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Louisville, KY 40202
T 1-502-627-3673

July 9, 2007

Director of Marketing and/or Trading
XYZ Corporation
XXXX Street Address
City, State ZIPPP
(Counter Party of LG&E/KU that is Marketing Capacity and Energy)

**RE: Request for Proposals for Renewable Energy Supply
(RFP)**

Dear Colleague in Development, Marketing and Trading of Renewable Electrical Power,
[or specific person's name]

Louisville Gas and Electric Company and Kentucky Utilities Company (“the Companies”) are requesting proposals for long-term supply of capacity and energy powered by renewable fuel resources to strengthen our renewable portfolio to serve the increasing electrical needs of our customers. We believe that our need coupled with current market conditions may promote mutually beneficial deal structures in the near future. It is the Companies intent to analyze proposals and determine potential cost effective and reliable solutions from counterparties that may lead to agreements this year or in the near future.

Please review the products described below and provide proposals consistent with the stated terms. Alternative deal structures, including asset acquisition, are also encouraged.

Proposals for alternative deal structures should include all pertinent details of the proposed transaction/asset.

Offers in response to this RFP must meet all FERC requirements for firm capacity including the need to provide a site specific generator that the Companies can designate as a network resource (DNR). The seller is responsible for all arrangements to ensure the firm delivery of energy to the Delivery Point from the DNR including transmission, fuel transportation and fuel supply.

This inquiry is not a commitment to purchase and shall not bind the Companies or any subsidiaries of E.ON U.S. LLC in any manner. The Companies in their sole discretion will determine with which Respondent(s), if any, it wishes to engage in negotiations that may lead to a binding contract. The Companies shall not be liable for any expenses Respondents incur in connection with preparation of a response to this RFP. The Companies will not reimburse Respondents for their expenses under any circumstances, regardless of whether the RFP process proceeds to a successful conclusion or is abandoned by the Companies at their sole discretion.

1. **Term** – Capacity and Energy is required starting June 1, 2008 for up to 30 years. Other terms will be considered; however, a minimum term of 1 year is required.
2. **Capacity Need** – The Companies are requesting proposals for up to 750 MW of capacity for the term stated above in minimum quantities of 2MWs. Multiple purchases from various suppliers may be executed to meet the Companies' needs.

3.0 Product Descriptions

- 3.1. **Renewable Power Supply Agreement from a specific source(s)** – The Companies would purchase renewable generation capacity and have the right to schedule a quantity of the energy at any time (day ahead, week ahead, etc.) up to 60 minutes before delivery. Proposals are desired with fixed pricing depicted on a monthly basis for demand and energy for the defined term.
- 3.2. **Renewable Generation Asset Acquisition** – The Companies would purchase full or partial ownership in an existing site specific renewable generation facility or the development of renewable generation. Please provide all necessary details for the Companies to perform a thorough evaluation.
- 3.3. **Alternative Deal Structure** – The seller may have another structure that is not defined above. Please provide all pertinent details of this structure including pricing details.

4. **Delivery Point** – Power will be delivered into the Companies’ control area sink, (POD and Sink designator – LGEE), from a defined source of generation capacity. The seller is responsible for all costs for firm transmission and transmission studies including any future changes in the industry’s practices for transmission charges. The seller is responsible for tagging all schedules. Failure to obtain transmission service will not be an excuse for failure to meet delivery obligation.

5. **Pricing Information** – Pricing will include all existing and future cost associated with the delivery of the power at the specified delivery point for the defined term. Offers will be considered firm unless stated otherwise.

6. **Level of Service** – The Companies prefer firm service with availability guarantees. Seller is responsible for specifying the proposed level of service within its offer.

7. **Credit Rating** – Bidders will be reviewed to ensure compliance with the Companies’ credit criteria. Failure to comply may be remedied by providing a letter of credit acceptable to the Companies.

8. **Confidentiality** – The Companies will treat each proposal as confidential during the evaluation process and expects each bidder to agree that the proposal and associated negotiations will be treated as confidential during the evaluation process. As regulated utilities, it is expected that the Companies will be required to release proposal information to various government agencies and/or others as part of a regulatory review or legal proceeding. The Companies may also share proposal information with potential joint owners in renewable capacity and energy. The Companies will use reasonable efforts to request confidential treatment for such information to the extent it is labeled in the proposal as “Confidential”. Please note that confidential treatment is more likely to be granted if limited amounts of information are designated as confidential rather than large portions of the proposal. However, the Companies cannot guarantee that the receiving agency, court, or other party will afford confidential treatment to this information. The Companies also reserve the right to disclose proposals to its officers, employees, agents, consultants, and the like (and those of its affiliates) for the purpose of evaluating proposals. Otherwise, the Companies will not disclose any information contained in the Seller’s proposal that is marked “Confidential”, to another party except to the extent that (i) such disclosures are required by law or by a court or governmental or regulatory agency having appropriate jurisdiction, or (ii) the Companies subsequently obtains the information free of any confidentiality obligations from an independent source, or (iii) the information enters the public domain through no fault of the Companies.

9. **Schedule for the RFP Process**

9.1	RFP Issued	July 9, 2007
9.2	Proposals due	August 31, 2007
9.3	Evaluation Completed (tentative)	November 15, 2007

After the evaluation of proposals is completed, the Companies will enter into negotiations on a timely basis if the Companies determine that a proposal is in their customer's best interests. Any subsequent contracts will be contingent on obtaining the necessary regulatory approvals.

The Companies reserve the right, without qualification, to select or reject any or all proposals and to waive any formality, technicality, requirement, or irregularity in the proposals received. The Companies also reserve the right to modify the RFP or request further information, as necessary, to complete their evaluation of the proposals received.

10. **Contact Information** – The Companies must receive Proposals by 5:00 p.m. EDT on Friday, August 31, 2007. Email notification that a proposal has been sent is requested. A signed copy of each proposal sent by email is expected in 2 business days. Please contact Charlie Freibert with all proposal information, questions, or concerns. For immediate concerns in Charlie's absence, please contact Donna LaFollette at 502-627-4765.

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In closing, I look forward to your response by Friday, August 31, 2007 and the possibility of doing business to meet the Companies' future renewable power needs. Your interest in this request is greatly appreciated.

Sincerely,

Charles A. Freibert, Jr.

Charles A. Freibert, Jr.
Director Energy Marketing

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E.ON U.S.

**Evaluation of Energy Efficiency
at E.ON U.S.**

Final Report

April 6, 2007



07-026

Passion. Expertise. Results.

page



E.ON U.S.

**Evaluation of Energy Efficiency at
E.ON U.S.**

Final Report

April 6, 2007

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1. Executive Summary

E.ON U.S. (E.ON) engaged ICF International (ICF) to assist with a broad review of its existing and proposed programs, as well as industry best practice, to support E.ON's objective of establishing its DSM portfolio within the top quartile of U.S. utilities. ICF's tasks for this project included the following:

1. Review energy efficiency initiatives in place and/or proposed by E.ON U.S.
2. Provide recommendations on existing and proposed programs, including potential enhancements
3. Provide information about programs and/or initiatives utilized by other entities or in other jurisdictions that may be appropriate for E.ON U.S.
4. Provide recommendations on additional initiatives and/or technologies that E.ON U.S. should consider.
5. Produce documentation of the above in the form of a summary report

This report is the culmination of ICF's work for this project, and constitutes the summary report mentioned in Task 5 above.

1.1. Approach to the Project

ICF and E.ON took a "portfolio" approach to this project, thinking about the Company's overall DSM objectives and how to link new programs and concepts to E.ON's successful existing programs. Increasingly, utilities are approaching the DSM planning process explicitly as an exercise in investment portfolio planning, driven by clear articulation of objectives and a view on the risks associated with individual investments. This approach requires that each program perform a specific role within the portfolio, and it provides a structure within which companies can evaluate the value of existing programs and identify gaps to be filled by new or restructured programs.

ICF worked with E.ON to develop a set of potential portfolio objectives and then proceeded with a review of existing and potential programs through a four-step process.

1. We developed a "portfolio map" or matrix that lists each of the Company's portfolio objectives as row headings, and each of the relevant DSM market segments as column headings. The cells in this matrix represent the desired mix of programs, although clearly single programs can cover a number of cells.
2. We compiled information regarding E.ON's existing and planned programs and prepared an initial portfolio mapping, by fitting these programs into the matrix described above. We then identified and compiled information for several programs considered to be exemplary or best practice. Best practice in this context is extremely subjective. Many of the programs we examined were selected as exemplary by the American Council for an Energy Efficiency Economy (ACEEE) based on a broad nomination process. Nevertheless, there is nothing in the process of selecting these programs that suggests they are broadly applicable to any other utility. Results can vary widely depending on programs structure, end use fuel mix, weather, and the length of time that a program has been in the field.
3. Based on the portfolio mapping exercise, we identified portfolio gaps—cells in the matrix that were not filled with existing or planned programs.

Executive Summary

4. We identified program types that could be considered for filling those gaps and prepared templates describing key attributes of the programs.

The comparisons between E.ON's programs and those chosen to represent best practice were focused on two areas. The first was to identify any elements of programs that represented design or implementation innovation and might be suggestive of an evolution in program design. Second, we attempted to compare E.ON's and other programs across a range of basic program performance metrics. Unfortunately, due to some data limitations, these comparisons cannot be considered definitive.

1.2. E.ON's Current Environment and DSM Portfolio

ICF worked with E.ON to understand its existing DSM programs and the environment in which the Company currently operates, and used this review to ensure that our recommendations take E.ON's unique environment into account. E.ON currently operates four primary DSM programs, all of which report high customer satisfaction:

- Residential Energy Audits
- Commercial Energy Audits
- Demand Conservation Program
- WeCare (low-income weatherization) Program.

E.ON's unique environment includes the lowest retail electricity rates in the country.¹ Not surprisingly, these low prices have led to per capita consumption significantly above average, and support relatively strong demand growth, expected to be in the range of slightly above two percent per year on average over the next twenty years. This growth is expected to drive the need for several new generating stations. In large part, the low electricity prices are the product of the state's coal supply which creates a very competitive fuel source for E.ON's fleet. This same supply, however, could create obstacles to competitiveness if the United States enacts regulations on CO2 emissions. And there is a growing sense that some response to customer and public concern might be warranted prior to any legislation that might emerge over the next several years.

These factors combine to fashion a unique DSM planning environment. Low prices historically have meant that consumers have invested relatively less in energy efficiency than their counterparts across most of the country, leaving what we expect would be a huge vein of untapped efficiency potential. At the same time, avoided costs have historically been low and, from a total resource cost perspective, relatively little of that potential has been cost effective to acquire. These avoided costs already are rising as the Company faces the need to add additional capacity, and these costs would rise still further if the risk premium associated with potential CO2 regulation is factored in.

The effect of this environment on the E.ON DSM portfolio as it exists today has been four-fold:

1. Because of low avoided costs, pure energy efficiency programs have not been cost-effective on the whole. Demand response programs, however, do exhibit better economics by being

¹ Commonwealth Energy Policy Task Force, Kentucky's Energy: Opportunities for our Future, page 2.

Evaluation of Energy Efficiency at E.ON U.S.
Executive Summary

able to capture value inherent in reducing peak production costs. The effect is to tilt E.ON's portfolio toward demand response.

2. Due in-part to the opt-out clause for industrial customers, programs have been focused on residential customers. Close to 85 percent of program expenditures are for residential programs.
3. Because the planning environment has not changed perceptibly for a number of years, a number of programs have been operated "as is" for quite some time. The advantage of continuity is that enables continuous improvement and improved efficiency. However, the environment of continuous operation can sometimes lead to continued use of approaches, tools, and techniques that may no longer be best practice.
4. Finally, rising avoided costs and rapid advances in technology and program theory combine with Kentucky's large untapped efficiency potential to create substantial opportunity for innovative portfolio design.

Table 1 and Table 2 provide some additional context by showing total DSM spending and spending per capita for the top ten utilities and E.ON, as well as the national averages.

Table 1: Total Spending on DSM²

UTILITY NAME	TOTALCOST (\$1000)
Top-Ten Utilities	
Southern California Edison Co	\$293,322
Pacific Gas & Electric Co	\$183,416
Florida Power & Light Company	\$144,192
Public Service Elec & Gas Co	\$138,827
San Diego Gas & Electric Co	\$85,438
Northern States Power Co	\$81,065
Progress Energy Florida Inc	\$58,283
Connecticut Light & Power Co	\$56,443
Massachusetts Electric Co	\$53,184
Interstate Power and Light Co	\$46,912
Average of all U.S. utilities	\$4,151
Kentucky (KU and LG&E)	\$8,460

² Kentucky spending is based on E.ON KPI workbook for 2006. Other utility data are for 2005 from EIA.

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Table 2: Per Capita DSM Spending³

State	EE Spending per capita (\$)
Top-Ten States	
Vermont	28.26
Massachusetts	21.49
New Hampshire	16.45
Washington	15.21
Rhode Island	14.13
Oregon	13.44
Wisconsin	11.33
New Jersey	11.31
Montana	10.65
Iowa	10.17
Average of all states	4.65
Kentucky	2.09

1.3. Best Practice Notes

Sections 4 and 5 compare E.ON's existing and proposed programs with similar programs considered exemplary or best practice. At the end of each program comparison we provide a series of "Best Practice Notes" suggesting key design and implementation features. Table 3 summarizes these notes related to existing and proposed E.ON programs. Additional detail can be found in the body of the report.

Table 3: Best Practice Notes

Program	Best Practice Notes
Residential Audit Program	<ul style="list-style-type: none"> • Best practice is evolving along one of two branches: <ul style="list-style-type: none"> – On-line audits—69% of utilities offer some form of on-line audit. More efficient use of resources and lower per unit costs. – Industry is migrating toward "whole-house" approaches that focus on total home performance.
Commercial Audit Program	<ul style="list-style-type: none"> • Industry migrating toward energy benchmarking rather than traditional audit programs. • Large customers are likely to benefit from online energy data for self-diagnostics, but will require more sophisticated auditing. Small customers typically require direct-installation or financing to adopt EE recommendations and can benefit from much simpler audits and analyses.
Residential Low Income Weatherization Program	<ul style="list-style-type: none"> • Low income weatherization programs generally tend to be consistent across the country, and the Company is consistent with standard practice.

³ Kentucky data from E.ON KPI workbook for 2006. Other data from ACEEE's 3rd National Scorecard on Utility and Public Benefits Energy Efficiency Programs: A National Review and Update of State-Level Activity, Dan York and Marty Kushler, October 2005.

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Program	Best Practice Notes
Demand Conservation Program	<ul style="list-style-type: none"> ◦ Programmable thermostats are compelling incentives for the customer as they are a familiar technology and offer attractive value-added features such as a Web interface. ◦ Customer acquisition costs can be reduced through market segmentation strategies that identify and target desirable customer segments, and through utilizing trade ally marketing and sales channels such as HVAC contractors and/or DIY retailers. E.ON's consideration of using contractors in the residential audit program to promote smart thermostats is consistent with this trend.
Residential New Construction	<ul style="list-style-type: none"> ◦ Residential new construction programs' success depends on recruiting builders; directly targeting home buyers is not considered effective. ◦ Practice is transitioning away from providing incentives directly to builders to offset the costs of the home. Practice is transitioning towards providing incentives to raters or marketing incentives to builders. This approach aims to stimulate the development of the infrastructure and engages raters to help sell builders on the program.
Residential HVAC	<ul style="list-style-type: none"> ◦ With the increase in federal central AC standards, best practice is rapidly evolving toward a focus on proper sizing, installation, charge, and airflow for both new and existing systems. Best practice increasingly targets mid-stream market segments (HVAC contractors and distributors) ◦ The remaining large pocket of HVAC savings lies in ducting systems. An increasing number of utilities are offering duct testing and sealing programs, although an effective program requires a service infrastructure.
Residential Lighting & Appliance Programs	<ul style="list-style-type: none"> ◦ Most leading edge lighting and appliance programs now work upstream with manufacturers and retailers. In some cases, rebate funds are paid directly to the retailer or manufacturer based on sales data. This upstream focus enables utilities to exercise the most market leverage in terms of product pricing and cooperative advertising. Directly attacking the mass market can be extremely expensive. ◦ CFL programs typically can account for up to one-third of portfolio savings and therefore are extremely valuable elements in a portfolio with savings goals.
Commercial HVAC	<ul style="list-style-type: none"> ◦ The program under consideration by E.ON is, as we understand, reflective of many best practice design elements, such as: <ul style="list-style-type: none"> – Using HVAC service contractors to market the program and provide tune-up services. – Providing contractor incentives to reduce the cost to the customer and give contractors a reason to sell program services. – Including ongoing M&V mechanism to ensure savings persistence and demonstrate the energy savings value to customers.
Critical Peak Pricing	<ul style="list-style-type: none"> ◦ Incorporate enabling technology such as programmable thermostats to improve demand reduction by automating response process; customers should be offered the flexibility of overriding the signal. ◦ Customer motivation to participate is strongly affected by non-financial objectives such as demonstrating they are good corporate citizens; drive participation by incorporating such messaging into program marketing efforts.
Commercial Prescriptive Incentives	<ul style="list-style-type: none"> ◦ Develop and maintain strong relationships with trade allies such as equipment vendors and installation contractors. Some programs offer trade ally incentives to encourage trade ally involvement. ◦ Through mechanisms such as electronic application systems, streamline incentive application as well as verification/quality control processes to facilitate ease of participation and minimize the time required for incentive payment. ◦ Tie incentive levels to measure payback, with one- to two-year payback as the industry norm, offering higher incentives for premium efficiency equipment.

Executive Summary

Program	Best Practice Notes
Information, Education and Training	<ul style="list-style-type: none"> An effective information and education program will be designed to serve as the broad foundation for other portfolio elements, and will itself contain elements or sub-programs that provide what is sometimes called “market conditioning” support for financial incentive programs. For example, Building Operator Certification Training provides a foundation for benchmarking and retro-commissioning programs, web-based consumer education programs support lighting and appliance initiatives, and so forth.

1.4. Recommendations and Conclusions

Our review of the existing E.ON DSM portfolio, as well as a number of programs under consideration by E.ON leads us to the following conclusions:

- E.ON’s current portfolio of programs is well-managed and achieves high customer satisfaction. However, it is difficult to assess the cost-effectiveness of the current programs.
- E.ON’s current programs are perhaps “over-weighted” towards the residential sector. Over 80 percent of current funding goes to these programs. This weighting is almost the opposite of what we would expect to see *if* the portfolio was designed to acquire cost-effective energy efficiency resources. However, it may well reflect the nature of the collaborative process in Kentucky and a relative lack of interest in DSM programs on the part of commercial customers.
- E.ON’s current portfolio would appear, at first, to be “over-weighted” towards demand response and load management. However, this weighting may be appropriate in light of the Company’s historical rates and avoided costs.
- The Company is running an effective and popular weatherization program that is competitive with other utilities’ weatherization programs.
- The Company’s two audit programs are based on approaches that are labor-intensive—a fact that will likely hurt cost-effectiveness. Most utilities have moved away from on-site audits, at least for the residential sector. On the commercial side most of the audit recommendations and follow-up actions involve lighting. Typically, on-site audits are not required, and few utilities subsidize them, for the purpose of flagging lighting upgrade opportunities in larger commercial buildings. Lighting contractors typically will provide such services. Smaller commercial customers often will not have the resources (time or money) to follow-up on audit recommendations and often direct install programs are more effective with this sector.

Specifically:

- For the residential program:
 - Upgrade the audit tool/technology utilized by contractor, consistent with the Summit Blue recommendation.
 - Consider incorporation of a “whole-house” approach. Home performance programs look at a building throughout the lifecycle and strive to encourage cost-effective home improvements. Programs begin with a home performance evaluation, similar to an energy audit. Potential program measure and service add-ons could include blower-door tests/air-sealing packages, HVAC diagnostic/tune-ups, programmable thermostats, and additional lighting measures, including occupancy sensors.
- For the commercial program:

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- Consistent with the Summit Blue recommendation, update and improve the audit tool/technology used by contractor—update audit forms to ensure comprehensive and systematic audit. Consider replacing Excel-based audit with a web-based system.
- Consider adding energy benchmarking (EPA ENERGY STAR Portfolio Manager http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager) or energy modeling programs to portfolio of programs for commercial customers in addition to or in place of commercial audits.
- Consider a two-tiered system, providing simpler audit services for small commercial clients, and more comprehensive benchmarking services for large commercial clients.
- Risk is not a major concern for the portfolio despite over-weighting given that E.ON does not have savings targets. However, if such targets were chosen, we believe the portfolio carries substantial performance, technology and evaluation risk as it currently stands.
- E.ON's residential load control suite, and particularly its advanced Responsive Pricing/Smart metering pilot, represents a significant innovation and may provide an exciting platform for an integrated energy efficiency and demand response program. This program places E.ON squarely in the top tier of utilities exploring advanced demand response technologies.
- IF E.ON chooses to set energy and/or demand savings goals, certainly its current portfolio and most likely even the proposed portfolio will exhibit gaps. Recognizing that it is inappropriate to simply port programs from one jurisdiction to another, most top quartile utilities will have some or all of the following programs in their portfolios:
 - Residential HVAC diagnostics and tune-ups
 - Residential lighting and appliances rebates
 - ENERGY STAR New Homes
 - Prescriptive and/or custom commercial rebates
 - Broad-based education and information programs
 - Hard-to-reach customer programs, particularly direct install of measures in the low income, multi-family and small commercial sectors.
 - Commercial benchmarking and retro-commissioning.
- Top-tier utilities also frequently have developed targeted market programs to reach deeper within specific sub-sectors. However, these programs tend to require more management attention and are more expensive if only due to recruiting costs, than the more simply-structured Prescriptive and Custom incentive programs.

A substantial body of best practice exists on which E.ON could rely should it elect to pursue any of these programs as part of its portfolio. We do urge the Company to carefully consider its portfolio objectives prior to developing a longer-term strategy. What we see as portfolio gaps are a direct function of how we have chosen to view portfolio objectives; a different view will yield different perspective on gaps and appropriate strategies for filling those.

2. Introduction

2.1. Overview of the Project Scope

E.ON U.S. (E.ON) engaged ICF International (ICF) to assist with a broad review of its existing and proposed programs, as well as industry best practice, to support E.ON's objective of establishing its DSM portfolio within the top quartile of U.S. utilities. Specifically, ICF was directed to:

- Review energy efficiency initiatives in place and/or proposed by E.ON U.S.
- Provide recommendations on existing and proposed programs, including potential enhancements, taking into consideration the current and future environmental regulatory climate, current and projected energy costs, planned capacity additions, rate impacts, federal and state legal and regulatory issues, customer interests, available technologies, and other relevant factors.
- Provide information about programs and/or initiatives utilized by other entities or in other jurisdictions that may be appropriate for E.ON U.S. given our regulatory and environmental climate, rates and generation portfolio.
- Provide recommendations on additional initiatives and/or technologies that E.ON U.S. should consider.
- Produce documentation of the above in the form of a summary Report (including Executive Summary, Review & Assessment of Proposed Programs, Benchmarking Comparison to Other Successful Energy Efficiency Programs, and recommendations). The Report is to address the appropriateness of the E.ON U.S. existing and proposed programs and recommend additional programs and technologies that E.ON U.S. should consider. The Report should be in a form suitable for distribution to all stakeholders, including the public at large.
- Potentially testify to the content of The Report in the anticipated proceeding before the Kentucky Public Service Commission (in which LG&E and KU seek approval of establishment of programs for regulated utility customers under applicable state regulations) or in other forums as requested by E.ON U.S.
- Otherwise assist E.ON U.S. in the development of strategy and the review, analysis, and development of energy efficiency initiatives as appropriate.

ICF proposed to structure the substantive work in three broad tasks: (1) Construction of a basic DSM portfolio framework to guide subsequent steps; (2) A review of current E.ON programs and comparisons with similar programs identified as best practice; and (3) A review of proposed and possible E.ON programs, taking into account gaps in the Company's portfolio, best practice portfolio design, and best practice programs employed elsewhere. This report presents the results of these tasks.

2.2. Our Approach to the Project

The project began with a kick-off meeting held at E.ON US' Louisville headquarters. At that meeting the Company described the context for the project, provided background on existing and proposed programs, and clarified basic project objectives. ICF presented its proposed approach to the review. Subsequent to that meeting, E.ON provided a substantial amount of information for our review, including 2000 and 2005 IRP filings, recent evaluations of existing programs, load forecasts, a description on planned programs, the Kentucky DSM statute, and the Kentucky Energy Strategy.

