3. RESIDENTIAL PROGRAMS

The key informants identified 17 resource acquisition programs in the residential sector. These programs include audit programs, weatherization retrofit programs, loans for residential equipment and weatherization, equipment purchases and new construction. We completed 11 summaries for programs in the residential sector. Two were dropped either because the program was yet to be developed or because the programs were all market transformation programs, and four summaries could not be completed.

Some of these residential programs have been operated for over 10 years and have been revised multiple times to reflect different requirements from utility management or regulators as well as from customer and trade ally response. As a consequence our contacts rarely could discuss the early lessons learned in the first six months of a program. Rather, they focused on what they see as the effective aspects of the programs either today or at the apex of the program's implementation if it is no longer being implemented.

Perhaps surprising to the reader will be the lack of budget information or savings information for many of the programs. Our contacts often did not have this information, in some cases had done no recent evaluation work, and for budgets often felt that it was confidential to the organization they represent. This proved to be true for residential as well as commercial and industrial programs.

Table 3 provides a list of the 12 programs we reviewed for the residential sector along with the type of program and the location of the program.

Table 3

PROGRAMS IDENTIFIED FOR THE RESIDENTIAL SECTOR

ORGANIZATION	PROGRAM	TYPE	LOCATION
Benton County PUD	Dipstick Weatherization Program	Audit & Weatherization	Northwest
Efficiency Vermont	Lighting and Appliance Rebates	Rebates	Vermont
Efficiency Vermont	Residential High Use Program	Audit, Weatherization	Vermont
Energy Efficiency Homes Midwest	ENERGY STAR® Homes Program	New Construction	Indiana
National Grid	Appliance Management Program	Base Load	Northeast
National Grid	EnergyWise Program	High Use Weatherization	Northeast
New Jersey Utilities	Residential HVAC Program	HVAC	New Jersey
Northeast Utilities:	Lighting Catalog	Lighting	Northeast
Sacramento Municipal Utility District	Residential Loan Services	Loans	California
Tacoma Utilities	Residential Weatherization Program	Audit, Weatherization & Loan	Northwest
Wisconsin	High Efficiency Furnace Program	Furnaces & Weatherization	Wisconsin
Wisconsin Energy Conservation Corporation	ENERGY STAR® Homes Program	New Construction	Wisconsin

RESIDENTIAL PROGRAM SUMMARIES

Benton County PUD: Dipstick Weatherization Program

Name of Organization: Benton County PUD

Name of Program: Dipstick Program

Name of Contact: Tom Schumacher

Phone and Email: 509.582.1268; SCHUMACT@bentonpud.org

Reason for Nomination

The Bonneville Power Administration (Bonneville) designed a weatherization program for the region in the early 1980s. The program included a heat-loss calculation audit, requiring a utility auditor visit a home, review the conditions, use a computer to calculate the optimum combination of measures to install in the home, estimate the savings and calculate the incentive. In the mid-1980s Benton County tested a new audit called the Dipstick Program. The results showed that the savings were comparable and the costs of the program lower using this method. Benton County used a Dipstick Program approach implemented by contractors until two years ago. Currently Benton PUD has returned to offering a utility audit, not the dipstick audit approach, in order to have direct contact between utility staff and customers.

Program Delivery

Contractors deliver the dipstick audit as a way to determine what type of weatherization services are appropriate for a customer. The dipstick audit is so named because the contractor measures existing levels of insulation and conditions of the house and recommends weatherization measures based on a form listing the available measures and the program contribution available for each measure. There is no "real audit" and no heat loss calculation involved in the determining what would qualify for incentives.

The process begins when the customer calls the utility requesting assistance on their heating, cooling or an audit. The customers are placed on a waiting list, and as their name comes up they are sent a packet of material about the program

including a list of certified contractors. Customers arrange for at least two contractors to come to their home and provide a bid. The utility reviews the bids for discrepancies and contacts the customer to assess their choice for the contractor to do the project. The incentive is based on a percentage of the bid price. Once the project is completed and passes inspection the payments are made to the contractor. The utility makes the agreed payment and the customer pays the contractor the difference.

Contractors are certified to offer weatherization services in the program after they take a training course on how to assess measures and pass the associated test. The contractors are trained to observe the insulation and weatherization needs of the home existing conditions and then to make recommendations as to what measures are required to bring the home up to a set level of efficiency given the existing conditions.

Incentives

Incentives have varied over time being as high as 70% of project cost and now about 25-30% of project cost.

Program Marketing

The utility markets the program to its customers; contractors (can or cannot) also market the program to customers.

Customer Service

Customers can call the utility for questions.

Staffing and Contracting

Staffing for the Dipstick Program included two utility auditors to conduct inspections, two clerks to answer questions and assist customers with the bid process, and one contract auditor to assist on a part time basis with inspections. In contrast the current program with performed audits by Benton PUD has a staff of two auditors, three meter readers that assist with audits and inspections on a part time basis, two contractors for back-up assistance for audits and inspections, plus three clerks to answer questions and assist customers with the bid process.

Participation and Savings

Program participation has ranged between 400-800 completed weatherizations per year for the Dipstick Program. Typically about 60% of those who requested an audit completed a project, depending on the incentive level. In the current utility audit program about 50% of those who request an audit complete a project. Currently there have been approximately 500 completed over a twelve-month period.

Budget

Not available.

Key Issues for Dipstick Program

Each project is inspected prior to payment. Contractor bids are reviewed and discrepancies noted. If the discrepancy was more than 10% an auditor was sent to the residence to evaluate the discrepancy if discrepancies persist the contractor will be asked to attend more training or be removed from the Weatherization List.

The dipstick approach requires that the customer be at home for the contractor visit and the inspection. The in-person visit approach requires that the customer also be home for the initial audit by the utility auditor.

Key Issues for Cost Control

The Dipstick Program resulted in substantial cost savings over the heat loss audit method approach and the current utility audit. Wasted audit time in the field was eliminated audits performed with no participation, plus used the contractor as the auditor. No duplication of effort between the contractor/auditor.) The additional savings typically were used to increase the incentives.

Monitoring and Evaluation

The dipstick was evaluated in the mid 80s, copies of the evaluation are available through the BPA. Additional evaluations have not been conducted.

Transferability to the Energy Trust

The dipstick approach is a very effective approach for delivery residential weatherization. Inspections could be conducted on a sample rather than for every project. Inspections could be front-loaded on contractors when they first work with the program to ensure they understand the program requirements.

Efficiency Vermont: Lighting and Appliance Rebates

Name of Organization: Efficiency Vermont

Name of Program: Residential Efficient Products Program

Name of Contact: Chris Neme

Phone and Email: 802.658.6060 x 1022; cneme@veic.org

Reason for Nomination

Efficiency Vermont residential programs were nominated as best practice in delivering in the residential sector for capturing all cost effective opportunities.

Program Delivery

The appliance and lighting programs are similar to those run in the region by NEEP, however EVT is maintaining the incentive offers. This results in higher market share for ENERGY STAR® products.

Incentives

Table 4 displays the incentives for new or replacement equipment.

Table 4

INCENTIVES PROGRAM MEASURES

MEASURE	INCENTIVES		
Lighting	$4/ ENERGY STAR® CFL maximum 6	$15/ ENERGY STAR fixture maximum 4	$20/ ENERGY STAR® torchiere
Room Air Conditioner	$25 seasonal rebate		
Refrigerator	$25 seasonal rebate		
Clothes Washer	$50 year-round rebate		

Program Marketing

Circuit riders work with trade allies for the lighting and appliance program. Outreach also occurs at the annual Building Solutions conference each February with builders and contractors, as well as a range of trade shows and other events. The circuit riders provide point of purchase support and sales training. EVT provides bill inserts, a website, and public relations activities to support the program.

