-effectiveness of such home weatherization measures.

Given its ambitious scope, the program evaluated some weatherization measures and design characteristics that were ultimately deemed too costly (Hirst 1987b). “If you don’t push the limits, you don’t know what the limits are,” said evaluator Ken Keating who was part of the BPA team with HRCP (Keating 2010). Understanding this context is important when evaluating the total cost for HRCP’s conservation measures: not all of the measures saved more in energy than they cost.

Program Implementation

Making Efficiency Easier for Homeowners

The first step for homeowners to participate in HRCP was to sign up for a home energy assessment. For the assessment, a vendor hired by HRCP examined the insulation levels in floors, walls, ceilings and heating ducts (if applicable); type of glass used in doors and windows; and whether or not there was a water heater wrap (Hirst 1987b). The assessments identified leaks, poor insulation and other shortfalls in weatherization. A computer program then analyzed the assessment results to determine expected electricity savings and costs for the weatherization measures needed.[3] Once homeowners provided written approval of the weatherization measures, contractors were randomly assigned to the projects. After the work was completed, project inspectors examined the work and corrective action was taken, if necessary, to ensure that all work met industry standards.

Organizing Input

The development of a Regional Advisory Group and its consensus-oriented approach was an important factor in the program’s success. From the outset, the project involved a broad set of stakeholders, including many organizations that traditionally had been adversaries. For example, the Regional Advisory Group included representatives from BPA, Hood River Electric Cooperative, Natural Resources Defense Council, Northwest Power Planning Council, Northwest Public Power Association, Pacific Northwest Utilities Conference Committee, and PP&L. To effectively harness the potential of this diverse group, it was necessary to foster open dialogue and promote cooperation. Staff said they applied skills from other community organization efforts (G. Peach, Personal Communication, 2010). These techniques proved effective in engaging the broad set of stakeholders involved with HRCP.

[3] In mid-1983, there were not well-established prices for many of the weatherization measures included in HRCP (Hirst 1987b). As a result, HRCP staff initially solicited competitive bids from five local contractors and reviewed these bids in terms of expected cost effectiveness given the $1.15 limit. The competitive bidding process created a significant administrative burden that led to project delays. After several months, HRCP was able to use the bid information to establish reasonable unit prices.

Designing a Research Program for Evaluation
Hood River, a semi-isolated community, was selected for the pilot for two reasons. First, Hood River was deemed to be representative of Oregon (i.e. results/findings would be generalizable). Second, Hood River was served both by PP&L, an investor-owned utility, and Hood River Electric Cooperative. Evaluators therefore could to examine whether the program delivered different results in communities with different utility models.

Given the ambitious scope of the HRCP, the staff designed a rigorous evaluation process. HRCP recognized the importance of evaluating the effectiveness of marketing and outreach efforts. One of HRCP's five project objectives was to test what efficiency marketing techniques were most effective.

Marketing a program such as HRCP to a single town presents unique challenges for research design. Specifically, the reliance on broad marketing communications efforts like billboards and radio spots as well as word-of-mouth information make it nearly impossible to exclude and/or control who receives information about the program. As a result, it is impractical to isolate a random sampling of households within the community. So instead of selecting a control group within Hood River, the program identified two comparison communities (Grants Pass, OR and Pendleton, OR) with similar electricity rates, populations, locations, economies, and climates. In addition, a random sampling of PP&L customers across the region was identified to provide an additional comparison group.

Engaging People to Drive Demand

The upfront time and effort that HRCP invested into understanding the local community played a key role in the program's marketing and was seen in details like tapping into the community's pride in its orchard-based livelihood with the HRCP logo design (see Figure A).

Figure A: Logo from Hood River Conservation Project

Prior to the official program launch, HRCP spent a year assessing likely reception to the program, issues that might arise and what messages and messengers might be effective. HRCP hired a sociologist to interview 60 residents and produce a Community Assessment (Social Impact Research 1983; Hirst, 1987b). According to the study, Hood River residents had an aversion to handouts, dislike of orders from outsiders, and concern over fairness(e.g. eligibility for electric heated homes versus oil heated homes and the perceived fairness for those homes that had already made home energy improvements earlier) (Hirst 1987b). There was also some suspicion about the rate impact of efficiency efforts. Specifically, PP&L rates had recently gone up 40%, so people were suspicious that the program costs would simply result in additional rate hikes. “People were suspicious of ‘free.’ It took marketing corrections throughout the project,” to address these concerns, recalled BPA evaluator Ken Keating (K. Keating, Personal Communication, 2010).

To address these concerns, messaging emphasized the voluntary nature of the program and that only cost-effective retrofits would be covered. If measures were deemed to exceed the cost-effectiveness limit, homeowners could opt to drop the measures that exceeded the limit or pay for these measures themselves. To foster goodwill across the community, homes with oil and gas heating were also offered a free energy assessment - although they were not eligible for free weatherization measures.

HRCP aimed at 100% participation among eligible households. “(Outreach) was not done through conventional marketing, it was done through what today you’d call social networking,” noted H. Gil Peach, who was part of the PP&L team working on HRCP (G. Peach, Personal Communication 2010).

Program managers recruited approximately 10% of Hood River households to participate in a variety of pre-program studies, such as end-use monitoring of homes. This one-on-one contact with HCRP staff raised awareness of program offerings. Many pre-program recruits became early program adopters, but they also served as enthusiastic HRCP champions (Hirst 1987). These early participants helped bring neighbors and friends aboard.

Word-of-mouth marketing proved to be a powerful mechanism for encouraging others to get involved. Over time, there was a snowball effect. The proportion of people who learned of the project from a friend, relative, or neighbor, or community leader grew from 52% of participants (Hirst, 1987, p. 26) in the first 3 months to more than 80% in HCRP’s last 6 months.

HRCP also did traditional marketing including newspaper advertisements that featured customer testimonials. Coupled with newspaper coverage of the program, this avenue was effective in generating program awareness – more than a quarter of Hood River residents reported learning about the program from the local newspaper. HRCP’s marketing plan was designed to start with low-cost efforts and then escalate into more expensive efforts, if needed.

In the final months of the program, HRCP adopted more aggressive, and expensive, marketing techniques, from phone calls to going door-to-door to get the stragglers. Even so, early program

success eliminated the need for many of the more expensive options that were identified in the initial HRCP marketing plan.

The home energy assessment offered a valuable marketing opportunity. As part of the HRCP home energy assessment, all electric customers received four low-cost measures: outlet gaskets, an electric water heater wrap, hot water pipe wrap, and a low-flow showerhead as well as energy efficiency materials (Phillips et al 1986). These measures offered some small, yet potentially meaningful changes, to reduce energy use immediately. Moreover, the level of satisfaction with the assessments was an important factor in overall customer satisfaction with HRCP.

Lessons Learned

A successful marketing effort may generate a large turnout that can overwhelm program staff, lead to delays in services and result in customer dissatisfaction. HRCP adjusted to the groundswell of customer interest by increasing its field office staff and the number of contractors (Hirst 1987b). Demand still exceeded HCRP's capacity. HRCP staff said the long hours took a toll, and avoiding employee burnout is key for program longevity.

HRCP also struggled to get a computer tracking system running, which led to delays in processing some homeowner requests (Flynn Brown 1986). While the use of a computer may have been more unusual for a program in the 1980s, the broader issue should not be taken as an artifact of the time. Developing new systems to process, manage, and track programs can be complex. Given this complexity, programs may need to budget extra time and money for these systems.

One insight from customer interviews was that residents saw contractors as ambassadors for the program. Poor quality work early on produced negative attitudes about the program. During the first phase of HRCP, almost half of the projects failed inspection and required additional work from the contractors (Hirst 1987b). To address quality control issues and delays, two contractors were eliminated and new contractors were added (Hirst 1987b). HRCP's ability to monitor and quickly respond to perceptions about the program was important to its overall success.

HRCP also provides lessons regarding the importance of setting clear, upfront expectations. Many homeowners did not understand the program definition for what constituted "cost effectiveness." Customers received seemingly inconsistent answers from HRCP staff (Brown 1986). Although the retrofits were touted as cost-free, homeowners still bore the cost of any required preparation work for the home energy improvement (e.g. replacing broken windows, repairing dry rot, exterminating vermin, and in some cases, removing old insulation) (Brown 1986). Some disgruntled customers refused to make the repairs, and for other customers, these repairs presented a real economic barrier to program participation. A cutting-edge HCRP experiment with weatherizing mobile homes also incurred some disappointment.

On one level, HRCP's difficulties may be natural for any new program. Even a carefully designed program will encounter bumps along the way, but HRCP's experience suggests that a program's overall success can ride on anticipating issues and adjusting course as needed.

Impact, Cost & Evaluation

HRCP demonstrated that "if you reduce the amount of effort required by participants, you can achieve high savings and high participation" (Keating 2010). Among the 3,500 eligible households, 91% received an assessment and 85% of the eligible households implemented at least one of the recommended measures. Moreover, participants were from the "traditionally hard-to-reach groups," including low-income households, renters, and residents of multi-family buildings (Hirst 1987c).

HRCP participants saved, on average, 2,600 kWh in the first year (Hirst 1988). The weatherization measures cost approximately $4,400 per house, or $1.70 per KWh of first year savings (Hirst 1988). Several factors led costs to exceed the $1.15/first year kWh limit (Hirst 1987c). These included overambitious engineering estimates, fuel switching, and behavioral changes (Hirst 1987c).

Engineering estimates were in their infancy during HRCP and led to inflated estimates of savings potential. One insight gained from the HRCP is that certain assumptions (e.g. all rooms are heated at the same temperature, ducts don't leak, calibrating estimated baseline use with actual pre-retrofit usage) don't match with reality. Early software in the 1980s didn't account for such nuances. Given these issues, it's not entirely surprising that the actual HRCP energy savings (2,600 kWh) were 43 percent of what the home energy assessments had predicted. These estimates were further complicated by homes that exhibited low savings potential and/or fuel switching. By design, HRCP was focused on 100% community participation. As a result, this group included mobile homes, multi-family homes, and single-family homes that used electricity as a secondary heating fuel (Hirst 1988). Because this mixed group had lower savings potential as compared to single-family homes that used electricity as its primary source of heating, it also dragged down the average in actual savings.

Changing demographics, economic conditions, and behaviors impacted energy use and the estimated cost-effectiveness of certain measures. Many HRCP participants relied on wood as a primary heat source due to the proximity to forests, recent electricity rate increases, and a depressed economy. As economic conditions improved, people relied more on electric heating and enjoyed increased thermal comfort. Moreover, the community experienced an influx of new people (many of whom were wealthier) and these new homeowners also moved away from wood heating (Keating 2010). "Some people sold their homes and the new people didn't have any desire to haul ashes," noted Keating. According to HRCP's evaluation, energy savings in year two and three decreased from the previous year, likely due to changes in demographics, economic conditions, and behavior.

As part of the program evaluation, there was follow-up with non-participants. Interestingly, the non-participants were wealthier, lived in newer homes, and had lived there fewer years than participants — they may have had had less interest and/or need for weatherization (Hirst et al 1987c).

From the outset, marketing was budgeted to be six percent ($1,796,000) of the total cost of operations (Philips et al 1987). Because of the early success in attracting participation through word-of-mouth, approximately 75% of the planned marketing budget was not spent (Hirst 1987b). Total marketing costs for HRCP were $113,269, as reported in May 1986 (Philips et al 1987).