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This approach, roughly consistent with the broad tasks outlined above, focused first on developing a sound understanding of the Company's DSM portfolio objectives. Historically, what passed for DSM investment portfolios across the industry were merely amalgams of individual programs without the "connective tissue" supplied by an overarching view of what was to be accomplished and what the specific roles of individual programs were within this context. Increasingly, utilities are approaching the DSM planning process explicitly as an exercise in investment portfolio planning, driven by clear articulation of objectives and a view on the risks associated with individual investments. This approach requires that each program perform a specific role within the portfolio, and it provides a structure within which companies can evaluate the value of existing programs and identify gaps to be filled by new or restructured programs. Our first step in this project was to draft a set of potential portfolio objectives and an overview of the portfolio development process for consideration by E.ON.

Our review of existing and potential programs followed a four-step process.

1. We developed a "portfolio map" or matrix that lists each of the Company's portfolio objectives as row headings, and each of the relevant DSM market segments as column headings. The cells in this matrix represent the desired mix of programs, although clearly single programs can cover a number of cells.
2. We compiled information regarding E.ON's existing and planned programs and prepared an initial portfolio mapping, by fitting these programs into the matrix described above. We then identified and compiled information for several programs considered to be exemplary or best practice. Best practice in this context is extremely subjective. Many of the programs we examined were selected as exemplary by the American Council for an Energy Efficiency Economy (ACEEE) based on a broad nomination process. Nevertheless, there is nothing in the process of selecting these programs that suggests they are broadly applicable to any other utility. Results can vary widely depending on programs structure, end use fuel mix, weather, and the length of time that a program has been in the field.
3. Based on the portfolio mapping exercise, we identified portfolio gaps—cells in the matrix that were not filled with existing or planned programs.
4. We identified program types that could be considered for filling those gaps and prepared templates describing those programs.

The comparisons between E.ON's programs and those chosen to represent best practice were focused on two areas. The first was to identify any elements of programs that represented design or implementation innovation and might be suggestive of an evolution in program design. Second, we attempted to compare E.ON's and other programs across a range of basic program performance metrics. Unfortunately, due to some data limitations, these comparisons cannot be considered definitive.

2.3. The Context for the Review

2.3.1. The Company's Planning Framework

The Company currently operates four primary DSM programs:

- *Residential Energy Audits:* Targets customers who own or occupy single-family homes, apartments, or condominiums. The program provide an on-site home energy audit, some

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direct install measures and points interested customers toward additional energy saving measures that they may implement.

- *Commercial Energy Audits:* Targets all commercial class customers in the LG&E service area and all KU General Service commercial customers. The implementation contractor for this program also makes arrangements for measure installation at the customer's expense.
- *Demand Conservation Program:* This program cycles residential and commercial central air conditioning units and residential pool pumps of both KU and LG&E customers. The Company currently provides a small incentive to customers willing to participate.
- *WeCare Program:* This program provides low income weatherization services, and is available to LIHEAP eligible customers in the Louisville and Lexington metropolitan areas.

Total expenditures for these programs in 2006 were slightly under \$8.5 million. Of that amount, the Demand Conservation Program (residential) accounted for 60 percent, and the Residential Energy Audit and WeCare Programs for about 29 percent. Recent evaluation of these programs report high customer satisfaction.

These programs are planned and operated within a unique environment, characterized by the lowest retail electricity rates in the country.⁴ Not surprisingly, these low prices have led to per capita consumption significantly above average, and support relatively strong demand growth, expected to be in the range of slightly above two percent per year on average over the next twenty years. This growth is expected to drive the need for several new generating stations. In large part, the low electricity prices are the product of the state's coal supply which creates a very competitive fuel source for E.ON's fleet. This same supply which has fueled Kentucky's growth, however, could create obstacles to competitiveness if the United States enacts regulations on CO2 emissions. And there is a growing sense that some response to customer and public concern might be warranted prior to any legislation that might emerge over the next several years.

Kentucky also enjoys one the country's most progressive DSM cost-recovery and incentive structures, authorizing recovery of direct program costs and lost revenues, as well as a performance incentive. However, cost recovery is conditioned upon the participation of a variety of stakeholders in the planning of E.ON's DSM programs; a process that to-date has worked reasonably well, but could become more complex should E.ON expand its portfolio and expenditures. Finally, industrial customers are given the option to opt-out of utility DSM programs, meaning that industrial program costs would be recovered from only a portion of customers in the rate class.

These factors combine to fashion a unique DSM planning environment. Low prices historically have meant that consumers have invested relatively less in energy efficiency than their counterparts across most of the country, leaving what we expect would be a huge vein of untapped efficiency potential. At the same time, avoided costs have historically been low and, from a total resource cost perspective, relatively little of that potential has been cost effective to acquire. These avoided costs already are rising as the Company faces the need to add additional capacity, and these costs would rise still further if the risk premium associated with potential CO2 regulation is factored in.

⁴ Commonwealth Energy Policy Task Force, Kentucky's Energy: Opportunities for our Future, page 2.

The effect of this environment on the E.ON DSM portfolio as it exists today has been four-fold:

1. Because of low avoided costs, pure energy efficiency programs have not been cost-effective on the whole. Demand response programs, however, do exhibit better economics by being able to capture value inherent in reducing peak production costs. The effect is to tilt E.ON's portfolio toward demand response.
2. Due in-part to the opt-out clause for industrial customers, programs have been focused on residential customers. Close to 85 percent of program expenditures are for residential programs.
3. Because the planning environment has not changed perceptibly for a number of years, a number of programs have been operated "as is" for quite some time. The advantage of continuity is that enables continuous improvement and improved efficiency. However, the environment of continuous operation can sometimes lead to continued use of approaches, tools, and techniques that may no longer be best practice.
4. Finally, rising avoided costs and rapid advances in technology and program theory combine with Kentucky's large untapped efficiency potential to create substantial opportunity for innovative portfolio design.

2.4. Overview of the Report

The remainder of this report consists of four sections and an Appendix. Section 3 describes a "portfolio-based approach" to the review and further development of E.ON's DSM programs. We describe the general approach to portfolio construction, outline a number of important portfolio objectives, and illustrate the use of portfolio mapping as a tool for flagging gaps in the portfolio.

Section 4 includes a review of E.ON's existing programs within the context of industry best practice, and presents a tabular comparison of each of the E.ON offerings with those of several other utilities. As noted several places in this report, "best practice" is a subjective label that is context-sensitive. We believe that the comparisons included in Section 4 should be viewed generally as a benchmarking exercise. At the conclusion of each program sub-section we offer several best practice notes designed to illustrate the direction in which program design and implementation is moving.

Section 5 includes a comparison of proposed E.ON programs and similar programs being implemented by other utilities using the format employed in Section 4. This section also includes a review of a number of program types that E.ON might consider at some point for inclusion in its portfolio.

Section 6 presents our conclusions, and the Appendix includes more detailed descriptions of the programs used for the comparisons in Sections 4 and 5.

3. DSM Portfolio Theory and Definition of Best Practice

3.1. Introduction

Smart investors build portfolios to satisfy a range of specific financial objectives, taking into account the risks inherent in various investments. The essence of a portfolio is balance—a mix of investments corresponding to different objectives and with different risk profiles that help ensure goals are met even if individual investments under-perform. The set of demand-side programs that E.ON ultimately selects should be viewed in similar terms. The mix of programs should be structured to satisfy a variety of public policy and Company objectives, while ensuring that even if some programs under-perform, the portfolio as a whole will fulfill its role in the Company's overall resource strategy.

This section describes a demand-side management investment philosophy to guide selection of the E.ON DSM portfolio. The design of the portfolio framework includes two basic steps: the definition of DSM investment objectives and establishment of a perspective on program and portfolio risk. Investment objectives are set to reflect both policy and regulatory standards, as well as program performance and customer service criteria.

3.2. Setting the Investment Objectives

In the following brief sections, we outline what we consider to be key portfolio design objectives.⁵ Invariably, the extent to which some important objectives are satisfied cannot be expressed quantitatively. In addition, we should expect that it will not be possible to simultaneously maximize/satisfy all objectives. Finally, parties will likely weight these objectives and will assess risks differently. Our purpose here is simply to suggest a set of relevant design objectives. We recognize that, as E.ON's analysis proceeds, multiple portfolios will likely be considered as trade-offs among objectives are considered.

3.2.1. Regulatory and Policy Objectives

The Kentucky DSM statute describes several factors that the Kentucky Commission must consider when reviewing a utility DSM plan. Although, these do not constitute objectives per se, they reflect objectives that are common to many regulatory structures. These factors include:

- The specific changes in customers' consumption patterns which a utility is attempting to influence (implies a load reduction objective);
- The cost and benefit analysis and other justification for specific demand-side management programs and measures included in a utility's proposed plan (implies at least a loose cost-effectiveness objective);
- A utility's proposal to recover in rates the full costs of demand-side management programs, any net revenues lost due to reduced sales resulting from demand-side management programs, and incentives designed to provide positive financial rewards to a utility to

⁵ An earlier version of this section, including proposed portfolio objectives was sent to E.ON for review and comment. As of the writing of this draft, comments have not been received. Therefore, the portfolio objectives described in this should be treated as CIF's initial suggestion of possible objectives for E.ON to consider, and not as objectives that E.ON has endorsed in any way.

encourage implementation of cost-effective demand-side management programs (implies the objective of creating an incentive to pursue cost-effective energy efficiency);

- Whether a utility's proposed demand-side management programs are consistent with its most recent long-range integrated resource plan (implies consistency with the most recently filed IRP as an objective);
- Whether the plan results in any unreasonable prejudice or disadvantage to any class of customers (implies that all customer classes have an opportunity to benefit or, at a minimum, than none are disadvantaged);
- The extent to which customer representatives and the Office of the Attorney General have been involved in developing the plan, including program design, cost recovery mechanisms, and financial incentives, and if involved, the amount of support for the plan by each participant, provided however, that unanimity among the participants developing the plan shall not be required for the commission to approve the plan (implies a collaborative design process as an objective); and
- The extent to which the plan provides programs which are available, affordable, and useful to all customers (implies as an objective that at all customers have the opportunity to participate in at least one program).

While these are only factors to be considered, when configured as at least loose objectives, they can be extremely useful for portfolio development.

3.2.2. Defining Cost-Effectiveness

An overarching objective of portfolio design is cost-effectiveness. Under the Kentucky DSM statute, there is no explicit reference to the appropriate cost-effectiveness test(s) to use. It is our understanding that the practice in the State is to use what is sometimes referred to as the California Standard Practice tests, although these tests are not applied in a hard-and-fast manner. While flexibility in the application of cost-effectiveness screening is important, it is equally important to employ a basic cost-effectiveness protocol as a guide. We propose the following:

- All *measures* should be screened using the Total Resource Cost (TRC) test. The test should be applied loosely with the equivalent of a 10% dead band, such that if a measure is within 10% of a benefit-cost ratio (BCR) of 1.0 it should be passed to succeeding steps. This recognizes the uncertainty surrounding measure characterization and screening.
- *Programs* (defined as bundles of measures combined with explicit targeting, delivery and incentive strategies) should be screened against all standard practice tests. The objective should be to have as many programs with TRC benefit-cost ratios in excess of 1.0 as possible, recognizing that other portfolio objectives may require the inclusion of programs that are not cost-effective. For example, programs aimed at low income customer segments often test at less than a 1.0 BCR. Information and education programs, because they do not have savings associated with them, will test as not cost-effective, but can nonetheless be extremely valuable as part of a well-balanced portfolio. The Participant and Program Administrator tests as well as the Rate Impact Measure are important for program design purposes.
- The portfolio as a whole should have a TCR benefit-cost ratio in excess of 1.0. The structure and balance of programs should be adjusted to deliver this result.

According to the Company's 2005 IRP filing, the Companies used only the Participant and TRC tests to screen DSM options. This appears to be at least a slight change from the process described in its 2000 IRP, wherein the Company stated, "*The Companies analyze DSM programs that pass the Ratepayer Impact Measure (RIM) and the Participants tests. DSM programs that do not pass the RIM test must pass the Total Resource Cost (TRC) and the Participants tests as well as successfully compete with supply-side options in the Companies integrated planning process.*"

3.3. Portfolio Design Objectives

Within the broad parameters of these policy and regulatory objectives, we propose a number of additional objectives to guide the development of the DSM portfolio.

3.3.1. Achieve a Particular Level of Energy/Demand Reduction

Often the portfolio design process is governed by a specific energy efficiency target. Absent this target it is relatively more difficult to determine the "right" magnitude of the portfolio. We understand that the Company currently is considering the pros and cons of setting such a target.

3.3.2. Provide Coverage for Low-Income Customers

Energy efficiency programs that are intended principally to serve as a resource typically target the most accessible and cost-effective pockets of efficiency potential. Although these programs might be designed to allow all customers to participate, low income residential customer invariably are "hard to reach." These customers often face barriers to participation in efficiency programs that are more severe or complex than those addressed by mainstream efficiency programs.

3.3.3. Inclusion of Some Educational/Informational Elements to Promote Changes in Long-term Customer Behavior

A prudent investment strategy should lay the foundation for investment in sustainable energy efficiency even after direct ratepayer funded investment ends. We believe such activities can have significant value in several areas:

- Strengthening the capacity of downstream efficiency product and service suppliers to successfully sell energy efficiency;
- Moving target customer segments from awareness to action by providing focused information, technical assistance and training; and

Where appropriate, market preparation elements should be built into each program design.

3.3.4. Promotion of Emerging Technologies and Innovative Concepts

Resource acquisition strategies typically focus on promotion of commercialized energy efficient technologies and proven practices. However, a robust portfolio, particularly one designed to support program activity over a number of years, should include some level of investment in technologies, practices and program delivery methods that could emerge as important contributors to acquisition targets and market development in out-years of the portfolio. These investments could be configured as pilot programs or market research projects.

3.3.5. Strengthen Customer Service

Implementation of DSM programs provides an important opportunity to re-establish and strengthen relationships with consumers and energy efficiency product and service suppliers. Programs included in the portfolio should be designed to support customer service and satisfaction objectives.

3.3.6. Balance Energy Efficiency and Demand Response Elements

Although few utility portfolios actually purport to have achieved this, most agree that a robust demand-side portfolio should include both energy efficiency and demand management/demand response elements. More important, however, these elements should, to the extent possible, be conceptually/programmatically integrated to extract maximum value from the demand-side resource.

3.3.7. Minimize Rate Impacts

Although cost-effectiveness as measured from a Total Resource Cost and utility benefit perspective drives portfolio construction, individual program design elements should reflect an attempt to mitigate rate impacts where possible. For example, programs should be designed to minimize free-ridership.

3.3.8. Ensure Portfolio Flexibility

This objective includes several important elements:

- Programs should be scalable; those programs that either require heavy initial investment or cannot be easily ramped up or down, introduce excessive risk, particularly in a new portfolio.
- Program designs should be flexible to enable rapid changes if market conditions warrant.
- The Company should retain the flexibility to manage investment in individual programs such that investment can be shifted away from under-performing programs to stronger performers.
- The portfolio should be balanced across sectors and specific markets to spread participation risk and reduce cost.

3.3.9. Employ Best Practice Portfolio and Program Design

“Best Practice” often is an imprecise characterization of a complex mix of experience, practice, and environment that together yield outcomes widely recognized as superior. This is particularly the case for energy efficiency programs given that they serve a wide variety of objectives, market segments, and administrative models. The recipe for program success is one part good design and two parts good execution., and neither of these ingredients is entirely portable—a best practice program or program process inevitably contains locational or sponsor idiosyncrasies that have contributed to its success. Finally, what is best practice for a utility that has been designing and managing programs for two decades will be different in some cases from what should be viewed as best for an organization just entering the field. The energy efficiency portfolios managed by utilities with long experience tend to be characterized by narrower market segmentation, more complex delivery structures, and a larger number of programs. Attempting to replicate these portfolios would be extremely challenging for utilities just embarking on an energy efficiency investment program. We recommend that the Company pursue best practice in the sense that it adopts program “types” and implementation and management principles considered to be fundamental to success. The specific designs of programs must be firmly rooted in the E.ON

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context, and thus decisions regarding incentive levels, customer outreach and recruiting, eligible technologies and implementation structure should reflect E.ON's circumstances.

3.3.10. Additional Objectives to Consider

Although the intent of this process is not to develop as long a list of objectives as possible, it is important to include all that could have a significant effect on portfolio design. For example, if environmental stewardship is driving the portfolio to some extent, it might be appropriate to include an objective that all portfolio elements display a link to an environmental theme. If the Company is experiencing locational congestion, and objective related to the ability to target program impacts might be considered.

3.4. Applying the Framework

Table 3 distills the portfolio objectives we have suggested and illustrates how those objectives translate into specific design parameters and program elements. The Portfolio Design Parameters and Program Design Elements, while consistent with what we observe in the industry are illustrative only and do not necessarily represent E.ON's position. Note that we have not translated the statutory "factors for consideration" into objectives at this point. The first column recaps the portfolio objectives described above. The second column describes how those objectives could influence the general structure of the portfolio, and the third column suggests how these portfolio design parameters could shape specific program elements.

Table 4. Hypothetical Portfolio Objectives, Design Parameters, and Design Elements

Objective	Portfolio Design Parameters	Program Design Elements
Coverage of low income customers	<ul style="list-style-type: none"> Portfolio should include, at a minimum, elements aimed at serving low income residential customers. 	<ul style="list-style-type: none"> Include at least one low income residential program.
Inclusion of some educational/informational elements	<ul style="list-style-type: none"> Market preparation activities should be used where they (1) can help boost acquisition program effectiveness (2) are an essential element of an acquisition program and/or (3) help ensure sustainable market activity. 	<ul style="list-style-type: none"> All program designs should address the need for specific market preparation activities (e.g., trade ally training programs, awareness-building, etc).
Promotion of emerging technologies and innovative program concepts	<ul style="list-style-type: none"> The portfolio should earmark resources for a "Research and Development" element supporting technology research and demonstrations and pilot programs. 	<ul style="list-style-type: none"> Focus on segments/measures in which significant technology change is likely and/or where current measures are on the cusp of cost-effectiveness.
Strengthen customer service	<ul style="list-style-type: none"> Program designs should incorporate customer input, include branding, and link delivery to customer service functions. 	<ul style="list-style-type: none"> Employ customer focus groups during final program design phase. Ensure program designs incorporate links to the Company's customer service functions.
Balance energy efficiency and demand response	<ul style="list-style-type: none"> Demand response should represent a significant share portfolio load reduction, with the appropriate share determined by cost-effectiveness. 	<ul style="list-style-type: none"> Pursuit of this objective should be tempered by program design considerations focused on broad reach and delivery efficiency. Select program designs that can effectively integrate EE and DR.
Minimize rate impacts	<ul style="list-style-type: none"> Seek a balance between energy savings and demand reduction to capture savings when most valuable. Evaluate multiple portfolios to assess cost-effectiveness/rate impact trade-offs. 	<ul style="list-style-type: none"> Favor designs that minimize free riders. Favor designs that capture peak savings.
Ensure portfolio flexibility	<ul style="list-style-type: none"> Seek diversity across technologies and markets. Balance the need for broad coverage and minimizing administrative complexity through too many programs. 	<ul style="list-style-type: none"> Focus on broad designs that incorporate a wide range of measures and market segments.
Apply Best Practice Design Principles	<ul style="list-style-type: none"> Portfolio needs to be manageable given E.ON experience. Minimize the number of programs and avoid programs initially that require complex administrative structures. 	<ul style="list-style-type: none"> Focus on straightforward designs characteristic of "starter portfolios."

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3.4.1. The Portfolio Mapping Process

Figure 1 illustrates the Portfolio Map that we have developed for this project.

Figure 1: Illustrative Portfolio Map

	Residential			Commercial							Industrial	
	Mass Mkt	Multi-Family	Low Income	Office	Retail	Schools	Hospitals	Govt	Hospitality	Small C&I		
The portfolio should achieve a relative balance across sectors in the allocation of resources												NA
Coverage of low income customers												NA
Inclusion of some educational/informational elements												NA
Promotion of emerging technologies and innovative program concepts												NA
Strengthen customer service												NA
Balance energy efficiency and demand response												
Minimize rate impacts												
Ensure portfolio flexibility												
Apply Best Practice Design Principles												NA
Portfolio should offer a wide range of technologies enabling wide participation												
Cost-effectiveness												
The portfolio as a whole should be cost-effective measured against both the Total Resource Cost and Utility Cost tests												

In following sections we will complete this matrix with existing and proposed programs and identify remaining gaps. The implications of this mapping exercise will be discussed in greater detail below. However, we have identified what might be considered some important portfolio gaps. These gaps in no way indicate that the Company has not been diligent in its planning or implementation. The portfolio objectives, as we have noted, are at this point purely illustrative, and in any event E.ON, like most other utilities in the country is only beginning to reorient its planning to think in terms of a portfolio. This portfolio map is intended to be of value mostly as a device that can be employed by E.ON as it proceeds with its planning.

3.4.2. Managing Program and Portfolio Risk

Portfolio risk is defined as the likelihood that the portfolio will fail to deliver on its objectives, focusing principally on cost and performance. The way in which risk is managed depends on three factors:

(1) Parties' risk tolerance; (2) The relative riskiness of the programs included in the portfolio; and (3) The portfolio design elements used to mitigate and balance individual program risk.

- **Risk Tolerance.** We define the tolerance for the risk of not achieving a significant portion of the DSM potential that will as low. This implies a preference for a core of programs with relatively standard and straightforward program designs, high historic net-to-gross ratios, and a track record of successful implementation in other jurisdictions.
- **Program Risks.** Close to 20 years of experience with energy conservation program design and implementation yields valuable information about the relative success of different types of programs. This experience shows that certain types of program delivery, with certain types and levels of incentives have relatively less variability in performance. At the same time, these program types cannot easily be applied in all market segments.
- **Risk Mitigation.** The same experience that illustrates the relative riskiness of program types also suggests a range of methods for mitigating and managing these risks. For example, program implementers increasingly are being asked to assume a larger share of performance risk by tying payment to delivered savings. In other cases, where risks are closely associated with being able to influence a mass market, risk can be mitigated to some extent by moving the program focus upstream to retailers, distributors or manufacturers where greater control over performance can be exercised.

There are four types of risks that must be accounted for:

- **Performance risk.** The risk that, due to design or implementation flaws, the program does not deliver expected savings. This risk is common to all program types.
- **Technology risk.** The risk that technologies targeted by a program fail to deliver the savings expected. This risk is concentrated in programs that target emerging technologies; systems that are aggregates of specific technologies, and/or systems in which energy use is strongly influenced by external factors (e.g., customer behavior, economic conditions, etc).
- **Market risk.** The risk that, either because of a poor economic climate or the availability of better investments, customers choose not to participate in a program.
- **Evaluation risk.** The risk that independent EM&V will, based on different assumptions, conclude that savings fall short of what the implementers have estimated.

Typically, the first three types of risk are dealt with, first, through program design intended to minimize risk within a program and, second, by ensuring that the portfolio contains a mix of program types (different services, delivery mechanisms, providers, incentive types and levels, etc.) sufficient to avoid over-reliance on any one approach, technology or market.

Evaluation risk is addressed by commencing evaluation activities at the same time as programs are designed. Thus, evaluation protocols are understood by all parties at the outset, and the evaluation process is continuous as opposed to ex-post, allowing program implementers to adjust design and delivery to real-time information from the evaluators. This approach views evaluation not only as an independent verification of performance for regulatory purposes, but also as a vital input to a continuous process of program improvement.

We do not explicitly address the relative risk associated with existing and planned programs. However, we should note that given the nature of the cost recovery and incentive mechanisms

in place and the requirement that the Company collaborate with stakeholders, these risks should be factored into planning going forward.

Managing Risk over Time

Risk is also influenced by time. In the case of market risk, for example, risk increases as the implementation horizon expands, the longer the horizon, the more the economy and markets can change from what is assumed during the initial program design stage. This is a particular concern in this DSM analysis process given the need to assess DSM performance within the overall resource portfolio over an extended period of time. Technology risk tends to decline over time as performance characteristics become better understood, but at the same, the risk that technologies embedded in programs become obsolete increases. For example, three years ago residential central HVAC rebate programs were popular given the substantial cost-effective savings that could be achieved between the market baseline equipment and SEER 13 units. Now that the federal standard has risen to SEER 13, efficient central AC programs are rarely cost-effective. Finally, programs will gain market traction at different rates; some are capable of acquiring savings relatively quickly, while others require more market development. Program management efficiency is optimized when programs create a relatively smooth profile of savings over time. Therefore, it is important to balance the risks inherent in late-developing programs with programs that can deliver quick and sustainable efficiency gains.

Each of these phenomena argue for a portfolio that is both balanced with respect to time and dynamic in the sense that it can be easily modified if experience and market conditions suggest new opportunities or existing designs are not effective.