Customer Service

EVT has a customer service 1-800 number.

Staffing and Contracting

There are two managers and two assistants at EVT for all of the residential programs, probably a little more than 1FTE is devoted to the efficient products program. There are three contract circuit riders, and one contractor to provide fulfillment services on the incentives. These contractors provide services to all NEEP program utilities.

Participation and Savings

At the end of 2001,Vermont had the highest market share for ENERGY STAR clothes washers, other than Alaska as calculated by D&R International[7]. EVT did not provide information on other appliance for Vermont.

The 2001 EVT annual report lists 27,596 participants in the lighting and appliance program, most made lighting purchases. Total savings projected, net at generation, for the efficient products program in 2001 is 14,197 MWh savings with lifetime savings of 143,399 MWh.

[7] D&R International calculate market share for Energy Star products for EPA. Their market share estimates are based on reports only from national and large regional chains that participate in the process. No independents are included and some national and regional chains are not participating.

Budget

The 2001 program costs for the efficient products program was $2,028,108 administrative costs were 28%.

Key Issues for Program

The program is run consistently with the NEEP overall program design though Vermont has chosen to maintain incentive while other utilities have dropped them.

Key Issues for Cost Control

The program is run very leanly with minimal internal staff and use of circuit riders.

Monitoring and Evaluation

The program is being evaluated.

Transferability to the Energy Trust

The use of small incentives to increase sales of efficient products could be transferred to the Energy Trust, if the incentives are cost effective. The value of the Oregon tax credit for efficient equipment appears to be greater than the value of the incentives used in Vermont. The contact in Vermont sees the value of incentives not as reducing incremental costs but as another marketing instrument. Retailers find them very appealing because it gives them something to talk about with consumers that consumers can get back very quickly, which does not happen with tax credits.

Efficiency Vermont: Residential High Use Program

Name of Organization: Efficiency Vermont

Name of Program: Residential Emerging Markets (High Electric Users) Program

Name of Contact: Chris Neme

Phone and Email: 802.658.6060 x 1022; cneme@veic.org

Why Nominated

Efficiency Vermont residential programs were nominated as best practice in delivering in the residential sector for capturing all cost effective opportunities.

Program Delivery

The emerging markets program focuses on residential retrofit. The three features that are unique to the program are that:

1. The program captures all cost effective screw-in lighting retrofits, 7-10 lighting change outs per dwelling,
2. They focus on high users with electric heat and hot water. Fuel switching is a desirable outcome and efforts are made to do all cost effective fuel switching with these high users.
3. The program is delivered by Community Action Agencies as subcontractors to EVT, irrespective of income.

In addition, EVT replaces old inefficient refrigerators, where it makes sense. As well as custom measures that are identified such as pool pump timers, waterbed heaters, etc.

Incentives

The incentives for fuel switching and custom measures are negotiated for each project, though this may change in the future as it has created some problems when people learn that different incentives have been provided to different people.

Incentives for refrigerator replacement are $100; light bulbs and hot water conservation measures are free.

Program Marketing

The program is tele-marketed to high users.

Customer Service

EVT has 1-800 number for all programs.

Staffing and Contracting

There are two managers and two assistants at EVT for all of the residential programs, less than 1FTE is devoted to the residential high use program. EVT subcontracts with local CAP agencies to deliver the program. The CAP agencies have a good track record delivering weatherization services however; it takes time to get each agency up to speed to do the various activities needed in the program.

Participation and Savings

In 2001, 17 households participated in the high-use program. Savings for the entire emerging market program in 2001 were 265 MWh. Lifetime savings are estimated at 6,608 MWh, specific savings for the high-use portion of the program were not available.

Budget

The annual budget in 2001 for the entire emerging market program effort was $144,343 of which 53% were administrative costs. The high administrative costs and relatively low savings can be partly attributed to the fact that the other portions of the program consist primarily of consumer education through the Nexus software (for which EVT does not claim savings), and the fact that 2001 was the start-up year for the emerging market effort.

Key Issues for Program

The CAP agencies had to be trained. They did not have tracking systems initially, they did not know how to use the various measure screening tools. They had to learn how to install measures to meet VEIC/EVT specifications. However, the process has occurred over several years beginning in the late 1990s when VEIC first worked with one of the CAPs to deliver low-income programs. Over time, they have been trained and now they are quite effective.

Key Issues for Cost Control

The CAPS are very cost effective, focusing on high users is very cost effective, and maximizing the lighting installations is very cost effective.

Monitoring and Evaluation

This program is being evaluated.

Transferability to the Energy Trust

The program has some applicability to Oregon, though fuel switching is not considered a resource. The use of CAPs to deliver the program might be effective in some parts of the service area historically CAPs were effective implementers in Oregon though that may not be true currently. The main concern might be that weatherization contractors would be dissatisfied with the use of CAPs.

Energy Efficiency Homes Midwest: ENERGY STAR® Homes Program

Name of Organization: Energy Efficiency Homes Midwest

Name of Program: ENERGY STAR® Homes

Name of Contact: Mark Jansen, Energy Efficient Homes Midwest

Phone: 317-915-9204

Why Nominated

This program was nominated as a best practice because, with a modest subsidy in the beginning, the HERS rating business in Indiana has become a viable, profitable business, and the proportion of newly constructed homes in Indiana that are ENERGY STAR-labeled has steadily increased.

Program Summary

The efficient homes program began in Indiana in 1993 as the Five Star Home Program, with support from the state. In 1998 the Indiana Energy Office provided a $250,000 grant to form Energy Rated Homes Midwest, a not-for-profit business intended to privatize and encourage the growth of the HERS rating industry and the market share of ENERGY STAR-labeled homes. The former director of Energy Rated Homes Midwest has since left to form Energy Efficient Homes Midwest, a for-profit company, and Energy Rated Homes Midwest appears to be fading away. There has been only minimal support from local utilities, including occasional booths at home shows, and occasional bill stuffers.

Program Delivery and Staffing

At this point, there are five firms employing a total of 20 HERS raters in Indiana.

Incentives

There are no incentives to customers or to builders.

Program Marketing

Program marketing consists primarily of HERS rating firms dealing directly with builders to sell them on the marketing advantage of ENERGY STAR-labeled homes. This consists of personal calls to builders, having booths at trade shows, and involvement in builders' associations. Marketing to consumers consists of some builders using the ENERGY STAR label in their literature and in their weekly newspaper ads.

Customer Service

The HERS rater that works on a given house handles customer callbacks related to that house if they are energy related, such as comfort issues or high bills.

Participation Rates and Savings

In 2001, 1500 out of 30,000 homes built in Indiana, or 5%, were ENERGY STAR-labeled. The number of ENERGY STAR-labeled homes has increased every year since the program began, starting with 300 homes in 1993. Savings are estimated to be $450 per house per year.

Budget

The $250,000 grant from the Indiana Energy Office in 1998 included $80,000 for administrative salaries (those not involved in performing ratings), and the rest for implementation. At this point, all costs are covered by fees for HERS ratings, which are paid by builders.