Houston's Power to the People

Building Trust in Low-income Neighborhoods

The City of Houston's Residential Energy Efficiency Program (REEP) targets low income residents by neighborhood, offering them free weatherization services. REEP engages civic and religious leaders to build trust in the program. REEP also uses creative outreach tactics such as neighborhood block parties and tabling at local communities centers to get residents to participate. The program's goal is to weatherize over half of eligible homes in target neighborhoods. In one neighborhood so far, participation reached 95% of eligible homes.

Background

REEP is part of a broader energy-efficiency initiative called Power to the People. REEP launched in 2006, targeting single-family homes (owned or rented) in low-income Houston neighborhoods. Neighborhoods are chosen based on the age of the housing stock, the proportion of low-income residents, and the presence of community organizations that the program can work with. Residents sign up by filling out a simple form. If their income is less than 200% of the federal poverty line, they are eligible for weather stripping, window caulking, attic insulation, energy-efficient light bulbs, and ductwork. If their income is less than 125% of the federal poverty line, they also are eligible for an EnergyStar refrigerator, EnergyStar ceiling fans, EnergyStar window air-conditioning units, and shade screens. All of these measures are free.

REEP uses a production-line approach to energy upgrades with checks and balances. After a resident signs up, an inspection contractor visits to assess their needs. Then the program assigns a different contractor to do the work. When the work is completed, the homeowner signs off. An inspection contractor inspects the work and must sign off before the weatherization contractor is paid by the program.

The program originally was designed to target neighborhoods where a majority of households were under 200% of the poverty line and then allow anyone in that neighborhood to sign up for the program. REEP now is funded by the federal Weatherization Assistance Program, so the program can only weatherize where a household meets income restrictions, and as a result, applicants have to provide proof of income. With this requirement, program managers reported a decline in applications, but participation levels have since recovered due to increased marketing.

The program selects contractors in a competitive-bidding process, and there are four, large contractors performing energy upgrades for the program. Each contractor has been assigned to a different section of the city. They try to go street-by-street to achieve economies of scale. Contractors don't waste as much time in transit and there can be word-of-mouth buzz about the program. In practice there is a tradeoff between getting enough volume for the contractors and concentrating jobs.

Gaining Trust in the Community

Because the program targets low-income neighborhoods, gaining the trust of residents is a challenge. According to program manager Gavin Dillingham, the message that “we’re the government and we’re here to help you” is often met with suspicion. “To get people to sign up, we have to earn their trust,” he said. People do not want unfamiliar contractors in their homes, Dillingham said, and they often suspect that the program is a scam.

Program staffers say they have found that reaching out to churches and getting church leaders on board is a very effective trust-building tool, especially in African-American communities. “If they [church leaders] trust us, the rest of the community will too,” according to Dillingham. The program also partners with three multi-service community centers in the city and staffs tables at these centers on a weekly basis. Program representatives call people who live near the centers and have submitted incomplete weatherization applications and tell them they can come by the center to get help finishing the application.

REEP organizes block parties that can attract hundreds of residents. Staff also conducts door-to-door canvassing and advertises in local newspapers, radio, television, and in the city’s public transit system. The program used to send a letter to every household in their target neighborhoods; they have stopped because the response rate was low.

Contractors have proven to be a very effective means of outreach by marketing the program while working in a neighborhood. When contractors weatherize a home, they visit neighboring homes and talk to residents or leave door hangers. These residents then can talk to their neighbor who just got his home weatherized and confirm that the program is legitimate. When contractors are working on a house, they put a sign in the yard that says, “this house is being weatherized at no cost, ask us to sign up.”

To understand the efficacy of different marketing strategies, the City of Houston commissioned a survey of 500 eligible households in a neighborhood of 10,000 families. The survey found that concern about energy bills and the possibility for reducing bills was the main reason why households were interested in REEP. The city’s survey also found that significantly more households said they would participate if they knew that their neighbors were also participating. At least in this particular neighborhood, attitudes towards the city government did not significantly influence peoples’ willingness to participate.

Impact and Evaluation

The program aims to weatherize more than half of eligible homes in target neighborhoods. REEP staff report they are close to this target although the results vary by neighborhood. In one neighborhood, 95% of homes were weatherized. Yet in another neighborhood, a con man pretended to be from the city and scammed a lot of residents, so the weatherization program got very little traction. In follow-up surveys, 90-95% of households that participated in the program reported satisfaction with the weatherization. Thus far, the program has weatherized

more than 8,300 households in twelve neighborhoods. The program has reached about 36% of eligible homes.

The program's 2010-2011 budget is $23 million over 2 years, and plans call for weatherizing 5,300 homes. The average amount spent per home is $3,000 to $3,500 (not including administrative expenses). The program is administered by 5.5 fulltime Houston city staff, including a marketing and outreach manager, which accounts for 2.5% of the total program budget.

REEP staff say that gaining trust of neighborhoods has been the biggest challenge. The Houston experience suggests that working with community leaders and reaching out to the neighbors of people who have had their homes weatherized can be effective strategies in gaining trust. Program staff has been able to try a number of different marketing and outreach strategy to try to understand which are effective. According to Gavin Dillingham, successful outreach is "a matter of trying a variety of marketing methods and seeing what works in your particular context."

Jasper Energy Efficiency Program

Local Action is Cheaper than New Generation or Transmission

In the early 1990s, the Canadian Rockies town of Jasper, cut residential peak electricity demand by more than 20%. Alberta Power, the local utility, aggressively promoted energy efficiency under the hypothesis (which proved true) that efficiency would be cheaper than constructing new electricity generation or transmission. The Jasper Energy Efficiency Program (JEEP) utility reached out to the town through many channels and actively sought local feedback and guidance in running the program. JEEP focused on installing such measures as compact fluorescent lighting and hot water tank conversions, not comprehensive home energy improvements. In essence, the program was a turn-key operation delivered in a home visit that minimized transaction costs for the homeowner. About 70% of Jasper households were reached through the program.

Background

The Jasper Energy Efficiency Program (JEEP) was a program administered by regional utility Alberta Power in the town of Jasper, Canada (population 4,500) from 1991 to 1994. The goal was to reduce peak electricity demand in Jasper through energy efficiency to avoid either building an additional local generating unit or a transmission line to connect Jasper to the provincial grid. The goal of the program was to achieve a permanent 2 MW reduction in peak demand, with 0.5 MW coming from the residential sector (1,296 households) and the rest from the commercial sector (The Results Center 1996)[4].

Program Implementation

JEEP staff first went door to door and surveyed residential energy use to determine which measures would be most effective. Of the 911 surveys distributed, 488 residents filled them out and mailed them back. Among other survey questions, staff asked whether residents were using compact fluorescent light bulbs, whether they had electric water heaters, and whether they had electric heat. Based on what the survey revealed about how residents were using energy, a contractor evaluated the potential savings from installing different energy-saving products.

The residential component of the program did not involve full weatherization projects. Instead, the main measures promoted by the program were compact fluorescent lighting, power-saver cords[5], indoor/outdoor lighting timers, and hot-water tank conversions to natural gas. “JEEP Team” members – local residents hired by the program – underwent a week-long training program that included overviews of the products they were promoting, as well as communications. The residential upgrades were done from the September 1992 to February

[4] Unless otherwise noted, the data in this case study is taken from the Results Center case study.
[5] Power saver cords activate block heaters in vehicles when the outdoor temperature falls below 19F; without these cords, block heaters tend to be left on permanently consuming electricity regardless of the temperature.

1993. During these months, residents could request a home visit from JEEP. Two JEEP Team members would come to their house to explain, recommend, and sell the energy efficiency measures. Homeowners could buy CFLs, power-saver cords, and timers at a discount. There was also a $400 incentive to convert electric water heaters to natural gas; Alberta Power hired a contractor to change out the hot-water system, at a net cost to residents of $300 (Tools of Change 2004). JEEP used follow-up phone surveys and site visits to determine the extent to which energy efficiency equipment was actually being used.

Alberta Power set up a Public Information Committee consisting of local residents and representatives from Alberta Power, local schools, the hospital, environmental groups and businesses. The committee advised the program on all project components, including marketing and outreach (Hewitt, 2005). The JEEP program required 6.5 full-time staff on the residential program and 3.5 on the commercial program. This included a project coordinator based in Jasper, part-time administrative help, four JEEP Team members, a quality control supervisor for the commercial program, a part-time project manager and a part-time communications specialist.

Driving Demand

Alberta Power promoted JEEP intensively. Three hundred residents also attended the initial kick-off ceremony. JEEP staff cultivated a relationship with the local newspaper, which ended up printing JEEP's newsletters, in return for advertising support. The newsletter, Alberta Power Smart Report, reported the progress of JEEP, explained how to participate, and profiled satisfied customers. The advertising campaign also included newspaper ads, bill stuffers, and brochures. A fluorescent lamp sign in the middle of town tracked the kW of power saved.

JEEP staff and volunteers used personal marketing techniques that included door-to-door outreach (for the initial residential energy survey) and peer validation (by advertising of homeowners who had participated).

Results

JEEP exceeded its peak demand reduction target by avoiding 2.1 MW of new capacity. The residential segment of the program was roughly on target, achieving a reduction of 0.49 MW or 22%. Total energy savings were estimated at 6,321 MWh per year, and savings from the residential program were estimated at 890 MWh. The program had a goal of 75% penetration in the residential program, but the program ended after reaching 70% (891 households visited in less than 6 months). The program could have reached more households, but it already had met program goals.

The power savings were tracked based on data collected by the JEEP Teams. JEEP Teams reported the installed in a home, wattages, and occupant usage patterns. These data were entered into a statistical software package developed by Alberta Power (Hewitt, 2005). Measuring savings from billing data was challenging because meters were read every other

month and bills for the off-months were based on estimates using the previous year's consumption. Also, 30% of residents were on a billing scheme whereby winter and summer bills were equalized, so they didn't necessarily see an immediate post-upgrade reduction in their bills. Thus, the peak demand reduction of 2.1 MW was calculated based on engineering estimates. However, the accuracy of this calculation was verified when measured peak demand in 1994 was 10.8MW, 2.2MW lower than the previous utility estimate.

Participants reported high levels of satisfaction with the program. A phone survey that reached 358 participants found that 96% rated JEEP Team performance (in terms of product knowledge, ability to answer efficiency questions, and overall friendliness) as "very satisfactory." In contrast, 80% of respondents read the program literature but 70% did not find it very informative. This highlights the importance of personal communication and well-trained assessors to deliver program information.

JEEP ended up being cheaper on a per kW basis than either of the other options that the utility was considering (installing a new generator or new transmission capacity). The average cost of JEEP for residential and commercial was $519/kW, whereas a new peak-generating unit would have cost $978/kW. The residential segment cost $257,600 (including $78,899 in incentives), implying a cost per participating home of $290 (not adjusted for inflation). Alberta Power paid up to 80% of the cost of the residential measures.

Lessons Learned

Much like the BPA programs, JEEP offered significant financial incentives to attract customers. With 80% rebates, the program was very affordable for residents. Yet JEEP also took several other steps in addition to the financial incentives in order to attract participants. The program was designed as turn-key operation for residents, with very little administrative hassle required (homeowners simply called to request a visit from a JEEP Team). As noted, the program hired and trained local residents to discuss and sell energy-efficiency goods and services. Involvement of the community – local hirings, intense local media interest, local advice from the Public Information – was important to build trust and credibility.

