Successful State and Local Approaches to Improving Efficiency in Existing Homes

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ABSTRACT

Existing homes in the U.S. represent an enormous but challenging opportunity for cost-effective energy efficiency improvements. Three policy and programmatic approaches that cities, states, and utilities have used to successfully reduce barriers to energy efficiency investments and to bolster the efficiency of the existing housing stock include financing programs, residential energy conservation ordinances, and home energy rating systems linked with energy mortgages. This paper explores how these policies work and based on a review of numerous programs, presents recommendations on how to improve their effectiveness.

Introduction

America's more than 90 million existing homes represent an enormous opportunity for cost-effective energy efficiency improvements. However, without significant incentives, homeowners are often reluctant to invest in energy efficiency improvements because of lack of capital and uncertainty regarding factors such as the savings that will result from specific measures, how long they will own the home, and the resale market value of the efficiency improvements. Landlords also typically have little incentive to make capital improvements since tenants typically reap the benefits of these investments through lower utility bills.

This paper surveys three policy and programmatic approaches that cities, states, and utilities have used to reduce barriers to energy efficiency investments and to bolster the efficiency of the existing housing stock. These include:

- financing programs;
- energy conservation ordinances and standards; and
- home energy rating systems linked with energy mortgages.

The success of a policy in increasing homeowners' investment in energy efficiency depends on a number of factors ranging from political and financial considerations to the culture of the particular community. This paper explores each option and considers how jurisdictions might use these policy instruments to their best advantage. Numerous programs were reviewed to support the findings for this paper. A comprehensive review of these programs can be found in Suozzo, Wang & Thorne (1997). A few programs that include unique features that contribute to their success are highlighted in this paper.

Financing Efficiency Improvements in Existing Housing

Financing programs for home energy improvement activities, including zero- and low-interest loan programs, are offered by several states, many utilities, and a handful of other organizations throughout the country. In an era of declining utility rebate programs for energy efficiency, financing programs are

gaining renewed attention and importance. States and utilities are re-examining the role of financing incentives in fulfilling energy conservation goals.

The Mechanics of Loan Programs

Loans provide borrowers with access to significant amounts of capital that may be used for an array of energy conservation improvements. Many programs attract borrowers to invest in energy efficiency improvements by making capital available at below market rates and often for generous repayment periods. To steer consumers in one direction or the other, loan program administrators may design the interest rate structure based on the amount borrowed or the length of the loan (e.g., lower interest rates may be offered on larger loans to encourage more energy improvements).

A number of loan programs also provide consumers with a centralized informational and service clearinghouse, or a "one-stop shopping" station where trained staff are available to answer consumer questions and concerns on the loan programs, expedite same-day credit approval over the phone, dispense auditor and contractor referrals, provide contractor arranging and bidding services, and/or process loan applications. These services greatly simplify the loan participation process and increase consumer interest.

Many states and utilities work with partners in delivering and marketing home energy loans. This helps the lead agency/organization responsible for a loan program to conserve its resources while allocating services to those partners with expertise. First, a number of states and utilities fund third-party organizations to deliver and even design residential energy conservation loan programs. For example, the Wisconsin Energy Conservation Corporation (WECC) administers and processes residential loans for several Wisconsin utilities, as does Volt ViewTech, a small lending institution, for Pacific Gas & Electric (PG&E) and other utilities throughout the country. Second, most programs also rely on the financial local lending institutions to underwrite loans and to simplify the lending process for participating borrowers. And third, energy auditors and contractors are often key partners in marketing loan programs. To gain their support, many of the loan programs offer customers a referral service or listing of participating contractors, as well as auditor and contractor training.

The lead agency also often provides some form of quality control so that funds are not misused and to ensure that contractors are providing homeowners with quality service. These efforts may range from providing auditor/contractor training (mentioned above) to requiring inspectors to sign off on jobs before payments are authorized. Some programs require pre-loan energy audits, which are valuable because they offer an opportunity for the auditor to interact one-on-one with homeowners and to educate them on the program guidelines and the benefits of energy efficiency. Program administrators also typically perform some tracking of program success, necessary to understand the market for the loan and to address any barriers to participation.