Program Changes

The key recent change in the program is that it is now self-sufficient, with no ongoing subsidies from the state government. One possible future change is the passage of federal legislation providing a tax credit to builders for each home built that is 30% more efficient than the 1998 or 2000 IECC. If this legislation is passed—and Indiana HERS raters expect it to be—then the demand for HERS ratings and ENERGY STAR-labeled homes could explode.

Customer Satisfaction

Every buyer of an ENERGY STAR-labeled home receives a report on the rating and what it means, along with a stamped postcard asking about their satisfaction. Ninety-five to 98% of home buyers report being very satisfied, based on a return rate of 5% of the postcards.

Monitoring and Evaluation

Indiana HERS raters rate every house, not a sample, unlike the practice in some programs. Mark Jansen reviews every file sent in by HERS raters working for him, and he goes out to check key elements of the rating, such as a blower door test, for five percent of homes.

Reasons for Success

The program is successful because of the efforts and perseverance of HERS rating firms in their marketing efforts to builders. These HERS rating firms, in turn, have been motivated by the prospect of profitability, which has typically required two to three years to achieve.

Transferability to the Energy Trust

The EPA reports eight ENERGY STAR-labeled homes were constructed in 2001 in all of Oregon, Idaho, Montana, North Dakota, South Dakota, Washington, and Wyoming. It may be that the requirements for ENERGY STAR-labeled homes in Oregon are not much higher than required by code. However, whether ENERGY STAR is better than standard practice depends on code enforcement as well as code itself. Receiving the ENERGY STAR-label involves verification of efficiency through the requirement for a HERS rating or at least a sampling of HERS ratings. In Massachusetts, a study conducted in 2001 by Xenergy for the Massachusetts Board of Building Regulators and Standards (BBRS) showed, among other things, that only 46% of houses comply with the overall thermal performance requirements of the Massachusetts code.

Another consideration about the effectiveness of a homes program in Oregon is the possible legislation that would provide builders with a $1,250 or $2,000 tax credit for each home that is 30% more efficient than the 1998 IECC or 2000 IECC, respectively. While such a tax credit would undoubtedly stimulate demand, the current supply of HERS raters as well as builders and subcontractors who know

how to meet these standards might not be able to meet this demand. The Energy Trust could therefore consider a program that would build up the HERS rating infrastructure and the expertise of builders and subcontractors.

National Grid: Appliance Management Program

Name of Organization: National Grid

Name of Program: Appliance Management Program

Name of Contact: David Legg

Phone and Email: 508.421.7265; david.legg@us.ngrid.com

Why Nominated

National Grid's Appliance Management Program (AMP) his program is being adopted by several utilities in New England. The program is unique because it helps low- and moderate-income households reduce their electricity use by partnering with them to take lifestyle actions, and by providing energy-efficient lighting, weatherization, and refrigerators. One of the unusual aspects of the program is the use of a commitment statement to obtain a willingness to make the recommended lifestyle changes.

Program Summary

National Grid's Appliance Management Program (AMP) provides energy efficiency improvements and education for residential high-use electric customers with household incomes of up to 200% of federal poverty level. Customers must live in buildings with 20 units or fewer that are at least 50% low or moderate income.

The measures that customers can receive include CFLs, compact fluorescent fixtures, refrigerators, and weatherization. Weatherization is available for electric-, oil-, and propane-heated homes. Refrigerators are available if the units they replace are old, and if metering shows they are inefficient. In addition, customers receive up to 15 recommendations for lifestyle actions that will reduce their energy use, and are asked to commit to three or four of those.

Lower-usage customers may qualify for a mini-AMP if they are receiving a visit from a community agency program (CAP) agency for other services; in that case their refrigerator may be metered, and if it is inefficient enough, they may receive a new refrigerator. The program actively seeks high-use customer with at least 15 kW demand per day during shoulder months, but customers with at least 10 kW demand can qualify by request.

Program Delivery and Staffing

National Grid staff devoted to AMP includes the full-time program manager, plus part-time help from an administrative assistant, who looks up customer records to document account numbers and usage, and a database administrator; total staff time amounts to about 1.5 full-time equivalents. National Grid contracts with a lead CAP agency in Massachusetts, which in turn subcontracts to 14 CAP agencies. Customer contact is through CAP agencies, who are responsible for income verification and customer visits.

The CAP representative is responsible for conducting an audit using the MCALC software developed by National Grid, which involves disaggregating bills and matching with customer behavior, for refrigerator metering, for installing weatherization measures, for providing CFLs, and doing education around lifestyle changes. The CAP representative is also responsible for recommending up to 15 lifestyle actions that could reduce energy use, and asking the customer to commit to three or four (Note this use of a "commitment" is very innovative in efficiency programs and is a best practice.) National Grid trains the CAP auditor/representatives. The lead CAP agency purchases refrigerators, using volume to negotiate lower prices, and the refrigerators are delivered by an ESCO or one of five regional appliance dealers, depending on location of the customer. Lighting fixtures are delivered and installed by one of two ESCOs, which usually subcontract to electricians.

Incentives

The incentives in this program are the free energy-efficient measures: weatherization, CFLs, compact fluorescent fixtures, and refrigerators. Customers receiving these measures frequently also qualify for fuel assistance, another program.

Program Marketing

The program is marketed jointly with the fuel assistance program for low-income customers. In some cases the costs are split with other utilities in Massachusetts. Marketing includes radio (including ethnic radio), newspaper, and television advertising, along with bill stuffers. In 2001 the marketing budget in Massachusetts was $400,000. During the intake process for fuel assistance, CAPs recruit customers for the AMP program. CAPs also send direct mail and make follow-up calls to targeted customers, selected on the basis of their high electric use.

When visiting for other reasons, CAP representatives also meter refrigerators, and then try to recruit customers whose refrigerators are judged to be ailing.

Customer Service

The CAP representatives are trained to treat AMP participants as paying customers. The focus is on occupant safety, inspection, and education. Education focuses on how to save by providing many specific suggestions, and helping customers prioritize and identify a few that they think they will be able to achieve. After refrigerator delivery, the vendor is required to provide any needed service for the first six weeks, after which they must make sure all customer information goes to the manufacturer's database so the customer will be listed as the appliance owner. There is an 800 number for any other customer service issues.

Participation Rates and Savings

In Massachusetts in 2001 there were about 4000 AMP participants. About 3600 received CFLs, 1600 received refrigerators, 380 received weatherization, and 300 received fixtures; fixtures were introduced late in 2001, so this number is expected to increase in the future. There is a study in the works now that will define the eligible population. Annual savings are estimated to be 9,909 MWh, and lifetime savings are estimated to be 131,467 MWh.

Budget

The budget in 2001 was about $4.4 million.

Keeping Costs Down

The joint purchasing of refrigerators with other utilities increases buying power and keeps costs down. Also, the MCALC software was developed internally, and now is licensed to other utilities and to ESCOs, which brings in some revenues.

The CAP agencies have maintained the same cost levels for years while doing more work. This is partly through hard work and experience, but also because the introduction of software that allows one single CAP person to perform the audit and do the invoicing with minimal data entry.

Customer Satisfaction

A quantitative customer survey conducted in 1998 showed that 74% of customers who had participated in other, similar programs think AMP is better than the other programs. Eighty percent or more of customers give each of seven program components a four or five on a five-point scale. Asked to rate six aspects of delivery and installation, more than 80% of customers give a four or five rating on a five-point scale; a low rating for one aspect of delivery—"the installer filled out the warranty for me"—rated four or five by 55% of customers—resulted in a new service procedure to make sure warranty cards were filled out.