Pennsylvania's Keystone HELP

Engaging Contractors to Drive Demand

The Keystone Home Energy Loan Program (HELP) focuses on "reactive" customers who have already made the decision to make an energy-related investment (usually because an old piece of equipment has broken). HELP's contractors then promote more energy efficient options and more comprehensive home energy improvements, each accompanied by attractive financing. In four years, Keystone HELP has originated 5,500 loans totaling almost $40 million in total funding. Thus far, only about 10% of these loans (about 550 loans) have been for comprehensive home energy improvements, the rest are largely for single measure replacements. The program is noteworthy for the simplicity of the application process and for its network of contractors trained to use the program as a marketing tool and to perform high-quality home energy improvements.

Background

Keystone HELP is administered by AFC First Financial, a private lender, in collaboration with Pennsylvania's Department of the Treasury, Department of Environmental Protection, and Housing Finance Agency. Originally started as a pilot with the West Penn Power Sustainable Energy Fund in 2005, the program was launched statewide in 2006 to provide low-interest loans to owner-occupied single family homes and duplexes for energy efficiency improvements. Credit scores are used to determine homeowner eligibility. The eligible measures range from Energy Star appliances to comprehensive home energy upgrades recommended by a certified assessor. A variety of loan terms are available, ranging from a secured $5,000 to $35,000 loan with a 3.875% interest rate for comprehensive upgrades to an unsecured $1,000 to $15,000 loan with a 6.99% interest rate for Energy Star qualified equipment and single-measure upgrades. According to Peter Krajsa, President of AFC First Financial, this tiered financing approach has "been able to influence the market and force the market to change and, interestingly, also to get contractors to embrace a greater move toward home performance … because they're able to offer greater incentives if they move in that direction."

From the homeowners' perspective, the program is simple. Customers can apply online, by phone, or by mail and can find out within minutes whether they have been approved for a loan based on their credit score. For home energy improvement loans, some of which require an energy assessment, the improvements must have a projected savings of at least 15-25% of home energy use (depending on the initial energy efficiency of the home). When the work has been completed to the customers' satisfaction, the customer authorizes Keystone HELP to pay the contractor. Thus far, about 90% of loans have been for "reactive" energy efficiency upgrades (i.e. responding to something that urgently needs repair, such as a furnace replacement) as opposed to "proactive" home energy improvements, which are higher-value, more comprehensive improvements.

Engaging Contractors to Drive Demand

Recognizing that contractors have the power to influence consumers at the point when they are making a major purchase or renovation decision, Keystone HELP has chosen to develop a network of contractors and train them to sell the program. The program does limited outreach to communities, which includes attendance at trades shows and energy events. When the program was launched, Keystone HELP sales staff contacted contractors through direct mailings and through a "road show" across Pennsylvania of breakfast meetings.

Keystone HELP works with contractors to help them integrate the program into their marketing approach and sales pitch. Keystone HELP has 3.5 full-time sales staff working directly with contractors, as well as an internal support staff member. They do frequent webinar trainings for contractors and have recently built a website with sales tools and advertising templates for contractors. Providing templates allows Keystone HELP to control the message and make sure that customers are getting accurate information about the program. Contractors have been very receptive to the program – they see it as a way to generate new business.

Keystone HELP has three levels of contractor certification: approved, trained, and certified. "Approved" contractors have met basic financial and ethical practices, but are not eligible to do comprehensive upgrades. "Trained" contractors have gone through Keystone HELP's one-day home performance introductory training course and are eligible to perform home performance retrofits under the supervision of a Building Performance Institute[6] (BPI) accredited contractor. "Certified assessors" have been certified by both BPI and Residential Energy Services Network (RESNET) to conduct home energy assessments and must have a Home Energy Raters[7] (HERS) number, be operating under a HERS provider, or be an approved energy assessment provider under Pennsylvania's Home Energy Home Performance with Energy Star program[8]. There are approximately 1,600 contractors engaged in the program (and listed on the program website), but fewer than 100 have reached the "certified contractor" level.

According to Peter Krajsa, "Most consumers are motivated by necessity when it comes to energy efficiency so I call that the reactive consumer; somebody who needs to replace their furnace when it's broken or replace their boiler and that's really is what dominates the market." Keystone HELP primarily serves "reactive" consumers, but they are working to build up their network of trained and certified contractors by offering BPI trainings across Pennsylvania in order to support and market to proactive consumers.

Impact and Evaluation

In three years, Keystone HELP originated 5,500 loans with almost $40 million in total funding. Thus far, only about 10% of these loans have been for comprehensive upgrades, which average

[6] http://www.bpi.org/
[7] http://www.energystar.gov/index.cfm?c=bldrs_lenders_raters.nh_HERS
[8] http://www.pahomeenergy.com/homePerformance/index.html

$15,000 per loan. About 60% of loans have been for HVAC improvements and 30% for windows or insulation.

Krajsa emphasizes the importance of the program's simplicity for both contractors and consumers, and cautions that he has seen many programs fail because they are "too bureaucratic." In his mind, the three most important aspects to a residential energy efficiency program are: (a) a simple application process and easily identified eligible measures, (b) a network of contractors that understands the value of the program and is able to market it, and (c) a program management agency that can handle the financing and administration effectively.

KEYSTONE HELP® LOAN PROGRAMS		
Unsecured Loan for ENERGY STAR		**$1,000 to $15,000**
For HEATING, COOLING, WINDOWS, DOORS, INSULATION and other qualifying improvements that are ENERGY STAR qualified or meet program standards.	6.99% 3,5 or 10 Year Term	- Unsecured, No Lien - $150,000 Max. Household Income
Unsecured Loan for ADVANCED PERFORMANCE		**$1,000 to $15,000**
For HEATING, COOLING, CLOSED LOOP GEOTHERMAL, INSULATION and other qualifying improvements that exceed ENERGY STAR or meet program ADVANCED PERFORMANCE standards	5.99% 3,5 or 10 Year Term	- Unsecured, No Lien - $150,000 Max. Household Income
Unsecured Loan for WHOLE HOUSE with Certified Energy Audit		**$1,000 to $15,000**
For improvements recommended by a Certified Energy Audit. *Predicted minimum energy savings of 15% to 25% required, depending on your energy profile.*	4.99% 3,5 or 10 Year Term Plus $325 Audit Credit	- Unsecured, No Lien - $150,000 Max. Household Income
Secured Loan for WHOLE HOUSE with Certified Energy Audit		**$5,000 to $35,000**
For improvements recommended by a Certified Energy Audit. *Predicted minimum energy savings of 15% to 25% required, depending on home's energy profile.*	3.875% to 6.375% *Based on Home's Equity and Loan Term* 10,15 or 20 Year Term Plus $325 Audit Credit	- Up to 120% of Home's Value - 1st, 2nd or 3rd Lien - $150,000 Max. Household Income
ENERGYLOAN® PROGRAMS *For Improvements and Borrowers Not Eligible for Keystone HELP*		
Secured Loan for OTHER ENERGY IMPROVEMENTS incl. SOLAR *No Income Limits*		**$5,000 to $35,000**
For installation of non-qualifying Keystone HELP improvements that are energy efficient, including SUNROOMS (Heated), SOLAR THERMAL, SOLAR PV, CLOSED AND OPEN LOOP GEOTHERMAL	6.375% to 8.875% *Based on Home's Equity and Loan Term* 10,15 or 20 Year Term	- Up to 120% of Home's Value - 1st, 2nd or 3rd Lien - No Income Limits
Unsecured Loan for OTHER ENERGY IMPROVEMENTS *No Income Limits*		**$2,500 to $20,000**
For all makes and models of HEATING, COOLING, WINDOWS, DOORS, INSULATION, SOLAR THERMAL, WATER TREATMENT and other qualifying improvements	13.99% 3,5 or 10 Year Term	- Unsecured, No Lien - No Income Limits
Secured Loan for "R&R" GENERAL HOME IMPROVEMENTS *Non Energy Permitted*		**$5,000 to $35,000**
For installation of most types of home improvements (both energy and non-energy related) with a PHFA approved Home Evaluation	6.375% to 8.875% *Based on Home's Equity and Loan Term* 10,15 or 20 Year Term	- Up to 120% of Home's Value - 1st, 2nd or 3rd Lien - Max. Income 150% of HUD Area Median Income

Long Island Green Homes

Delivering High Assessment-to-Upgrade Conversion Rates

Operated by the Town of Babylon, Long Island Green Homes (LIGH) provides financing for comprehensive energy efficiency and renewable energy improvements. Since its launch in late 2008, the program has persuaded more than 70% of homeowners who had an energy assessment to invest in a full home energy renovation, with LIGH financing $3 million of improvements for more than 350 homes. The program's outreach strategy is designed to harness Babylon's existing resources without adding significant cost to either program participants or the town itself (LIGH's outreach cost per home upgraded is $39). Messaging has shifted since inception to brand LIGH as a program that educates residents about energy efficiency first, and provides a tool for paying for these improvements second. LIGH lately has recruited participants as spokespeople to sell the program to their peers.

Background

LIGH is operated by the Town of Babylon, New York. In 2006, Babylon, a town of 220,000, conducted a greenhouse gas (GHG) emissions inventory and found that more than one-third of the town's emissions came from residential buildings. The town then developed a comprehensive green building code and became the first Long Island town to adopt aggressive energy efficiency standards consistent with the EnergyStar New Homes performance standards for new home construction and to require LEED-certification for all new commercial buildings over 4,000 sq ft. Babylon also adopted the 12X12 Initiative to Combat Global Warming (a program of the Sierra Club), committing itself to reducing its greenhouse gas emissions 12% by 2012. LIGH was launched in October 2008 to reduce GHG emissions from the town's residential housing stock.

The LIGH program requires applicants to complete a $250 energy assessment and then finances the cost of participants' energy efficiency and/or renewable energy improvements. Contractors must be Building Performance Institute (BPI) accredited to be eligible to conduct assessments and upgrades for LIGH, and the LIGH program director does extensive outreach to these contractors to ensure they understand, and can communicate to customers, how the program works.

A Hands-on Approach to Program Administration

LIGH has been extremely successful in converting assessments into improvements, with a greater than 70% assessment-to-upgrade rate. This high conversion rate may be largely a function of the program's applicant pre-screening. The program pre-screens potential participants for energy-usage patterns and pre-existing conditions. Because applicants are required to pre-assess their houses and pay $250 for an assessment, the program separates "serious candidates from tire-kickers," according to Sammy Chu, Program Director of LIGH. Program managers review the application and streamline access to homeowner utility data.

LIGH actively communicates with residents that have expressed interest in the program to encourage them to apply and assist them through the process. While the contractor conducts the assessment and recommends improvements, LIGH staff reviews each application and ensures that applicants are comfortable with the expected cost savings from the energy improvements and how the financing works. LIGH staff also conducts quality assurance and works with property owners to ensure that they save more money on their energy bills than they're paying for LIGH financing.[9] While this approach is time intensive, staffers believe it is essential that early participants have a good experience with both energy-efficiency improvements and LIGH to enhance the program's reputation.