Improving Loan Program Effectiveness

A review of wide array of loan programs, that differ in program administration and design (including the rate offered to consumers, whether they charge for certain services, marketing and outreach to consumers, and partnerships) suggests several approaches for improving their effectiveness of loan (Suozzo, Wang & Thorne 1997). These generally are aimed at reducing barriers to customer participation.

Make it simple to participate. A loan program, like most voluntary programs, must not raise any more barriers than consumers already face in making energy efficiency investments. Instead, loan programs

should be designed to make it easy to get a loan. Programs that have simple loan application processes (with same-day loan approval and applications by phone) and offer services such as auditor and contractor referrals and contractor bid review facilitate participation (e.g., WECC"s New London Project).

Provide consumers with choice. Flexibility in borrowing amounts, interest rates, repayment period, and measures eligible for loan funds is attractive to consumers. Some customers may have limited opportunities for energy efficiency improvements in their home or may be unwilling to pursue recommended efficiency improvements; flexible loan packages give customers the freedom to choose the most appropriate options for their home.

Build in quality control mechanisms. While increased choice may attract consumers, it may also lead them to implement measures that are not cost-effective. Some programs require audits or face-to-face meetings before issuing a loan (e.g., Connecticut's Home Energy Loan Program) to help educate consumers about the cost-effectiveness of alternative energy conservation measures. Other programs key in on contractor education and preferred contractor programs or provide quality assurance inspections to encourage quality workmanship.

Partner with experts to deliver loan services and market the program. The presence of an attractive loan by itself will most often not be enough for the customer to act and should not be used as a substitute for effective program delivery and marketing (Edgar 1995). Unless the process is hassle-free and customers believe that there is substantial aesthetic, comfort, or savings benefits, they will probably not invest the time or resources to pursue it. Education and partnering with stakeholders who benefit from the program aids program delivery and marketing efforts. As mentioned above, many state and utility loan programs rely on the financial expertise of progressive lending institutions and vendors to simplify the lending process for participating borrowers. Nebraska "sweetens the pot" for participating lenders by purchasing half of the loan immediately after the loan closing so that lender effectively realizes twice the interest rate it charges customers (see Case Study #1). In addition, referral and arranging services provided by state and utility programs, minimize homeowner burden, and benefit auditors and contractors who, in turn, help to market the loan program. Furthermore, partnerships with lenders, auditors, contractors, and others are becoming increasingly important as oil-overcharge funds for loan programs dry up and federal funds decrease. More and more programs are experimenting with creative financing solutions and cost-recovery mechanisms (e.g., Connecticut, PG&E, and Wisconsin) to stretch available funds and foster long-term program sustainability.

Residential Energy Conservation Ordinances

A number of communities and states have adopted RECOs as a mechanism for improving the efficiency of the existing housing stock. These ordinances require homeowners or landlords to implement specific low-cost energy conservation measures at the time their house or rental property is sold or renovated. RECOs are designed to bring the existing housing stock (often with a focus on multi-family units or rental housing) up to some minimum standard of efficiency, and in fact, in certain cases, cities and states have incorporated RECO-type requirements into the housing code in the form of minimum weatherization standards. Provided that the political and institutional climate is favorable, RECOs can: (1) guarantee improvements in the existing housing stock to higher levels of efficiency (some estimates suggest energy savings of 15 percent); (2) ensure a minimum level of home comfort for residents and

Case Study #1:
Nebraska Dollar and Energy Savings Loan Program

Through a prudently designed partnership between the state government and local banks, savings institutions and credit unions, the Nebraska Energy Office leveraged nearly $39 million in private sector capital using $22 million state oil overcharge funds and $19 million in repayments (NEO 1997a; Osterman 1997). Since the programs inception in 1990 the program has issued more than 12,500 loans in all sectors (worth approximately $80 million) that has financed more than 13,000 projects, and saved over 4,400 MWh of electricity and 141,000 therms of natural gas annually (IRT 1994; NEO 1996b, 1997b). Most of the funds $62 out of $80 million) support residential energy conservation projects (NEO 1996a).