3.5. The Concept of Best Practice

3.5.1. Defining Best Practice

Energy efficiency program “best practice” is much more a term of art than science; there simply is too much variability across objectives, regulatory structures and program types to enable simple broad conclusions about what is best. For example, programs intended principally to effect a market transformation typically have very different designs, embody more program elements, require greater investment per unit of energy saved and are more difficult to evaluate, particularly over short periods than resource acquisition programs. Nevertheless, if a program sponsor is interested principally in changing the way a given market performs, these complications are less important to the program’s success than observed market effects. In addition, how one defines the practice being studied can yield quite different results in one’s conclusions about which programs offer the best examples of energy efficiency program implementation. Typically, best practice is considered a function of program result, i.e., did the program meet or exceed its objectives? An alternative view of best practice focuses on the design and execution of essential program elements, such as marketing, service delivery, program back office efficiency, etc. For example, though a particular program might not have delivered particularly stellar results overall, certain elements of its structure, such as incentive fulfillment might be considered best-in-class. Alternatively, while difficult, it is not unheard of for a program based on inefficient or flawed processes to nevertheless deliver outstanding results.

Programs often are most successful in environments conditioned to energy efficiency programs. Jurisdictions along the west and east coasts, and in Minnesota and Wisconsin have seen more or less constant program activity since the 1980s. Consumers in these jurisdictions, particularly

in the C&I sector, are more accustomed to energy efficiency programs, are more sophisticated in their understanding of efficiency investment, and are more likely to seek out programs than are customers in jurisdictions less accustomed to program activity. Thus, program marketing is easier and less costly, large customers in particular become more like program partners, the program sponsors come to understand customer motivations much better, and the sponsor and customers can engage in a virtuous cycle of program design, market reaction, and redesign.

This point leads to a final general observation; best practice should be viewed partly as a function of the experience of the program administrator and implementer. What is best practice for a utility that has been designing and managing programs for two decades will be different in some cases from what should be viewed as best for an organization just entering the field. For example, there is growing consensus that the most effective programs are those that view efficiency investment in comprehensive, systems terms. Thus, rather than focusing on individual efficiency measures, the programs adopt a “whole building” approach, or allow customers to custom-design incentives to meet their unique process needs. However, the notion that these programs are more effective is based largely on the idea that remaining large pockets of efficiency are embedded in processes rather than individual pieces of equipment.

If a utility has offered commercial lighting incentives for many years, it likely has captured a significant share of the basic fixture change-out market for large customers. Incremental savings, therefore, come from programs that extract savings from better lighting design and lighting system improvements (combining more efficient technologies and controls for example) or from programs that play off of the interactions between lighting and HVAC systems. Alternatively, as the large customer market is saturated, programs migrate into harder-to-reach small commercial segments that require not simply financial incentives, but a more intensive marketing and delivery approach. However, if a market has been largely untouched by large-scale efficiency programs, the most effective approach might well be a simple program offering incentives for basic lighting upgrades.

Given these cautions with respect to best practice transferability, we can draw the following conclusions with respect to the core elements of good (i.e., effective) programs for E.ON's consideration:

- Programs should focus on technologies/market segments with relatively large untapped potential. Program designs that offer prescriptive rebates for common technologies across the entire C&I market are relatively simple to design and administer, and are very effective in tapping into large veins of efficiency potential in lighting, motors and HVAC systems. Delivery of these types of programs has effectively been commoditized and offers the lowest cost per kW of energy saved.
- Programs should leverage existing branding and delivery structures. For example, residential lighting, appliance, and new homes programs built around the ENERGY STAR brand can leverage the market awareness the brand enjoys.⁶ Most major retailers and many homebuilders already have developed familiarity with these programs, are used to participating in ENERGY STAR programs, and often will share marketing resources. Other leveraging opportunities might be available through participation in Consortium for Energy Efficiency (CEE) initiatives. CEE is a

⁶ In fact, one major evolution in practice has been the migration away from utility branded new homes programs to ENERGY STAR-based programs that can take advantage of the valuable stock of collateral and the consistency in design standards.

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national, voluntary collaborative of organizations that fund energy efficiency programs. Through CEE these organizations are able to develop joint approaches to emerging efficiency opportunities.

- Programs should employ simple, straightforward program design. The more complex the design, the more difficult the implementation and administration of the program, and the greater the level of organizational capacity required to manage the program. For example, prescriptive rebate programs that employ deemed savings values and standard rebate amounts for common technologies are basic building blocks of virtually every utility program portfolio. Resource acquisition programs tend to be more straightforward and resource-efficient than market transformation programs.
- Incentives should be targeted at the point in the product value chain that yields the greatest leverage. For example, aiming the Company's incentives at large appliance retailers or manufacturers and having those entities provide the incentives to consumers would enable the Company to achieve greater scale faster and minimizes the resources the Company would have to deploy. Similarly, using residential HVAC distributors as the delivery vehicle for an air conditioning incentive program takes advantage of the distributors' existing networks and natural incentives to "sell-up."
- Large customers can be most effectively tapped with custom incentive programs. These programs provide rebates for groups of measures based on calculated savings and have proved to be very effective at generating low cost (to the utility) savings. These programs also provide utility customer account managers with valuable tools for enhancing customer satisfaction. The design of these programs is straightforward, with the utility providing an incentive threshold that customer can design projects against. However, given the industrial "opt-out" in Kentucky, combined with the fact that it is possible to establish prescriptive rebates for most types of equipment, and the likelihood that lighting will be the dominant efficiency measure, *we do not believe that such a custom program is a necessary feature of E.ON's portfolio, at least in the short-run.*
- Effective programs require close coordination of marketing, technical support and incentives. In most companies this requires an effective internal structure for working across multiple organizations within the firm.
- Effective portfolios represent a mix of education/consumer outreach, technical support and training, and incentive elements, each of which is structured to work with the others. For example, a program providing incentives for HVAC system tune-ups often works hand-in-hand with a program for training HVAC contractors in proper diagnostic and tune-up techniques, as well as in selling the service to customers. This training is designed to ensure not only that the program is effectively delivered (preserving customer satisfaction and ensuring program results), but that it helps condition the market so that contractors continue to sell and deliver the service even if the financial incentives go away. Finally, unless short-term resource acquisition is an overriding goal for E.ON, we believe that it is important to balance incentives with education to avoid consumers developing an unfortunate association of energy efficiency and rebates. The message should be "we want to help you change the way you use energy and will offer limited-time incentives to help you get on the road to savings," rather than, "we're going to pay you to purchase this product or service and hope it changes the way to use energy."
- With the commoditization of many types of program services, it is possible for a utility to develop and manage effective programs with significantly fewer internal resources than was

the case a decade ago. It is possible and cost-effective to outsource most program implementation services.

- When working with upstream market participants such as national retailers or manufacturers, programs will be more effective if they employ structures with which these market participants are familiar. For example, if a retailer is used to working with a point-of-sale rebate, it will be most efficient to design a new program around this preference. At the same time, recognize that retailers, in particular, operate under a wide variety of business process structures which can make program design a vexing process. For example, The Home Depot centrally programs cash registers, making it virtually impossible to structure a point-of-sale rebate within a specific service territory.
- Finally, while there are exceptions, most best practice programs have staying power. They become best practice because their sponsors have time to refine both design and implementation. Participation rates climb as program availability becomes known through market networks, and all points in the market chain have time to align with the program. Recognize that, particularly when working in the residential sector, there can be as much as a year between a new program offering and a manufacturer's ability to adjust to the program.

3.5.2. A Best Practice Portfolio

Best practice typically is viewed in the context of an individual program. However, rarely is a single program deployed by a utility; rather portfolios of programs designed to satisfy multiple market segments are the norm. It is at the portfolio level where performance matters most, and a strong efficiency portfolio, like any portfolio, is intended to balance risk in a way that ensures overall efficiency targets are met. Thus, best practice should be extended to the design and management of a program portfolio. In this context, best practice is characterized by relatively low administrative cost, overall performance, adaptability, and broad customer satisfaction. However, as every effective program fits the unique circumstances of each utility, an effective portfolio represents the combination of programs that best meets an often broad set of utility-specific objectives. Based on our experience in working with similarly situated utilities, we can suggest the following guiding principles and programs as basic elements of a portfolio for a utility new to the market.

Portfolio Design Principles

Although these principles appear intuitive, it is our experience that many portfolios are over-designed and, therefore, complex, costly to administer and less effective per incentive dollar spent.

- ***Flexibility is key.*** Individual programs should have relatively open designs that allow rapid changes if dictated by market response. Similarly, one should expect that the mix of programs and the allocation of funds to specific programs will need to change, perhaps frequently. This is not to suggest that the secret to success is frequent changes in programs—quite the opposite—the basic stability of a portfolio is enhanced by designing it to adapt to change and learning.
- ***Fewer programs with greater reach should be preferred.*** For example, a well-designed prescriptive incentive program and a new construction program might be the only two commercial programs needed, if properly positioned and marketed. Fewer and larger programs provide administrative economies of scale and scope, and are less likely to confuse customers. Programs targeted at specific end uses or technologies are best suited

to cases in which a specific delivery approach is required to overcome some market hurdle. And while it should go without saying, fewer programs require fewer administrative resources and fewer contractors to manage.

- **Program designs should be kept simple.** Complexity, while sometimes necessary to address certain markets, is not necessary for a portfolio's core programs. Complexity inevitably increases both management and implementation costs.
- **Leverage trade allies and upstream market actors.** Perhaps the greatest lesson learned from the last ten years of program implementation is that working with manufacturers, distributors, retailers, and service allies often yields greater bang for the buck than attempting to directly influence customers.
- **When beginning from a cold start, a phased approach to deployment of multiple programs works best.** This is particularly the case when program management resources are limited. Even if a utility chooses to outsource much of the in-field management of program implementation, the development of internal policies and procedures, building strong internal teams and developing program management expertise takes time. Attempting to put too many programs into the field at once can easily overload management capacity and create customer dissatisfaction.

The Elements of a “Starter” Portfolio

The right portfolio is the one that best meets a utility's unique objectives. Nevertheless, almost every portfolio is based on the desire to simultaneously offer services to all major customer classes at the lowest cost. As a rule-of-thumb, core C&I programs such as prescriptive and custom rebate programs are the least expensive to deliver per kW or kWh saved (in the range of \$500/kw—\$700/kW), while programs aimed at hard-to-reach residential and small commercial markets are the most expensive (can be upwards of \$1,000/kW). Therefore, the core elements of a portfolio with resource acquisition objectives will be those targeting the commercial sector (also made available to institutional and government customers). The least expensive and often most popular types of residential programs will typically be lighting and appliance rebate programs that can tap into retail networks already familiar with the ENERGY STAR brand and utility rebate programs. Virtually every national manufacturer and retail chain has worked with utility programs in multiple jurisdictions. ENERGY STAR new homes programs also often can be implemented at relatively low cost if there is an existing home energy rating infrastructure in place in the service territory.⁷

Based on these considerations, a typical “starter” portfolio of efficiency programs might include the following:

- **Commercial Prescriptive Incentive Program**—Available to all commercial customers. The program would provide fixed, posted rebates for specific common measures. Measure savings would be stipulated to simply estimates of overall program savings and to reduce administrative requirements. In a relatively new market like that of E.ON, this program could be simplified further by focusing initially on lighting, although one clear element of best practice is to avoid programs that cream-skim. The economics of lighting replacement are

⁷ If no such infrastructure exists program cost and complexity increases substantially since the program will need to both build the infrastructure and use that infrastructure to deliver program savings.

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such that they can effectively subsidize more complex and less cost-effective projects. An exclusive focus on lighting will limit the Company's ability to capture other non-lighting projects, since that subsidization effect will be lost.

- **Benchmarking with Commercial O&M Best Practices**—This type of program aims to deliver technical training and support rather than incentives to address changes in operational practices that can yield efficiency gains. Energy benchmarking or an audit program provides a necessary foundation for this type of program. Incentives could be incorporated to fund innovative O&M improvements (or retro-commissioning) that could serve as case studies available to other customers.
- **Small Commercial Lighting Direct Install**—This is an optional program, implemented primarily to provide program coverage to the smallest commercial customers. Typically these customers are hard to reach with energy efficiency programs, requiring a program design that incorporates a one-stop audit and installation process coupled with relatively high incentives. The audit should be what might be termed an “express audit”—a relatively quick walk-through to identify the major opportunities, recognizing that most small business owners may not own the building space or otherwise are not in a position to make major building investments. *Given the costs and complexities of such a program we would not recommend this as an initial element of the portfolio.*
- **Residential New Construction Program** —This program can yield substantial savings if new homes are being built with central air conditioning. However, this type of program requires relatively more market interaction and would be appropriate as part of a starter portfolio only if a relatively active home energy rating (HERS) infrastructure already exists. The program should be based on one of several high-visibility energy efficient or green housing brands.
- **ENERGY STAR Lighting and Appliances**—This is the most common and most cost-effective mass market residential program. Virtually every utility provides some form of this program. It is most effective if closely coordinated with manufacturers and/or retailers and incentives are offered. Many utilities structure their programs around EPA's Change a Light—Change the World campaign held in the fall of every year. Often there are opportunities to piggyback on other regional initiatives that might enable more competitive pricing and delivery.

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4. Review of Existing Programs

4.1. E.ON Existing Programs

4.1.1. Introduction

The following section analyzes E.ON's existing and proposed EE programs. For each E.ON program, we provide the following information:

- Brief description of the program.
- Conclusions drawn from other analyses of E.ON programs.
- A selection of comparable programs at other utilities.
- A matrix comparing E.ON's program to other utilities' programs.
- Best Practice notes for program type.

In performing this analysis, we have made use of E.ON IRP Filings, program evaluations performed by other entities, discussion with E.ON staff, and independent research of E.ON and other utility programs. Consistent with earlier direction from E.ON, we have not prepared an extensive comparison of existing programs with those of other utilities. We understand that E.ON is considering important changes to several of these programs, but that the Company is comfortable with the basic framework of these programs. We have focused instead on summarizing current trends in the design of the program types within which the existing programs fall.

In Appendix A of this report, we provide detailed program description sheets for E.ON programs and selected other utility programs. In Appendix B, we provide a comprehensive list of programs reviewed during our research for this report.

4.1.2. Portfolio Analysis

We have proposed an initial portfolio framework within which we believe that the Company's existing and proposed programs can most productively be viewed. Although that framework remains under review by the Company, we have used it as a way to create context for this assessment. Using the portfolio mapping process we described above, we overlay the Company's programs on the portfolio matrix to develop a perspective on how well these programs satisfy portfolio objectives. This is a step that we will repeat when we review proposed programs. Most important, we will use the overlay of existing and proposed programs to identify portfolio gaps that could be filled by new programs.

Figure 2 presents the initial mapping of existing programs. On the vertical axis, we provide the basic criteria on which we would propose E.ON base its EE portfolio. On the horizontal access, we provide the market sectors that EE programs may attempt to reach. Within the matrix, we provide our observations about how E.ON's current EE programs are addressing the criteria and sectors.

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Figure 2. Initial Mapping of Existing Programs

	Residential			Commercial							Industrial
	Mass Mkt	Multi-Family	Low Income	Office	Retail	Schools	Hospitals	Govt	Hospitality	Small C&I	
The portfolio should achieve a relative balance across sectors in the allocation of resources	Existing Res Audits		WeCare	Commercial Audit: Balance is off absent 2007 and other non-IRP programs. Load is roughly 30% Res and 30% Com. Typical potential studies would show greater EE potential in the Commercial sector and the savings are less expensive here.							
Coverage of low income customers		WeCare	WeCare							Commercial Audit	
Inclusion of some educational/informational elements	Standard consumer information and basic tools on web site			None that we have seen							
Promotion of emerging technologies and innovative program concepts	None, though Res LM is moving in that direction			None							
Strengthen customer service	Very strong customer satisfaction with audit		Very strong customer satisfaction	Strong customer satisfaction with audit							
Balance energy efficiency and demand response	Portfolio appears to be over-weighted to Res AC load control - 60% of total budget			Currently less than 1% of total portfolio budget - would expect to see more Commercial DR							
Minimize rate impacts	Rate impacts tend to be minimized when demand response can be combined with EE. The current portfolio is very light on incentives which also minimizes rate impacts, but also will hamper adoption of EE measures and will be a significant constraint if the Company adopts a savings goal.										
Ensure portfolio flexibility	Flexibility maximized by having fewer, broader programs that can be ramped up/down easily and within which measures can be easily added/subtracted and incentives increased/decreased. The current portfolio appears to offer relatively little flexibility, although the audit programs could gain flexibility with the option to incentivize installation of recommended measures. The "beyond IRP" programs - the rebate programs particularly, could offer valuable flexibility.										
Apply Best Practice Design Principles	Res Audit - consider taking this online			Utilities moving toward online energy data management with some diagnostics for larger customers; increasing use of benchmarking as a qualifier for more detailed audits. Current program may be too lighting heavy - lighting recommendations outweigh non-lighting recommendations by 7.5-1 in terms of kWh savings. We would expect, however, to see a greater prevalence of lighting, especially as customer size declines. Economics in E.ON territory favor low-cost lighting measures.							
Portfolio should offer a wide range of technologies enabling wide participation	Audit is comprehensive - program is widely available, but as the sole mass market program, the program is limited in measures that are installed			Same issue as Residential - heavily weighted toward lighting, but that is influenced by customer size and the relative economics of measures in the service territory.							
Cost-effectiveness	Insufficient data for full C-E analysis. Full on-site audits typically are not cost-effective unless install rate is high. Particular problem for E.ON with low avoided costs.		Insufficient data for full C-E analysis	Insufficient data; On-site audits tend to be quite expensive per unit saved unless customer follow-up is high.							
The portfolio as a whole should be cost-effective measured against both the Total Resource Cost and Utility Cost tests	Unclear if all existing programs have been screened - Evaluations did not include C-E analysis. Portfolio cost-effectiveness will be helped by heavy weighting of residential load management, which typically is very cost-effective.										

This initial mapping reinforces a point made earlier that the current portfolio is heavily weighted toward residential programs and, specifically, to residential load management. Even if one of the Company's objectives is a balance between energy efficiency and load management, the heavy weighting toward the residential load management program is not inappropriate per se. The Company's avoided costs may well determine that most value lies here and that energy efficiency programs are not, by-and-large, cost-effective. However, the heavy weighting toward the residential sector generally is more difficult to understand.

4.2. Residential Conservation Program

4.2.1. Description of E.ON's Program

The Company's Residential Conservation Program offers residential customers an on-site home energy analysis by a qualified energy audit contractor. Audits include an evaluation of the building, windows, doors, furnace, water heater, insulation, and other areas as needed. The customer pays \$15 for the audit which will be used to offset a portion of the cost to the company for performing the audit. E.ON has offered a residential demand-side management program since the 1990s. In 2001, the audit-only Home Energy Audit Program was changed to create the current Residential Conservation Program. Honeywell was contracted to deliver the Residential Conservation Program.

E.ON has explained that, under Kentucky regulations, utilities must offer residential audit programs—a hold-over from the original federal Residential Conservation Service audit.

4.2.2. Program Analysis

Key Findings from the Summit Blue Evaluations

- High customer satisfaction.
 - When asked if **they had** recommended the program to others, 69% said yes and 31% no.
 - When asked if **they would** recommend the program to others, 95.8% said yes and 4.2% no.
- Improved follow-up tracking methods needed.
- Program should be linked to financial incentives/financing.

Comparable Programs

To give a broad, varied comparison to E.ON's program we selected three programs from other utilities: Golden Valley Electric Co-Op HomeSense⁸, NYSERDA Multifamily residential audit⁹, and California Youth Energy Services¹⁰. These three programs allow for a comprehensive comparison of E.ON's residential single family audit with a variety of single family and multi family audit programs as well as an audit program with an advanced software online auditing function.

Program Comparison

The following table compares the programs across key program features.

⁸ ACEEE, Meeting Essential Needs: The Results of a National Search for Exemplary Utility-Funded Low-Income Energy Efficiency Programs (2005). Available at: <http://aceee.org/pubs/u053.pdf?CFID=1902315&CFTOKEN=52600158>.

⁹ Program details discovered as part of ICF's ongoing research into energy efficiency programs.

¹⁰ Evaluation, Measurement, and Verification of City of Berkeley—CA Youth Energy Services Program. Prepared by Summit Blue Consulting. (2006).

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Table 5. Comparison of Residential Conservation Program Key Features

Program Feature	E.ON	NYSERDA MF Audit	Golden Valley Electric Co-op	California Youth Energy Services
Market Segment	Residential, SF/MF	Residential MF.	Residential SF, low-income.	Residential SF/MF, Low-Mod Income.
Measures	Comprehensive audit—envelope, appliances, HVAC, lighting and hot water.	Comprehensive audit.	Comprehensive audit.	Comprehensive audit; Educational Materials; Low-cost hardware installation services.
Services Offered	On-site audit with recommendations; installation of low-cost/no-cost measures such as showerheads, faucet aerators, and compact fluorescence bulbs.	On-site audit; creative funding for recommended measures based on customer ability to pay and availability of other funding.	On-site audit with recommendations; incentives for low-cost measures. Weatherization providers bill services covered back to GVEA.	Energy education services; On-site energy audits; Basic energy efficiency measures and hardware.
Customer Acquisition	Largely passive recruiting; services provided in response to customer request and some direct mailings.		Print, broadcast advertising, and public presentations.	
Delivery Method	Customer requests referred to Honeywell—the implementation contractor.	Customer requests referred to NYSERDA contractor.	Customer requests referred via GVEA to contractor.	Implemented by the non-profit Rising Sun Energy Center.
Technology/Tools	Honeywell maintains program data in own database. In 2003, Honeywell transferred data to a Backbone Client Server database—a notable improvement in terms of data collection. E.ON U.S. maintains an invoicing database of the program in Microsoft Access.	Specialized software produces suite of recommendations.	Lighting meters used to overcome traditional thinking of CFLs. Watt meter/monitoring tool.	Excel spreadsheet utilized for measuring performance data.

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Program Feature	E.ON	NYSERDA MF Audit	Golden Valley Electric Co-op	California Youth Energy Services
Delivery Process	(1) Customer contacts Company. (2) Approved customers forwarded to Honeywell. (3) Honeywell arranges on-site audit. (4) Audit performed and low-cost measures installed. (5) Audit report completed and mailed to customer.		GVEA coordinates with Interior Weatherization, Alaska's low-income weatherization assistance program provider, to deliver program.	Program implemented by trained installers and auditors from Rising Sun Energy Center. CYES trained youth conduct home energy audits, disseminate information, and install hardware as customer requests.
Special Features	Customer used to be offered a financing option through a 3rd party; discontinued due to low customer interest.	Utilizes specialized software during audit to produce suite of recommended improvements.		Program goals include secondary objectives to train youth on energy efficiency and provide jobs to community members.
Incentive Structure	Customer cost is \$15—remainder of the audit cost is subsidized by E.ON ratepayers.	Gap funding approach—contractors determine how much a property owner afford to pay on his/her own. When there is a gap between cost of work and amount available from the property, other local, state, federal, and utility programs are tapped. When those sources are exhausted and if gap remains, NYSERDA provides the difference.	Customer cost is \$0, compared to normal price of \$40.	No-cost installations and at-cost installations. Customers can opt to have CYES install some services at their own expense. No charge to audit.

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Program Feature	E.ON	NYSERDA MF Audit	Golden Valley Electric Co-op	California Youth Energy Services
METRICS				
kWh/participant	293	686	7,216 (program lifetime savings)	343
kW/participant	0.09	N/A	0.39	0.03
cost/kWh	\$0.76 (First-year cost - total cost/total kWh saved)	\$1.54 (First-year cost - total cost/total kWh saved)	Cost of conserved energy—4.4 cents (based on lifetime energy savings)	N/A
cost/kW	N/A	N/A	\$810 (program lifetime)	N/A
cost/participant	\$223	\$1,059—includes incentives	N/A	N/A
participants	9,208 since inception	85,298 units in 293 MF properties	3,840 since inception	N/A

Review of Existing Programs

Best Practice Notes

- Audit programs often constitute the basic level of utility DSM offering—88% of utilities offer some form of audit.
- Audit programs often used as portals into other utility programs offering financial incentives; an enhancement the Company currently is considering.
- On-site audits increasingly use more sophisticated audit tools to enable instant audit reports.
- Best practice is evolving along one of two branches:
 - On-line audits—69% of utilities offer some form of on-line audit. More efficient use of resources and lower per unit costs.
 - Industry is migrating toward “whole-house” approaches that focus on total home performance.

Additional Considerations

- Many utilities (e.g., Nevada Power, PG&E, Xcel Energy) utilize “Nexus” software to power online audits. Nexus’ ENERGYprism[®] offers a comprehensive but low cost, multi-channel approach to supporting energy management goals, including on-line, e-mail, phone, and mail communications to reach customers the way they want to be reached.
- Upgrade audit tool/technology utilized by contractor, consistent with the Summit Blue recommendation.
- Consider incorporation of a “whole-house” approach. Home performance programs look at a building throughout the lifecycle and strive to encourage cost-effective home improvements. Programs begin with a home performance evaluation, similar to an energy audit. Potential program measure and service add-ons could include blower-door tests/air-sealing packages, HVAC diagnostic/tune-ups, programmable thermostats, and additional lighting measures, including occupancy sensors.
 - *Example:* Home Performance with ENERGY STAR (HPwES) serves as a national platform for whole-house programs wishing to use the ENERGY STAR brand and logo to promote improvements to a home’s safety, durability, and energy efficiency, and to the health and comfort of individuals in the home. HPwES focuses on home performance contracting services, rather than labeling a home as an “ENERGY STAR Home.” The general delivery system begins with a contractor, auditor, or home performance consultant performing a full visual and diagnostic energy inspection of the home and recommending improvements based on the inspection. An HPwES program will then connect homeowners to a qualified contractor to implement the recommendations. This evaluation is the first step in an integrated effort to realize improvement measures in homes.