Monitoring and Evaluation

There was a process evaluation of the 1998 program, and an impact evaluation of the 1996 pilot program. There is an impact evaluation of the 2001 program under way now.

Quality control is provided by the lead CAP agency through occasional site visits. Quality assurance is provided through National Grid's data system, in which the frequencies of measures installed or recommended by each CAP representative is compared to the average to make sure it is in line.

Reasons for Success

The main reason for success of AMP is the partnering with the CAP agencies; they have taken ownership of the program, and National Grid uses their input for program design. Another reason for success is the expertise of the CAP agencies in identifying actions on the part of customers that are likely to work. Another reason is the software, which, in matching bills to customer behavior, facilitates customer learning and buy-in.

Transferability to the Energy Trust

The program should transfer well to the Energy Trust, provided there is are CAP agencies experienced in delivering energy efficiency programs. The CAP agencies have in Massachusetts added the AMP activities onto their weatherization capability yet required good training on appliance diagnostics and appliance analysis software.

National Grid: EnergyWise Program

Name of Organization: National Grid

Name of Program: EnergyWise Program

Name of Contact: Bob O'Brien

Phone and Email: 508.421.7280; robert.obrien@us.ngrid.com

Why Nominated

This program was nominated because it cost-effectively reduces electricity use among high-use residential customers, both single-family and multi-family, and also overcomes the split incentive barrier by providing free or low-cost energy-saving measures for all multi-family customers.

Program Summary

National Grid's EnergyWise program provides high-use residential electric customers in single- to four-family homes and all customers in multifamily facilities with free on-site energy analyses and free or low-cost energy efficiency measures. For single family homes in Massachusetts, the lower limit for eligibility is 30 kWh usage per day in May or September. The measures that all customers can receive include CFLs, compact fluorescent fixtures, and appliance timers. Refrigerators are available if the units they replace are old, and if metering shows they are inefficient; while refrigerators are provided with incentives in multifamily facilities, single-family customers must pay the whole price. Customers with electric water heating can receive DHW measures, and customers with electric heating can receive thermostats, insulation, air sealing, and duct sealing. Customers with heat pumps can receive heat pump tune-ups.

Program Delivery and Staffing

National Grid has two full-time equivalent employees working on the program, including one full-time program manager and two part-time assistants. In addition, there are two implementation contractors, one handling single-family homes and one handling multi-family facilities.

With single-family homes, National Grid provides the contractor with lists of eligible customers based on usage. The contractor sends out materials to customers on the list, calls, schedules an appointment, monitors refrigerator usage unless it is new, and uses AMPCalc (a bill disaggregation tool). On that basis the vendor produces a report explaining the customer's energy use, makes recommendations for energy-saving measures, and has the customer sign an authorization form. The vendor, if applicable, does the heat pump tune-up, and any removable measures, such as DHW measures, CFLs, and appliance timers. The customer is then responsible for hiring a contractor to carry out the other recommendations.

For multi-family facilities, the contractor handles the entire project, including maintaining contact with the customer, performing the audit, bidding out the specs to subcontractors, and performing an inspection on the completed work. The vendor, if applicable, does the heat pump tune-up, and any removable measures, such as DHW measures, CFLs, and appliance timers. In buildings with 20 units or less, the contractor usually performs all other work as well, while in larger facilities they usually hire a subcontractor.

Incentives

Measures provided for free to all qualifying customers include CFLs, timers, duct sealing, and air sealing. For single-family homes, incentives are $20 for a thermostat, 25% for insulation, and $50 for a heat pump tune-up. For multi-family facilities, incentives are $10 per fixture in common areas, 100% of fixture costs in tenants' units, $50 for a heat pump tune-up, $200 to $400 for a refrigerator depending on its size, 25% of attic insulation, and 100% of ventilation (because of health issues).

Program Marketing

The vendors are responsible for marketing the program. The single-family vendor uses mailings and telemarketing, and usually targets the highest-usage customers. There is no marketing to multi-family facilities; it is by word of mouth only, and customers are dealt with on a first-come-first-serve basis, with priority for electric heating customers; currently there is a large backlog of multifamily customers applying for the program.

Customer Service

Each vendor has an 800 number for customer service, but customers sometimes call National Grid if there is a problem; these calls are handled by the program manager.

Participation Rates and Savings

EnergyWise resulted from the combination of a single-family program and a multi-family program in 1998. In 1998, a partial program year, there were about 10,000 units covered in Massachusetts. There were 11,000 units covered in 1999, 14,362 in 2000, and 14,644 in 2001. Of these 14,644 in 2001, 3,484 were single-family and 11,160 were multi-family units; these proportions have remained about the same through the years. The size of the population is not known, but the marketing list of high-use customers is getting smaller over time. Based on an outside impact evaluation, the estimated annual savings for an electrically heated single-family home in Massachusetts are 1,298 kWh, and 712 kWh for a non-electrically heated single-family home. For the entire program, annual savings were 9,962 MWh in 2000. The realization rate has traditionally been 97%, but last year a problem with a vendor's use of the screening tool resulted in a realization rate of 78% in Massachusetts; this problem has since been corrected.

Budget

The budget for the program is 2002 is $4 million, down from $5,175 million in 2001. Eighty-nine percent of these costs are for implementation.

Keeping Costs Down

The multi-family component of EnergyWise has not changed, but one cost-effective change in the single-family component is the auditor's use of a laptop with a printer, working with the customer's billing information, so that the audit and report can be done in a single visit. National Grid is also considering dropping refrigerator metering, and substituting lookups of refrigerator models and associated energy usage from a book.

Customer Satisfaction

Periodic surveys conducted by outside firms show customer satisfaction to be very high.

Monitoring and Evaluation

Impact and process evaluations are periodically conducted by outside firms. An impact evaluation, referred to above, caught a problem with a vendor's use of a screening tool, which has since been corrected.

Reasons for Success

EnergyWise works because it provides National Grid a way to respond to customers' high bill complaints, and helps customers both understand their bills and do something about them. Also, the fact that many measures are free or low-cost is quite important.

Transferability to the Energy Trust

For the program to work in Oregon (or elsewhere), especially on the multi-family side, many of the measures would have to be provided for free or inexpensively. For example, in EnergyWise, landlords don't pay for fixtures in tenants' units because of the split incentive issue.

New Jersey Utilities: Residential HVAC Program

Name of Organization: PSE&G, GPU, Conectiv, and Rockland Electric Company

Name of Program: Residential HVAC

Name of Contact: Chris Neme, VEIC

Phone and Email: 802.658.6060 x 1022; cneme@veic.org

Why Nominated

The New Jersey residential HVAC program was nominated because it is considered to have a very well thought out combination of incentives and industry partnering, making it a very transparent and consistent program for the New Jersey utilities, trade allies and customers.

Program Design

The New Jersey Residential Electric HVAC Program aims to improve the efficiency of new central air conditioners and heat pump systems. It promotes both the sale of high efficiency equipment and improvements in sizing and installation practices that affect operating efficiency. The program targets all residential dwellings (whether existing or new) into which a new central air conditioner or heat pump is being installed. Any such home that installs a new, qualifying central air conditioner or heat pump is also eligible for the program's programmable thermostat offering. Builders or buyers of new homes may participate in either the Electric HVAC program or the New Jersey ENERGY STAR Homes program, but not both.