Harnessing Existing Town Resources to Market LIGH

LIGH has been very active in developing brand recognition in Babylon. The program's outreach strategy is designed to harness Babylon's existing resources without adding significant cost to either program participants or the town itself. Marketing techniques have included a CFL giveaway, neighborhood canvassing, and making sure people see LIGH and its logo frequently – on lawn signs, on town vehicles, at festivals and in town newsletters. LIGH makes use of almost all Babylon public spaces to advertise, and the program has requested that each of the town's departments designate a representative to learn how to market the LIGH program to both peers and curious residents. As an added benefit, most of these employees live in Babylon, and the program encourages them to lead by example.

In addition, LIGH has been featured in more than 30 articles and has been the subject of 3 national television segments. This coverage has drawn significant attention to LIGH in Babylon, across Long Island, and around the country.

When LIGH was launched, staff members made frequent presentations to Babylon's civic and community groups. These meetings were typically very well attended (20-70 participants), and a number of key civic leaders were among the first to participate in LIGH. The program is now training several of these leaders to make presentations on behalf of LIGH themselves, as the program director has found that testimonials from program participants are often the best formula for selling LIGH.

LIGH has also had significant success conducting outreach at Babylon's public pools and beaches. The program hired 4 seasonal workers in 2009 to staff these high-profile locations, and it plans to train existing seasonal workers (lifeguards, concession stand workers, etc) to market the LIGH program this season, as seasonal workers often have significant periods of idle time during the workday. If all seasonal workers were trained, this would mean between 200 and 400 LIGH advocates, all at virtually no additional cost to the town.

[9] LIGH has the capacity to extend the financing term to reduce monthly payments. The program has only done this once, and the adjustment still left the financing term under ten years.

Presenting the Product Not the Financing

While LIGH has experimented with a number of messages and messengers, one of its biggest lessons learned has been to present the product first. Initially, marketing focused on the nitty-gritty of how the financing mechanism worked. In other words, messaging presented a financing program capable of funding energy efficiency improvements. Subsequently, program managers have shifted messaging to brand LIGH as a program that educates residents about the importance of energy efficiency first, and provides a tool for paying for these energy improvements second. “Car dealers don’t explain the auto loan terms first, then have you test drive the car,” says Sammy Chu, the program director. “They sell you on the car then get into the technical details!”

Impact and Evaluation

Since its launch in October 2008, LIGH has financed over $3 million of energy improvements on 366 Babylon homes. Over 1,100 Babylon residents have attended LIGH presentations in the past year and a half. Other outreach techniques have driven over 1,900 residents to request further information on the program. LIGH estimates that the outreach cost per job converted has been approximately $39. LIGH plans to test a number of new innovative outreach techniques, including extensive neighborhood canvassing, in the next year.

The Marshfield Energy Challenge

A Community-Focused Approach to Increase Demand for Retrofits

The Marshfield Energy Challenge (MEC), a two-year pilot program, reduced the town's peak electricity use by bundling energy efficiency, solar photovoltaics (PV), and direct load control initiatives. The utility-led program made its offerings seamless and straightforward, then recruited local leaders as ambassadors. These leaders – selected from local schools, elected office, churches, and business – set the standard for energy improvements in their own homes and talked to townspeople about the program, both selling it and listening for feedback. Marshfield is an affluent town, and the program translated its message of using less energy into one of increasing property values. The MEC also used targeted direct mail to reach key households and businesses on a constrained electrical circuit. Over two years, the Marshfield Energy Challenge reduced the town's peak electricity demand by over 1.2 MW. Two-thirds of this reduction was from the residential sector. Almost 1,300 homeowners received energy assessments, and 90% installed at least one energy efficiency measure.

Background

The $4 million Marshfield Energy Challenge in Marshfield, MA was administered and partially-funded by NSTAR, the regional utility, with additional funding from the Massachusetts Technology Collaborative (MTC), and the state's economic-development agency. The initiative's goal was to reduce the town's 25 megawatt (MW) peak electricity demand by 2 MW. To do so, NSTAR offered free energy assessments to households and businesses, 500 free "smart thermostats" that would give NSTAR the capacity to raise household temperatures up to 4 degrees during peak demand, and 30 solar PV systems. While the Marshfield Energy Challenge attempted to reach all of the town's residents, it made special efforts to get property owners on a congested electrical circuit to participate.

Harnessing Local Leaders to Engage the Community

NSTAR and its partners developed a marketing and outreach strategy early in program planning. During initial planning, the Marshfield Energy Challenge hosted a two-day community meeting and planning workshop and found strong support for the program from community leaders and residents. NSTAR capitalized on this by selecting twelve program ambassadors—school representatives, politicians, clergy members, and businessmen. Not only would these ambassadors lead by example by retrofitting their homes and businesses, but they would explain how the program worked to community members and serve as the program's eyes and ears in Marshfield, delivering timely feedback to program managers.

NSTAR also had an employee who already served as the company's Marshfield community liaison. The liaison had pre-existing relationships in town that were critical to the program's success. No program manager has the capacity to show up in a town and have trusted relationships, and the liaison not only convinced politicians to get engaged in the Marshfield

Energy Challenge, but assisted program staff in ensuring that the program had a presence at important town events.

Increasing Participation with Targeted Outreach

The program took a two-tiered marketing and outreach approach. It conducted an umbrella advertising campaign focused on community-wide energy reduction using traditional media outlets (weekly newspaper and radio) and direct mail. Messaging focused on making the program specific to Marshfield and building community ownership and initiative. The program then used targeted direct mail advertising that included special offers to reach households and businesses that were contributing to peak demand on the constrained electrical circuit.

Direct mail was a successful vehicle for attracting interest in the program—industry average response rates to direct mail are 0.5%, and the Marshfield Energy Challenge got a 1.2% response rate to its direct mail campaign. More impressive, it got a 13-16% response rate to its targeted letters to those businesses and households on the key circuit. In follow-up interviews with program participants, almost 50% noted that mail was their preferred method of providing information, higher than any other medium. While direct mail had the highest conversion rates, program managers felt that the umbrella advertising was essential for branding and creating awareness of the program.

The program used a number of additional outreach tools to get its message into the community including e-mail updates, telephone follow-up, an energy lecture series, breakfast meetings, and activities at schools, concerts, fairs, and on election day. It did not, however, use online social outreach tools like Facebook and Twitter (although it did host a website and blog). Knowing how prevalent these tools are today, program managers mentioned they would make a much stronger online effort if they had to do it again.

Community-Focused Messaging

De-emphasizing NSTAR's role in the program was critical. Residents typically do not have the power to select their utility, so messaging focused on the benefits to Marshfield as a whole to create greater community buy-in. In fact, NSTAR's name did not appear in program advertising until the 3rd week of the marketing campaign.

The key message was, "It's all about where we live, work, and play." According to Kathleen De Vito, a contractor responsible for much of the initiative's outreach strategy, while the program didn't ignore environmental messaging, it focused on communicating that "you live here, this is the biggest investment you have, and we (The Marshfield Energy Challenge) want to help improve the return on your investment. Energy efficiency and a greener tomorrow are just additional perks." The program also attempted to make messaging very town-specific to build grassroots support. This effort was so popular that neighboring towns began to pressure NSTAR to bring the "Energy Challenge" to their communities.

One important lesson learned was that, early on, the ambassadors felt that the Marshfield Energy Challenge needed a reward if the town reached its energy reduction goal. However, several focus groups indicated that rewards were not a motivator. Instead, people were motivated by wanting to do the right thing. In this vein, all program participants were given static cling labels that said “I did my part” to put in the windows of their homes and businesses.

An Integrated Offer to Potential Participants

While marketing and outreach were important to the Marshfield Energy Challenge’s success, just as crucial was the seamless offer to potential participants. Residents and business owners called a single dedicated line to schedule assessments, ask questions, and get follow-up assistance. The program piggybacked on the existing Mass Save[10] residential energy efficiency assessment program and integrated a solar assessment and enhanced NSTAR and MTC incentives for lighting, refrigerators, air sealing and insulation, thermostats, an HVAC tune-up, and solar PV into the presentation of investment options. By offering all of these services during the home visit, NSTAR simplified the process for potential participants. A similar assessment was offered by a third party vendor to Marshfield’s businesses, although there was less emphasis on the commercial side of the program. “Ease of participation” was the most important factor in the decision to take part in the program among surveyed Marshfield residents

NSTAR encouraged those residents that chose to participate in the Challenge to invest in comprehensive energy solutions that would maximize demand reduction by sweetening existing 50-75% subsidies for insulation and air sealing costs to 100% subsidies when homeowners consented to installing a thermostat with load control.

Impact and Evaluation

Over 21 months, the Marshfield Energy Challenge spent just over $125,000 on marketing and outreach. The Challenge reduced the town’s peak electricity demand by over 1.2 MW. Two-thirds of this reduction was from the residential sector. Almost 1,300 homeowners received energy assessments (higher than the Challenge’s 1,200 assessment goal), and 90% installed at least one energy efficient light bulb. Between 10 and 20% installed insulation, air sealing, or heating measures, or completed an AC tune-up and 32 (2.5%) residential customers installed solar panels. 88% of residential program participants rated their experience with the program as good.

It’s important to note that Marshfield is a small, wealthy town, and messaging/incentives may need to be tailored to target audiences in other areas. Financing was not a major obstacle in Marshfield, and may be a more significant barrier in less affluent communities. In larger cities, it may be difficult to develop the grassroots support that the program relied on.

[10] For more information on MassSave, a partnerships between utilities, energy efficiency service providers, and state organizations, please visit: http://www.masssave.com/

Given a short time period to implement the program, NSTAR and its partners successfully harnessed existing trusted sources of information in the town to communicate the benefits of participating in the Marshfield Energy Challenge. NSTAR engaged these community leaders from the beginning, and their input was incorporated into program planning. Messaging focused on community and property benefits, and integrating marketing, implementation, and customer assistance was key to creating a seamless, simple experience for participating Marshfield residents and business owners.

New London Resource Project

Coupling Community-Based Outreach with Financing

The New London Resource Project (NLRP), a three year program in New London, WI, drew on support among influential local leaders for design and implementation, then used on-bill financing of energy-efficiency measures tailored so that energy bill savings exceeded loan payments. Two utilities and two public-power associations joined with a third-party efficiency administrator to sponsor the program. An advisory group of influential local leaders helped design and champion the program among fellow townspeople. NLRP subsidized home visits where program staff conducted an energy assessment, talked to the homeowner about efficiency and on-bill financing and directly installed initial efficiency measures. If desired, staff selected a contractor for more comprehensive home energy improvements at pre-negotiated prices. Almost 750 residential customers (about 25% of total customers) got energy assessments, and the project delivered 2.5 million kWh of annual savings of which almost 500,000 kWh came from the residential sector.

Background

Operated from 1992 to 1995, the $550,000 NLRP was a collaboration between New London Utilities (a municipal utility) and Wisconsin Gas Company, with additional funding from Wisconsin Public Power Incorporated and the American Public Power Association, and programmatic support from the Wisconsin Energy Conservation Corporation (WECC). The project's goal was to test the use of positive cash flow financing and community-based outreach to deliver low cost energy savings in the residential, commercial, and industrial sectors. Part of the motivation for the multi-utility project was concern about limited residential electricity savings opportunities and the need to pursue gas and water savings (as well as non-energy benefits) to deliver attractive economics. New London, a community of 6,750 people, was chosen via competitive application in part because it had two large industrial manufacturers.