The mechanism by which the Nebraska Energy Office subsidizes the energy conservation loans preserves 100 percent of the original loan pool used to leverage low-interest funds from the private sector. This strategy increases the program's capacity to offer a great number of loans while conserving funds for administrative resources and fixed costs for either partner (IRT 1994). For a particular energy retrofit project, the Energy Office uses oil overcharge funds to purchase one-half of the loan amount approved by the lending institution at 0 percent interest (e.g., the Energy Office immediately pays $10,000 to the lender for its share of a $20,000 loan). This transaction is transparent to the borrower, who continues to pay 6 percent interest on the full amount of the loan (e.g., $20,000). After the project is completed, the lender verifies the work through a physical inspection or proof of purchase and the borrower proceeds with loan repayment. As the borrower pays back the loan plus interest to the lender, the lender returns the state's portion of the original loan amount to the Energy Office to begin the cycle again with another homeowner.

The lender is motivated to provide its loans at below-market rates in part because of the reduced risk it faces and the relatively high rate of return that it receives—the bank still gets 6 percent on the whole principal, despite the fact that half of the principal is owned by the Energy Office, thereby effectively earning 12 percent on its half of the loan. More than 320 Nebraska banks, savings institutions, and credit unions at more than 675 locations across the state

renters; (3) cost relatively little to operate; and (4) help to support jobs in the community by providing a regular source of work for energy auditors, contractors, and other conservation professionals.

RECOs In Action

RECOs typically require measures such as attic insulation; water heater tank and pipe wraps; duct sealing and insulation; weather-stripping and caulking for windows, doors and cracks; and water-saving measures. A given community typically chooses those measures that optimize energy savings at the least cost for that area. Weatherization measures tend to produce greater energy savings in colder climates, such as Vermont and Wisconsin, and less overall savings in temperate and warm climates, such as Virginia and California. Hence, measures such as attic and wall insulation tend to be stricter in colder communities. The typical attic insulation requirement in Wisconsin, for example, is R-38, while in San Francisco it is R-19. In dry climates, water conservation measures may be featured in the RECO. Finally, in locations with many more apartments than single-family homes in the existing housing stock, the RECO may focus its requirements on multi-family buildings in order to capture energy savings in a larger share of the housing stock (Butterfield & Eisen 1987).

In most cases, the seller is identified as the party responsible for compliance, although some communities put the onus of RECO compliance on the buyer or allow both the seller and buyer to use RECO compliance as a part of the negotiations of sale. The seller (or buyer) typically is required to contact an inspector to physically examine the home and identify those items that do not meet the RECO

requirements; the seller (or buyer) then is responsible for contracting for the required retrofit measures (or where permitted, performing the retrofits him/herself).

Many communities include cost ceilings in their RECOs that set a limit on the total amount a homeowner must spend to comply with the ordinance at either a pre-determined dollar amount (such as $1,000) or a small percentage (usually about 0.75 percent to 1 percent) of the selling price or cost of renovation of the home. In addition, many RECOs provide stipulations that exempt homeowners from implementing certain measures if they result in major alterations to the integrity of the building structure or if they involve items that are inaccessible.

Once the homeowner implements the required measures, an inspector typically returns for a final inspection to verify compliance and either issues a "certificate of compliance" or requires the contractor to return to perform more work. A final inspection and certificate of compliance represent the minimum level of enforcement. Additional strategies may require the homeowner to show proof of compliance before the deed is recorded and/or ensure that the home is re-certified by an energy inspector every few or more years. More sophisticated enforcement systems include tracking mechanisms that follow the RECO process, issuing follow-up reminders to responsible parties, and prosecuting for non-compliance

Recommendations for Designing and Implementing RECOs

RECOs and weatherization standards target easy to implement (and relatively small) household energy efficiency improvements that reach a large portion of the households in a given community, rather than on large per household energy savings. However, if a community can achieve the political support needed to approve the ordinance and effectively enforce its requirements, a RECO can result in substantial overall energy savings in the housing stock and cost relatively little to implement. Based on case studies examined in Suozzo, Wang & Thorne (1997), a number of themes emerge as important in designing and implementing successful RECOs.