The program promotes two efficiency tiers for central air conditioners and air source heat pumps:

Tier 1: SEER 13, EER 11 and (in the case of heat pumps) HSPF 8

Tier 2: SEER 14, EER 12 and (in the case of heat pumps) HSPF 8.5

In addition (i.e. under either tier), documentation of proper sizing and installation of qualifying high efficiency equipment must be submitted. In the case of units installed in new homes, this will mean (a) submission of Manual J sizing

calculations, (b) documentation of proper charging, and (c) documentation that airflow is within the range recommended by manufacturers (i.e. between 350 and 450 cfm/ton). In the case of units installed in existing homes, this will mean (a) submission of Manual J sizing calculations, (b) documentation of proper charging, and (c) submission of measurements of actual airflow rates.

The program also promotes ground source heat pumps with an EER of at least 13 and ENERGY STAR-rated programmable thermostats.

Program Delivery

The program is delivered primarily through HVAC contractors. The program provides HVAC contractors technical training (proper sizing, charging, airflow, and duct design) and training in how to sell energy efficiency. It also promotes certification by NATE (the American Technician Excellence certification test), and has provided funding to the Eastern Heating and Cooling Council for training courses; the technical training courses have largely become self-sustaining (through fees to participating contractors), which is not the case for the sales training courses.

Incentives

Statewide incentives for high efficiency central air conditioners and air source heat pumps will be as follows in Table 5.

Table 5

NEW JERSEY HVAC INCENTIVES

MINIMUM EFFICIENCY STANDARDS[8]			INCENTIVES	
SEER	EER	HSPF	CENTRAL A/C	HEAT PUMPS
13.00	11.00	8.00	$370	$460
14.00	12.00	8.50	$550	$710

8 Note that rebates are also contingent on documentation of proper sizing and installation.

Statewide incentives for ground source heat pumps and programmable thermostats will be as follows in Table 6.

Table 6

NEW JERSEY HEAT PUMPS AND THERMOSTAT INCENTIVES

EQUIPMENT	MINIMUM EFFICIENCY STANDARD	INCENTIVE
Ground Source Heat Pump	13 EER	$580/ton
Thermostat	ENERGY STAR-rated	$50

Incentives may be payable to the consumer, the HVAC contractor or the builder.

Program Marketing

The program is marketed both to HVAC distributors and contractors (through direct mail and circuit riders) and to consumers (through bill inserts, and most importantly through ads in the Yellow Pages, since that is how consumers find HVAC contractors).

Customer Service

Customer service is provided through an 800 number going to a call center that serves all joint utility programs in New Jersey.

Staff and Contractor Responsibilities

Each utility has a program manager, who is responsible for other programs as well as this one. Honeywell DMC performs rebate processing for GPU and Connectiv, while PSE&G does it in house. Each utility is responsible for its own marketing. As mentioned earlier, HVAC contractors deliver the program to customers.

Penetration

There are approximately 100,000 central air conditioning and heat pump systems installed in New Jersey each year; of these, 13,500 in 2000 and 16,000 in 2001 received rebates. Penetration of 13+ SEER units is about 30% over the 1998-2000 period, but many of the non-rebated units were oversized and/or improperly installed. However, there was more proper sizing than proper installation, possibly indicating that the program has had more effect on sizing than on installation practices.

Budget

The overall budget in 2001 was about $17 million, including $11 million for incentives, $1.5 million for marketing, $1.3 million for implementation (inspections and rebate processing), $500,000 for training, $750,000 for market research and evaluation, and $1 million for performance incentives paid to the utilities.

Program Changes

Recent changes to the program have included standardization of rebates across the state, the use of circuit riders to market to distributors and contractors, and the promotion of NATE certification. In aspects of program design related to contractors, input from the industry—the advice of the Air Conditioning Contractors Association (ACCA)—is sought. Because of on-going issues with air flow, next year may see the introduction of a duct-sealing component to the program, or possibly a separate duct-sealing program.

Quality Control/Assurance, Tracking, and Evaluation

Ten percent of all rebated systems are inspected.

Monitoring and Evaluation

Market research and evaluation includes a baseline study conducted in 2001 (even though individual utilities have had similar programs for several years). A process evaluation is taking place now, and there will be an independent evaluation of the quality of sizing and installations.

Transferability to the Energy Trust

The transferability of this program to Oregon depends on several factors, including the cooler weather, which could make the program less cost effective than in New Jersey. Also, if heat pumps are more prevalent in Oregon than New Jersey, the savings impact in the heating season could be much more significant. Finally, typical duct systems may also differ between the two areas, which would affect how ducts are dealt with in the program.

Northeast Utilities: Lighting Catalog

Name of Organization: Northeast Utilities

Name of Program: Smart Living Catalog

Name of Contact: Felicia Domrowik

Phone and Email: 860.832.4770; dombrfj@nu.com

Why Nominated

This program was nominated because it is built on a clear vision of market transformation for the residential lighting market, involving the use of a consumer catalog to accelerate manufacturer product develop and the introduction of these products in retail stores. The program also has a clear role to play in resource acquisition enabling the utilities that use the catalog to easily promote residential lighting measures. A fairly predictable sales response generally follows each catalog issue.

Program Summary

The Northeast Utilities (NU) Smart Living Program involves a catalog sent to all of NU's residential customers in three states (Connecticut Light & Power, Western Massachusetts Electric, and Public Service of New Hampshire); United Illuminating, a separate utility in Connecticut, also uses the Smart Living Catalog. Ordering either through the mail, through an 800 number, or over the Internet, customers may purchase ENERGY STAR-labeled CFLs, interior fixtures, exterior fixtures, or torchieres, with a discount provided by NU.

The mail and on-line catalog complements the availability of energy-efficient lighting through local retailers, also with a discount (an instant rebate). On the retail side, NU provides marketing materials and circuit riders, who negotiate with stores to carry products.

NU works with manufacturers to persuade them to develop aesthetically pleasing fixtures. For example, NU negotiated with a manufacturer to make an inexpensive, generic table lamp by retrofitting an incandescent model to accept only pin-based CFLs. NU bought one container of 800 lamps. Through the catalog it sold 8,000

fixtures in three days (the other 7,200 through back orders). The idea is to provide a test market for manufacturers to see how well a product sells, and to convince retailers to carry it. After retailers pick up a product, NU drops it; so far, the catalog has introduced 93 lighting products that were subsequently picked up by retailers and then dropped by the catalog.

Program Delivery and Staffing

NU has one senior program administrator and one program administrator devoted to the program. In addition, there is a contractor that does catalog design and layout, a contractor that handles product fulfillment—including providing information and taking orders from 8 AM to 8 PM on Monday through Thursday and 8 AM to 5 PM on Friday, and a call center that takes orders (but does not provide information) when the fulfillment contractor's call center is closed.

Incentives

Incentives vary by state, but Connecticut Light & Power, the largest NU operating company, provides incentives of $3 per CFL (if the cost is $5 or more), $10 per exterior fixture, $10 per interior fixture, and $20 per torchiere (if the cost is $40 or more).

Program Marketing

In 2001, the Smart Living Catalog was mailed to 1.3 million customers among the four utilities; in 1996, the first year of the program, it was mailed to 1.1 million customers among two utilities (Connecticut Light & Power and Western Massachusetts Electric). Other marketing varies by company, and includes print and radio ads, bill inserts, web link ads, and cable network advertising.

Customer Service

The fulfillment contractor handles customer service, which consists largely of dealing with returned products.