NLRP offered all of the town's residents subsidized energy assessments, on-utility bill financing, contractor assignment, a $100 conservation check to purchase energy efficiency products at participating retailers, and free new construction and home remodeling plan reviews to identify energy efficiency opportunities. NLRP also developed a conservation education curriculum for local schools and assisted retailers with energy efficiency product stocking and employee training.

Eliminating Barriers to Residential Energy Improvements

NLRP developers identified three key barriers to residential program participation:

1. Lack of access to capital to undertake efficiency improvements
2. Customer avoidance of hassle, transaction costs, and risk involved in selecting and working with contractors to complete projects
3. Customers not familiar with energy savings options, their benefits and costs.

While program sponsors saw significant potential in positive cash flow financing – financing set up so that the bills savings are greater than the loan payments – they knew that they had to design the program to make it as easy as possible to save energy. NLRP had a single full-time employee charged with delivering the bulk of the program, including residential energy assessments. To increase operational efficiency, NLRP tried to schedule a large number of assessments at the same time in a single neighborhood. For under $35, these assessments included direct installation of low cost energy and water saving measures, a blower door test, a report highlighting cost and savings estimates for appropriate major measures, and an explanation of on-bill financing to reduce up-front cost barriers. Once homeowners decided to invest, they were given the option of choosing a contractor or having the program assign a qualified contractor. All participating contractors agreed to pre-negotiated prices for improvements like programmable thermostats, air sealing, and insulation to give residents confidence in the fairness of the bids they received.

Engendering Community Support for the Project

NLRP engaged the New London community throughout the design and implementation phases. The Community Advisory Committee (CAC), a 14 member team composed of 3 utility representatives and 11 influential community members, provided input and served as the project's public ambassadors. CAC members were strategically recruited to reach as many constituencies as possible, and the committee's large role in program development created a sense of project ownership. These members also helped fine tune delivery and marketing to be responsive to community members and local culture. George Edgar, Policy Director for Wisconsin Energy Conservation Corporation (WECC was contracted to support the implementation of the NLRP), noted that CAC members were well-known and worked very hard to create buzz, provide credibility in the community, and to get the town engaged.

Harnessing Grassroots Enthusiasm to Enhance Outreach

Two energy fairs, the first of which attracted almost a thousand attendees, were essential to building community awareness when NLRP first launched. The project then used a number of traditional marketing approaches including radio and newspaper advertising to reach out to residents. Messaging focused on saving energy and branding the project as a community initiative. While there was a community focus, the New London Utilities manager played a highly visible and involved role that gave the project credibility and enhanced the utilities' standing in the community. In an attempt to increase the efficiency of program delivery, direct mail was sent to targeted neighborhoods a few weeks before the assessor visited, followed by door hangers the day before he began work there. Residents were permitted to sign-up for assessments on the day of the assessor's visit.

NLRP supplemented these efforts with outreach tools designed to harness strong community support. In focus groups before project launch, residents requested an active role in NLRP, so it created the Resource Partner Volunteers (RPV) initiative. RPV's conducted home visits to

provide energy education and schedule assessments. They also visited participant homes to evaluate satisfaction and encourage participants to join the RPV effort. In addition, when residents had assessments completed on their homes, they were given a “Pass It On” card to give to neighbors or friend.

Impact and Evaluation

750 residential customers (about 25% of total customers) got energy assessments. The project delivered 2.5 million kWh of annual savings of which almost 500,000 kWh came from the residential sector. One-quarter of the program’s financing, $137,000 went to residential energy improvements. In later years, the program struggled to schedule residential energy assessments and to convert these assessments into upgrades. 85% of those that did invest in upgrades were satisfied with their participation.

While streamlining the process is important, a post-pilot analysis pointed out that it is important that residents take ownership of some project services, such as selecting a contractor, in order to realize long-term sustainable benefits. New London’s experience may have limited applicability to larger towns and cities, because creating “buzz” and community ownership of a project like this may be more difficult outside of a small community.

NYSERDA's Home Performance with ENERGY STAR Program

Leveraging Contractors' Ability to Sell Home Energy Upgrades

The Energy $mart program run by the New York State Energy Research and Development Authority (NYSERDA) created a statewide network of key partners – contractors , local groups, retailers, and manufacturers – to offer energy-efficiency education, products, and financing for New Yorkers. Energy $mart supports the comprehensive home energy improvement market with both supply- and demand-side initiatives. The program is notable paying a portion of contractors' marketing costs for energy improvements. NYSERDA has leveraged $3.5 million of cooperative marketing funds with over $10 million of total contractor marketing expenditures, and more than 32,000 homes have been upgraded through the program since 2001.

Background

New York State Energy Research and Development Authority (NYSERDA), a public benefit corporation funded by state utility- ratepayer System Benefits Charges, operates the New York Energy $mart initiative. This initiative includes an Home Performance with Energy Star (HPwES) program that encourages comprehensive energy upgrades in existing one- to four-unit residential homes through an independent network of home-improvement contractors accredited by the Building Performance Institute (BPI).[11] To participate, a homeowner contacts a contractor from the list of approved contractors available on the Energy $mart website, and the contractor then serves as a one-stop shop—performing a home energy assessment, installing energy improvements, and offering HPwES financing and rebate options.

NYSERDA offers a range of incentives to encourage contractors to participate in the HPwES program including discounts on BPI certification, subsidies for diagnostic equipment, listing on the Energy $mart website, access to consumer financing options and incentives, use of NYSERDA marketing materials, referrals/leads from NYSERDA's public awareness campaigns, and co-operative advertising reimbursements. Most of these incentives are performance-based, which allows NYSERDA to encourage scale, reward performance, and maximize its resources.

Two-Tiered Advertising Strategy

While contractors are the key point of customer contact, Energy $mart runs an extensive marketing campaign (involving television, radio, newspaper, direct mail, public relations, and special events) to build recognition for HPwES and other NYSERDA programs encouraging residential energy efficiency[12]. NYSERDA's HPwES advertising is intended strictly to help catalyze the development of a robust market for the HPwES program, not to extend NYSERDA's own brand. Contractors mention that this singular focus has contributed to the

[11] For more information on BPI: http://www.bpi.org/

[12] Other programs operated under Get Energy $mart include the Market and Community Support Program, the CFL Expansion Program, the Communities and Education Program, EmPower New York, and the Buying Strategies and Energy Awareness Program. For more information: http://www.getenergysmart.org/

success of establishing the HPwES brand in New York. NYSERDA couples its general HPwES marketing with cooperative advertising incentives that reimburse contractors for a portion of their own advertising expenses. The reimbursement rates and caps are a function of the number of upgrades a contractor completes and range from 25% to 50% of a given advertising expense up to a maximum of $150,000 annually per contractor.

According to Mike Rogers of the home performance contracting firm GreenHomes America, this two-tiered outreach effort is effective at driving the market. NYSERDA's advertising campaign creates a general awareness about the benefits of home performance, while the cooperative incentives help contractors attract consumers to do comprehensive upgrades where contractor capacity exists. Rogers says, "Program-wide marketing alone runs the risk of giving a message that market infrastructure may not be ready to receive. Programs spend a lot of money getting homeowners to pick up the phone, but if qualified contractors aren't there to provide home energy services, you end up with a frustrated homeowner. If you frustrate a homeowner on the first call, getting them to make energy improvements in the future becomes a much more difficult task."

Advertising materials must be pre-approved and include specific mention and visual placement of program messages and brands. By requiring contractors to get materials pre-approved, the cooperative advertising incentives allow NYSERDA to coordinate contractor messaging with its broader marketing campaign. This messaging consistency is important to avoid consumer confusion on the "best approach" to making one's home more efficient.

Point-of-Sale Training and Messaging

NYSERDA operates a one-day training program in sales and marketing that teaches contractors skills on communicating the importance of HPwES and a whole-house approach to energy efficiency. This training focuses on the customer experience and addresses some of the key hurdles to converting leads into jobs. Experienced whole-home energy-efficiency contractors note that programs often spend a lot of time on technical training but not nearly enough on showing contractors how to make a living performing energy efficiency improvements. HPwES programs typically add overhead costs to businesses and contractors must be able to educate homeowners and communicate the benefits of a whole-home approach to energy efficiency to beat out their competitors. While a number of messages have been explored, the Get Energy $mart and HPwES advertising campaigns focus on saving money. NYSERDA has done extensive focus-group analysis and found that about three in four people say that understanding the amount of money is most effective in encouraging them to invest in home energy improvements.

Impact and Evaluation

Since 2001, over 32,000 home energy upgrades worth more than $247 million have been completed through HPwES by approximately 250 participating contractors[13]. These improvements have saved over 22 million kWh and over 1 million MMBTU to date. All of the program's active contractors have used NYSERDA incentives to earn BPI certifications. Since 2003, HPwES penetration of New York's home remodeling market has climbed from less than 0.5% to approximately 3% annually. NYSERDA has paid almost $3.5 million to contractors since the cooperative advertising initiative began in 2001. This public spending enhances contractors' ability to convert marketing expenditures into jobs and has been leveraged into over $10 million of total contractor spending on outreach. Over 20% of active HPwES contractors used the cooperative marketing in 2010. NYSERDA is considering developing templates that will create uniformity and benefit smaller contractors, who have been less active in using these incentives. In addition to helping contractors piggyback on NYSERDA's HPwES branding efforts, these incentives help them market their services directly to customers *and* capitalize on the inherent value of the contractor-customer relationship in recruiting new customers and converting leads into comprehensive upgrades.

NYSERDA's HPwES advertising also has reinforced confidence in the organization's long-term commitment to HPwES and helped convince contractors that the time and expense required to get BPI certified and invest in diagnostic equipment are worth it. Public programs are often short-lived and a couple years are not enough time for the public to understand a program's opportunities or for contractors to take advantage of them. Mike Rogers of GreenHomes America notes that "(w)hole home energy-efficiency retrofits are not as sexy as iPads, and it takes time for traction to develop."

As part of a broader campaign to develop a robust whole-home energy improvement market in New York, HPwES cooperative advertising incentives allow NYSERDA to leverage its advertising dollars and control the message while harnessing contractors to sell the program. Contractors benefit from the financial assistance and NYSERDA's broader HPwES branding campaign.

[13] For more information, please visit New York's 2010 System Benefits Charge Programs Evaluation and Status Report available here:
http://www.nyserda.org/pdfs/sbc_annualprogramsevaluation_statusreport_end2009.pdf

Take Charge Challenge

Community-Led Competition to Save Energy in Kansas

The Take Charge Challenge was a year-long energy use reduction competition between towns sponsored by a regional nonprofit in Kansas. In six towns, leadership teams were recruited among respected town leaders who communicated the benefits of the program to different constituencies within each town and played up the competition. The initiative led to savings of more than 6 million kWh during the program's single year. The installation of permanent energy-saving measures such as interruptible thermostats and more efficient air conditioning as a result of the Challenge also locked in more than 7 million kWh annual savings. The combination of local leadership with the incentive of competition resulted in higher levels of participation than organizers initially envisioned.

Background

The Take Charge Challenge is an initiative of the Climate and Energy Project.[14] The goal was to prove that energy efficiency can lead to significant energy use reductions in every part of Kansas and under any utility structure (investor-owned, municipal-owned, or co-op). The program accomplished this goal, as well as turning the Leadership Teams in each town into enthusiastic energy efficiency champions.