Engage interested parties in all phases of RECO development and implementation. Many communities are reluctant, particularly in the current political climate, to impose additional requirements, such as time of sale energy conservation requirements, on their constituents despite the benefits. Other communities that have managed to codify these requirements often have lax enforcement, thus losing a significant opportunity to garner the benefits. Still other communities and states had in place (or were developing) standards that fell to political pressure, primarily from the real estate community (e.g., Portland, Oregon and South Dakota).

As a result, it is important when designing a RECO to get the support of energy auditors and inspectors, Realtors, and homeowners early in the process and throughout all phases of its development (see Case Study #2). Simple, easy to implement, and less aggressive energy requirements may make it easier to win the support of more stakeholders and to get the standards approved. Difficult requirements can lead to opposition and likely demise of an otherwise satisfactory RECO. In addition, a predictable, agreed-upon process for revising the ordinance built into the program's design can provide program managers with flexibility to improve the ordinance and some assurances that the key stakeholders will expect gradual but continuous improvements to the program.

Once the ordinance has passed, regular communications with Realtors, title companies, and property owners aimed at creating awareness and generating support for the program can bolster compliance monitoring, enforcement, and homeowner/buyer education efforts. Communities and states that emphasize stakeholder education and training on the requirements of the RECO find that they win

Case Study #2
San Francisco's Residential Energy Conservation Ordinance

Since its adoption in 1981, the ordinance has resulted in the weatherization of more than 160,000 homes and reduced average household energy consumption by more than 15 percent, saving the city a total of $6 million (DOE 1996). Currently, at least 65,000 units are known to be in compliance with the RECO.

The city introduced the RECO as a means of reducing the impact of rising energy costs on its population. One intent of the ordinance was to encourage rental property owners, in particular, to maintain their buildings and, in turn, benefit the 70 percent of San Francisco's residents that rent housing—many of whom pay their own electricity and water heating bills. More generally, the ordinance was seen as a means of tapping the largely untapped potential for energy conservation in the existing housing sector, which market forces were not reaching.

Initially, the ordinance met the resistance of the real estate community. However, strong support for the RECO from the city's Board of Supervisors, extensive public support, an intensive educational campaign, and annual training workshops for both city and private inspectors quelled their opposition. Realtors were eventually persuaded that RECO compliance, and hence home energy savings, could be used as a selling point to increase home sales. At this point, the San Francisco RECO is a routine part of title transfer (DeSnoo 1997).

stakeholder support and foster an environment in which verifying compliance with the RECO becomes a routine part of doing business (e.g., San Francisco, Berkeley, and Wisconsin). At the same time, inspectors and Realtors become a valuable source of information on the ordinance for homeowners.

Develop effective compliance tracking and enforcement mechanisms. In addition to garnering stakeholder support, successful energy conservation ordinances and weatherization standards have well-developed systems for tracking and enforcing compliance. Today computer databases with links between relevant city agencies (e.g., the energy office that implements the RECO and the assessor's office that tracks property values and transactions) provide a more sophisticated means of tracking RECO compliance than was available just a few years ago. A number of programs (e.g., San Francisco and Wisconsin) have been quite successful at employing these tools. More important to the RECO's success in increasing energy efficiency is effective compliance enforcement. Clear and predictable responses to non-compliance and appropriate penalties for non-compliance have been successfully employed in San Francisco and Wisconsin. These programs employ strategies including sending warning letters, withholding recording of the property transaction, and imposing property liens and fines to discourage non-compliance. However, the enforcement system does not have to be complicated or "high tech" to be effective. Berkeley uses index card files to track compliant residential units and relies heavily on Realtors and title companies, which do not want to be responsible for selling properties encumbered by RECO liens or fines, to pursue RECO compliance.