Participation Rates and Savings

In 2001, there were about 59,000 orders placed by 54,000 customers; this compares with about 30,000 orders placed by 15,000 customers when the program began in

1996, available only to Connecticut Light & Power and Western Massachusetts Electric customers. The response rate is 3.75%, compared to an industry standard (for catalogs) of 2%. Estimated savings are 140,000 product lifetime MWh. The realization rate is approximately 90% for the three states. These figures come from NU's planning department.

Budget

The catalog budget for four utilities is about $3.5 million per year, of which 30% is for incentives, 3% is for administration, 3% is for evaluation and market research, 3% is for call centers, 17% is for marketing, and 45% is for design, printing, postage, paper, and photography.

Keeping Costs Down

To save money, incentive dollars have been lowered as product prices have decreased, lighter weight paper stock is used for printing, catalogs are bulk mailed by route number, paper purchase and printing are performed off-peak, the width of the catalog has been trimmed to save paper and postage costs, most of the administration is done internally rather than being outsourced, and digital photography is now used rather than film.

Program Changes

As mentioned earlier, program changes have included participation by two additional utilities, and the continual introduction of new products, which are then dropped as retailers pick them up. The 1996 catalog had 20 pages, while the 2002 catalog has 60 pages. Over time, the intention is to shift lighting sales entirely to retailers. For the catalog, this will mean fewer and fewer pages devoted to products, with more attention to articles; eventually, product pages will be gone and the catalog will become an energy-efficiency magazine for customers.

Customer Satisfaction

A formal assessment of the 1997 and 1998 programs (covering Connecticut Light & Power and Western Massachusetts Electric only) measured customer satisfaction at 80%.

Monitoring and Evaluation

There was an evaluation of the 1997 and 1998 programs (covering Connecticut Light & Power and Western Massachusetts Electric only), and there is one going on now covering the 1999, 2000, and 2001 programs. Both have used external evaluation contractors. Evaluations examine how long products are used, repeat orders, number of and reasons for returns (usually size of fixture or breakage during shipment), estimated savings, and characteristics of buyers.

NU has its own internal quality assurance-testing program; it is considering moving this responsibility to an independent lab.

Reasons for Success

The program is successful because NU works with manufacturers to make fixtures that are attractive—and aesthetics are one of the main barriers to increased sales of energy-efficient fixtures. In addition, customers can save money on their energy bills, and they get incentives to try new products.

Transfer to the Energy Trust

This catalog would be easy to transfer to the Energy Trust provided the effort was in conjunction with NU. The network for fulfillment is already established, the catalog is already being produced. Northeast Utilities would be willing to work with the Energy Trust on the project.

Developing a catalog from start to finish would be more difficult, though the fulfillment network would probably be readily available to work with the Energy Trust, the need to work independently with the manufacturers and graphic designers would make the project more costly and complex.

Sacramento Municipal Utility District: Residential Loan Services

Name of Organization: Sacramento Municipal Utility District

Name of Program: Energy Efficiency Loan Program

Name of Contact: Dave Galbraith

Phone and Email: 916.732.5497; dgalbra@smud.org

Why Nominated

The SMUD Residential Loan program was nominated as a best practice due to high loan closure rates and low loss rates.

Program Delivery

The program is delivered through contractors who sell qualifying HVAC, solar water heating, windows and insulation services. The loan is an additional tool contractors can use to provide their customers with point of sale financing for the products and services they sell. Products and services must meet SMUD qualifications to qualify for the loan.

SMUD trains the contractors in how to prepare the loan documents. Any contractor who meets the following three criteria can offer the loan:

- Proper and current license, in good standing
- Proper insurance and bonding
- Willing to install measures to SMUD specifications, in some cases above code

SMUD reserves the right to inspect all installations, but inspections tend to be front-loaded occurring more frequently when a contractor first signs up for the program and less so after they have worked with the program for several years.

The contractor puts the loan package together and brings it to SMUD for approval. SMUD provides a 24-hour turn-around on the approval. Qualifications for the loan are that the customer must be:

- A homeowner
- Have satisfactory outside credit as well as payment on SMUD electric account
- Have an acceptable income/debt ratio
- Pay the loan application fee of $50 for amounts over $1000 (refunded if not approved)

The loan approval is valid for 60 days and the contractor must notify SMUD within the 60-day period that the project is completed. At that time SMUD will normally record a fixture filing (UCC1 Financing Statement) with the County Recording as collateral for the loan. Loans terms are available for up to 10 years except for insulation, which is 5 years. Payment on the loan is made directly to SMUD, separately from the utility bill. (The UCC1 Financing Statement gives SMUD priority over the first mortgage.)

Incentives

The loan is currently at a fixed rate of 9.25%

Program Marketing

The program is marketed by contractors though SMUD provides information on the loan on their website and through their customer service center.

Customer Service

The contractor provides customer service and the utility does not track what specific services are provided.

Staffing and Contracting

There are 180 contractors providing loans to the residential customers. SMUD has 23 staff people assigned to the loan program. 14 to 15 deal with loan origination and the rest deal with loan servicing. Currently they outsource billing, though that has not always been true and may not be true in the future. A new software loan management system will link multiple sources of information and is likely to improve the efficiency of the administration. Staff is cross-trained to do multiple

functions so that they can flexible given fluctuating volume and so staff can retain interest in their jobs.

Participation and Savings

No specific program savings is available. Participation runs at about 5,000-5,500 annually.

Budget

Loan demand has been averaging $25-26 million over the past few years. Repayments from existing loans exceed that amount by $3-4 Million per year. Administrative costs average $2.6 Million (net) annually and are recaptured in the retail interest rates.

Key Issues for Program

SMUD does all the origination and servicing in house, however these can be outsourced, as can contractor screening and training. At the moment this is not the option the SMUD is using.

An advantage for this type of loan to contractors and customers is that no other entities offer loans in the size range; too small for banks.

Have to monitor the use of the SMUD name in advertising by contractors about the loan program.

Key Issues for Cost Control

The program has been operated for over 10 years, at the outset the loan was included in the bill, but this proved to be a problem in many ways and is easier and less costly to manage as a standalone service.

Efforts to work with Fannie Mae have not proved worthwhile. Fannie Mae has a higher decline rate (40-45% versus 18% for SMUD and about 20-23% for banks), this is due to the fact that Fannie Mae loans are unsecured as opposed to SMUD's security interest via the UCC1 Fixture Filing.

The UCC1 Fixture Filing collateralizes the loan, which results in a higher rate of recovery in cases of delinquency. Prudent loan underwriting policies have had a

significant effect on reducing loan losses. Fixture filings take precedence over all liens of record if filed within 20 days of purchase.

Monitoring and Evaluation

The impact of the loan program in particular has not been calculated.

Transferability to the Energy Trust

The SMUD loan program might be difficult to transfer because of access to utility bill payment records. However, SMUD does not consider this a driver of the program, since many customers with good credit are "notorious" for not paying utility bills on time. As an effective loan program this program has a higher rate of acceptance and lower loss than most similar programs and thus provides a sound model for a loan program.

Tacoma Utilities: Residential Weatherization

Name of Organization: Tacoma Public Utilities

Name of Program: Residential Weatherization

Name of Contact: Dalene Moore, Assistant Energy Services Manager

Phone and Email: 253.502.8653; dmoore2@ci.tacoma.wa.us

Reason for Nomination

The residential weatherization program with financing was offered as a best practice for controlling costs of weatherization programs and providing a variety of ways for customers to finance the weatherization while ensuring that savings were obtained.