4.3. Commercial Conservation Program

4.3.1. Description of E.ON's Program

The Company's Commercial Conservation Program identifies energy efficiency opportunities for the Company's commercial class customers by performing no-cost energy audit inspections to reveal ways commercial customers may conserve energy and reduce energy expenses. The Company hired E-Max to conduct the commercial energy audits. They also have the expertise to perform follow up installation, if the customer opts to have E-Max install recommended measures. E-Max has been implementing the commercial audit program for E.ON since 1994 and they won the bid process in 2000 for the current cycle of program services.

4.3.2. Program Analysis

Key Findings from the Summit Blue Evaluations

- High customer satisfaction
 - 97 percent responded that the program intake process worked smoothly.
 - 94 percent responded that the on-site visit was scheduled quickly after the initial call.
 - 100 percent responded that the energy specialist was courteous and knowledgeable.
 - 97 percent responded that they **would** recommend the program to others; 25 percent had **already** recommended the program to others.
- Lighting measures represented \$12 million of the total energy savings (kWh); non-lighting measures represented \$2 million of the total energy savings (kWh). The data collection instrument is too heavily oriented toward lighting opportunities. Increased focus on non-lighting measures encouraged.
- Program should improve audit form and process as current audit forms are not very detailed or systematic.
- Since 2003, the average number of audits has increased 50%. At the same time, there have been a decreasing amount of total recommendations, and a decreasing amount of identified savings per participant.
- Of the total 4,533 audits performed, 101 customers who received audits also used E-Max to install measures recommended. This indicates that only 2.3% of audited customers initiated some type of installation with E-Max.
- Of the total 4,533 audits performed, many customers chose to install measures independently of E-Max. About 18.5% of the customers who received an audit initiated projects independently of E-Max.

Comparable Programs

We selected the Ameren Commercial End Use¹¹ and Northeast Utilities Custom Services Programs¹² as program “comps.” These programs allow for a productive comparison of E.ON’s commercial audit program by demonstrating other commercial audit programs with distinguishing features that have gleaned significant energy savings.

Program Comparison

The table on the following page compares the programs across key program features.

¹¹ Energy Trust of Oregon, Best Practices From Energy Efficiency Organizations and Programs. (2002). Available at: http://www.energytrust.org/library/reports/Best_Practices/index.html?link_programs_reports_lin1Page=3

¹² Energy Trust of Oregon, Best Practices From Energy Efficiency Organizations and Programs. (2002). Available at: http://www.energytrust.org/library/reports/Best_Practices/index.html?link_programs_reports_lin1Page=3 and ACEEE, America’s Best: Profiles of America’s Leading Energy Efficiency Programs. (2003). Available at: <http://www.aceee.org/pubs/u032.htm>

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Table 6. Comparison of Commercial Conservation Program Key Features

Program Feature	E.ON	Ameren	Northeast Utilities
Market Segment	Commercial	Commercial—primarily large customers (program is no longer offered as priority changed to demand buyback program).	Commercial.
Measures	Comprehensive audit—focus depends on type and size of facility.	End use audit program—focus on existing and new building recommendations.	Comprehensive audit and energy services.
Services Offered	On-site audit with recommendations; Educational information provided. Recommendations include energy efficient lighting, air conditioning retrofits, water heater retrofits, set back thermostats, energy management systems, timer systems.	On-site audit with recommendations; Building systems energy modeling with DOE-2; Energy savings impact assessments.	PRIME and Tailor HVAC services.
Customer Acquisition	E-Max solicits commercial customers or alternatively, E.ON provides customer brochures and newsletters. Customers also contact E.ON business service center also.	Customers referred through large architectural or engineering firms; Utility sponsored seminars for account executives and targeted customers through direct marketing.	Utility account executives and local economic development organizations target customers; Word of mouth referrals; Media coverage.
Delivery Method	Customer requests referred to E-Max—the implementation contractor.	Customers referred to one of six implementation contractors.	Customer requests prompt utility walk through to determine applicable program. Utility refers customer to contractor on project-to project basis.
Technology/Tools	Microsoft Excel instrument and spreadsheet based analysis; Microsoft Access database. E-ON U.S. has invoice database in Microsoft Access.	DOE-2 modeling.	
Delivery Process	(1) Customer contacts Company or E-Max contacts customer. (2) Approved customers forwarded to E-Max. (3) E-Max arranges on-site audit. (4) Audit performed and low-cost measures installed. (5) Audit report completed and mailed to customer.	Provides energy modeling services along with traditional audit. Project usually takes 14 months start to finish.	(1) Staff conducts an initial facility walkthrough to determine the potential for the applicable program component. (2) Contractors hired on project-by-project basis to implement eligible projects.

Program Feature	E.ON	Ameren	Northeast Utilities
Special Features	Ameren conducted end-use metering to verify whether actual energy savings matched anticipated savings based on modeling.	Program involves customer's management and operations staff to ensure buy-in.	
Incentive Structure	Customers have option of below market interest rate financing.	Direct incentives were based on payback, as determined by DOE-2 modeling. Initial walk through was subsidized. As was more detailed modeling, the results of which were provided to customers.	Utility pays half of up-front cost of energy audit and refunds the other half once the recommended energy efficiency measures have been implemented; Utility provides incentives up to full incremental costs associated with installation of higher EE equipment.
METRICS			
kWh/participant	2924	38,325	88,875
kW/participant	0.74	150	18
cost/kWh	0.26	N/A	0.28
cost/kW	\$1,096	N/A	1,319
cost/participant	\$816	N/A	\$23,750
participants	4,533	200	400

Best Practice Notes

- As noted earlier, audit programs increasingly are used as portals into financial incentive programs, an enhancement that we understand the Company to be considering.
- Industry migrating toward energy benchmarking rather than traditional audit programs. Energy benchmarking tracks energy usage across single buildings or across a portfolio of buildings. A focus on energy benchmarking can allow commercial customers to identify high energy intensive areas within their property and target improvement efforts.
- Industry often addresses small commercial customers differently than large commercial customers, recognizing that the two customer types have fundamentally different behavior. Large customers are likely to benefit from online energy data for self-diagnostics, but will require more sophisticated auditing. Small customers typically require direct-installation or financing to adopt EE recommendations and can benefit from much simpler audits and analyses.
- Many utilities are beginning to implement retro-commissioning programs, in which existing building systems are inspected and recalibrated, as necessary to ensure that they are performing at maximum efficiency. This is a natural progression from standard audit programs and makes use of benchmarking.
- Many commercial programs rely on lighting measures to achieve much of the program savings.
- U.S. EPA energy performance rating system within Portfolio Manager available at <https://www.energystar.gov/istar/pmpam/>

Additional Considerations

- Consistent with the Summit Blue recommendation, update and improve the audit tool/technology used by contractor—update audit forms to ensure comprehensive and systematic audit. Consider replacing Excel-based audit with a web-based system.
- Consider adding energy benchmarking (EPA ENERGY STAR Portfolio Manager http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager) or energy modeling programs to portfolio of programs for commercial customers in addition to or in place of commercial audits.
- Consider a two-tiered system, providing simpler audit services for small commercial clients, and more comprehensive benchmarking services for large commercial clients.

4.4. Residential Weatherization Program

4.4.1. Description of E.ON's Program

The Company's WeCare Low Income Weatherization Program aims to reduce the energy consumption of high-use, low-income customers by providing energy audits, energy education, blower door tests, and by installing extensive weatherization and energy conservation measures at no cost to the customers. The program organizes in-house evaluations and inspections to eligible residential customers. In many cases, the program tries to connect its in-house visits with the local Weatherization Assistance Program to offer a consolidated service. The initial visit includes an energy audit, client education, and installation at no cost to the customer by an educator/technical specialist. A pilot program that included educational and weatherization process was implemented in 1994 as the Energy Partners Program (EPP). After a series of contractor studies and reviews, EPP evolved to become the WeCare Low Income Weatherization Program in 2001.

4.4.2. Program Analysis

Key Findings from the Summit Blue Evaluations

- High customer satisfaction
 - Customers reported that they were satisfied or very satisfied with the program 97 percent of the time.
- The program categorized customers in three tiers by annual energy consumption. Tier A customers consume up to 1,299 ccf and up to 11,499 kWh; Tier B customers consume 1,300-1,800 ccf or 11,500-16,000 kWh; and Tier C customers represent those who consume anything greater than Tier B. Tier A and B customers are exceeding saving goals for gas and electric, while Tier C customers are falling short of savings goals. Goals should be updated for all tiers to be more consistent with savings findings.
- Participation goals should be adjusted to more effectively distribute limited program funds.
- Duct leakage and sealing processes should be re-evaluated looking for more opportunities for energy savings.

Comparable Programs

We selected the Tacoma Utilities Residential Weatherization Program¹³, Efficiency Vermont Low Income Multi Family¹⁴, and Efficiency Vermont Low Income Single Family Programs¹⁵ as program "comps." These three programs allow for a diverse comparison of E.ON's We Care Low Income Weatherization Program by presenting single family and multi-family programs with varied incentive structures.

Program Comparison

The following table compares the programs across key program features.

¹³ Energy Trust of Oregon, *Best Practices From Energy Efficiency Organizations and Programs*. (2002). Available at: http://www.energytrust.org/library/reports/Best_Practices/index.html?link_programs_reports_lin1Page=3.

¹⁴ "Multifamily Low-Income Program Efficiency Vermont," *America's Best: Profiles of America's Leading Energy Efficiency Programs*. From ACEEE, 2003. <http://aceee.org/utility/1amultifamvt.pdf>

¹⁵ "Low Income Single Family Service," *Meeting Essential Needs: The Results of a National Search for Exemplary Utility-Funded Low-Income Energy Efficiency Programs*. From ACEEE, September 2005. p. 25.

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Table 7. Comparison of Residential Weatherization Program Key Features

Program Feature	E.ON	Tacoma Utilities	Efficiency Vermont—MF	Efficiency Vermont—SF
Market Segment	Residential Weatherization—Low Income Single Family and under certain conditions, Multi-family.	Residential Weatherization—Low Income.	Residential Weatherization—Low Income Multi-family.	Residential Weatherization—Low Income Single Family.
Measures	Weatherization services provided through energy audit at no cost.	Weatherization services through energy audit.	Weatherization services.	Weatherization services.
Services Offered	In-house weatherization evaluations and inspections; Perform blower door tests and install weatherization and energy conservation measures; Provide educational materials.	Audits to improve home insulation; Contractor provides educational information regarding appliances, lighting, and other non-weatherization EE measures.	In-house weatherization evaluation with recommendations; Design Guide for Energy Efficient Multifamily Housing; Comprehensive financing approach to encourage adoption of all cost effective measures.	In-house weatherization evaluation with recommendations; Energy bill analysis; Make arrangements with contractors for selected services.
Customer Acquisition	Targeted based on LIHEAP eligibility status and energy savings potential. Customers with less annual consumption enter through word of mouth, with referrals through CAA, CAC, State DOE, WAP, churches.	Direct mail campaign; home parties with "give aways."		
Delivery Method	Customers who have not received LIHEAP funding in the past one year are referred to E.ON contractor for qualification.	Customers referred to program contractor.	Coordinate with Weatherization Assistance Program.	Most services delivered by the five regional WAP agencies.
Technology/Tools	Program tracking database supports implementers and evaluators track the program.	Variety of modeling tools to establish the energy savings of measures proposed.	No specifics noted.	Measure and fee data are tracked on paper and then manually transferred to a database. Currently exploring use of portable electronic data devices for data collection and reporting.

Program Feature	E.ON	Tacoma Utilities	Efficiency Vermont—MF	Efficiency Vermont—SF
<p>Delivery Process</p> <p>(1) Company sends LIHEAP list to Contractor with annual usage information. (2) Contractor contacts Customer. (3) Contractor arranges evaluation. (4) Contractor performs evaluation audit and installs many measures at no cost. (5) Auditor creates work orders for second measure visit or subcontractor visit. (6) Possible subcontractors visit to install attic insulation or other measures.</p>	<p>(1) Customer shows interest in program. (2) Utility forwards customer to central scheduling coordinator. (3) Scheduling coordinator sets up weatherization evaluation and audit with contractor and customer.</p>	<p>Initial development of program was funded through a Rebuild America grant of DOE.</p>	<p>(1) Customers express interest (2) Customers forwarded to one of five WAP agencies (3) WAP energy auditors assess opportunity for electric efficiency improvements during evaluation</p>	<p>Special Features</p> <p>Liens are placed on each home that receives a loan.</p>
<p>Incentive Structure</p> <p>No cost for audits, educational materials, and weatherization services. Other services provided at no cost include water heater insulation blankets, waterbed insulated covers, low flow showerheads, attic and wall insulation, air sealing, duct sealing, clean and tune of both gas furnace, heat pump and central air conditioners, replace winder air conditioners, replace refrigerators and CFLs. No extra dollars given to participants; energy techniques and measures installed will assist the customer to take over utility bills.</p>	<p>Average cost per audit is \$150; Weatherization installations average \$370. Low income customers qualify for either (1) Zero interest loan (2) A 70% grant; or (3) A 100% grant depending on income level.</p>	<p>Lighting fixtures and several other measures installed at no cost to income-eligible customers. WAPs leverage and facilitate property owner financing of major measures.</p>	<p>Offered for comprehensive project, not on a prescriptive basis.</p>	<p>Program Feature</p>

Program Feature	E.ON	Tacoma Utilities	Efficiency Vermont—MF	Efficiency Vermont—SF
METRICS				
kWh/participant	1,391	3,012 (2002)	1,350 (2002)	1,890 (2004)
kW/participant	0.18	NA	0.12	NA
cost/kWh	\$1.05 (Based on savings and costs reported for 2001-2006)	\$0.73	\$0.67 (2002 first year savings)	\$0.55 (2004 first year savings)
cost/kW	NA	NA	NA	NA
cost/participant	\$1,466 (Based on participation and costs for 2001-2006)	NA	\$900 (2002)	\$1,046 (2004)
participants	4,916	800 audits in 2002	5,937 (1997-2002)	4,515 (2000-2005)

Best Practice Notes

- Low income weatherization programs generally tend to be consistent across the country, and the Company's program is consistent with standard practice.
- Industry is migrating away from the traditional focus on heating and cooling toward a "whole-house" energy usage and "whole-community" effects.
- The "whole-house" approach addresses the energy use in low-income homes comprehensively, as well as related health and safety improvements.
- The "whole-community" approach allows utilities to focus on a community of low-income households and enables Weatherization providers to serve as a resource for community based efforts to conserve energy and boost economic development. The goal of this approach is to ensure that weatherization efforts link with other social programs, taking advantage of combined marketing and word-of-mouth referrals.

Additional Considerations

- The Company is running an effective and popular weatherization program that is competitive with other utilities' weatherization programs.
- Consistent with the Summit Blue findings, update Tier level participation and savings goals to drive continued success in the Tiers that are succeeding and adjust to encourage success in the Tiers that are not currently meeting targets.

4.5. Demand Conservation Program

4.5.1. Description of E.ON's Program

The Company's Demand Conservation program cycles residential and commercial central air conditioning units, electric water heaters, and residential pool pumps. It is designed to provide customers with an incentive—in the form of a bill credit of up to \$20 per year—to allow the Company to interrupt service to their central air conditioners and/or electric water heaters during peak demand periods. The Company installs necessary load control switches at no cost to the customer, with installations performed by qualified contractors. While there are no specific cycling schedules during load control events, the program generally will control between 12 and 16 days per year between the hours of 2pm and 6pm.

As a new program component for 2007, the Company also offers programmable thermostats to participating residential and commercial customers. The thermostats will allow the Company to reduce peak demand by cycling the air conditioner for a few minutes each half hour. Programmable thermostats are provided to customers at no cost, but customers who select the programmable thermostat option are ineligible to receive the bill credit.

4.5.2. Program Analysis

Key Findings from E.ON Program Evaluations

The 2005 evaluation of LG&E's Demand Conservation Program by GoodCents is primarily an analysis of load control impacts for air conditioning and water heating equipment covered by the program. The report also assesses temperature and relative humidity changes in participating homes during control periods, and evaluates a change in load control switch technology on end-use metered sites. It does not attempt to evaluate program design, cost-effectiveness, or customer satisfaction. However, the report does conclude that the moderate cycling strategies employed by the Company are unlikely to adversely affect customer comfort by creating substantial changes in household temperature or humidity.

Comparable Programs

The recent FERC survey of demand response programs indicated that direct load control programs are the most common form of demand response program. Though most direct load control programs target the residential market, 33 percent of survey respondents also offered direct load control programs to commercial customers.¹⁶ The Company's Demand Conservation program employs a straightforward and proven program design for direct load control that is used by many other utilities. According to the Edison Electric Institute's 2006 survey of utility energy efficiency and demand response programs, utilities running AC cycling programs similar to EON's include Alliant Energy (also includes water heaters), Commonwealth Edison, Detroit Edison, Indianapolis Power & Light, MidAmerican, Nevada Power, Pacificorp, Southern Company, and Xcel Energy.¹⁷

¹⁶ Federal Energy Regulatory Commission (August 2006). *Assessment of Demand Response and Advanced Metering*. Docket No. AD-06-2-000.

¹⁷ Edison Electric Institute (2006). *Highlights of Member and Non-Member Residential/Commercial/Industrial Energy Efficiency and Demand Response Programs*. Available at: http://www.eei.org/industry_issues/retail_services_and_delivery/wise_energy_use/programs_and_incentives/progs.pdf.

Review of Existing Programs

We selected two residential load control programs to compare with E.ON's Demand Conservation Program: Nevada Power Company's Air Conditioning Load Management (ACLM) program and the Energy Partners program at We Energies. Nevada Power is a comparable utility to E.ON in terms of size. Since 2001, the utility has conducted extensive testing of alternate AC and pool pump load control devices in the residential market, including duty cycle switches and one-way and two-way communicating thermostats. After testing multiple control devices, Nevada Power has selected the two-way communicating setback thermostat for full-scale deployment in its 2007-2009 ACLM program. Similarly, the We Energies Energy Partners program has been running for a number of years, and cycles residential AC equipment using duty cycle switches.

Program Comparison

The following table compares the programs across key program features. Additional program details are provided in the summary of each program in Appendix A.

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Review of Existing Programs

Table 8: Comparison of Residential Load Control Programs

Program Features	EON Residential Load Control	Nevada Power ACLM Program	We Energies Energy Partners Program
Market Segment	Residential customers with central AC.	Residential customers with central AC.	Residential customers with central AC.
Measures	Duty cycle switches; communicating programmable thermostats.	Duty cycle switches; 2-way communicating programmable thermostats.	Duty cycle switches.
Services Offered	Free installation.	Free installation.	Free installation.
Customer Acquisition	Direct mail, outbound telemarketing, customer newsletter, web site.	NPC plans some marketing through HVAC/DIY trade allies.	Direct mail to targeted customers.
Delivery Method	Contractor provides equipment installation.	Contractor provides equipment installation.	Contractor provides equipment installation.
Technology/Tools		Customer can control thermostat through Web interface.	
Delivery Process	(1) Customer enrolls. (2) EON arranges installation with contractor.	Unknown.	(1) Customer enrolls by phone, online, or by mail. (2) WE arranges installation with contractor.
Special Features	N/A	N/A	N/A
Incentive Structure	Free installation; ongoing incentive of up to \$20 per year for switch only.	Free installation; up-front incentive of \$25 per thermostat. However, NPC plans to experiment with offering the free thermostat & installation as the only incentive.	Free installation; customer can choose between 3 load control strategies that provide annual incentive of up to \$50 per year.

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Program Features	EON Residential Load Control	Nevada Power ACLM Program	We Energies Energy Partners Program
kWh/participant	0	17	NA
kWh/participant	1.03	1	1.5 (average)
Cost/kWh	NA	Unknown	NA
Cost/kW	\$204.48	\$36.96	\$262
Cost/participant	\$210.62	Unknown	\$50 Includes incentive only)
Total Energy Savings (kWh)	0	414,641	
Total Demand Reduction (kW)	113,166	24,000	43,882
Total Participants	109,870	24,000	24,335
Total Cost (including incentives)	\$23,140,491	\$3,229,000	\$11,509,000
Incentive Cost	\$6,150,000	1,400,000	NA
Admin Cost	\$230,796	1,829,000	NA
TRC		1.13	1.16
Utility Cost Test		1.45	1.31
RIM Test		1.38	1.3

METRICS

Best Practice Notes

- For load control programs using programmable thermostats, a number of utilities (including Long Island Power Authority and ConEd) offer only an upfront incentive and no ongoing incentive.
- Programmable thermostats are compelling incentives for the customer as they are a familiar technology and offer attractive value-added features such as a Web interface.
- Customer acquisition costs can be reduced through market segmentation strategies that identify and target desirable customer segments, and through utilizing trade ally marketing and sales channels such as HVAC contractors and/or DIY retailers. E.ON's consideration of using contractors in the residential audit program to promote smart thermostats is consistent with this trend.
- For programs employing duty cycle switches, allowing customers to choose between a number of different cycling strategies may increase participation.
- Utilities have long used interruptible/curtailable tariffs and time-of-use rates as key components of their demand response strategies, but the prevalence of direct load control and interruptible/curtailable programs is growing, in part spurred by technological advances in controls, communications, and metering, and also due to increasing regulatory support.

Extended Description of Industry Trends

There is a growing appreciation of the complementary roles that load management programs and energy efficiency programs can play in terms of reducing peak demand, and a balanced DSM portfolio will include both types of programs.

Several key trends emerged from our review of relevant literature:

- Some utilities are finding that a portfolio of demand response programs comprised of voluntary (nonfirm) and mandatory (firm) commitments is the most cost-effective demand response strategy, which also offers customers increased flexibility in terms of selecting the demand response option that is best suited to their risk tolerance.
- There is growing technological sophistication in the types of equipment employed in direct load control programs, from smart thermostats like those employed in the Company's program to home climate control systems that can be programmed through a Web-based interface.

A recent LBNL study describes the trend towards offering a number of different demand response options: "Although it is more complex to design and implement a portfolio of DR options, giving customers more flexible DR program elements (including variable incentive levels and opt-in/out windows) should increase program participation and increase the cost-effectiveness of DR offerings."¹⁸ Similarly, the FERC analysis notes that multiple demand

¹⁸ T. Fry, R. Hinkle, and D. Engel, prepared for Lawrence Berkeley National Laboratory (June 2006). *Demand Response Program Design Preferences of Large Customers: Focus Group Results from Four States*. Available at: <http://eetd.lbl.gov/ea/EMP/reports/60610.pdf>.

Review of Existing Programs

response offerings can serve complementary goals. For example, large-scale implementation of time-based rates reduces the severity or frequency of reserve shortages, which in turn reduces the need for mandatory curtailments. Reductions in the frequency of curtailment events may also boost participation in incentive-based mandatory curtailment programs by reducing the risks associated with frequent curtailment events.

The Company's smart thermostat offering through the Demand Conservation Program is in line with industry trends towards increased technological sophistication, particularly in programs targeting mass markets.¹⁹ In advanced implementation markets like California, load management solutions are becoming increasingly sophisticated in terms of the technologies they employ. In 2004 California IOUs launched the Advanced Demand Response System (ADRS) pilot program which employed the GoodWatts system to control load in single family homes. GoodWatts is an advanced home climate control system that offers two-way communications as well as a web-based interface for programming user climate control preferences—both for central air conditioners as well as other household loads such as swimming pool pumps and spas. Users are also able to view whole-house or end-use equipment energy consumption data in real time, and in terms of historical trends. Such programs are clearly more complex to implement, require a higher level of customer participation and engagement, and more expensive per kW of demand reduction potential. At the same time, sophisticated technologies may increase participation. A similar program offered by Puget Sound Energy was very popular, with customers expressing a high degree of satisfaction with the web-based interface. Even though few customers actually did so, they appreciated having the ability to over-ride the utility set point if they wanted to.²⁰

Additional Considerations

The Company's Demand Conservation Program conforms with standard program design for residential and commercial load control programs and achieves similar performance. Based on our review of similar programs, we offer several suggestions.

- For customers using the switch option, consider increasing flexibility by allowing customers to choose between multiple cycling/incentive tiers.
- Explore the potential for employing innovative sales and marketing channels for programmable thermostats, such as DIY retailers or HVAC contractors.