Collect and disseminate program impacts data to stakeholders. One of the largest obstacles encountered in assessing the benefits of RECOs and weatherization codes is the lack of data on program impacts. For many programs, energy savings estimates and data on other intended and unintended program benefits are either unavailable or not readily accessible. Demonstrating the ease of compliance to homeowners, the energy saving potential to home buyers, and the professional benefits to other stakeholders is essential to garnering their support. In general, where stakeholders perceive substantial program benefits, they will be supportive. Realtors in San Francisco and Berkeley are allies of those programs, in part because they see RECO compliance as a selling point for homes. Dollar and energy

savings, job creation, and pollution prevention data, as well as qualitative impacts, illustrate how well the program works to political constituents (including taxpayers who ultimately fund and are subject to the program). Additionally, assessments of the impacts of alternative program designs can help program managers define and refine provisions of the ordinance to achieve the greatest energy savings. Unfortunately, few programs build in mechanisms for gathering information on program benefits and stakeholder perceptions at the program's outset.

Home Energy Rating Systems (HERS) and Energy Mortgages (EMs)

Home energy ratings systems (HERS) and energy mortgages (EMs) work in concert to provide consumers with information and mortgage incentives to improve the energy efficiency of existing homes or to assist customers in purchasing a home that has been rated as energy-efficient. Home energy ratings provide standardized comparisons between the energy consumption of one home against a reference home, regardless of fuel use. EMs include energy improvement mortgages (EIMs), which provide financing for upgrading an existing home, and energy-efficient mortgages (EEMs), which "stretch" the debt-to-equity ratio above maximum loan limits for those homes rated as energy-efficient. Currently, more than 20 states offer HERS programs, although many of these programs are but a few years old. For the most part, these states have spent the last few years establishing the infrastructure necessary to deliver HERS and EMs directly to consumers and have performed relatively few ratings. As a result there is little information on (and likely little actual) energy savings from these programs at this point.

How HERS Work

Virtually all HERS programs rely on the performance-based scaled rating system outlined by the U.S. Department of Energy (DOE) Voluntary HERS Guidelines. This draft represents a consensus between the technical committees of two key organizations: the HERS Council and the Residential Energy Services Network. Homes are rated according to their efficiency on a scale of 1 to 100; this rating is then translated into an easy-to-use star rating (1 to 5 star ratings, with 5 star being the most efficient).

An energy rater can choose from a variety of computer rating software programs to assist in estimating the home energy rating (e.g., Rateview, REMRate, and EZ Rater). Ideally, the rater performs diagnostic tests to complement the data input requirements of the rating software, which many states now require as a part of a home energy rating. From this information, an energy rating report is produced. This typically includes the home's rating, a description of its energy-features, information on estimated energy use and cost, and recommendations on cost-effective improvements. Because an accurate energy rating is of primary importance to lenders and consumers to ensure that their energy investments will produce positive cashflow, knowledgeable and experienced raters are needed to generate accurate and credible ratings. Thus, a number of HERS providers offer comprehensive rater training and certification programs

One of the most important tasks of the HERS provider is program marketing and education (Farhar, Collins & Walsh 1996). Marketing campaigns for HERS programs generally need to target all of the stakeholders involved in the home purchasing process, as each party is also a potential ally in marketing HERS and EMs to the home buyer. Educating the lending community, real estate professionals, energy auditors and raters, and consumers about the positive benefits and profitability of a home energy rating linked with EMs can help ensure that HERS providers will have allies in marketing the program and generating a continuous demand for their services.

Most state-wide scaled home energy rating programs incorporate quality control and monitoring as a key element of their programs and several have participated in a DOE-sponsored program evaluation (see Collins et al. 1994; Farhar, Collins & Walsh 1996; Farhar, Collins & Walsh 1997). In the past, however, tracking and monitoring of EMs by the primary and secondary mortgage market has been lacking, particularly since most mortgage lenders are still unaware of the products currently available nationally.

Increasing the Value of HERS

For the past 10 to 15 years, the HERS and EMs industries have been developing and refining their products while building an infrastructure to accommodate the delivery of these products to consumers. The infrastructure requires an educated stakeholder group consisting of consumers, lenders, Realtors, auditors, utility personnel, appraisers, contractors, and builders, from both the private sector and all levels of the government. The infrastructure has been reinforced and is supported by federal legislation enacted in the early 1990s, the secondary mortgage market, and several federal offices. Today, the infrastructure is mostly in place and the industry is on the verge of exploiting a market that is just beginning to respond with consumer demand. The task is not finished yet, however. The lessons of several programs suggest additional activities to support HERs and EMs.