The Take Charge Challenge ran from April 2009 through March 2010. Prior to starting the program, the Climate and Energy Project met with utilities to decide which towns to work with; they wanted a mix of urban and rural locations, small and large communities, and geographic diversity. All of the targeted towns agreed to participate in the program, and the Climate and Energy Project set up meetings with key leaders in each town from the Chamber of Commerce, schools, retail sector, etc. With the support of these key leaders, they recruited a larger Leadership Team of approximately 50 people per town. These Leadership Teams met about once per month during the Challenge.

To launch the program, the Leadership Team in each town hosted a community-wide party with free food and fun activities. Each quarter, there was another community party to announce the energy saving results to date and launch the next quarter of the competition. There were two competitions within the challenge based on: (1) actual kWh savings (relative to nearby non-participating towns); and (2) estimated savings from prescriptive measures installed (these included switching light bulbs and appliances and completing home energy improvements). The second competition metric was included to emphasize the importance of persistent savings in addition to behavioral changes. Switching light bulbs was a major focus of the competition, but households were also encouraged to install programmable thermostats, participate in the

[14] The Climate and Energy Project is a nonprofit organization working in the Midwest to reduce greenhouse gas emissions "by increasing energy efficiency and developing renewable energies in a sustainable manner." Url: http://www.climateandenergy.org/WhoWeAre/AboutUs/Index.htm

Weatherization Assistance Program, and participate in utility-sponsored programs like appliance and HVAC rebate programs and home energy assessments.

Community Leadership and Competition

Nancy Jackson, program director of the Climate and Energy Project, emphasized the role of the Leadership Teams in promoting the program; “we [the Climate and Energy Project] were visible to the members of the Leadership Teams but not to the towns themselves.” The community leaders were the face of the program in each town. In choosing the Leadership Teams, the Climate and Energy Project realized that “there is no such thing as ‘the public’ ” – they needed to market the program to many audiences, and so they found leaders from each of these target audiences. These included churches, schools, low-income neighborhoods, Chambers of Commerce, agricultural interests, etc.

The Challenge messaging focused on energy savings, cost savings, and competition. According to Jackson, “it was the contest and the community pride and community spirit that really drove this.” Although the Climate and Energy Project offered prizes to the two winning communities, in retrospect Jackson believes that this was not necessary and that the towns would have been just as competitive without this incentive.

As part of the program, a website was set up on which residents could log how many CFL light bulbs they had installed. This website allowed people to see which town was winning the Lighting Challenge aspect of the competition in real-time, and scrolled the names of participants and the number of bulbs they had changed, keeping the competition lively. However, Jackson notes that because many in these towns do not use computers, word of mouth and person-to-person contact was critical.

The communities were very creative in pursuing energy efficiency savings. For example, for Halloween, one town held a “vampire hunt” in which schoolchildren looked for “phantom” (plug) loads in their homes; the classroom with the most children who participated won a pizza party.

One superintendent of schools (who served on the Leadership Team) realized that one school was using vastly more energy than an identical school in the district. Both schools had received efficiency upgrades in the late 1990s, so the typical “low-hanging fruit” of lighting, boilers, HVAC and systems operations had been plucked. Behavioral changes – mostly janitorial and summer thermostat settings – led to a million kWh and $42,000 savings annually.

The Climate and Energy Project worked closely with local media to spread the word. In one town, one member of the Leadership Team owned six local radio stations that recorded and played public service announcements throughout the Challenge. These PSAs showcased members of the Leadership Team explaining why the competition was valuable to different segments of the community. Local media often showcased personal stories of how much energy people were saving; in one town, the first home energy assessment completed by the local utility received news coverage.

Results and Evaluation

The Take Charge Challenge was run by two half-time staff at the Climate and Energy Project, plus additional staff time devoted to website and press communications. The Climate and Energy Project spent $150,000 on the program, split evenly between staff time and program expenses (including prizes and giveaways). Utilities estimated that they spent a combined total of $20,000 on the program, and towns also ended up contributing resources, mainly city staff time and event venues. Though the program could not precisely track how many residents were engaged by the Challenge, they estimate that over 10,000 people (more than 10% of the total population of the participating towns) attended at least one event.

Evaluating kWh savings was difficult because of the challenge of choosing a suitable baseline. Because of the economic downturn, comparing to the previous year would have overestimated the savings attributable to the Challenge. Instead, each town was compared to a nearby town or region with similar demographics. The winning town in the kWh savings competition reduced energy consumption by 5.5% relative to its control town. For the other competition (estimated savings from long-term measures like weatherization and appliance upgrades), the winning town saved an estimated 3.7 million kWh per year from both the residential and commercial sector (about 2.5% of the town's total electricity use). In terms of comprehensive energy improvements, the program resulted in 112 assessments and 300 households that signed up to participate in the Weatherization Assistance Program.

Lessons learned

According to Nancy Jackson, "peer to peer communication is critical to the success of the program." She emphasized the importance of identifying "credible messengers and credible messages." Influential, engaged, and active Leadership Teams delivered the energy conservation message to town residents. Granting so much autonomy to the Leadership Teams led to many creative ideas that the Climate and Energy Project could not have developed on its own. And tapping into the towns' pride and competitive spirit was a huge motivator in generating interest. According to Jackson, in the next round of the Take Charge Challenge, they plan to work in towns that are already natural rivals (for example, sports rivals) in order to capitalize on the competition aspect even more. The Challenge was also a valuable educational opportunity for the Leadership Team members, many of whom entered the initiative with very limited knowledge of energy efficiency. According to Jackson, "we now have very loud champions for energy efficiency who previously literally didn't know what efficiency meant."

Twin Cities One Stop Program

Making the Best of Your Only Shot at Reaching Homeowners

Minneapolis and Saint Paul have developed a model for delivering home energy-improvement services that reduces marketing costs for programs and transaction costs for homeowners. By delivering energy efficiency education, subsidized energy assessments, and home energy-improvement services to many homes in a single neighborhood at once, the Twin Cities One Stop Program reduces barriers that have led to low participation in residential programs. The program's coalition of cities, nonprofits, and utilities works from the notion that homeowners are more likely to make a major investment if they have been directly involved in learning and taking a few small steps first. The program's Home Energy Squads have visited 1,800 homes and for each delivered typically 10% to 15% energy-use reductions. All participating homes are served at a cost of ~$600, of which the homeowner pays $30. The pilot is collecting information about what motivates homeowners to invest in energy efficiency, who should sit at the kitchen counter to "seal the deal," and how to reduce overall program costs.

Background

In June 2009, a coalition led by the cities of Minneapolis and St. Paul made a pledge to upgrade 50% of the cities' buildings in 10 years. The cities partnered with the Center for Energy and Environment (CEE)[15] and the Neighborhood Energy Connection (NEC)[16] to design an integrated residential energy-efficiency program. The coalition chose to focus program resources on the residential sector because of historical difficulty in achieving substantial participation and energy savings through these efforts. Carl Nelson, CEE's Minneapolis program manager explains: "Sure, the savings you can achieve in commercial or industrial buildings dwarf what you can achieve in residential buildings. But it's not an either/or situation. We are going to need extensive efficiency improvements everywhere to meet our targets for reductions in energy use and climate emissions."

The pilot program was launched in fall 2009. Twelve demographically diverse neighborhoods, seven in Minneapolis and five in St. Paul, were selected. Program funding came from two utilities and the state lottery.

Program Design

According to staff, the Twin Cities One Stop Program involves several insights and well-defined steps.

Step #1: Pick a Target Neighborhood. Targeting selected neighborhoods with a package of outreach and service-delivery methods is critical to ramping up the number of homes being retrofitted and ensuring that administrative costs are kept to a minimum.

[15] The Center for Energy and Environment is a state-wide nonprofit with a forty year track record of delivering energy conservation and efficiency programs.

[16] The Neighborhood Energy Connection is a St. Paul-based nonprofit with a mission to reduce pollution, conserve resources and improve quality of life by offering tools for energy efficient living.

Step #2: Invite the Homeowner to a Free Workshop. CEE staff said past experience showed that free workshops pique the interest of homeowners and persuade them to schedule a home visit. Workshops are a safe first step for a homeowner to take, much easier than inviting a stranger into their homes.

Participating communities in Minneapolis and St. Paul have used different strategies to conduct outreach about the free workshops. These range from door-to-door visits to newspaper articles and advertisements. During the workshop, participants receive basic information about improving energy efficiency, and free devices they can install at home, such as CFLs and faucet aerators. Attendees also become eligible for a subsidized home visit scheduled shortly after the workshop, and in Minneapolis, over 95% of homeowners attending workshops pay the $30 to sign up for the home visit.

Step #3: Send in the "Home Energy Squad." A central element of the Twin Cities pilot program is a home visit conducted by a "Home Energy Squad." The squads are designed to provide homeowners with new information and the chance to make small energy improvements immediately. While a squad member performs a blower door test to determine the necessity of major ail sealing and insulation work, the rest of the squad does a home walk-through with the property owners, showing them what they can do to save energy. Some improvements are made on the spot, such as replacing light bulbs, wrapping water heaters with fiberglass blankets, and weather-stripping doors. Homeowners learn by doing, and squad members tell them what more they can do, and are educated about steps they can take in the future. Home visits are scheduled so energy squads can perform many in the same neighborhood on the same day. The goal is to keep the whole visit to 90 minutes. The homeowner has virtually no cost: just $30 for a home visit valued at $400, provided as a subsidy by the program.

These squads are funded by the area's two utilities, Xcel Energy and CenterPoint Energy, as part of their Demand Side Management programs. The funding covers only the on-the-spot improvements and does not include a blower door test or other diagnostics. However, in order to deliver a comprehensive program and increase program effectiveness, CEE raised funds to conduct blower door testing and other critical diagnostic measures. In St. Paul, the NEC has a separate utility contract to provide comprehensive home energy assessments, so diagnostics are performed in a separate visit and can be targeted at households most willing to make major improvements.

Step #4: Assess the Need for Deeper Investments, and Make the Pitch.
If the blower door test shows that a home would benefit from major energy-efficiency investments, the Home Energy Squad closes the visit by trying to bring the homeowner as close as possible to a decision to move forward. Squad members offer assistance in locating skilled contractors. The squad explains that energy improvement investments are not as hard as homeowners may think by providing cost ranges and by exploring financing options to eliminate

or reduce up-front costs.[17] In practice, this is the biggest challenge, and the piece that will need the most refinement over time. Squads will eventually be equipped with laptops so they can print out reports with key recommendations, such as improving insulation and air sealing – on the spot.

Step 5: Follow-up and feedback.
The programs provide assistance for homeowners interested in completing major upgrades. This includes both consultation and financing (both CEE and NEC have loan officers on staff that can provide a range of financing options to customers). A Home Energy Progress report is sent bi-monthly to encourage better energy-consumption habits. This report tracks homeowner's energy usage against average use in similar homes, as well as individual targets.

Program Design Motivations
The design of the Twin Cities One Stop program was focused on three ideas:

Go Systematically, Neighborhood by Neighborhood. The pilot program aims to motivate == entire neighborhoods to complete upgrades at the same time. Twin Cities One Stop staffers say it is extremely expensive responding to individual homeowners who call a hotline or fill out a web-based form. Home energy Squads visit many homes in an area on the same day to cut back on mobilization costs without sacrificing service provision.