More important, the pilot Responsive Pricing/Smart Metering program that the Company has proposed based on the Trilliant technology platform represents, in our view, a leading edge initiative. As we understand it, the technology provides a foundation for a broad array of sophisticated control regimes that can be price-based. As end use technology improves, and pending the outcome of the pilot, this platform positions the Company to offer innovative and integrated packages of demand-response and energy efficiency measures.

¹⁹ G. Heffner and C. Goldman, Lawrence Berkeley National Laboratory (August 2001). *Demand Response Programs: An Emerging Resource for Competitive Electricity Markets?* Available at: <http://eetd.lbl.gov/ea/EMP/reports/48374.pdf>

²⁰ G. Heffner and C. Goldman, Lawrence Berkeley National Laboratory (August 2001). *Demand Response Programs: An Emerging Resource for Competitive Electricity Markets?* Available at: <http://eetd.lbl.gov/ea/EMP/reports/48374.pdf>

**Evaluation of Energy Efficiency at E.ON U.S.
Review of Existing Programs**

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5. Proposed Programs and Program Gaps

E.ON is considering a number of programs for possible implementation. These include:

- A demand response (Responsive Pricing/Smart Metering) program built upon a sophisticated mesh network that enables customer-programmed control of energy using devices in response to prices.
- A Residential Lighting program that might entail distribution of a fairly large number of CFLs to participants in the residential audit program.
- An HVAC Diagnostic and Tune-Up program incorporating a contractor incentive. This would include formation of an HVAC dealer network that pre-screened HVAC allies.
- A Residential New Construction program most likely built on the ENERGY STAR Homes platform.
- A Commercial Lighting Incentive Program.
- A Commercial Refrigeration Program incorporating a device for controlling the defrost cycle.

While our discussions with E.ON staff were able to provide some information regarding some of these programs, most were in the early stages of development during the course of our work and we have very little information about actual structures. Therefore, our review of proposed programs takes place within the context of a broader range of programs that the Company could consider to fill the gaps in its existing portfolio.

5.1. Portfolio Gaps

The Company's existing portfolio has a number of strengths, including the ability of audit programs to inform customers about a wide range of savings opportunities. In particular, the Company's proposed advanced residential time-of-use offering represents the deployment of cutting edge technology. Our review of existing programs suggested a number of portfolio gaps. These include:

- Few commercial sector offerings and thus potential portfolio imbalance.
- The existing residential non-low income program, while in theory providing broad measure coverage, is an audit, and as such does not actually induce significant measure installation aside from any measures distributed/installed at the time of the audit. Installations are, of course, critical if the Company sets any sort of demand or energy reduction target. Moreover, an in-home audit program, due to its cost, has a more limited reach than some mass market programs.
- While the Company has a basic consumer information offering, it does not have a broad information, education, and training (market conditioning) program that supports the entire portfolio.
- The Company does run an effective low income weatherization program, and its commercial audit program, by default, appears to be serving primarily small customers. If the Company has a savings objective, the small commercial sector most likely will require an incentive-backed program to induce any significant investment.
- Beyond the proposed advanced Responsive Pricing/Smart Metering program based on the mesh network technology, the portfolio relies on standard technologies and is not configured to test and promote advanced technologies as they become market-ready. There is no deployment channel.

**Evaluation of Energy Efficiency at E.ON U.S.
Proposed Programs and Program Gaps**

Figure 3 illustrates the portfolio map that we have completed based on proposed and possible programs.

Figure 3: Final Portfolio Mapping

	Residential			Commercial							Industrial
	Mass Mkt	Multi-Family	Low Income	Office	Retail	Schools	Hospitals	Govt	Hospitality	Small C&I	
The portfolio should achieve a relative balance across sectors in the allocation of resources	Existing Res Audits Expanded Res Audits Res NC Res Related Res HVAC Tune, Dead Air Rebate	Partial Gap?	We Care	Commercial Audit, Com HVAC Tune-Up, Com Rebate and Com ERP. Balance is off absent 2007 and other non-IRP programs. Load is roughly 30% Res and 30% Com. Typical potential studies would show greater EE potential in the Commercial sector and the savings are less expensive here							
Coverage of low income customers		Partial Gap?	We Care	NA	NA	NA	NA	NA	NA	Gap?	
Inclusion of some educational/informational elements	Education - Not clear if this is mostly focused on res mass market or across all sectors. Likely need additional programs here, e.g. schools program web site, etc			Gap?							
Promotion of emerging technologies and innovative program concepts	Expand Res Load Control, and Responsive Pricing - May want m to explore as pilots, for emerging technologies such as white LEDs			Com Responsive Pricing - could include pilot ideas for some of the more advanced program ideas, like targeting specific sectors, integrating DR+EE, etc - Also consider some kind of tie-in to climate, e.g. E.ON provides climate audits.							
Strengthen customer service	Customer satisfaction is strong with existing programs, but could extent reach			Same as Res							
Balance energy efficiency and demand response	Relatively good balance on Res side, particularly if 2007 progs are considered			Balanced only if 2007 programs are considered.							
Minimize rate impacts	Rate impacts tend to be minimized when demand response can be combined with EE. The current portfolio is very light on incentives which also minimizes rate impacts, but also will hamper adoption of EE measures and will be a significant constraint if the Company adopts a savings goal.										
Ensure portfolio flexibility	Flexibility maximized by having fewer, broader programs that can be ramped up/down easily and within which measures can be easily added/subtracted and incentives increased/decreased. The current portfolio appears to offer relatively little flexibility, although the audit programs could gain flexibility with the option to incentivize installation of recommended measures. The "beyond IRP" rebate programs particularly, could offer valuable flexibility.										
Apply Best Practice Design Principles	Res Audit - consider taking this online	Partial Gap?	Appears well-designed	Consider benchmarking - focus on broad programs that have a lot of flexibility within them - also look for examples of innovative outreach strategies for different sectors						Gap?	
Portfolio should offer a wide range of technologies enabling wide participation	Res Rebates and Res NC consider Res Home Performance	Partial Gap?	Broad range of technologies	Com Rebates - if structure is as Mutual Prescription, rebates - avoid specific measure-based programs							
Cost-effectiveness	Audit program appears to be expensive. Consider on-line		Unclear - evaluations should include C-E analysis	Com Audit appears to be expensive. Consider switch to automated benchmarking??							
The portfolio as a whole should be cost-effective measured against both the Total Resource Cost and Utility Cost tests	Existing EE programs do not appear to have been screened. Audits not likely to be cost-effective.			Existing Com Audit does not appear cost-effective							

If the matrix is viewed in color, blue indicates an existing offering, green denotes a proposed program, and orange signifies a program type that we suggest be considered. Red text indicates a design note.

Because proposed programs were in very early stages of design, insufficient information was available for us to prepare comparisons similar to what had been done for the existing programs. Instead, what we present below are descriptions of a variety of program types that would help fill identified portfolio gaps.

We should also note that, based on our discussions with the Company, a number of its proposed initiatives will represent enhancements to existing programs. On the one hand, this is a powerful design strategy in that it preserves basic program infrastructure and avoids potential market confusion. On the other hand, it is not entirely clear that all existing programs represent best practice at this point, and embellishing those programs may not be the most effective longer-term strategy. For example, the Company is considering increasing the number of CFLs

distributed through the audit program. This actually can be an effective way to ensure installation (and boost program net-to-gross ratios). At the same time, it uses a rather administratively heavy delivery structure (in-home audit visits), when most CFL programs are now run as upstream partnerships with retailers or manufacturers. The latter types of programs potentially can leverage more product per implementation dollar, though they do suffer generally from lower installation rates.

In the sections below we review a number of program types that we believe could enhance the E.ON portfolio, recognizing that: (1) E.ON is considering some form of several of these program types and (2) the appropriateness of many of these programs for inclusion in an E.ON portfolio hinges on whether or not the Company sets savings goals. Several programs, such as a Residential Lighting and Appliances Program and a Commercial Prescriptive Incentive Program are best suited to environments in which resource acquisition is key.

5.2. Residential New Construction Programs

5.2.1. Program Typology

The Company currently is considering a New Construction program based on the ENERGY STAR platform. However, insufficient information was available at the time our report was completed to prepare a complete comparison with other programs.

5.2.2. Program Analysis

We reviewed residential new construction programs implemented by CenterPoint Energy²¹, Wisconsin Focus on Energy²², Energy Efficiency Homes Midwest²³, and Vermont ENERGY STAR Homes²⁴. These programs all approach residential new construction programs in a slightly different way—each program targeting different actors for incentives. The ENERGY STAR Homes Program offered by CenterPoint Energy is based on one of nine program designs approved by the Public Utility Commission of Texas. The program provides incentives directly to builders and raters, although program implementers have learned over the course of the program that builders are more motivated by advertising and promotion rather than the dollar incentives. The Wisconsin ENERGY STAR Homes program meets national ENERGY STAR Homes program requirements and has added its own site visits to the program requirements. This program offers discounts and cash-back rewards to builders for certified Wisconsin ENERGY STAR homes. The Energy Efficiency Homes Midwest program began in the 1990s and has focused on developing the HERS rating business in Indiana. The Vermont ENERGY STAR Homes Program grew out of Vermont's long history of leadership and innovation with

²¹ "Texas ENERGY STAR Homes Programs." ACEEE, America's Best: Profiles of America's Leading Energy Efficiency Programs. (2003). Available at: <http://www.aceee.org/pubs/u032.htm>. Also used research from ongoing EE Programs research

²² Energy Trust of Oregon, Best Practices From Energy Efficiency Organizations and Programs. (2002). Available at: http://www.energytrust.org/library/reports/Best_Practices/index.html?link_programs_reports_lin1Page=3 and ACEEE, America's Best: Profiles of America's Leading Energy Efficiency Programs. (2003)

²³ Energy Trust of Oregon, Best Practices From Energy Efficiency Organizations and Programs. (2002). Available at: http://www.energytrust.org/library/reports/Best_Practices/index.html?link_programs_reports_lin1Page=3 and ACEEE, America's Best: Profiles of America's Leading Energy Efficiency Programs. (2003)

²⁴ "Vermont ENERGY STAR Homes" ACEEE, America's Best: Profiles of America's Leading Energy Efficiency Programs. (2003). Available at: <http://aceee.org/utility/5bstarhomesvt.pdf> Also used research from ongoing EE Programs research.

initiatives to increase residential energy performance. Vermont Gas Systems and Efficiency Vermont have partnered to bring their previously distinct ENERGY STAR Homes programs into one cohesive statewide initiative that provides unified marketing and simple participation for the residential new construction market.

5.2.3. Program Comparison

The following table compares the CenterPoint Energy, Wisconsin Focus on Energy, Energy Efficiency Homes Midwest, and Vermont ENERGY STAR Homes programs across key program features. Additional program details are provided in the summary of each program in Appendix A.

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Table 9: Comparison of New Construction Programs

Program Feature	Market Segment	Measures	Services Offered	Customer Acquisition	Delivery Method	Technology/Tools
CenterPoint Texas	Residential E.S. New Construction	Incentives for builders to support ENERGY STAR Homes; Integrated advertising program.	Incentives to builders to support ENERGY STAR throughout new construction market. Trains raters, builders, sales staff, lenders, realtors, etc. Advertising campaign jointly funded by the program and builders. Established process for certifying and documenting ES homes.	Advertising and consumer seminars	Offer incentives to builders, not HERS raters.	
Wisconsin Focus on Energy	Residential E.S. New Construction	Homes Consultant site-visit and inspections. Customized direct marketing to builders. Discounts and cash back rewards for builders.	Wisconsin Energy Conservation Corporation, the program implementer, provides general assistance to customers. Provides objective advice rather than promoting a particular product or manufacturer. Builders provided instruction on ENERGY STAR requirements via seminars and 1-on-1 meetings.	Customer seminars; local home building associations	Customers request Homes Consultant	
Energy Efficiency Homes Midwest	Residential E.S. New Construction	Program marketing to support ENERGY STAR Homes. HERS raters deal directly with builders to sell the marketing advantage of ES Labeled Homes.	Indiana HERS raters rate every house and market to builders encouraging them to build ENERGY STAR homes.	Personal calls, trade shows, builder's associations.	5 firms employing total of 20 HERS raters in Indiana.	
Vermont ENERGY STAR Homes	Residential E.S. New Construction	Incentives for HERS raters to support ENERGY STAR home builders. Conferences for home builders.	Services to builders includes: marketing support, plan review and recommendations to achieve high performance homes through builder and subcontractor training; proposed and as-build energy savings; pre-drywall site inspections; ENERGY STAR homes labeling.	Cooperative newspaper and real estate guide ads, signage, marketing materials.		

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Program Feature	CenterPoint Texas	Wisconsin Focus on Energy	Energy Efficiency Homes Midwest	Vermont ENERGY STAR Homes
Delivery Process	<p>1) Marketing incentives to builders.</p> <p>2) HERS raters promote program to builders and provide technical support.</p>	<p>Main office staff and contractors develop relationships with local building community. 1) Home consultants visit home site after framing, looking for leaks; 2) Home consultant reviews Wisconsin ENERGY STAR homes inspect home to certify construction quality standards were met.</p>	<p>HERS rating firms deal directly with builders to sell them on marketing advantage of ENERGY STAR homes—personal calls, trade shows, builder's associations.</p>	
Special Features	<p>Certification and documentation process for ENERGY STAR homes and independent protocols to ensure that raters are providing high quality and consistent support to builders.</p>	<p>In addition to meeting ENERGY STAR requirements, the program has added requirements including construction site visits, shell air tightness, equipment standards</p>	<p>Completely self-sufficient. Program is successful because of HERS raters' marketing efforts to builders.</p>	<p>Sponsors an annual conference "Better Builders by Design"—brings together building professionals to share expertise and building and designing high performance homes.</p>
Incentive Structure	<p>Providing incentives to builders, not HERS raters is most effective. Incentives ~\$250/home.</p>	<p>WECC offers discounts and cash back rewards for certified constructed ENERGY STAR homes. WECC covers 2/3 of certifying home that qualifies.</p>	<p>No incentives to homes or builders.</p>	<p>Range from \$160 to over \$1500. Incremental incentives of \$15 for each additional EE lighting fixture surface mounted and \$25 for each recessed lighting fixture.</p>
METRICS				
annual kWh/participant	2,283 (2002)	1188 (2002)	N/A	2,860 (2001)
kWh/participant	1.68 (2002)	0.28 (2002)	N/A	0.48 (2001)
cost/kWh	\$0.59 (first year)		N/A	\$.69 (first year)
cost/kW	\$803 (first year)		N/A	\$4,545 (first year)
cost/participant	\$442 (2002)		N/A	\$2,647 (2001)
participants	33,103 ENERGY STAR homes were constructed (2000-2003)	1,572 Homes Certified in Program	NA	19917-2002—1,470 Labeled Homes

Best Practice Notes

- Residential new construction programs' success depends on recruiting directly targeting home buyers is not considered effective.
- Practice is transitioning away from providing incentives directly to builders to reduce the costs of the home.
- Practice is transitioning towards providing incentives to raters or market incentives to builders. This approach aims to stimulate the development of infrastructure and engages raters to help sell builders on the program incentives to builders supports the idea that builders will more than make their money back from ENERGY STAR homes²⁵ because they can sell homes at a higher price and can differentiate themselves from competition.
- Focusing programs on co-op marketing—helping the builders to sell—rather than thought of as a key to a sustainable program.

5.2.4. *Additional Considerations*

New Homes program capture what are known as “lost opportunities”—efficiently not made at the time a building is built or rehabbed, cannot later be made efficient at a higher cost. These programs are most effective where codes are weakly enforced and there is substantial competition between builders for market share. Although these programs can require more infrastructure, they nevertheless have become a basic element of many utility portfolios.

²⁵ We understand that the Company may be pursuing a new construction program that is based on the Earth Craft brand. An Earth Craft Home is not necessarily the equivalent to an ENERGY STAR Home.

5.3. Residential HVAC

5.3.1. Program Typology

The Company currently is considering a program that would offer dealer incentive customer co-pay, for central air conditioning diagnostics and tune-ups. We expect residential HVAC programs; one which provided rebates for the turn-in of existing room air conditioners and the other which is a central AC “check-and-tune” program with technology. We also include information on a New Jersey central AC rebate enactment of higher central AC efficiency standards, very few straight rebate must for SEER 14 and above) are cost-effective. Nevertheless, there could be considering a program to train HVAC dealers in proper installation and sizing HVAC units, and which could apply to all new air conditioners.

5.3.2. Program Analysis

The CheckMe! Program is a central AC diagnostic and repair system that delivers reductions and energy savings. It is a program developed and trade-marked by Proctor Engineering and has been implemented in a number of jurisdictions. Proctor ensures accurate test results and proper repairs by field training each HVAC technician through a computerized system.²⁶ The NYSERDA Keep Cool program encourages residential customers to purchase ENERGY STAR room air conditioners to reduce electric load during summer months. Customers who turn in old room air conditioners can receive a \$75 bounty. The Clean Energy Collaborative’s Cool Advantage Program was designed to train HVAC contractors in addition to promoting the sale of high-efficiency equipment. Proctor promotes improvements in sizing and installation practices.

5.3.3. Program Comparison

The following table compares the New Jersey, NYSERDA, and Proctor Engineering programs across key program features. Additional program details are provided in Appendix A.

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Table 10. Comparison of Residential HVAC Programs

Program Feature	CheckMe! Program	NYSERDA Keep Cool, New York	New Jersey Clean Energy
Market Segment	Residential AC diagnostic.	Residential AC Replacement.	Residential HVAC.
Measures	In-house evaluations coupled with phone tests for accuracy.	Refrigerator replacement and incentives for turning in old room air conditioning units.	Rebates for sale or purchase of installation of high-efficiency equipment for which documentation and sizing is provided.
Services offered	Field-trained HVAC technicians perform diagnostics in the field, verified by centralized computer expert system. Technician phones in test readings to CheckMe! Call center; data is analyzed by computer and recommendations are made on refrigerant charge and air flow.	Program offers \$75 bounty to customers who purchase a new ENERGY STAR room air conditioner (RAC) if they turn in their old RACs.	Incentives and rebates for purchase of energy efficient equipment as well as sizing and installation; consumer marketing campaign on key elements of efficiency; direct marketing to HVAC distributors through "outreach coordinators"; training of HVAC contractors on key elements of quality installations; ENERGY STAR sales training to contractors; and promotion of HVAC technician certification.
Customer acquisition	No information listed.	Marketing awareness plan developed by contractor attempts to change residents' behavior and purchasing decisions. Promotion of ENERGY STAR label in retail stores.	No information listed.
Delivery method	Customer visited by trained HVAC technician.	Customer visits retailer to purchase new ENERGY STAR RAC.	Customers purchase efficient equipment. HVAC contractors implement improvements in sizing and installation practices.
Technology/Tools	Call Center; computerized expert system.		N/A

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Program Feature	CheckMee! Program	NYSERDA Keep Cool, New York	New Jersey Clean Energy
<p>Delivery process</p> <ul style="list-style-type: none"> (1) Field trained HVAC technician performs in-house evaluation of AC system. (2) Technician phones test readings from customer sites to CheckMee! Call center. (3) Call center staff analyzes data with computerized expert system. (4) Recommendations made on refrigerant charge and airflow. (5) After repair, technician calls in final set of test results to ensure proper repairs. 	<ul style="list-style-type: none"> • Technicians in field call in to call center with 100% human interaction; no automated phone response. • Paperless process. • Program used to be computer based scheme where technician entered data into field computer. Technicians disliked the process and the program adapted to the onsite data transfer via call center. Technicians much more enthusiastic. 	<ul style="list-style-type: none"> (1) New York residents purchase new ENERGY STAR room air conditioner (RAC). (2) Customer may turn in old RACs and receive \$75 bounty. (3) program recycles old RACs to ensure they are removed from system. 	<p>First program in the country to the rebates not only to purchase of efficient equipment but also the documentation of proper sizing and installation.</p>
<p>Special Features</p>	<p>No information listed.</p>	<p>\$75 bounty for turning in old refrigerators.</p>	<p>Incentive Structure</p>
<p>No information listed on dollar amounts. Incentives offered for sale or purchase and installation of high-efficiency HVAC equipment.</p>	<p>No information listed.</p>	<p>No information listed.</p>	<p>Incentive Structure</p>

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Program Feature	CheckMe! Program	NYSEDA Keep Cool, New York	New Jersey Clean Energy
METRICS			
All figures calculated from data presented in ACEEE report			
kWh/participant	622 (2002)	256	779 (2002)
kW/participant	0.5 (2002)	0.26	0.60 (2002)
cost/kWh	\$0.14 (2002)	\$0.44 (2002)	\$1.21 (2002)
cost/kW	\$169 (2002)	\$444 (2002)	\$1364 (2002)
cost/participant	\$84/diagnostic run (2002)	\$114/unit sold (2002)	\$946 (2002)
participants	108,742 diagnostic runs (total program) 53,268 diagnostic runs (2002)	217,721 units sold (2000-2002)	66,000 participants (1999-2002)

Best Practice Notes

- With the increase in federal central AC standards, best practice is rapidly evolving toward a focus on proper sizing, installation, charge and airflow for both new and existing systems.
- Best practice increasingly targets mid-stream market segments (HVAC contractors and distributors).
- The remaining large pocket of HVAC savings lies in ducting systems. An increasing number of utilities are offering duct testing and sealing programs, although an effective program requires a service infrastructure.
- Residential and small commercial HVAC offers a powerful opportunity to merge demand-response and energy efficiency, by cross-selling demand response devices/tariffs and efficiency upgrades, recognizing that efficiency improvement will reduce the DR baseline.

5.3.4. Additional Considerations

The HVAC end use represents the primary pocket of residential energy efficiency and demand savings, and should be considered as a basic portfolio element. Given the Company's innovative approach to residential demand response using the sophisticated mesh network, E.ON has a unique opportunity to develop an integrated approach to DR and energy efficiency. The Company should explore a program structure that enables cross-selling the two elements.

5.4. Residential Home Performance Programs

5.4.1. Program Typology

The Company currently does not offer a Home Performance program. However, it could use its existing Residential Audit program (Residential Conservation Program) as the assessment portion of a future Home Performance program.

5.4.2. Comparable Programs

Best practice home performance programs typically attempt to build an infrastructure of qualified contractors and technicians to provide energy savings to residential customers. These programs typically include the following sub-sectors and measures:

Sub-sectors	Measures
<ul style="list-style-type: none">• Low-income• Single family• Multi-family	<ul style="list-style-type: none">• Insulation and air sealing• HVAC and water heating equipment replacement• Other energy saving devices—including CFLs, programmable thermostats, faucet aerators, low-flow showerheads

The Wisconsin Focus on Energy's Targeted Home Performance program utilizes the state's existing low-income weatherization network of contractors to implement energy efficiency measures in low-income customer residences. The program first qualifies customers according to income and household size, and then uses professional program consultants to conduct energy savings assessments, similar to the audits that the Company currently conducts. The residential customer then agrees to have a contractor implement all of the recommended measures. The customer's only obligation is to provide a 10% co-payment. The State's public benefits charge covers the remainder of the costs. Based on the low co-payment and variety and lifetime of the installed measures, we estimate that the program is cost-effective from the utility and customer's perspective. Wisconsin's program is successful because it utilizes an existing low-income weatherization network. E.ON could be well-positioned to migrate its existing weatherization program to a more formal home performance structure.

NYSERDA's Home Performance with ENERGY STAR program has also been recognized as a best practice program because it concurrently offers the same services to the same sub-sectors and builds an industry infrastructure of accredited firms and certified technicians. NYSERDA is building this infrastructure by supporting the New York Building Performance Contractors Association and the Building Performance Institute (BPI), a national building science resource that sets technical standards for the industry. Since participation in the Home Performance program is limited to certified technicians, NYSERDA subsidizes their training costs. NYSERDA also initiated a marketing campaign that leveraged the ENERGY STAR brand and other industry resources. NYSERDA initially launched the program in six markets, and then expanded into two additional ones.

5.4.3. Program Comparison

The following table compares the programs across key program features.