Ensure rating accuracy. An accurate energy rating is of primary importance to lenders and consumers to ensure that their energy investments will produce positive cashflow. Ensuring that an energy rating is accurate is not a trivial matter. To build lender confidence, however, some HERS providers put a premium on rater quality control (see Case Study #3). Leading private mortgage companies in the United States have recommended that a non-governmental, industry-driven system of HERS accreditation be developed to ensure the mortgage industry's investments in residential energy efficiency will be economically viable. To that end, a committee composed of state energy officials and operating home energy rating systems is developing an accreditation program.

Redouble marketing efforts. Once consumers learn of the availability of HERs and EMs, consumers are generally receptive. The challenge, however, is exposing consumers to the availability of these products. The industry must continue to expand its network of trained and knowledgeable stakeholders for HERS and EMs. Realtors and lenders are potentially key allies in reaching consumers. However, Realtors may perceive that transactions involving home energy ratings and EMs involve additional paperwork, which may complicate and jeopardize a sale. To mitigate this concern, the benefits of selling energy efficient homes that would enable participating Realtors to distinguish themselves from competitors can be highlighted. For example, drawing the connection between energy-efficient homes and "quality" and "healthy" homes, which appeals to consumers, can add value to a home energy rating and potentially facilitate sales. Lenders may be hesitant about offering EIMs (most existing homes are not efficient enough to qualify for EEMs) for fear of hassles in handling escrows and the risk that energy improvements won't be done on budget and won't achieve a reasonable HERS rating when complete (Faesy 1997).

Improve data collection and tracking. A comprehensive organized system for data collection and program evaluation is crucial for isolating and precisely defining problems so that programs can be improved upon, and also important for generating further stakeholder support for HERS and EMs. Several questions about the effectiveness of HERS and EMs, all of which depend upon well-organized data

Case Study #3
Kansas Energy Star℠ Program

Formally established in February 1996, this program operates within the Housing Division of the Kansas Department of Commerce and Housing. Although relatively new, the Kansas Energy Star℠ program appears to be well designed, with a strong emphasis on monitoring and quality control, and consumer education and marketing.

From the outset, Kansas Energy Star℠ made quality control of its raters and program monitoring major components of its program design. Kansas Energy Star℠ provides a week-long training course for raters, involving both classroom and field education. After a written exam within the classroom setting, the trainees submit their first three ratings to Kansas Energy Star℠ for review. Kansas Energy Star℠ monitors 60 percent of all subsequent ratings throughout the rater's two-year tenure for quality and accuracy by matching rating results against the homeowner's utility bills. Kansas Energy Star℠ also tries to perform comprehensive evaluations of at least 10 percent of all ratings. To renew their licenses, raters, certified for two years, must pass a written exam and then submit two ratings (one based on plans and one based on a site visit). Prior to the exam, an optional two-day refresher course is held. To date, over 90 percent of raters seeking re-certification have opted to attend the course.

The program also takes responsibility for delivering the necessary tools for raters to become successful in their businesses by incorporating basic marketing principles in rater training and producing and distributing marketing materials to its raters. Most of Kansas Energy Star℠ marketing materials target homeowners, rather than lenders and real estate professionals. The marketing campaign includes printed materials mentioned above and television public service announcements. Kansas Energy Star℠ relies heavily upon its raters to market the program to homeowners and Realtors, who in turn educate the lenders in their area on providing EEMs.

One person administers the Kansas Energy Star℠ program within the Division of Housing. He is responsible for the program implementation, design, marketing, and training of raters, one-third of whom are Weatherization Assistance Program employees.

collection systems, remain unanswered. For example, data is needed on the number and percentages of ratings used for financing or other incentives. More information needs to be gathered on the recommended energy improvements that are actually implemented. And information is lacking on the market resale value of energy-efficient homes versus homes that are not (Farhar, Collins & Walsh 1996). To address some of these issues, an evaluation of HERS and EMs in the Housing and Urban Development/Federal Housing Administration (HUD/FHA) pilot states has been planned and is being implemented (see Collins et al. 1994; Farhar, Collins & Walsh 1997). The results of this work is beginning to reveal some of the keys and barriers to successful HERS programs and suggest approaches for designing and delivering effective programs. Accounting of ratings performed, financing programs accessed, and dollar and energy savings resulting from retrofit projects will be increasingly important for program sustainability as the industry grows.