Focus on Motivating Homeowners , Not Just "Educating" Them Many traditional assessment programs are premised on the theory that more information will lead to more action; however, it has been well established that information alone does not necessarily prompt people to make significant changes. Therefore, the Twin Cities pilot utilizes behavioral strategies, such as walking homeowners through the first small steps to move them toward pursuing more expensive but effective opportunities for improving efficiency.

Do As Much As Possible in "One Stop." It is cheaper to visit a home only once, and it is never certain that a second visit is possible. The Twin Cities pilot is designed to accomplish multiple tasks in a single home visit. The crew conducts diagnostic testing of the home, installs simple efficiency technologies, educates the homeowner on the benefits of efficiency improvements, and makes recommendations for additional efficiency upgrades based on diagnostic testing results. The coalition believes that homeowners are most likely to make a major investment if they have been directly involved in learning and taking a few small steps first.

Lessons for Driving Demand

Customize Outreach Approach for Each City and Neighborhood
The Twin Cities coalition designed for flexible outreach approaches. "The core strategy is connecting with neighborhood leaders and getting those people behind you," says Anne Kraft, a

[17] Both organizations maintain a list of contractors that meet their standards.

Product Developer at Xcel Energy who is working with the coalition. “The strategy for exactly how to do that looks a little different for each neighborhood.”

In Minneapolis, CEE issued a Request for Proposals to locate prospective community partners. “The RFP asked ‘What are you willing to do?’” says Carl Nelson. “We [CEE] can organize the first workshop, train volunteers, develop marketing materials, deliver the program…’What can you bring?’ We are mainly looking for organizations that want to work with us to deliver people to that first workshop. We train volunteers recruited by those organizations, and they go door to door signing people up.”

In St. Paul, where there are fewer neighborhood groups with less funding, the approach has been different. The Green Institute, a nonprofit, has overseen workshop outreach. Chris Duffrin, NEC’s Executive Director, explains that knocking on doors is not the preferred strategy during the winter, when “you hardly see your neighbors for months.” Media outreach has been the main means for getting the word out. The NEC plans to introduce coordinated door-knock blitzes through neighborhoods during the summer months.

Separate the Pitch from the Technical Assistance

In Minneapolis, each Home Energy Squad includes an “energy technician” and an “energy counselor.” The energy counselor attempts to ensure that personal, responsive interaction with the homeowner doesn’t get overridden by a dense technical download.[18] Once counselors have done walkthroughs with homeowners, they help explain the results of the technician’s tests and recommend further efficiency upgrades. The counselor can also answer questions about how to go about installing efficiency measures. The fact that the squad does not stand to benefit financially from further improvements helps to ease homeowner concerns about whether the recommendations they receive are in their best interest.

While keeping the homeowner engaged is a critical part of their residential model, it remains a work in progress. In the early stages of the pilot program, focus was placed on organizing the squads and training them to do the direct-installs. Training has now been updated to help squads learn skills to improve homeowner interactions.

Make a Disciplined Case for the Highest Value Investments

Recognizing that too many recommendations can be overwhelming to homeowners, home energy squads try to give just three suggestions for high-impact energy-efficiency improvements. Says CEE’s Nelson, “We don’t want to encourage homeowners to take steps that might save a little energy and keep them busy on weekends, but that won’t have much impact.”

[18] In St. Paul, crews also have multiple members, but don’t carry these explicit job titles. Each crew has an NEC staff member to provide overall direction and consistency, and several younger people from the Minnesota Conservation Corps.

In practice, the program is still refining this effort through squad training as counselors often find difficulty keeping keep homeowners focused on high-impact investments. “Sometimes a homeowner asks a question about an action that he or she has heard a lot about and is really interested in – such as window replacement – but that doesn’t deliver significant energy savings at a reasonable cost,” reports Nelson. “When that happens, it can be challenging for the energy counselor to redirect the conversation to the most cost-effective upgrades such as air sealing.”

Try a Small Scale First, Then Be Accountable for Specific Outcomes

Pilot programs should establish quantitative measures to evaluate the success of innovative outreach approaches. These measures should be designed to inform how program implementation can be improved. One of CEE’s most important success metrics is the percentage of homeowners that follow-through on a recommendation made during their home visit to do a major energy efficiency upgrade. CEE is exploring methods for improving its conversion rate above the current estimated 20%. Its goal is for 50% of the homeowners who receive recommendations for major efficiency upgrades to follow through. Twin Cities One Stop staff is exploring providing detailed insulation bids to homeowners, with pre-approved pricing, during the home visit. This approach in a previous program run by CEE resulted in a 70% conversation rate. CEE will also be implementing a home energy labeling program later in 2010.

As Twin Cities One Stop moves out of its pilot phase, the program plans to expand the services it offers to homeowners as they consider recommendations for significant efficiency upgrades. The program will eventually hire individuals whose sole job function is to follow-up with homeowners during the decision phase – carefully helping them sort through financing approaches and vendors. Duffrin dubs this role “the energy concierge.”

Impacts and Evaluation

Since the Twin Cities One Stop pilot program launched in October 2009, Home Energy Squads have visited over 1,800 homes (1,200 in Minneapolis and 600 in St. Paul).

Staffing levels have grown rapidly to respond to the interest in the program. In Minneapolis, CEE now has 15 full time field staff serving on two-person crews, and another seven full- and six part-time office staff working on outreach and data systems development for the Twin Cities pilot and for similar programs in six other Minnesota cities. Staffing levels in St. Paul have also grown; the program expects to have 10 squads working in St. Paul neighborhoods by the end of 2010.

The “all-in” cost for this work is about $550 to $600 per home, plus the value of utility rebates provided to homeowners. While CEE estimates that the program will reduce energy use in participating homes by 10 to 15% on average across all of the homes served, the energy savings are difficult to measure as robust systems are not yet in place for tracking which homes invest in energy improvements. The program is developing a data system that will use utility bill data to track energy use changes in homes visited by the Home Energy Squads. This data will be used to judge program success and to inform participants about their progress in reducing their energy use, particularly relative to their neighbors and a hypothetical “efficient home”. This

system will also allow the program to focus expensive diagnostic tests only on the highest energy-use homes.

The Twin Cities One Stop Program hopes to, ultimately, conduct home visits in every single family residential building in the cities' jurisdictions. In the near term, CEE targets completion of 3,000 Minneapolis homes in 2010 and another 3,400 in 2011.

This case was prepared by the Institute for Sustainable Communities.

Vermont Community Energy Mobilization (VCEM) Project

Mobilizing Community Volunteers to Reduce Costs

Vermont's energy efficiency utility, Efficiency Vermont (EVT), designed the Vermont Community Energy Mobilization (VCEM) Pilot Project to test whether local volunteers could cost-effectively increase home energy savings. The VCEM Pilot Project ran for five months in 2009 and included nine competitively-selected towns with active volunteer groups. The local volunteers made “home energy visits” that combined of “kitchen table discussions” about energy-saving opportunities with on-the-spot water- and energy-efficiency improvements. These ranged widely from installing CFLs and water-heater wraps to low-flow shower heads and programmable thermostats. Over 700 homes participated over the 5 months, and the levelized cost of energy savings over the life of the measures installed is 3.5 cents/KWh, not including thermal savings from reductions in heating fuel use. Efficiency Vermont had hoped this program would lead to more comprehensive home energy improvements. While 20% of the participants surveyed said they planned to have an energy assessment done, only 11 of the 576 single family homes (2%) got an energy assessment as of September 2009. EVT is looking at re-designing the program to encourage post-home visit actions such as comprehensive home energy improvements.

Background

Efficiency Vermont (EVT), the state of Vermont’s energy efficiency utility, ran intensive Community Energy Initiatives in two towns from 2006 to 2008. While EVT met its aggressive goals for annual savings (5-7% savings achieved community wide) and participation (40-45% of all residential accounts participated), it found that staff time and other expenses were significantly higher than other energy efficiency opportunities. For example, the levelized cost of energy efficiency for the Community Energy Initiative pilots was approximately 18 cents/kWh saved. In comparison, the average cost for energy efficiency measures in Vermont has been around 3 cents/kWh and the approximate cost of comparable electricity supply is 14 cents/kWh. While the Community Energy Initiatives included one-time program development and startup costs, EVT management judged that even the direct staff time spent was simply too much to meet their mandate to find low-cost sources of energy savings. In response, they decided to look for ways to engage community members more actively to reduce their staffing costs for community-based programs.

Mobilizing Volunteers

EVT designed the Vermont Community Energy Mobilization (VCEM) Pilot Project to test whether community-based volunteers could cost-effectively increase home energy savings and raise awareness about energy efficiency. The VCEM Pilot Project ran for five months in 2009. EVT held a competitive solicitation for communities to participate and selected 9 towns with active groups of volunteer organizers. These local organizers recruited other volunteers, organized “home energy visits,” coordinated the supply of energy saving products, and completed a home energy visit form with data from each home. EVT developed educational and

guidance materials, ran trainings for the volunteers, and followed up with people who asked to be contacted with more information.

Results

Ultimately over 240 volunteers went door-to-door to offer home energy visits, which consisted of "kitchen table discussions" about energy saving opportunities and on-the-spot improvements including compact fluorescent light bulbs, pipe insulation, insulated tank wraps, low-flow shower heads, faucet aerators, and programmable thermostats. Over 700 homes participated in 5 months, and the measures they installed will save 366,421 KWh and 1448 million BTUs in the first year. The total cost of the pilot was $87,000, which included program design and start up costs. These costs also included giving the local organizing groups $10/house for a community project of their choice. The levelized cost of energy savings over the life of the measures installed is 3.5 cents/KWh – close to the average 3.1 cents/KWh saved spent by EVT in 2008. This 3.5 cents/KWh saved does ***not*** include the thermal savings from reductions in heating fuel use.

Program evaluators concluded that EVT designed an effective means for reaching target populations, but the question is now how to modify this program to achieve a range of desired outcomes. Participants were satisfied with the program – 97% rated the home energy visits either favorably or very favorably – but these home visits did not necessarily lead to household investment in more comprehensive efficiency improvements. EVT did market research showing that "word-of-mouth" was the most common reason cited for Vermonters to pursue a comprehensive home energy upgrade – EVT had hoped this program would lead to many more comprehensive upgrades. While 20% of the participants surveyed said they planned to have an assessment done, only 11 of the 576 single family homes (2%) got an energy assessment as of Sept 2009. EVT is currently looking at ways to re-design the program to encourage post-home energy visit actions such as comprehensive upgrades. For example, in 2010 they are offering participants a $150 off-the- assessment coupon that expires a few months after the home energy visit to push participants towards more substantial energy improvements.

WeatherizeDC

Applying Campaign Mobilization Tactics to Drive Demand

WeatherizeDC is the anchor initiative of the DC Project, a nonprofit in Washington, DC. WeatherizeDC applies political campaign organizing tools and tactics to generate demand for home energy improvements. WeatherizeDC targets homes based on demographic information, such as age of home and household income, and reaches out to them in various ways, including door-to-door canvassing, to bring onboard participants, supporters, and volunteers. The program applies data tools such as outreach micro-targeting and tracks program metrics and best practices in real time through web-based platforms accessible to volunteers, field staff, and contractors. The program delivers a triple bottom-line message as volunteers engage homeowners in deeper conversations about the program: weatherization will (1) create high-quality jobs in DC's underserved communities, (2) result in energy savings and more comfortable homes, and (3) have positive environmental impacts. The DC Project anticipates that home energy improvements from initial pilot will mobilize $300,000 to $600,000 of private investment in energy efficiency, and project staff plan on launching programs across the US.