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Table 11: Comparison of Residential Home Performance Programs

	Wisconsin Focus on Energy—targeted Home Performance	NYSERDA—Home Performance with ENERGY STAR
Program Feature	Residential	Residential
Market Segment	While house measures	Whole house measures, professional education
Measures	Energy Efficiency assessment, implementation of measures	Training and measures implementation
Delivery	Assessment of house, implementation of insulation, air-sealing, equipment replacement, and CFLs for low-income residential customers	Training for residential contractors, implementation of whole house measures for low-income, single-, and multi-family residential customers
Services Offered	Customers are identified and qualified based on income levels and household size; renters may also participate	Marketing campaigns through ENERGY STAR brand and home improvement industry
Customer Acquisition	Through existing low-income weatherization network	Technicians receive training and certification through Building Performance Institute (BPI) and then are able to provide services to residential customers
Delivery Method	Includes diagnostic safety testing of combustion appliances	BPI certification exams
Technology/Tools	Low-income weatherization network contractors identify potential customer, conduct assessments, implement all recommended measures	NYSERDA support BPI, assists with technicians' trainings, who then assess and implement energy efficiency measures
Delivery Process	Provides services for customers that fall between 150% and 200% of the federal poverty level—an underserved part of the market	NYSERDA subsidizes technicians' training costs
Special Features	Program is funded through the state's public benefits charge; customers provide 10% co-pay	Homeowners pay for a majority of costs, with some NYSERDA subsidies
Incentive Structure	\$2,000,000	NA
annual budget	806	576
annual kWh/participant	NA	0.10
annual kW/participant	NA	NA
cost/kWh	NA	NA
cost/participant	NA	1,198 households
participation	641 households	

Best Practice Notes

- While Home Performance programs represent best practice in terms of program design, they often struggle for cost-effectiveness, particularly when cost-effectiveness is based on gas or electric savings; programs that focus on and count only electric savings have not yet been show to be cost-effective.
- The objective of most Home Performance programs is to seed and grow a local home performance industry that can thrive based on direct sales to customers for whom the economics are much more compelling. However, with the low rate environment in Kentucky it is unclear if such a program would prove cost-effective to consumers or not.

5.5. Residential Appliances and Lighting Programs

5.5.1. Program Typology

E.ON is considering a Residential Lighting program that, as we understand it, would expand the number of CFLs distributed through its audit program. It is not actively considering for near-term implementation a broader residential rebate program. Programs for residential appliances, and for lighting, are similar in that offerings and incentives are straightforward, savings are easily achieved and measured, and customers' satisfaction is high. The following illustrates the types of sub-types of program:

- Appliances and lighting—direct install or rebates
 - Lighting only
 - Other appliances
 - Refrigerator, freezer, or room air-conditioner turn-in

5.5.2. Comparable Programs

Best practice appliance and lighting programs—like those at Northeast Energy Efficiency Partnerships, Northwest Energy Efficiency Alliance, and Northeast Utilities—typically leverage regional energy efficiency alliances and the national ENERGY STAR brand label. The Northeast Energy Efficiency Partnerships set up an Appliance and Lighting Working Group (ALWG) with representatives from 11 utilities across six states to coordinate planning, implementation, and marketing efforts. The ALWG also includes representatives of the manufacturers, and the Consortium for Energy Efficiency (CEE), which works to develop technical standards for energy efficiency. Among other things, the ALWG works to:

- Reduce the incremental cost of, and offer rebates for ENERGY STAR appliances
- Increase the availability and market share of ENERGY STAR appliances
- Increase the number of utility programs for energy efficient appliances
- Continually increase federal energy standards and ENERGY STAR technical specifications

The Northwest Energy Efficiency Alliance's (NEEA) ENERGY STAR Home Products Program operates similarly to NEEP's program. NEEA provides energy efficiency product-related training to retail staff, and conducts public relations and media outreach to customers. In addition, NEEA coordinates with utilities, manufacturers, and retailers to provide program and marketing support.

Northeast Utilities (NU) offers a residential lighting program that interacts with customers, retailers, and manufacturers across three subsidiary utilities in three states. Through a mail-order catalog, customers receive information about energy efficient lighting products, such as CFLs, interior and exterior fixtures, and torchieres, and can order them at a discount through the catalog, online, or through a call center. NU also works with manufacturers in order to encourage them to develop aesthetically-pleasing products, as aesthetics is often cited as a major barrier to improved residential energy efficiency. NU also works with retailers so that customers can purchase and receive instant rebates on lighting products. Unique characteristics of this program include a higher than usual response rate and an 80% customer satisfaction rate.

5.5.3. Program Comparison

The following table compares the programs across key program features.

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Table 12: Comparison of Residential Appliance and Lighting Programs²⁷

Program Feature	E.ON	Northeast Utilities Lighting Catalog	Northeast Residential ENERGY STAR Appliances Initiative
Market Segment	Residential	Residential	Residential
Measures	Lighting	Lighting—CFLs, fixtures, torchieres	Appliances
Delivery	Through existing Residential Conservation program	Catalog of efficient lighting products, relationships with manufacturer and retailers	Rebate program, and marketing and awareness campaign
Services Offered		Availability of and incentives for efficient lighting products	Incentives for clothes washers, refrigerators, room air conditioners, and other appliances
Customer Acquisition		Catalog is sent to all NU residential customers in CT, MA, NH; NU also works with retailers	NEEP works with manufacturers, retailers, and customers to increase market share of ENERGY STAR appliances
Delivery Method		Mail and online catalog, participating retailers	Working group formed to achieve economies of scale in appliance program offerings
Technology/Tools			
Delivery Process	Lighting program would piggyback on the existing Residential Conservation program	Customers receive the catalog at home, and can purchase discounted efficient lighting products through the mail or online, or in-store with a participating retailer	Working group meets to coordinate planning, implementation, and marketing activities to utility customers
Special Features		NU works with manufacturers to develop aesthetically-pleasing products, overcoming major customer barrier	Involvement of 11 utilities across 6 states, manufacturers, and other groups
Incentive Structure	None	Fixed incentives per product, incentives vary by state	Incentives per product

²⁷ Insufficient data were available to support a full comparison with the Northwest Energy Efficiency Alliance Program

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Program Feature	E.ON	Northeast Utilities Lighting Catalog	Northeast Residential ENERGY STAR Appliances Initiative
METRICS			
annual budget	\$48,000	\$3,500,000	\$224,762
annual kWh/participant	642	216	172
annual kW/participant	0.06	0.22	0.07
cost/kWh	\$0.08	\$0.30	\$0.27
cost/kW	\$888.89	\$300.00	\$893.71
cost/participant	\$53.00	\$64.81	\$48.43
participation	900 customers per year	54,000 customers (2001)	4,841 rebates (2002)

Best Practice Notes

- Most leading edge lighting and appliance programs now work upstream with manufacturers and retailers. In some cases, rebate funds are paid directly to the retailer or manufacturer based on sales data. This upstream focus enables utilities to exercise the most market leverage in terms of product pricing and cooperative advertising. Directly attacking the mass market can be extremely expensive.
- Practice adaptive management by adjusting to energy efficiency market conditions and changing information
- CFL programs typically can account for up to one-third of portfolio savings and therefore are extremely valuable elements in a portfolio with savings goals.
- Take notice of changing market conditions—adjust incentives according to decreasing incremental costs, and add new products as existing products become more mainstream

5.6. Commercial HVAC Tune-Up Programs

5.6.1. Description of E.ON's Proposed Program

Under the planned commercial HVAC tune-up program, commercial customers will receive an analysis of existing commercial AC systems, and discounted corrective action when necessary to correct the refrigerant charge and air flow across the evaporator coil.

5.6.2. Comparable Programs

We reviewed rooftop HVAC tune-up programs implemented by Avista Utilities, the Northwest Energy Efficiency Alliance (NEEA), PG&E, and Puget Sound Energy (PSE). The Avista Utilities Rooftop HVAC program, a short-term initiative launched in response to the energy crisis of 2001, achieved the distinction of being awarded an honorable mention in ACEEE's 2003 report on America's leading energy efficiency programs. The NEEA AirCare Plus program was implemented as a pilot program in 2001 and market tested a number of different implementation and incentive strategies. Though NEEA elected not to implement a full-scale program due to its unsuitability as a market transformation-only program, the evaluation of the pilot program provides some useful insights for identification of program best practices. Structuring AirCare Plus as a resource acquisition program, the implementation contractor for the NEEA pilot, Portland Energy Conservation Inc. (PECI), has gone on to offer the program to a number of utilities, including PG&E and Avista Utilities. Lastly, PSE offers a similar HVAC tune-up program to its customers. One unique characteristic of the PSE program is that incentives are dependent upon customers entering into a three-year premium service agreement with participating contractors. Though we do not have detailed program metrics for the PSE program, we include information on program approach and incentive levels in Appendix A.

5.6.3. Program Comparison

The following table compares the Avista Utilities, NEEA, and PG&E programs across key program features. Additional program details are provided in the summary of each program in Appendix A. (Puget Sound Energy's Premium HVAC Service Program is not included in the below matrix as it is substantially similar to the other programs in terms of design and implementation, but a program description is provided in Appendix A).

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Table 13: Comparison of Commercial HVAC Tune-Up Programs

Program Feature	Avista Utilities Rooftop HVAC	Northwest Energy Efficiency Alliance AirCare Plus Pilot Program	PG&E AirCare Plus
Market Segment	Commercial (big box, manufacturing, fast food, small retail).	Small commercial customers with 5-15 ton RTUs.	Small to medium-sized commercial customers with packaged RTUs.
Measures	Repair/parts replacement for rooftop AC units.	Opportunistic repairs; physical changes expected to improve the compressor operation such as cleaning the coil, increasing the fan speed and adjusting the refrigerant charge; adjust outside air fraction; adjust economizer; thermostat programming/scheduling.	Basic checks to evaluate airflow, refrigerant charge, and economizer functionality; economizer retrofits; refrigerant & airflow modifications; thermostat adjustment & replacement.
Services Offered	Assessment and maintenance; free programmable thermostat installation.	Program provides training to HVAC service contractors to diagnose and correct problems per above-listed measures.	Provides training for technicians to optimize standard HVAC efficiency and properly install high efficiency units.
Customer Acquisition	Targeted outreach through building managers associations and restaurant associations.	Evaluation found that marketing efforts by participating contractors were limited to direct mail & networking with customers; determined that use of utility name/marketing support was significant to driving participation.	Participating HVAC contractors are provided a number of marketing tools to use in recruiting customers, including letter templates, brochures, utility logos, and other customizable marketing materials. Program also maintains Web site.
Delivery Method	Local HVAC dealers provided the services and were paid by the utility.	Pilot program was administered by 3rd party contractor (PECI); program outreach via participating trained contractors. Phase I involved no incentives or utility involvement; Phase II involved varying levels of utility support/incentives to test market effectiveness.	Program is administered by 3rd party contractor (PECI). Program outreach via participating trained contractors using franchised method.

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Program Feature	Avista Utilities Rooftop HVAC	Northwest Energy Efficiency Alliance AirCare Plus Pilot Program	PG&E AirCare Plus
Technology/Tools	14-point inspection checklist was used by participating contractors.	CheckMe! Tool by Proctor Engineering used in Phase I, replaced by Honeywell Service Assistant in Phase II. PECI developed proprietary software/data collection system for Palm PDA.	Honeywell Service Assistant digitally measures the temperatures and pressures of HVAC unit; service data is collected using PDA. PDA and AirCare Plus software guides technician through each service and allows paperless data collection/storage.
Delivery Process	<ul style="list-style-type: none"> (1) Customer is contacted by utility or outreach partner. (2) HVAC dealer conducts inspection and repairs. (3) Utility conducts post-inspection and pays HVAC dealer. 		<ul style="list-style-type: none"> (1) Customer signs up with participating HVAC contractor. (2) contractor provides HVAC assessment and retrofit services. (3) incentive is paid to contractor (PECI audits a percentage of completed installations).
Special Features			
Incentive Structure	Services were free to customers, including programmable thermostat installation if desired. HVAC dealers received payment from Avista for conducting the services.	Market test involved offering varying incentive levels—from no utility incentives or support (i.e., entirely contractor driven), to utility technical assistance (marketing, training) but no \$ incentives, to full utility support (marketing, training) and incentives of up to \$175 per project.	Participating HVAC contractors earn measure incentives for providing qualified services.

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Program Feature	Avista Utilities Rooftop HVAC	Northwest Energy Efficiency Alliance AirCare Plus Pilot Program	PG&E AirCare Plus
METRICS			
kWh/participant	6,500	665	2,573
kW/participant	Unknown	NA	0.48
Cost/kWh	\$0.13	NA	\$0.24
Cost/kW	Unknown	NA	\$613
Cost/participant	\$875	NA	\$296
Total Energy Savings (kWh)	13,000,000	35,885	15,894,000
Total Demand Reduction (kW)	Unknown	NA	6,177
Total Participants	2,000	54	12,779
Total Cost	\$1,750,000	NA	\$3,783,786
Incentive Cost	Unknown	NA	NA
Admin Cost	Unknown	NA	NA

Best Practice Notes

The program under consideration by E.ON is, as we understand, reflective of many best practice design elements, such as:

- Using HVAC service contractors to market the program and provide tune-up services.
- Supporting participating trade allies by:
 - Providing extensive training, both to enroll contractors in the program and also in terms of ongoing technical assistance.
 - Developing detailed protocols and other materials to support contractor training.
 - Providing a technical platform that adds value for participating service contractors, speeds up and standardizes the assessment process, and improves quality control by minimizing potential for contractor error.
 - Developing marketing materials that leverage the E.ON brand, particularly materials that support consumer education.
- Providing contractor incentives to reduce the cost to the customer and give contractors a reason to sell program services. The cost of the service (\$250-\$300) means that the energy savings alone may not be a compelling enough reason for customers to participate, particularly for equipment that is out-of-sight, out-of-mind.
- Providing incentives both for mechanical adjustment services as well as for hardware retrofits (programmable thermostats are offered by multiple programs).
- Incenting a broad list of measures and services to reduce lost opportunities and encourage contractors to provide more than the minimum service.
- Marketing the program through existing commercial networks such as business associations, retail and food service chains, building management associations.
- Including ongoing M&V mechanism to ensure savings persistence and demonstrate the energy savings value to customers.

5.7. Responsive Pricing Programs

5.7.1. Description of E.ON's Proposed Program

The Responsive Pricing/Smart Metering pilot program will vary the price of electricity during the various hours of the day, giving customers the incentive to move energy usage from higher price (and cost) time periods to lower price (and cost) periods. Enabling technologies installed through the program will include a smart meter, smart thermostat, in home energy display and controls to regulate water heaters and other large loads.

5.7.2. Comparable Programs

We reviewed program data on two critical peak pricing (CPP) or responsive pricing programs: (1) a small commercial program that was implemented in Southern California Edison's (SCE) service territory (part of the larger California Statewide Pricing Pilot that tested the impact of several time-varying rate structures on electricity usage by residential and small C&I customers); and (2) a Fully Automated Critical Peak Pricing pilot program that was market-tested in PG&E's service territory. The SCE program evaluation provides key insights into critical peak pricing program design for hard-to-reach commercial market segments. The PG&E program targeted large commercial customers and was implemented by Lawrence Berkeley National Laboratory (LBNL) to test the effectiveness of CPP rates in conjunction with technologies that fully automate the response to CPP events. These two programs span the range of commercial CPP programs in terms of target markets and the level of technological sophistication.

5.7.3. Program Comparison

The following table compares the programs across key program features. Additional program details are provided in the summary of each program in Appendix A.

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Table 14: Comparison of Critical Peak Pricing Programs

Program Feature	Southern CA Edison Small C&I CPP (part of California Statewide Pricing Pilot)	PG&E Fully Automated Critical Peak Pricing in Commercial Buildings
Market Segment	Small commercial.	Large commercial (peak demand >200 kW) facilities with pre-installed Energy Management Control System (EMCS).
Measures	Smart thermostat.	Participants were provided either the web-service program source code or Internet relay device depending on the EMCS interface option they selected.
Services Offered	2-tiered rate. Free smart thermostat installation (if desired by customer).	CPP period is May 1 through October 31. 2-tiered TOU rate; 2-tiered CPP rate; maximum of 12 CPP events per year.
Customer Acquisition	Unknown.	PG&E Account Managers identified eligible customers; outreach consisted of emails with program flyer and phone calls. Additional outreach through program presentations at relevant meetings/conferences.
Delivery Method	Utility calls CPP period based on forecast temperature (day ahead). Customers notified by direct telephone call, alphanumeric pager, email, cell phone, or fax.	CPP events triggered by temperature. Program worked with customers to determine their two-level DR control strategies (for medium and high CPP) and customer Energy Management Control System (EMCS) were programmed accordingly. Automated interface with PG&E server during CPP events.
Technology/Tools	Smart thermostat that receives pricing signals (optional).	Demand Response Automation Server (developed by LBNL & Akuacom); price signals transmitted over the Internet; interface with customer EMCS via Internet gateway, CLIR Box, or Internet relay system.
Delivery Process	(1) Customer receives CPP notification (typical notice is 1 hour). (2) Customer elects whether to adapt energy usage (if customer has "smart" thermostat, equipment is automatically set back).	(1) 1 day prior to CPP event, PG&E DR communications system (InterAct II) notifies the DR Automation Server of CPP event (based on forecast temperature) (2) Server posts Internet notification. (3) Customer EMCS carries out pre-determined demand response at time of CPP event.

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Program Feature	Southern CA Edison Small C&I CPP (part of California Statewide Pricing Pilot)	PG&E Fully Automated Critical Peak Pricing in Commercial Buildings
Special Features		Customers could select their own 2-tiered DR strategy for CPP events. Most sites programmed their EMCS to reduce HVAC system electric loads, while some included lighting sheds.
Incentive Structure	Enabling technologies are installed cost-free	Customers are on TOU rate during non-CPP periods; CPP has two rate tiers: Moderate CPP is from noon-3:00 @ 3x on-peak TOU rate, and High CPP is from 3:00 to 6:00 @ 5x on-peak TOU rate
METRICS		
kWh/participant	NA	NA
kWh/participant	Unknown. Overall, the California Pricing Pilot program found load reductions ranging from 5- 15% in response to high price signals from the critical peak price tariff	Average demand reduction per facility was 8%, with a maximum demand reduction of 28% at best-performing facility
Cost/kWh	NA	NA
Cost/kW	NA	\$26
Cost/participant	NA	\$4,700
Total Energy Savings (kWh)	NA	NA
Total Demand Reduction (kW)	NA	1,000
Total Participants	NA	12
Total Cost	NA	NA
Incentive Cost	NA	NA
Admin Cost	NA	NA

Best Practice Notes

- Allow adequate time for the program to gain customer acceptance, recognizing that price-based demand response programs involve a long-term market development and education process (e.g., 5 years), particularly in comparison with direct load control programs.
- Incorporate enabling technology such as programmable thermostats to improve demand reduction by automating response process; customers should be offered the flexibility of overriding the signal.
- Align annual program planning/budget cycle and marketing/sales efforts to ensure adequate number of participants are enrolled before summer peak season.
- Use multiple mechanisms for notifying customers of CPP periods, automating notification as much as possible to minimize burdens on program staff.
- Customer motivation to participate is strongly affected by non-financial objectives such as demonstrating they are good corporate citizens, drive participation by incorporating such messaging into program marketing efforts.
- To mitigate the perceived risks associated with participating in Responsive Pricing programs, some utilities have used guarantees that customers will not pay more for power during the first year of participation, or have limited the number of CPP hours per year.
- Voluntary (opt-in) Responsive Pricing programs are viewed with less customer suspicion/resistance than default (opt-out) price response programs.

5.8. Prescriptive Incentive Programs

5.8.1. Program Description

Prescriptive incentive programs provide pre-set incentives for a range of common energy efficiency measures and have proven themselves to be efficient and effective in capturing efficiency savings in all sectors. Program designs that offer prescriptive rebates for common technologies across the entire commercial market are relatively simple to design, administer, and evaluate, and are very effective in tapping into large veins of efficiency potential in lighting, motors and HVAC systems. To maximize market impact, prescriptive programs are typically trade ally-driven, and may involve manufacturers, vendors, equipment installers, and retailers. Delivery of these types of programs has effectively been commoditized and offers the lowest cost per kW of energy saved. Due to their straightforward design and implementation approach, prescriptive incentive programs can also be ramped up quickly, and are the basic building blocks of virtually every utility program portfolio. E.ON is not, to our knowledge, proposing such a program, although we do understand that it is considering inclusion of lighting incentives in its commercial audit program.

5.8.2. Comparable Programs

Prescriptive incentives programs employ a fairly consistent design and implementation approach. We have reviewed the programs offered by Nevada Power and We Energies as these utilities are similar of similar size to E.ON. We have also included information on the Express Efficiency program offered first by PG&E and now by all three California IOUs, which was named an exemplary program by ACEEE in its assessment of the country's leading energy efficiency programs. The We Energies and California IOU programs are straightforward prescriptive incentive programs, while the Nevada Power program incorporates elements for serving hard-to-reach market segments, and also includes custom incentive approaches.

5.8.3. Program Comparison

The following table compares the Nevada Power, We Energies, and California IOU programs across key program features. Additional program details are provided in the summary of each program in Appendix A.

Table 15: Comparison of Commercial Prescriptive Incentive Programs

Program Feature	Nevada Power Sure Bet	We Energies Prescriptive Program	CA IOUs Express Efficiency
Market Segment	Commercial, industrial, institutional. In 2006, 25% of funding set aside for small customers.	Commercial, industrial, institutional.	Small and medium-sized commercial customers.
Measures	Lighting, cooling, motors, refrigeration and vending machine controls.	Lighting, HVAC, chillers, motors, variable speed drives, energy recovery ventilators, compressed air measures, food service equipment, vending machines & controls, guest room energy management systems.	Lighting, refrigeration, air conditioning, and agricultural measures, as well as natural gas savings measures for small business market.
Services Offered	Prescriptive rebates as well as custom incentives for measures resulting in verifiable energy savings; building optimization; direct install measures.	Prescriptive rebates for qualifying measures that replace existing less efficient equipment.	Prescriptive rebates for qualifying measures that replace existing less efficient equipment.
Customer Acquisition	Hard-to-reach customers are solicited through door-to-door canvassing.	Direct marketing efforts include utility account manager referrals and mail and telephone solicitations. Program is also marketed through trade ally network.	Program is marketed primarily through trade allies.
Delivery Method	Implementation contractor provides program services.	Implementation contractor provides program services.	Extensive trade ally involvement to promote sales of qualifying equipment
Technology/Tools		Online application submittal for lighting measures.	ENERGY STAR benchmarking offered for eligible customers.
Delivery Process	<ul style="list-style-type: none"> (1) Customer completes application to reserve funding (recommended for incentives above \$7,500). (2) Qualified measures are installed. (3) Customer submits Request for Payment and documentation as specified by program staff. (4) Incentives are paid within 4-6 weeks. 	<ul style="list-style-type: none"> (1) Pre-approval not required for incentive applications less than \$40,000. (2) Qualifying measure(s) are installed by customer. (3) Customer submits application form with required documentation within 30 days of completion. (4) Projects subject to random verification. (5) Incentive is paid within 8 weeks. 	<ul style="list-style-type: none"> (1) Incentive reservations can be made by phone and are recommended but not required. (2) Qualifying measures are installed by the customer/trade ally. (3) Customer/trade ally submits rebate worksheet that calculates incentive, along with required documentation. (4) Incentive is paid 30 days after utility receives application and verifies installation

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Program Feature	Nevada Power Sure Bet	We Energies Prescriptive Program	CA IOUs Express Efficiency
Program Feature	Nevada Power Sure Bet	We Energies Prescriptive Program	CA IOUs Express Efficiency
Special Features	Program minimizes lost opportunities by combining prescriptive, custom, and direct installation services.	Program works extensively with trade allies to identify and target customer niches, and to engage them in sales and marketing efforts.	Easy, straightforward participation process makes this one of PG&E's most popular programs. Rebates can be paid either to the customer or the trade ally at customer's discretion.
Incentive Structure	Most incentive levels are set to provide 2-year payback; custom incentives are paid at \$0.03/kWh saved and \$100/peak kW reduced.	Incentive levels are based on incremental measure cost and/or project cost. Limited-term bonus incentives have been offered for targeted technologies (High Bay Fluorescents, high-efficiency commercial AC equipment).	Rebate levels are set to encourage installation of energy-efficient measures by offsetting the customer's initial cost.
METRICS			
kWh/participant	267,505	NA	37,500
kW/participant	36.8	NA	5.5
Cost/kWh	\$0.04	NA	\$0.08
Cost/kW	\$296.15	\$413.33	\$577.75
Cost/participant	\$10,905.33	NA	\$3,177.60
Total Energy Savings (kWh)	40,928,341	NA	300,000,000
Total Demand Reduction (kW)	5,634	6,293	44,000
Total Participants	153	NA	8,000
Total Cost	\$1,668,516	\$2,601,061	\$25,420,783
Incentive Cost	1,004,686	NA	NA
Admin Cost	\$663,830	NA	NA
TRC	1.74	3.02	NA
Utility Cost Test	4.36	4.06	NA
RIM Test	0.54	0.63	NA

Best Practice Notes

- Design prescriptive incentive programs to complement other energy efficiency initiatives.
- Develop and maintain strong relationships with trade allies such as equipment vendors and installation contractors. Some programs offer trade ally incentives to encourage trade ally involvement.
- Ensure that participating in the program is simple, both for customers and for trade allies.
- Communicate regularly with participating trade allies to educate them about the program, inform them about program changes, address issues as they arise, and ensure they are actively engaged in promoting the program.
- Through mechanisms such as electronic application systems, streamline incentive application as well as verification/quality control processes to facilitate ease of participation and minimize the time required for incentive payment.
- Tie incentive levels to measure payback, with one- to two-year payback as the industry norm, offering higher incentives for premium efficiency equipment.
- Ensure consistency in incentive levels, using short-term promotions sparingly, but re-evaluate incentive levels and incented measures on an annual basis so the program can adapt to changing market conditions.
- Leverage trade ally marketing efforts, but also conduct some utility-branded mass marketing to promote the program.
- Evaluate opportunities to leverage the nationally-recognized ENERGY STAR brand for products such as programmable thermostats, exit signs, and commercial food service equipment.