Better link HERS and EMs. A number of states and localities have made significant progress toward linking their HERS programs with lenders that provide EMs. However, in the five HUD/FHA pilot states, many ratings were performed with relatively few EEMs issued. The future availability of EM products depends primarily on greater consumer demand for ratings, but also on greater participation from the primary and secondary lending community. Leadership is emerging among several private lenders (Chase Manhattan, Inland Mortgage, PHH, Countrywide Home Loans, GMAC, Norwest) as well as the U.S. Environmental Protection Agency (EPA), which developed energy mortgage and energy financing products to support its ENERGY STAR® Homes program.

Combining Elements of Retrofit Programs

Some of the retrofit policy instruments examined in this report are more effective at attracting customers and garnering energy savings than others. Because of their relative simplicity, RECOs tend to be the lowest cost option to implement, requiring relatively small start-up budgets and subsequent administration. RECOs, however, do not produce huge per household energy savings. And to pass a RECO that satisfies the interests of multiple stakeholders presents challenges. Loan programs, while potentially costly to start-up and market, may offer the "biggest bang for the buck" in terms of energy conservation dollars. But their success is largely dependent on the extent to which consumers are aware of the loan product and perceive energy efficiency as beneficial. HERS programs require considerable resources early in the program development phase for building partnerships, establishing program infrastructure, marketing the program to its beneficiaries (including contractors), and building lender confidence. Although, since most HERS programs are in the relatively early stages of development, it is too early to assess the energy savings attributable to information gleaned from home energy ratings.

Combining elements of these programs, however, is likely to result in more opportunities for education, greater participation, and ultimately greater energy savings. A number of recommendations for combining elements of home energy efficiency improvement programs follow:

- Require ratings instead of RECO inspections or in lieu of loan program audit requirements;
- Expand use of home energy ratings and link with other energy efficiency financing.
- Offer energy efficiency financing to ease the financial burden on parties subject to RECOs;

More and more products relying on home energy ratings would serve to support and bolster the value of home energy ratings and development of HERS infrastructure. At the same time, information on home energy ratings in a given community could be used to inform the design of RECOs and loan programs. For example, the distribution of rating values among energy-rated homes could be used by RECO and loan program managers to establish baseline energy use and determine program requirements, such as minimum standards or eligible conservation measures. A home's energy rating can be used to trigger a combination of performance-based and prescriptive requirements for a RECO. For example, a rating below a given threshold can trigger specific prescriptive requirements, whereas a rating above that threshold can indicate compliance with the RECO.

For loans, ratings and accompanying recommendations for energy improvements can be used to help program participants determine which measures to invest in, thus minimizing the number of less effective energy conservation measures that consumers might otherwise implement. Energy improvement financing products can also use energy ratings as a basis for determining eligibility and financing terms.

To encourage compliance with RECOs or weatherization standards, program managers can forge linkages with programs that sponsor low-interest loans and EMs. These financing products offer consumers access to more or cheaper capital, such as zero- and low-interest loans, federal energy improvement products for homeowners seeking to upgrade their homes, and governmental and private secondary mortgage market EEMs for new home buyers, and thus can make compliance with RECOs and weatherization standards more affordable.

In addition to offering potential benefits in terms of participation and energy savings, combining elements of different programs enables program managers to partner with new and different stakeholders (e.g., real estate professionals may begin encouraging home energy ratings if ratings are used to determining RECO compliance) and offers the potential for greater cost sharing among programs.

Together, energy conservation ordinances, loan programs, and rating systems can demonstrate that cost-effective home energy efficiency improvements are achievable, save energy, and benefit the communities in which they are implemented.

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