Program Overview

Tacoma Utilities' Residential Weatherization program provides a Home Energy Check and weatherization services to customers with electrically heated homes built before 1988. The Home Energy Check is used to evaluate customer's homes' energy efficiency. The program helps customers get their homes insulated and inefficient windows replaced. Insulation measures include ceiling insulation with ventilation; floor insulation with ground cover, ventilation, and pipe insulation; duct insulation; and wall insulation. The program weatherizes rented homes with the property owner's approval as well as owner-occupied homes. Liens are placed on each home that receive a weatherization loan.

Financial assistance in the form of grants is available to help weatherize the homes of customers who meet certain income guidelines. Zero-interest loans with a set-up fee are available to all qualifying customers regardless of income.

Program Delivery

Tacoma's residential weatherization program is delivered via in-house staff and "qualified" weatherization contractors. Program participants schedule audits through a central scheduling coordinator. In-house auditors perform the audits. Tacoma Power maintains a list of qualified contractors to perform the

weatherization services identified by the audit. Customers may choose from among a list of qualified contractors or perform the work themselves. Weatherization work is based on a list of deemed measures maintained by Tacoma Utilities. In-house staff conducts inspection of the finished work.

Customers qualify for a zero interest loan based on their Tacoma Utilities payment history. In the event of insufficient payment history an Equifax credit report is used. Multi-family owners undergo a full review of credit worthiness conducted by Tacoma Utilities' contractor, Pierce County Economic Development.

Multifamily audits are performed using a variety of modeling tools to establish the energy savings of measures proposed. Proposed projects are then analyzed for cost-effectiveness to Tacoma Utilities.

Incentives

The program offers a free audit to qualified customers and a zero percent loan or grant depending on income. Non-low income customers are offered a zero percent, 7-year loan (5 year for multifamily). Low-income customers qualify for either a zero interest loan that is deferred until the home is sold, a 70% grant or a 100% grant depending on income level. Grants are available for insulation measures in the homes of low-income customers. The financial assistance available for installation of other measures such as windows is the zero percent interest loan.

Windows are done only with loans, i.e. if a customer qualifies for a grant the grant will be for only the non-window costs. Loans have a seven-year term and minimal set-up fees that may be added to the loan amount.

Program Marketing

The program is primarily marketed through a targeted direct mail campaign. Information is mailed to 2,500 customers approximately every two weeks. The mailing is targeted to specific zip codes in order to group responses for efficient audit scheduling.

Tacoma Utilities also is present at various local events. Home parties have also been used with "give aways" (CFLs, etc) and have generated interest in the weatherization service.

Customer Service

Customers may sign up for service through the Energy Information Center or from the front desk staff. Credit application is simplified by use of the payment history as the basis. Survey reply cards the customer return after each audit are analyzed to measure customer satisfaction. Customer satisfaction is very high, greater than 90% satisfied or very satisfied.

During the audit, customers are often provided with educational information regarding appliances, lighting and other non-weatherization energy efficiency, depending on the interest of the customer.

Staffing and Contractors

TPU assigns two clerical, three auditors, and one working supervisor to the program. There are no contractors working directly for the utility. Tacoma Utilities maintains a list of qualified contractors for installation work.

Participation and Savings

Participation is approximately 800 audits and 550 loan/grant participants per year out of 145,000 residential customers. Savings average 3,012 annual kWh per home, 4,400 MWh total. The most recent billing analysis indicates 3,012 annual kWh per home. Realization rate is not calculated as there is no savings estimate developed based on the deemed measure list.

The Program has been in existence since 1983. Overall participation is not readily available.

Annual Budget

The annual budget is $400k for grants, roughly $800k for loans, and staff costs ($200K excluding benefits and indirect administration). Average cost per weatherization job is $370. Average cost of audit is about $150, inclusive of energy education.

Key issues for Program

Program changes involved centralizing the scheduling of appointments and various procedural efficiencies.

Keeping Costs Down

Laptops with forms and spreadsheets with efficiency information as well as mobile printers are used by field reps. Audits are grouped geographically and scheduled to minimize travel.

Monitoring and Evaluation

A billing analysis evaluation is conducted every two years.

Transferability to the Energy Trust

The special feature of the Tacoma Utilities approach, which is pretty much standard utility audit program is that they use the loan as a way to leverage more energy efficiency improvements measures for consumers that seek a loan in order to do only windows. This improves the attractiveness of the program to consumers. The program is generally easy to transfer, though the use of bill payment history as a proxy for creditworthiness would not be transferable. Other credit checks are possible. Another asset for such a program would be coordination with OOE energy tax credits.

Wisconsin: High Efficiency Furnace Program

Name of Organization: Wisconsin Utilities

Name of Program: High Efficiency Furnaces

Name of Contact: Scott Pigg, Energy Center of Wisconsin

Phone and Email: 608.238.8276; spigg@ecw.org

Why Nominated

This program was nominated because it is known to have been very effective in transitioning the gas furnace market to high efficiency products.

Program Delivery

[Comment: The focus of this program was to increase the use of gas condensing furnaces. The program began in the early 1980s and was phased out in the mid-1990s, although the Energy Center of Wisconsin (Energy Center) continues to track penetration of high-efficiency furnaces. The best recent description available is by Hewitt (2000. "The elements of sustainability," *Efficiency & Sustainability: Proceedings of the 2000 Summer Study on Energy Efficiency in Buildings*, 6.179-6.190.)]

A key barrier to the use of high-efficiency furnaces was contractor concerns with the reliability of this equipment (because cooling the flue gases to extract more heat increased the probability that corrosive gases would condense on the heat exchangers, causing premature failure). The program began with heavily subsidized installations in the low-income sector. Clear specifications were set for the heating contractors and they were given extensive training. In addition, the utilities required manufacturers to provide adequate warranties, especially on the vulnerable heat exchangers. The utilities also conducted quality control (QC) inspections of the installations.

As a result of the experience gained—and with training and a rebate program in place, as well as stronger manufacturer warranties—contractors carried the new equipment into the regular market. The contractors were experiencing reduced callbacks and saw the technology as compatible with consumer desires.

Incentives

Rebates for qualifying furnaces.

Program Marketing

The program was marketed through heating contractors, with assistance from the utilities. All homes served by participating utilities were eligible.

Customer Service

The contractors provided customer service and the utilities did not track what specific services were provided.

Staffing and Contractors

The number of program staff is unknown at this time. At each utility, the functions of program management, rebate fulfillment, and quality control would have to be covered.

All heating contractors in the state were eligible for training and participation in rebate program.

Heating contractors were responsible for sales and installations. Utility staff were responsible for other functions noted above.

Participation and Savings

In the last year that utilities offered rebates (1989), high-efficiency units had a 70 percent market share in the gas furnace market. As indicated in later published reports, the market share has in fact increased (to 90 percent in 1995), but then slipped in parts of the state that are less subject to extreme cold temperatures and more affected by competition from outside builders and contractors (i.e., the southeastern portion of the state). Currently statewide penetration is about 75 percent, with 90 percent penetration in the northern portions of the state and 50 to 60 percent in the southeast.

Studies covering the entire home are in progress.

For the furnace itself, savings can be calculated on the basis of the difference in AFUE ratings.

The overall participation and penetration rate is not available for the state as a whole at this time. Hewitt indicates that more than 16,000 units were installed through low-income programs.