5.8.4. Other Considerations

A broad-based prescriptive incentive program is a fundamental component of a balanced energy efficiency portfolio. Should E.ON decide to develop a prescriptive incentive program for the commercial market, we recommend that it takes into consideration the following program design elements:

- Complement E.ON's existing and planned energy efficiency and demand response programs. For example, identify prescriptive incentive measures for energy savings opportunities commonly identified in commercial energy audits or HVAC tune-ups.
- Determine the best approach for utilizing trade allies to promote the program.
- Assess the potential for electronic rebate application and processing.
- Consider opportunities to leverage the national ENERGY STAR brand, both through measure incentives as well as through process-oriented approaches like facility energy use benchmarking with EPA's Portfolio Manager benchmarking tool.

5.9. Custom Incentive Programs

5.9.1. Program Description

Prescriptive incentive programs fail to capture savings that are associated with more complex measures or with systems that include multiple, integrated measures often found in nonresidential sectors. These savings are best acquired through custom incentive programs that provide incentives tailored to the energy savings associated with retrofit/replacement of these systems. Such programs are typically most successful with larger commercial or industrial customers that take a more strategic approach to energy management. In the commercial market, custom programs typically focus on building performance improvement, while in the industrial market such programs emphasize process improvement. Custom incentive programs are an important element of the energy efficiency portfolio as they provide utility customer account managers with valuable tools for enhancing customer satisfaction.

Custom programs can be implemented using a variety of incentive structures, but the most basic approach is to provide a fixed incentive per kW for verified energy savings.²⁸ The design of these programs is straightforward, with the utility providing an incentive threshold that customer can design projects against.

Given the complexity of such programs, we do not recommend that E.ON adopt such a program at least initially.

5.9.2. Comparable Programs

We have reviewed custom incentive programs offered by National Grid and We Energies. Both utilities offer a custom incentive approach that is designed to complement prescriptive incentives. For National Grid, custom and incentive tracks are both offered through the Energy Initiative program. For We Energies, custom incentives are offered for measures not incented through the utility's prescriptive incentive program.

5.9.3. Program Comparison

The following table compares the programs across key program features. Additional program details are provided in the summary of each program in Appendix A.

²⁸ Custom incentive programs can also use a bidding structure where potential participants bid a price per kW or kWh saved, bids are scored against pre-set criteria, and available funds are awarded to the lowest bidders that meet portfolio criteria. As these types of programs are most commonly targeted towards the industrial sector, we have not included a discussion of RFP programs.

Table 16: Comparison of Commercial Custom Incentive Programs

Program Feature	National Grid Energy Initiative—Custom Track	We Energies Custom Program
Market Segment	Commercial, industrial, institutional.	Commercial, industrial, institutional.
Measures	Lighting, high efficiency HVAC controls, variable frequency drives, premium efficiency motors.	Any measures producing energy demand reduction during peak periods and not covered by the Prescriptive Program.
Services Offered	Installation is the customer's responsibility, but the program covers 50% of the installed cost for custom track projects, and offers technical assistance and training on O&M and commissioning. Energy Initiative program also offers prescriptive rebates.	Program offers rebates based on calculated energy savings, and technical assistance (feasibility studies, comprehensive energy audits) for some projects.
Customer Acquisition	Trade ally sales & marketing efforts.	Customer marketing includes general advertising, direct mail, and account manager referrals, as well as training presentations and participation in trade shows/conferences. The program is also provides outreach and training to trade allies who agree to market the program to their customers.
Delivery Method		Implementation contractor provides program services.
Technology/Tools		ENERGY STAR benchmarking offered for eligible customers.
Delivery Process	<p>(1) Customer works with program staff to determine project eligibility—customer inquiries are routed either to custom or prescriptive track.</p> <p>(2) Customer is required to sign Minimum Requirements Document specifying equipment specs and operational requirements, as well as proposed incentive.</p> <p>(3) Customer completes project.</p> <p>(4) Utility conducts post-installation inspection.</p> <p>(5) Incentive is paid.</p>	<p>(1) Customer submits application for proposed project.</p> <p>(2) Program staff review application, estimate incentive and issue acceptance letter.</p> <p>(3) Customer completes installation within 120 days.</p> <p>(4) Post-installation inspection for larger projects.</p> <p>(5) Incentive is paid.</p>

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Program Feature	National Grid Energy Initiative—Custom Track	We Energies Custom Program
<p>Special Features</p> <p>Supports national/regional market transformation efforts in the areas of O&M, compressed air, and retrocommissioning. Technical assistance includes the Industrial Systems Optimization Service, which quantifies non-energy benefits of industrial process retrofits.</p>	<p>Rebate covers 50% of installed cost</p>	<p>Partial funding for feasibility studies and comprehensive energy audits; measure incentives based on customer's incremental cost and demand reduction calculation. Limited-term bonus incentive (\$100/kW) offered to energy consultants for non-lighting project referrals</p>
METRICS		
kWh/participant	NA	NA
kW/participant	NA	NA
Cost/kWh	NA	NA
Cost/kW	NA	\$474.35
Cost/participant	NA	NA
Total Energy Savings (kWh)	1,600,000	NA
Total Demand Reduction (kW)	55,000	5,167
Total Participants	5,000	Unknown
Total Cost	\$5,000,000	\$2,450,980
Incentive Cost	NA	NA
Admin Cost	NA	NA
TRC	NA	2.52
Utility Cost Test	NA	3.23
RIM Test	NA	0.68

Best Practice Notes

- Avoid program silos that customers and trade allies may perceive as artificial or confusing. Ensure that customers undertaking custom projects are aware of opportunities for prescriptive incentives and vice versa.
- Ensure that prescriptive and custom program designs are complementary. For example, custom measures can be defined as any measures not incented through the prescriptive program.
- Share the cost of energy analysis between the customer and the utility, offering a higher utility share if the customer implements recommended measures.
- Structure incentives to buy down the customer's initial incremental investment, with one to two year payback as the industry norm.
- Keep application forms and participation processes as simple as possible, ensuring that program requirements are not overly burdensome.
- Provide technical assistance to customers and trade allies to guide them through the participation process.
- Ensure that engineers conducting the energy analyses for custom projects are well-trained, understand program requirements, and can explain them to customers.
- Communicate regularly with participating trade allies to educate them about the program, inform them about program changes, address issues as they arise, and ensure they are actively engaged in promoting the program.
- Due to the increased technical complexity of custom programs, trade ally involvement will likely be narrower in scope than for prescriptive programs, and contractor incentives can be an effective mechanism for motivating trade allies.
- Leverage private sector marketing efforts, particularly ESCOs.
- Evaluate opportunities to leverage the nationally-recognized ENERGY STAR brand by promoting the use of EPA's energy benchmarking tool.
- Market the program through building owner and management associations and other business groups.
- Develop case studies and use them to promote the program.

5.9.4. Additional Considerations

Custom incentive programs typically require a more complex delivery structure, and if prescriptive programs are well-designed, custom programs will cover relatively few measures. *Therefore, we would not recommend a customer incentive programs as an element of E.ON's short-term portfolio strategy.*

Should E.ON decide to explore such a program later, we suggest the following design considerations:

- Ensure that the participation process is as simple as possible, and develop necessary tools and informational materials to guide customers through the participation process.

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- Assess whether the technical and engineering expertise that the custom program will require is best offered through a third party contractor or through E.ON's in-house staff.
- Determine the best approach for utilizing trade allies to promote the program, and develop protocols for trade ally training and assistance.
- Consider opportunities to leverage the national ENERGY STAR brand through process-oriented approaches like facility energy use benchmarking with EPA's Portfolio Manager benchmarking tool.

5.10. Hard-to-Reach Commercial Programs

5.10.1. Program Description

Energy efficiency programs that are intended principally to “acquire” conservation resources typically target the most accessible and cost-effective pockets of efficiency potential. Although these programs might be designed to allow all customers to participate, certain market segments invariably are “hard-to-reach.” Low income customers, small businesses, not-for-profit organizations, and renters often face barriers to participation in efficiency programs that are more severe or complex than those addressed by mainstream program design. While a prescriptive incentive program provides broad program coverage, some utility portfolios also include specialized programs designed to target these hard-to-reach customer segments where a specific delivery approach is needed to overcome market-specific participation barriers. Where such programs exist they most frequently target low income customers, multi-family properties, small businesses, and non-English speaking customers.

However, given the implementation complexity and cost of such programs we do not recommend that E.ON develop such a program as part of its near-term portfolio strategy.

5.10.2. Comparable Programs

We reviewed five programs designed to serve hard-to-reach segments of the commercial market: Northeast Utilities’ Small Business Energy Advantage Program, PG&E’s RightLights Program, We Energies’ Commercial Electrical Business Assistance Program, SDG&E’s Small Business Energy Efficiency Program, and National Grid’s Small Business Services Program. The Northeast Utilities and National Grid programs employ a similar design, offering an innovative interest-free on-bill financing mechanism for energy efficiency upgrades that has been emulated by California utilities and is currently under consideration for programs in Pennsylvania, Nevada, and Oregon.²⁹ We Energies is the most similar utility to E.ON in terms of size, and employs innovative marketing approaches through churches, neighborhood and community organizations to access hard-to-reach market segments. The Commercial Electrical Business Assistance Program is also designed to complement a natural gas savings program targeting the same market, but as the electric efficiency program was launched in 2007, no program results are yet available. The PG&E and SDG&E programs are programs with multi-year results, and both involve direct install measures that are designed to offer immediate energy savings with minimal effort on the part of the customer.

5.10.3. Program Comparison

The following table compares the Northeast Utilities, PG&E, and We Energies programs across key program features. Additional details for these programs as well as the SDG&E and National Grid Programs are provided in the summary of each program in Appendix A.

²⁹ *Business Week* (March 8, 2007). “Cutting Utility Bills, Saving the Planet.”

Table 17: Comparison of Hard-to-Reach Commercial Programs

Program Feature	Northeast Utilities Small Business Energy Advantage	PG&E RightLights Program	We Energies Commercial Electrical Business Assistance Program
Market Segment	Small commercial (peak demand <200kW are eligible, but focusing on >50kW accounts).	Small commercial (demand less than 500 kW).	Small commercial (demand less than 100 kW), churches, and nonprofits.
Measures	Lighting upgrades, lighting controls, HVAC controls and tune-ups, refrigeration, load control devices.	Quick Saver Package measures (installed on initial audit visit) include: CFLs, LED exit sign upgrades. Comprehensive assessment includes additional lighting measures.	Direct install measures: CFLs, low flow showerheads, aerators, pipe wrap, and pre-rinse sprayers for customers with electric water heaters. Prescriptive or custom incentives: other lighting measures, electric to gas water heater conversions, motors, VSDs, AC, chillers.
Services Offered	Customer receives energy audit, technical advice, measure design/installation, and utility financing of customer's share of cost.	Initial site audit, Quick Saver Package installation (CFLs and LED exit signs), lighting efficiency measures, subsequent lighting retrofit installations.	Direct installation measures offered on initial site visit; site visit identifies additional measures eligible for incentives.
Customer Acquisition	Primarily marketed through trade allies. Utility also maintains a program Web page and conducts periodic informational mailings to promote the program.	Energy auditors primarily marketed the program by canvassing local businesses (84% of participants reported hearing about the program thru walk-in visit). Participants were encouraged to refer other local businesses to the program.	Proactive marketing in targeted communities through neighborhood associations, churches, and not-for-profit organizations—direct mail, community events, etc. Program may also canvas retail customers.
Delivery Method	Implemented through trade allies (lighting and mechanical engineering firms) which market the program within their assigned territories (approx 12 allies assigned to each area).	Program is implemented by a third party contractor, Ecology Action.	Implementation contractor provides program services.

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Program Feature	Northeast Utilities Small Business Energy Advantage	PG&E RightLights Program	We Energies Commercial Electrical Business Assistance Program
Technology/Tools	<p>Proprietary software for the trade allies to provide documentation of proposed projects.</p>	<p>Customized Microsoft Access database called Facilities Evaluation Tool (FACET®), which has a proprietary front end developed by the Center for Energy and Environment (CEE) that automates the process of calculating the costs and savings.</p>	<p>Self Guided Energy Analysis tool on the We Energies Web site.</p>
Delivery Process	<ol style="list-style-type: none"> (1) Contractor submits lead for eligibility determination. (2) Qualified leads entered into SBEA software and forwarded to contractor. (3) Contractor presents assessment results to SBEA. (4) Upon SBEA approval, contractor presents proposal to customer for signature. (5) Project completed by contractor w/in 30 days. (6) Incentive paid to contractor w/in 30 days of receipt of completed project documentation. (7) If customer receives financing, utility pays contractor balance, and customer is billed for loan repayment on ongoing basis. 	<ol style="list-style-type: none"> (1) Initial site visit includes Quick Saver Package installation and assessment of comprehensive lighting efficiency opportunities. (2) Data are entered into FACET to generate cost/savings/payback. (3) Customer signs off on comprehensive proposal that includes the rebate amount. (4) Agreed-upon measures are installed. 	<ol style="list-style-type: none"> (1) Site visit is conducted and direct install measures are installed. (2) Customer receives list of additional measures eligible for incentive. (3) Additional measures are installed. (4) Incentive is paid.
Special Features	<p>Turnkey approach minimizes burden on the customer; program provides comprehensive services from assessment of opportunities, through installation and financing.</p>	<p>Program negotiates pricing with local retailers, distributors, and equipment manufacturers to lower program costs and ensure adequate supply of qualified equipment.</p>	<p>Combination of direct install, prescriptive, and custom measures lets customer choose desired level of participation. Program minimizes lost opportunities by using same design/approach as a similar natural gas conservation program.</p>

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Program Feature	Northeast Utilities Small Business Energy Advantage	PG&E RightLight Program	We Energies Commercial Electrical Business Assistance Program
Incentive Structure	Incentives paid to contractor. Direct install lighting measures receive 50% rebate and non-lighting measures receive up to 100% rebate. Customer's share of install costs may be eligible for 0-percent on-bill financing (24 months), so customer pays nothing up front.	No cost for Quick Saver Package; substantial funding for comprehensive lighting retrofit depending on customer's rate schedule (average 80-85% of cost, but may be as much as 100%).	No cost for direct install measures; prescriptive/customer incentives are designed to cover a significant portion of the incremental measure cost.
METRICS			
kWh/participant	30,260	11,990	NA
kW/participant	7	2	NA
Cost/kWh	\$0.20	NA	NA
Cost/kW	\$900	NA	\$1,143
Cost/participant	\$5,950	NA	NA
Total Energy Savings (kWh)	18,307,000	29,832,161	NA
Total Demand Reduction (kW)	4,000	5,633	700
Total Participants	605	2,488	NA
Total Cost	\$3,600,000	NA	\$800,000
Incentive Cost	NA	\$2,510,797	\$610,000
Admin Cost	\$500,000	NA	\$190,000

Best Practice Notes

- Design program to offer comprehensive, turnkey services to facilitate participation.
- Offer simple and immediate participation mechanisms such as cost-free direct installation of straightforward energy-efficient technologies such as CFLs, LED exit signs, programmable thermostats, and occupancy sensors.
- Complement other energy efficiency program offerings by informing customers about opportunities to participate in prescriptive or custom incentive programs.
- Offer additional incentives to overcome barriers to implementing efficiency upgrades aside from direct install measures, such as incentive adders or no-interest financing mechanisms.
- Develop and maintain strong relationships with trade allies such as equipment vendors and installation contractors.
- Include educational elements and technical assistance to promote better energy management practices.
- Develop simple, straightforward marketing materials that reinforce program messages (benefits to customers, what is offered, how to participate, etc.)
- Achieve participation in the targeted market through high-touch marketing strategies such as door-to-door canvassing and promotional efforts through affinity groups (small business associations, etc.).

5.11. Targeted Market Programs

5.11.1. Program Description

Targeted market programs, as the phrase suggests, are intended to reach into specific commercial/industrial market segments. Targeted market programs are most successful where there is substantial energy savings potential from technologies that are particularly pervasive in a given market segment—for instance, refrigeration equipment in grocery and convenience stores, or commercial food service equipment in restaurants and fast food establishments. Certain sectors may also have unique barriers to participation in energy efficiency programs (lack of organizational resources, limited attention paid to energy management issues, etc.). Such barriers may best be addressed with a targeted market approach that focuses resources on key technologies that offer the greatest energy-savings opportunities, and devotes programmatic resources to developing relationships both with customers and with key trade allies serving the sector. In fact, a number of utilities and program administrators (e.g. PG&E, the Wisconsin Focus on Energy Program, and the Northwest Energy Efficiency Alliance) have reoriented their C&I programs to target specific markets, believing that successful programs must align with the business models characterizing these individual segments.

5.11.2. Comparable Programs

Given E.ON's interest in targeted commercial programs promoting energy efficiency in grocery and convenience stores, we have reviewed the EnergySmart Grocer Program offered by the California IOUs, and the BetterBricks Grocery Initiative offered by the Northwest Energy Efficiency Alliance. As the EnergySmart Grocer Program is a direct installation and prescriptive incentive program and the BetterBricks Grocery Initiative is a market transformation program, these two examples span the range of possible program designs for this particular target market.

5.11.3. Program Comparison

The following table compares the programs across key program features. Additional program details are provided in the summary of each program in Appendix A.

Table 18: Comparison of Commercial Targeted Market Programs

Program Feature	California IOUs EnergySmart Grocer Program	Northwest Energy Efficiency Alliance BetterBricks Grocery Initiative
Market Segment	Independently-owned food retailers.	Regional grocery wholesalers and larger independent retail chain operators (5-35 stores).
Measures	<ul style="list-style-type: none"> • Direct install: CFLs, Cooler/Mixer beverage vendor controller, anti-sweat-heater (ASH) control. • Low-cost: strip curtains, gaskets for case doors, auto closers, evaporator fan control. • Retrofits: floating head/suction pressure refrigeration controls, high efficiency lighting. 	<p>Program develops a number of informational tools to promote better energy management practices in target market (most are still in development):</p> <ul style="list-style-type: none"> (1) Benchmarking tool (2) Best practices manual (3) Life-cycle costing (4) Maintenance service package to be offered by trade allies (5) New construction guide (6) Energy action plan template (7) Education and training materials/services (8) Marketing materials.
Services Offered	Energy audits, direct installation, retrofits of energy-efficient refrigeration, lighting, and HVAC measures.	Technical advisory services; marketing services; education & training services.
Customer Acquisition	Unknown	Meetings are held with corporate contacts at regional grocery chains & wholesalers, focusing on contacts that make financial/operations decisions, and facility management contacts.
Delivery Method	<p>Third party contractor (PECI) implements the program, conducts energy audits, makes recommendations, and provides technical and project management assistance. Network of participating contractors identify and implement low-cost energy saving measures w/out conducting a full energy audit, and also implement more extensive retrofits identified by PECI.</p>	<p>Program manager and market specialist provide direct support to store staff. Also train key trade allies (like refrigeration contractors) to promote better energy management for their customers.</p>

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<p>Program Feature</p>	<p>California IOUs EnergySmart Grocer Program</p>	<p>Northwest Energy Efficiency Alliance BetterBricks Grocery Initiative</p>
<p>Technology/Tools</p>	<p>GrocerSmart audit tool is a tablet-based software program developed by PECL. Allows auditors to deliver a thorough assessment of energy saving opportunities that span lighting, refrigeration and HVAC within three hours. Analyzes loads, case types, compressor and condenser configurations, auxiliary loads and climate conditions. GrocerSmart also tracks detailed retailer audit information, interest in opportunities, bids, and the technical review of bids.</p>	<p>Program has developed an energy benchmarking spreadsheet tool using data from 100+ local stores. Eventually this will be developed into a web-based tool.</p>
<p>Delivery Process</p>	<p>(1) Target customers identified by utility and contractor trade allies (2) Audit is scheduled (3) Audit is conducted and direct install measures are implemented (4) Audit results are given to customer, along with contractor referrals (5) Customer chooses contractor and retrofits are completed (6) PECL verifies installation (7) Rebate check is generated. Note: audit steps are skipped in instances where contractor implements low-cost and direct install measures w/out PECL audit.</p>	<p>(1) Initial meetings with retailer/wholesaler contacts (2) Assessment of candidate organizations to identify opportunities (3) Account plan for implementing energy management changes is developed (4) Tools and materials are developed to assist the targeted chains in implementing the account plan.</p>
<p>Special Features</p>	<p>Combination of no cost direct-install measures and prescriptive rebates for low-cost and more comprehensive retrofits.</p>	<p>Program services/support provided at no cost to the customer.</p>
<p>Incentive Structure</p>	<p>Combination of no cost direct-install measures and prescriptive rebates for low-cost and more comprehensive retrofits.</p>	<p>Program services/support provided at no cost to the customer.</p>

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Program Feature	California IOUs EnergySmart Grocer Program	Northwest Energy Efficiency Alliance BetterBricks Grocery Initiative
kWh/participant	40,410	NA
kW/participant	9	NA
Cost/kWh	\$0.13	NA
Cost/kW	\$911	NA
Cost/participant	\$5,751	NA
Total Energy Savings (kWh)	54,836,000	NA
Total Demand Reduction (kW)	12,736	NA
Total Participants	1,357	NA
Total Cost	\$7,476,534	NA
Incentive Cost	NA	NA
Admin Cost	NA	NA
METRICS		

Best Practice Notes

- As grocery stores tend to be action-oriented and have limited staff time and financial resources, resource acquisition programs offer a more straightforward and cost-effective means of promoting energy efficiency than market transformation approaches.
- Design program to offer comprehensive, turnkey services to facilitate participation.
- Offer simple and immediate participation mechanisms such as cost-free direct installation of straightforward energy-efficient technologies such as refrigeration controls, strip curtains, case door gaskets, LED exit signs, CFLs, programmable thermostats, and occupancy sensors.
- Complement other energy efficiency program offerings by informing customers about opportunities to participate in prescriptive incentive programs.
- Include educational elements and technical assistance to promote better energy management practices.
- Develop simple, straightforward marketing materials that reinforce program messages (benefits to customers, what is offered, how to participate, etc.)
- Develop and maintain strong relationships with trade allies such as equipment vendors and installation contractors.
- Use trade allies primarily for efforts targeting the larger stores which are more cost-effective for them to serve. As trade allies are unlikely to spend much time on small stores, serving these establishments directly will increase the likelihood of educational and energy-saving impacts.
- Achieve participation in hard-to-reach segments of the targeted market through high-touch marketing strategies such as door-to-door canvassing.

5.11.4. Other Considerations

Given the greater complexities associated with targeted market programs, we do not recommend that E.ON pursue such programs as part of its near-term portfolio strategy.

5.12. Targeted Process Programs

5.12.1. Program Description

A balanced energy efficiency portfolio may also require specialized programs designed to target process changes and O&M improvements. There is growing consensus that the most effective programs are those that view efficiency investment in terms of comprehensive building systems. Energy efficiency program administrators are looking to move beyond prescriptive rebate strategies and towards more comprehensive building energy efficiency improvements as a way to capture greater energy savings. Thus, rather than focusing on individual efficiency measures, process-oriented programs adopt a “whole building” approach, allowing customers to custom-design incentives to meet their unique process needs. The best-designed programs involve educational components that inform customers about how to improve energy management and promote better practices for ongoing O&M.

Our discussion focuses on two process-oriented program types: (1) whole building energy benchmarking programs and (2) retrocommissioning (RCx) programs. These process-oriented programs go beyond the basic energy audit and take a holistic approach to looking at building energy use. Though benchmarking itself does not produce energy savings, utilities typically offer benchmarking services to enhance customer relationships and better target energy efficiency program activities. RCx programs are a process-oriented approach to taking basic benchmarking/retrofit programs to the next level, offering a more extensive examination of building systems. Benchmarking and RCx programs are complementary, with ENERGY STAR benchmarking used as the first stage in RCx programs offered by NYSERDA, Northeast Utilities, Xcel Energy, and all three California IOUs.