Background

Founded in January 2009, WeatherizeDC has served as an incubator for the DC Project to develop, test, and refine job creation in the home performance industry. Their three-pronged model includes driving demand for home energy improvements, forging partnerships that can generate high-quality jobs and workforce development for neighborhoods with high unemployment, and pursuing more affordable financing for all.

Driving Demand

At the core of the DC Project's demand creation strategy is harnessing existing neighborhood networks and relationships to mobilize consumer interest in home performance retrofits, all the while meticulously tracking data about their efforts and impact. Neighborhood residents are approached not merely as customers but as potential leaders who can spread WeatherizeDC's message within their neighborhoods, faith congregations, schools, unions, and other networks.

Ensuring High Standards

With its social- and economic-justice mission, the DC Project reached agreement with local business and labor partners to ensure that its demand creation efforts help the District of Columbia's more disadvantaged communities. The DC Project provides contractors with new business leads, provided that the partners meet specific requirements for local hiring, certification-based training, livable wages, and benefits. By partnering with home-performance businesses that meet job-quality and workforce-sourcing criteria for being a WeatherizeDC contractor, the program tries to ensure that home energy improvements create jobs in distressed neighborhoods.

Policy Engagement
The DC Project launched WeatherizeDC in a market where many neighborhoods face difficulty accessing affordable financing or attractive incentives for home energy upgrades, barriers than can put weatherization out of reach for, many residents. The DC Project is working with local government leaders and other partners to advance financing programs and other policies to support home energy improvements.

Lessons for Driving Demand

WeatherizeDC micro-targets messaging based on detailed demographic information and employs several outreach methods to reach potential program participants and supporters. WeatherizeDC relies most heavily on door-to-door canvassing. WeatherizeDC has, to date, canvassed only neighborhoods where median income is high enough that homeowners either have access to financing or can pay for improvements out of pocket.

At the doors, volunteers and paid organizers focus on developing a relationship with residents, presenting information designed to resonate with the neighborhood. Project staff tests messaging with neighborhood leaders, conduct the outreach effort, and carefully track responses. Prior to launching WeatherizeDC, the DC Project conducted focus groups that found that the top three messages homeowners responded to are; 1) immediate energy-cost savings, 2) benefits to the environment and 3) local job creation. “However, with experience we discovered that the number one reason people were choosing to weatherize their homes was actually increased comfort, a message not included in the original focus-group testing,” says John Lauer, DC Project Program Director.

Canvassers are trained to educate homeowners, answer basic questions,, gauge interest in weatherization, then sign people up to attend a house or community meeting, usually within the week. Field director Sam Witherbee explains that “we found it is much more effective to ask them at the door to attend an already scheduled meeting in their neighborhood, in fact we often knock on doors around the house where the next community meeting is scheduled.”

At the meetings, homeowners learn about WeatherizeDC and hear other homeowners talk about their experience with weatherization. Staff offers to connect the homeowner with a contractor. Approximately 55% of homeowners who attend a meeting commit to getting an assessment, and over half of those have followed through with an assessment to date. The DC Project discovered that the messaging that drives people to a meeting is not necessarily the same as what they express interest in at the meetings. At the doors, people say energy savings and comfort are their primary reasons for interest. When people gather with their neighbors and peers, they express more interest in the greater good, the economy, and jobs.

While WeatherizeDC tailors the primary message (the quick pitch) according to the audience, it delivers a triple bottom line message to all potential supporters as they engage in deeper conversations about the program: weatherization will create high-quality, much-needed jobs in the district’s underserved communities; it will provide monetary savings and comfort to

homeowners; and it is good for the environment. This approach gains the support of individuals and organizations with varying interests and priorities.

The DC Project also relies heavily on online outreach through its “New Media Suite,” using Facebook, Twitter, YouTube, Flickr, email and blogs to reach diverse audiences. Messages are tailored to the audience rather than copied from a template, and responses are tracked digitally.

Outreach tactics are adjusted based on results. These assessments are also shared with organizers to motivate them and track their progress toward goals. WeatherizeDC tracks a host of metrics about its efforts including:

- Volunteer engagement: collaborating organizations, energy captains, team leaders, trainings, training attendees, campus fellows, active volunteers, and specific volunteer interests, profiles, and constituencies;
- Weatherization outreach: doors knocked, phone calls made, depth and type of interest by homeowners, households at energy meetings, households connected with local green businesses;
- Industry fulfillment: assessments completed, homes weatherized, money generated, jobs created, and energy consumption and reduction.

WeatherizeDC volunteers and contractors talk to homeowners during home energy assessments and improvements process to better understand their energy usage, energy-improvement needs, and estimated savings that will be realized post-upgrade. Homeowners are encouraged to track their energy consumption through Earth Aid, a free web application that enables households to monitor their electric and gas usage.

Impact, Cost & Evaluation

Four months into its pilot, WeatherizeDC has trained over 200 volunteer leaders, partnered with 24 local organizations, visited 2,126 homes, and brought 220 households to energy meetings. Of those, 70 have completed energy assessments, and 17 have completed home improvements, with more homeowners connected to a contractor and planning improvements. The DC Projects anticipates that completed upgrades and leads from the pilot will mobilize $300,000 to $600,000 of private investment in energy efficiency. To date, four full-time jobs have been created for DC residents in high-unemployment neighborhoods.

This case was prepared by Green for All.

Appendix B – Contractor Survey Methodology

We received a list of 52 randomly selected Home Performance contractors from Efficiency First's membership database and administered the following survey by phone to 30 of the 52 contractors that we were able to reach. We will publish a more complete set of results from this survey in a subsequent publication.

Survey Script

1. We want to know what you think are the **top three drivers** for your clients to follow through with a home retrofit. We would like you to rank these in order of importance from a list we will give you. If there are only 1 or 2 top drivers in your opinion, you can just choose 1 or 2. I'll read the list, and then you tell me the top three drivers in order of importance. If there is something we are missing, we can add it to the list:

    - Environmental awareness and/or climate change
    - Comfort
    - Saving money by increasing energy efficiency
    - General concern about home repair and maintenance
    - Improving health issues
    - Broad social concerns like job creation and community involvement
    - Increasing home or business property value
    - Positive recommendation from a friend or colleague
    - Utility/public incentives
    - Other, please describe: _____

Any additional thoughts on what is most important to get your clients to follow through with a home retrofit:

2. Are there government or utility programs in your area that encourage retrofits? Yes/No
   If yes, what do you like most about those programs?

3. If you could create from scratch a publicly-funded program to encourage retrofits, what are the **top three program design elements** you would include to make that program successful, in order of importance? If there are only 1 or 2 top program elements in your opinion, you can just choose 1 or 2. I'll read the list, and then you tell me the top three program elements in order of importance. If there is something we are missing, we can add it to the list:

    - Free or subsidized audits
    - Rebates for home owners
    - Marketing and education for home owners
    - Financing for home owner
    - Interim financing and growth capital for contractors
    - An energy advocate to walk the home owner through the retrofit process
    - Training in marketing and sales for contractors
    - Home performance skills training for contractors

- Quality assurance standards for the program, such as 3rd party verification
- Other, please describe: _____

Any additional thoughts on what is most important for publicly-funded programs that encourage retrofits:

4. Now let's focus specifically on **marketing and outreach** to drive demand for retrofit work in homes. I'm going to read a list of possible ways to market retrofits to home owners. For each, I'd like you to rate how effective you think each could be from **5 = extremely effective** to **1 = not at all effective**.

- **Local** awareness campaigns about energy efficiency through TV, radio, and print media
- **National** awareness campaigns about energy efficiency through TV, radio, and print media
- EE and financing program outreach via local lenders
- Requiring home owner attendance at an educational workshop that discusses EE and RE options, with a focus on cost effective options, before qualifying for financing or rebates
- Traditional contractor marketing and advertising
- A coop marketing program where the govt pays for part of a contractor's own advertising expenses within certain guidelines
- Contractors converting single issue inquiries (like the replacement of a furnace or windows) into more comprehensive projects
- Door-to-door outreach campaigns where neighbors encourage each other to sign up for retrofits
- Community competitions where towns compete against each other to save energy
- Home Makeover competitions where homes apply for an "energy makeover" and the winners receive media attention about the improvements they made
- Online advertising through paid search queries, Facebook, Twitter, etc
- Outreach campaigns organized by congregations, community groups, and other nonprofits.

5. How much would your company be willing to pay to acquire a new customer that wanted a comprehensive home retrofit? Again, your response will remain anonymous.
6. Is there anything else we should ask you to understand what actually drives demand for retrofit work in homes?

7. Finally, we'd like to ask a few questions to better understand your particular company. All of your responses will be confidential, and this information will not be able to be connected with your company:

    - Are you a BPI accredited contracting company? Yes/No
    - Number of full time and part time employees: _____ FT _____ PT
    - How many BPI certified professionals do you employ? _____ people
    - Approximate dollar sales **for home retrofit work** in 2009: $_____
    - Number of homes retrofitted in 2009 _____
    - Number of homes retrofitted since Jan 2010 _____
    - Average project value for retrofit work per home: $ _____
    - How would you describe the type of customer that you target? _____

Appendix C – Acronyms

BNEC	Baltimore Neighborhood Energy Challenge
BPA	Bonneville Power Administration
BPI	Building Performance Institute
BTU	British Thermal Unit
CAC	Community Advisory Committee
CEE	Center for Energy and Environment (in Minnesota)
CFL	Compact Florescent Light
CMI	Community Mobilization Initiative
CO_2	Carbon Dioxide
CPA	Chinese Progressive Association
EECBG	Energy Efficiency and Conservation Block Grant Program
EWEB	Eugene Water & Electric Board
EVT	Efficiency Vermont
GHG	Greenhouse gas
HELP	Home Energy Loan Program
HER	Home Energy Rater
HPwES	Home Performance with Energy Star
HRCP	Hood River Conservation Project
HVAC	Heating, Ventilation, and Air Conditioning
ISC	Institute for Sustainable Communities
JEEP	Jasper Energy Efficiency Program
LEED	Leadership in Energy and Environmental Design
LIGH	Long Island Green Homes (operated by the Town of Babylon, NY)
MEC	Marshfield Energy Challenge
MMBTU	Million British Thermal Units (BTU)
MTC	Massachusetts Technology Collaborative
MW	Megawatt
MWh	Megawatt hour
NEC	Neighborhood Energy Captain
NLRP	New London Resource Project
NPPC	Northwest Power Planning Council
NRDC	National Resources Defense Council
NYSERDA	New York State Energy Research and Development Authority
PG&E	Pacific Gas & Electric
PP&L	Pacific Power and Light
PSAs	Public Service Announcements
PV	Solar Photovoltaics
RCS	Residential Conservation Service
REEP	Residential Energy Efficiency Program (operated by the City of Houston)
RESNET	Residential Energy Services Network
RFP	Request for Proposal
RPV	Resource Partner Volunteers
SMUD	Sacramento Municipal Utility District
VCEM	Vermont Community Energy Mobilization Project
WECC	Wisconsin Energy Conservation Corporation
ZIP	Zero Interest Program (operated by Pacific Gas & Electric)