Budget

Not available at this time. The design of the program entailed few administrative costs.

Key issues for Program

Relevant issues—which do have some salience for a resource acquisition program as well as a market transformation program—include determining when a program is so successful that it should be phased out; and then ensuring that the program's success continues after the program is over.

The current focus is on reducing electricity consumption by focusing on the blowers and encouraging the use of premium efficiency motors. (These savings are particularly important where a household sets the fan to "on," rather than "automatic.")

Keeping Costs Down

At the outset of the program, getting the cooperation of the manufacturers in strengthening the product warranties was critical to removing risk from the utilities. As the program matured, the cost issue emerged with respect to the necessity of the rebates.

Monitoring and Evaluation

As indicated, the utilities conducted QC inspections; they also tracked sales, as Energy Center continues to do.

Transferability to the Energy Trust

A focus on gas furnaces would be useful if the Energy Trust wishes to encourage fuel switching or if the Energy Trust enters into an agreement to implement gas energy efficiency programs as well. On the other hand, the key factor in the success of the program was that the program specifically addressed the barriers to adoption of highly efficient gas furnaces. If similar barriers exist for electric furnaces then a similar program could be adopted.

Wisconsin Energy Conservation Corporation: ENERGY STAR® Homes Program

Name of Organization: Wisconsin Energy Conservation Corporation

Name of Program: ENERGY STAR® Homes

Name of Contact: Ed Carroll

Phone and Email: 608.249.9322 x.180; ed@weccusa.org

Why Nominated

The WECC ENERGY STAR® Home program was nominated because their rate of participation is very high and acceptance of the program by trade allies is reputed to be high.

Program Delivery

The key program goal is to demonstrate to builders that increasing energy efficiency is viable and will reduce their costs. The main office staff is 4 professionals and 0.5 for a marketing person. There are seven full-time subcontractors who act as regional coordinators, developing relationships with the local building community, identifying other consultants who can act as inspectors, and consult with builders. In part, these "satellite offices" ensure a presence in key localities and avoid having WECC as the sole service provider. In addition, this model is intended to help ensure the sustainability of the construction improvements as the program investments and WECC's lead role are reduced or phased out.[9]

An important key to program success is to demonstrate to the building community that they can readily adopt the practices involved: They are not cost-prohibitive and they offer additional benefits, such as eliminating mold issues (a major concern for Wisconsin builders at this time). Thus, the program is not just for energy efficiency enthusiasts, but is of value to all those on the supply side.

[9] Additional discussion of this issue may be found in Carroll *et al.* (2002).

Incentives

WECC will cover two-thirds of the cost for certifying a home that qualifies. The outlay is approximately $750, which includes modeling and plan review (e.g., of the venting strategy).

Program Marketing

The most effective marketing is through consumer seminars, to which participants are drawn via advertising referrals and participating builders. These are held in the evenings and have drawn between 25-30, in Madison, and 60-70, in Green Bay and Appleton, where there is more of a program track record because of a more active builder community and staff.

Marketing to builders is accomplished through local home-building associations. The key is for program managers to become "insiders," attending monthly events and serving on committees. (They are currently involved in 12-13 of the 23 in the state.) By "being there," the managers help overcome the perception that the program is a temporary entry in the market. And the overall cost is low.

An interested builder is given a discussion of standards, over about one hour, including an opportunity to discuss detailed questions about the program. He (or she) is then asked to sign a participation agreement committing the project to meet ENERGY STAR standards in return for program support.

Customer Service

WECC provides general assistance to consumers. They have acted as an ombudsman, but not often. Moreover, their role is to offer objective advice rather than promoting a particular product or manufacturer (e.g., exterior Styrofoam).

It is important that builders can and do make their own case for building homes that qualify for the program. WECC has attempted to hold sales training seminars for a group of builders. However, the attendance over three tries was only about eight per workshop. It appears that one-on-one is a better approach.

Staffing and Contractors

There are seven subcontractors who act as regional coordinators and eighteen part-time consultants who help to certify participating homes. These professionals are already insured and easily trained, and they provide a flexible resource.

Internal WECC staff is largely responsible for program design, administration, and overall marketing. Regional coordinators are largely responsible for identifying and marketing to builders, as well as assisting in quality control and working with the inspectors.

Participation and Savings

The program is still new and evolving, (See Carroll, et al., 2002). WECC expects more than 20,000 single-family dwellings, duplexes, 4-family units, and 8-family residential units to be built in 2002. At the time of the interview, approximately 600 qualifying units had been completed, but they expect a total of 750 to be included during the current program year, which is the maximum they can handle with the current staff.

A comparison of program homes and new non-program homes indicates that most savings are in the reduction of air leakage. Space heating requirement are approximately 100 therms less per year, which is about 10 percent savings. To increase the savings on electric use, which are estimated at about 4 percent,[10] the program will add targeted incentives; e.g., for the installation of variable speed drives with forced air furnaces and the use of gas clothes dryers.

Over the first three years, they have already completed 1000 homes. Seventy of the 280 participating builders have completed five or more homes in the program. Using the approximate savings values found in the ECW evaluation, and completion of 1,000 qualifying homes, the program is now saving approximately 100,000 therms per year and 400,000 kWh per year.

[10] The relatively low level of savings reported is not surprising, given Wisconsin's stringent code requirements, which are well enforced, and the very high base level for sale of high efficiency heating equipment (over 80 percent market penetration).

Budget

The program was at $1.8 MM in the previous program year and will be at $2.3 MM for the 2002 program year.

The administrative budget is about $300K for internal time and subcontractors. In addition, approximately $650,000 has gone to incentives; $390,000 to the costs of site visits; $500,000 for program development; and $400,000 to marketing. (The marketing budget is low, reflecting only WECC's costs: As indicated elsewhere, the program relies on the builders making the case to buyers. If the builders do not do so, the program is not successful.)

Key Issues for Program

The initial problem for WECC was managing growth. This entailed a careful ramp-up to avoid reliance on inexperienced staff, as well as to ensure timely service and the ability to report on business effects.

WECC is currently seeking to reduce the cost of conducting three site visits to each home under construction, once the builder involved has shown his or her capabilities. One effort involves having certain builders conducting their own quality control with subcontractors. One barrier is that many builders want the external visitations continued.

Another modification under active study is the creation of different program tiers, including one based on quantifiable evidence for ventilation rather than simply the HERS rating, as discussed in Carroll *et al*. (2002).

Keeping Costs Down

Within WECC, a focus has been to find ways of sharing staff across related programs (e.g., they have a remodeling program as well as this RNC program).

Monitoring and Evaluation

An independent assessment of customer satisfaction was done for part of the program (when still funded by individual utilities). Home buyers were happy with their gas bills; less so with their electric bills. As noted above, an independent estimation of savings has also been completed.

Transferability to the Energy Trust

The Wisconsin model (which is similar to the Vermont approach) is expected to achieve long-term, lasting results with builders in the state. An alternative is the New Jersey model. This approach is very simple and user-friendly and uses the A/E firm's own employees (rather than outside contractors). Such an approach offers greater control for the builder and—together with high incentives—seems to get speedy results.

References

Carroll, Ed, Pigg, Scott, Nahn, Gregory, and Nagan, Joseph. (2002) *Roll with the Changes: The Evolution of a Residential New Home Construction Program in Wisconsin*. In Proceedings of the 2002 ACEEE Summer Study on Energy Efficiency in Buildings. Asilomar, CA. pps. 2.41-2.52.