5.12.2. Program Analysis

Comparable Programs

Our review of process-oriented energy efficiency programs included an assessment of the ENERGY STAR benchmarking program that NSTAR has run since 2003, and RCx programs offered by Portland General Electric (PGE) and SDG&E. The NSTAR program is a successful model that leverages the ENERGY STAR brand through use of the EPA’s Portfolio Manager benchmarking tool, and incorporates a more in-depth assessment of facility energy use than traditional audit programs, as well as providing strategic energy management education to participating customers. The program is an entry point for varying levels of energy efficiency upgrades and process-oriented changes. The PGE RCx program was one of the first such programs in the country, and the SDG&E program was implemented by PECl, the market leader in RCx program implementation.

Program Comparison

The following table compares the programs across key program features. Additional program details are provided in the summary of each program in Appendix A.

Table 19: Comparison of Targeted Process Commercial Programs

Program Feature	NSTAR ENERGY STAR Benchmarking Program	Portland General Electric Existing Building Commissioning Program	SDG&E Retrocommissioning Program
Market Segment	Commercial and institutional.	Commercial and industrial.	Commercial.
Measures	<ul style="list-style-type: none"> • Low/no cost: power management of personal computers, changes to HVAC or DHW temperature setpoints, adjustments to energy management controls, installation of programmable thermostats, vending machine controls, and energy education programs. • Retrofits: lighting, occupancy sensors, daylighting controls, exhaust fan controls, insulation, metering equipment, sector-specific measures for grocery stores and hotels. • Items requiring additional study: HVAC equipment replacement, installation of an energy management system, or re-commissioning 	<p>Low cost electricity-saving measures; additional opportunities for capital improvements are also identified.</p>	<p>Equipment operating schedules, demand-controlled ventilation, sequencing of chiller loads, sensor & thermostat calibration, temperature resets for chilled & hot water, VFD retrofits for fans/pumps, actuator/damper operation, simultaneous heating/cooling, supply air temperature reset</p>
Services Offered	<p>(1) Individual training on the use of Portfolio Manager and assistance in benchmarking their facility</p> <p>(2) Energy Efficiency Opportunity Assessment (EEOA) walkthrough and report identifying energy efficiency improvement opportunities and available NSTAR incentives</p> <p>(3) Ongoing technical and educational support and incentives through other NSTAR programs.</p>	<p>RCX investigation of energy savings opportunities.</p>	<p>RCX investigation of energy savings opportunities; assistance with implementation of RCX recommendations.</p>

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<p>Program Feature</p>	<p>NSTAR ENERGY STAR Benchmarking Program</p>	<p>Portland General Electric Existing Building Commissioning Program</p>	<p>SD&E Retrocommissioning Program</p>
<p>Customer Acquisition</p>	<p>Strategic Accounts (with annual T&D revenue over \$165,000) were targeted, particularly facilities with low participation in other NSTAR programs.</p>	<p>Unknown</p>	<p>Most successful approach was networking through Chamber of Commerce and San Diego Regional Energy Office. Direct mail and advertising were less successful.</p>
<p>Delivery Method</p>	<p>Implementation contractor provides program marketing, outreach, and implementation services.</p>	<p>Customers contract with qualified RCx providers that conduct services.</p>	<p>Program was implemented by a third party contractor, Portland Energy Conservation Inc. (PECI) that issued an RFP and contracted directly with commissioning providers (5 providers were actively involved in the program). Participants noted that it would have been preferable to use locally-based RCx providers.</p>
<p>Technology/Tools</p>	<p>EPA's Web-based Portfolio Manager benchmarking tool.</p>	<p>Daily 15-minute load interval data is useful in terms of identifying patterns of excess energy use, and for savings verification.</p>	<p>Program Toolkit workbook for RCx providers included a detailed program overview along with chapters to guide the providers through each step of the program process.</p>

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Program Feature	NSTAR ENERGY STAR Benchmarking Program	Portland General Electric Existing Building Commissioning Program	SDG&E Retrocommissioning Program
<p>Delivery Process</p> <p>(1) Customer signs MOU; (2) 2-4 hour benchmarking training conducted at customer facility which included entering facility data into Portfolio Manager and explanation of scores (3) 2-4 hour Energy Efficiency Opportunity Assessment walk-through is conducted (4) EEOA results are provided.</p>	<p>(1) PSE conducts pre-screening to determine customer eligibility (2) Qualified RCX provider gathers building data and develops SOW (3) Building owner enters into contract with RCX provider (4) RCX assessment is conducted (5) Customer implements recommendations with payback of <2 years (6) PSE reimburses customer for cost of commissioning fee.</p>	<p>(1) Customer submits screening application with basic data on building characteristics and energy use (2) RCX provider conducts initial walkthrough and determines whether there is an adequate energy savings potential (3) RCX provider develops cost estimate and SOW, and building owner signs MOU (4) RCX provider performs detailed survey of building systems, performs baseline monitoring, identifies energy saving improvements, estimates savings, and issues Findings Report (5) Customer implements the identified improvements (6) Performance tracking system is put in place for M&V purposes and to ensure savings persistence (7) Incentive is paid.</p>	<p>Special Features</p> <p>Leverages ENERGY STAR brand through use of Portfolio Manager tool.</p>

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Program Feature	NSTAR ENERGY STAR Benchmarking Program	Portland General Electric Existing Building Commissioning Program	SDG&E Retrocommissioning Program
Incentive Structure	<p>Program provides the following services at no cost to the customer:</p> <p>(1) Benchmarking training and support</p> <p>(2) Facility walkthrough and Energy Efficiency Opportunity Assessment (EEOA)</p> <p>(3) Ongoing assistance with implementing the recommendations and continued benchmarking efforts</p> <p>(4) Measure incentives through other NSTAR programs.</p>	<p>PSE covers cost of initial RCx provider assessment that is required for development of SOW (2-3 days of work and includes interviews with building staff). Customer agrees up front to implement all measures reimbursed for the cost of the RCx services upon completion of these installations.</p>	<p>Original incentives were based on measure savings; pathway through program additional incentives for the process of implementing RCx recommendations were added. Up-front customer payment was required for investigation; evaluation recommended changing this requirement to increase participation.</p>
METRICS			
kWh/participant	NA	242,488	2,472,209
kWh/participant	NA	28	366
Cost/kWh	\$0.03-\$0.04/kWh	\$0.04	Unknown
Cost/kW	NA	\$388	Unknown
Cost/participant	NA	\$10,741	Unknown
Total Energy Savings (kWh)	NA	6,547,170	9,888,836
Total Demand Reduction (kW)	NA	747	1,465
Total Participants	NA	27	4
Total Cost	NA	\$290,000	Unknown
Incentive Cost	NA	Unknown	Unknown
Admin Cost	NA	Unknown	Unknown

Best Practice Notes

- Develop effective pre-screening protocol to effectively target program outreach efforts, ensuring that customer site can be accommodated by benchmarking tool, and that the program targets customers who are most likely to implement energy-saving recommendations.
- Engage customer representatives from multiple levels of the organization, from management decision-makers to facility and engineering staff.
- Obtain firm customer commitments early in the participation process (for example, through use of an MOU) so that investment of program resources is more likely to result in concrete energy-saving actions.
- Provide adequate technical assistance and support to guide customers through the program process, including providing training and assistance with facility information-gathering to support benchmarking.
- Provide incentives/cost buy-downs both for the investigation phase and for the implementation phase of targeted process programs.
- Ensure savings persistence by providing customer education, technical assistance, and incentives to promote ongoing energy use benchmarking and best energy management practices.
- Market the program through building owner and management associations, chambers of commerce, and other business groups.
- Develop simple, straightforward marketing materials that reinforce program messages (benefits to customers, what is offered, how to participate, etc.)

5.12.3. Other Considerations

Although we do not recommend that E.ON pursue a broad targeted market strategy at this time, we do believe that several best practice elements are worth active consideration:

- Incorporate ENERGY STAR benchmarking into commercial program offerings. The benchmarking process has become increasingly popular in certain sectors (hospitality, health care and commercial leased space, for example), particularly among owners/managers of portfolios of properties.
- Consider adding retro-commissioning services as a follow-on to benchmarking. We consider this an element of a longer-term portfolio strategy rather than one to be implemented immediately.

5.13. Education Programs

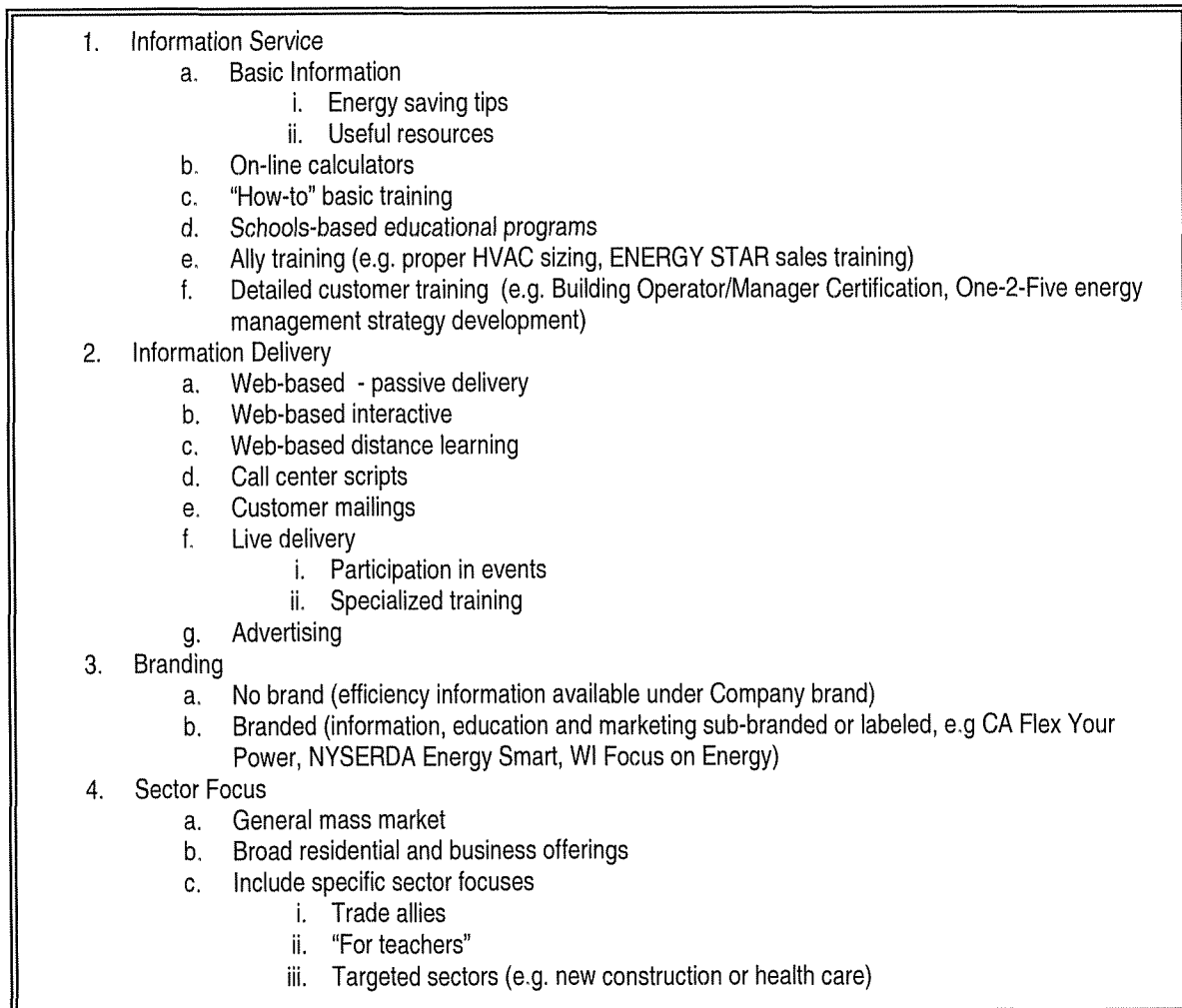
5.13.1. Program Typology

Perhaps no other type of program offers such a wide variation in form and function as education programs. Such programs range from what are basically information programs, passively distributed via web sites and call centers, to integrated information, training and education programs with links into major incentive and service offerings. In general, education programs vary along four basic dimensions:

1. The nature of the information service
2. Information delivery
3. Branding
4. Sector focus.

Figure 4 illustrates these distinctions.

Figure 4: Information Program Typology



5.13.2. Description of E.ON's Program

The Company currently does not offer an education program per se, but includes energy saving information on its website consistent with general practice. The website includes a variety of energy savings tips for residential customers during both summer and winter periods. The format and content of the website are similar to that of other utilities, many of whose education programs have been recognized as best practice. The website also includes a link to current and previous editions of the Company's newsletter, Power Source. The newsletter offers additional tips for energy saving measures.

The website includes interactive tools, developed and maintained by Apogee, including a Home Energy Calculator, and Energy Information Library. A separate version of the calculator and library are also available for commercial customers. The website also includes a Kids Connection link, maintained by Electric Universe. This link provides materials for educators, and is fairly standard among utility websites.

5.13.3. Comparable Programs

Utilities have designed and offer multiple education programs within a portfolio, often targeted to specific sub-sectors. Nevada Power's Energy Education program offerings are applicable in various residential and commercial sub-sectors, and makes use of existing organizations for collaboration. For example, the Small Commercial Customer Education program partners with two local organizations to offer classes and certification to building operators who are interested in reducing energy, operations and maintenance costs. This program represents one of the more comprehensive approaches to information and education programs, and is particularly notable in that it serves as a broad foundation for the rest of the Company's portfolio. The information and education program both serves as a portal to the Company's service and incentive offerings; it also provides a range of technical services for various market segments.

One increasingly popular educational offering is the Building Operator Certification (BOC) program developed by the Northwest Energy Efficiency Alliance (NEEA), and now offered in 20 states through regional alliances such as NEEA and sponsoring utilities. The BOC program offers two levels of certification, Basic and Advanced, and also offers continuing education. Past participants report high levels of customer satisfaction with the BOC program, and RLW Analytics completed an evaluation of the Northeast Energy Efficiency Partnership's (NEEP) BOC program attesting to energy savings, and the effectiveness of the program.

Southern California Edison's (SCE) Integrated School-Based Program is targeted towards the education sub-sector and seeks to achieve savings through activity kits that contain CFLs and low-flow showerheads. SCE's program also makes use of existing educational resources, developed by the Alliance to Save Energy (ASE), which have been tested and implemented successfully in other jurisdictions. The program leverages the existing Living Wise, Green Schools, and Green Campus programs and attempts to reach elementary and middle school students, educators, and staff, and high school and college students to learn about energy efficiency and conduct trainings and energy audits.

Other programs that have been recognized as best practice include California's Flex Your Power and the Energy Center of Wisconsin's (ECW) education trainings. Flex Your Power relies on social marketing or standard marketing principles targeted to specific audiences to produce socially beneficial outcomes such as energy savings. The ECW offers education and training to a variety of customers and sub-sectors, as well as for measures such as daylighting and

industrial processes. In addition, Commonwealth Edison recently announced plans to spend \$30 million over the next three years to expand its energy education and low-income programs. ComEd proposes to spend more than \$5 million on a variety of stakeholder-recommended measures, and \$2 million on free and discounted CFLs.

5.13.4. Program Comparison

The following table compares the programs across key program features.

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Table 20. Comparison of Education Programs

Program Feature	E.ON	Nevada Power Energy Education	Building Operation Certification Program	SCE Integrated School-Based Program
Market Segment	Residential Commercial	Residential, Small Commercial, New Construction	Commercial	Schools and colleges
Measures	Education	Education	Professional education	CFLs, low-flow showerheads, audits, education
Delivery	Website	Trainings, classes, certification	Classes and coursework	School activities, trainings
Services Offered	Energy saving tips, home and business energy calculators, resources for kids	Participation at home and trade shows, trainings for builders and real estate professionals and professional certification classes	Classes and coursework for building operators, certification and continuing education	Installation of CFLs and low-flow showerheads, trainings to primary school staff, energy audit trainings to college and high school students
Customer Acquisition	None	Trade show participation, sponsorship and partnership with other organizations	Marketing through regional energy efficiency alliances and utilities	SCE and subcontractors will perform all marketing activities
Delivery Method	Website	Education through direct interaction with customers, use of ENERGY STAR brand, classes to improve building operations and maintenance	Level I—basic courses, and Level II—advanced course in building and end-use operations and maintenance	Living Wise program for elementary and middle schools, Green Schools program for high schools, and Green Campus program for colleges
Technology/Tools			On-the-job application projects	
Delivery Process	Customers learn more about energy efficiency through the website or utility newsletter	Customers receive “Energy Conservation” bags at home and trade shows. ENERGY STAR brand promotion and trainings for the real estate industry, partnership with two local organizations to provide classes for building operators	Participants sign up for classes through a regional energy efficiency alliance or other provider, complete basic or advanced level, also receive continuing education	SCE and subcontractors solicit and recruit participation of school administrators up to 40,000 students for Living Wise, 50 schools for Green Schools, and 3 colleges for Green Campus

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Program Feature	E.ON	Nevada Power Energy Education	Building Operation Certification Program	SCE Integrated School-Based Program
Program Features		Portfolio approach to education with target sub-sectors	Const-sharing between the sponsoring utility and the student; program includes electricity, gas, and waters savings	Targeted sub-sectors with energy savings
Incentive Structure	None	None	Utilities provide partial or full payment of course tuition	None
METRICS				
Annual Budget	NA	\$400,000	Northeast—about \$800,000	\$5,000,000
kWh/participant	NA	NA	Northeast—0.35 kWh/sq.ft.	NA
kWh/participant	NA	NA	NA	NA
Cost/kWh	NA	NA	Northwest—1.4 cents/kWh	\$1.62
Cost/kW	NA	NA	NA	\$50.51
Cost/participant	NA	NA	NA	NA
Participation	NA	NA	Northwest—10% penetration	NA

Best Practice Notes

- Education programs are often coordinated with other organizations, such as national advocacy groups, and local business associations
- Education programs should use social marketing techniques to have a greater impact and reach larger audiences
- An effective information and education program will be designed to serve as the broad foundation for other portfolio elements, and will itself contain elements or sub-programs that provide what is sometimes called “market conditioning” support for financial incentive programs. For example, Building Operator Certification Training provides a foundation for benchmarking and retrocommissioning programs, web-based consumer education programs support lighting and appliance initiatives, and so forth.

5.13.5. Additional links

- California—Flex Your Power
<http://www.fypower.org/index.html>
- Energy Center of Wisconsin
<http://www.ecw.org/whatwedodetail.php?infopackageid=33>
- Nevada Power
<http://www.nevadapower.com/>
- Building Operator Certification program
<http://www.theboc.info/index.html>
<http://www.neep.org/boc/index.html>
- Southern California Edison—Integrated School-Based Program
<http://www.sce.com/NR/rdonlyres/D101598E-43CF-4C2B-B0C7-B867960AA029/0/SCE2504INTERGRATEDSCHOOLBASEDPROGRAM.pdf>

5.14. Research and Development Programs

5.14.1. Program Typology

Energy efficiency programs depend on technologies that will achieve energy savings at a reasonable cost for all market participants. This includes manufacturers and technology developers, who must continue to offer new technologies and products to retailers and customers. These technologies can include:

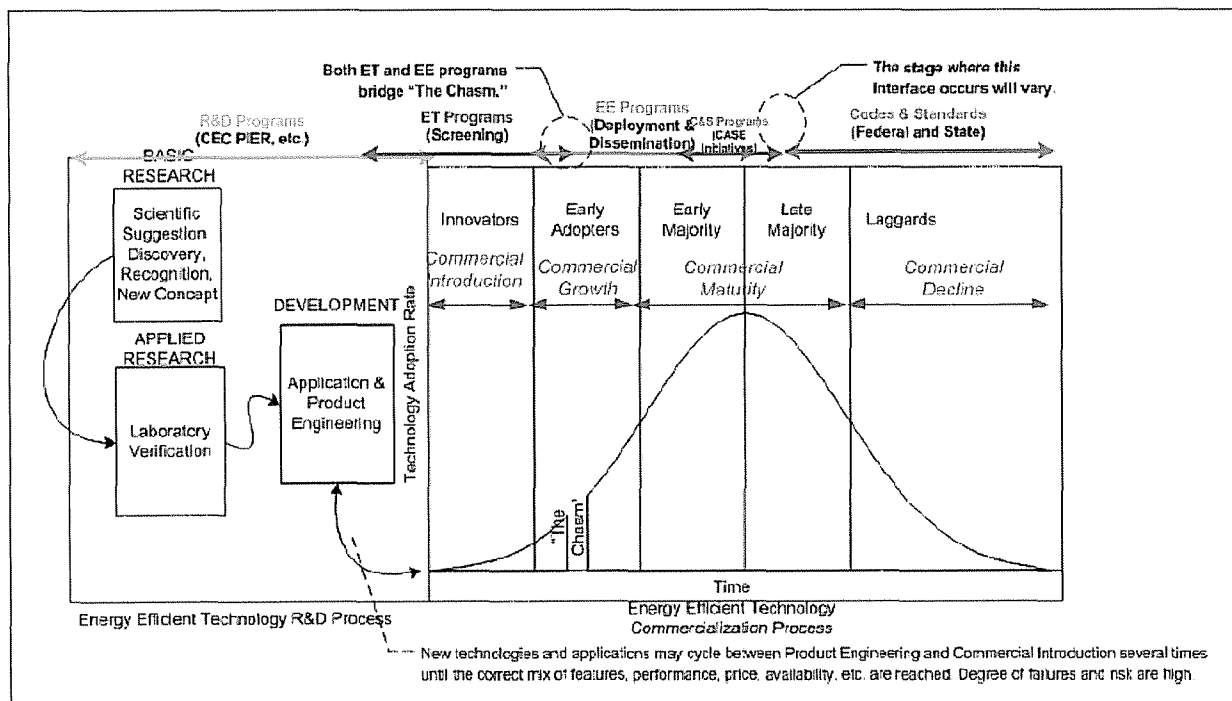
- Hardware
- Software
- Design tools
- Strategies
- Services.

A utility research and development program can help facilitate technology development through co-funding and knowledge-sharing. Recent examples of this include:

- A Commercial Kitchen Ventilation system
- HVAC Duct Sealing

These were commercialized with the help of California's ratepayer-funded research organization. Figure 5 illustrates the commercialization process for emerging technologies, which are a part of research and development programs, and will eventually become a part of utility programs.

Figure 5: Emerging Technology Commercialization Process



5.14.2. Description of E.ON's Program

Research and development programs are similar to education programs in that, typically, neither result in direct energy savings, but are vital to the long-run success of a portfolio with substantial savings goals. The Company currently does not offer an R&D program. If the Company were to offer an R&D program, it would want to use the following criteria to determine whether to include a program in its portfolio:

- The ability of the technology to fill a gap in the portfolio and/or the market
- Benefits to utility, customers, third-parties, and other market actors
- Energy and demand savings potential
- Market penetration potential
- Commercialization potential of the product or idea

5.14.3. Comparable Programs

Utilities often include R&D programs within a portfolio, as a way to shorten the commercialization process for a product or idea. In addition, a utility can make enhancements to an existing or past R&D program to turn it into a viable pilot or savings program. Nevada Power's two R&D programs - Market and Technology Trials, and Zero Energy Homes are applicable across all sectors, and include some targeting towards sub-sectors. In addition, Nevada Power makes use of existing companies and research institutions for collaboration. For example, a few of the housing-related projects within the Market and Technology Trials included collaboration with a housing developer, and energy efficiency researchers at the University of Nevada at Las Vegas (UNLV). The programs, and projects within, also make use of the knowledge and experience gained from other programs. For example, the Zero Energy Homes program could be thought of as both an R&D program and a future version of Nevada Power's ENERGY STAR Homes program. Nevada Power's approach is to provide some share of funding, ranging from \$3,000 to \$50,000, to about 10 projects, and evaluate results annually or over a three-year period.

As an energy efficiency leader, California has a variety of R&D programs. The California Energy Commission (CEC) administers the Public Interest Energy Research (PIER) program, which receives at least \$62 million annually through the IOUs' public goods charge. In addition, the IOUs individually or jointly run R&D programs. The IOUs' 2006-2008 portfolios include an \$11 million Emerging Technologies program that advances upon the work that PIER has done. Technologies are first evaluated for inclusion in assessment studies and demonstration projects. The Emerging Technologies Coordinating Committee (ETCC) then meets quarterly to evaluate these technologies and discuss study and project results. The ETCC also receives public input from various government agencies, industry and trade associations, manufacturers, and researchers, among others. The eventual goal is to add the technologies that achieve the greatest energy and demand savings to the IOUs' future portfolios.

The New York State Energy Research and Development Authority (NYSERDA) is the non-utility administrator of the state's energy efficiency programs and is also a research and development organization. NYSERDA's R&D Program's budget for the year ending March 31, 2006 was about \$18.5 million, and provided funding for buildings and industrial-related projects. The program receives proposals via a competitive solicitation, and can include funding for the following types of projects:

- Feasibility studies—such as conceptual design, technology, and market assessments

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- Product development—such as development of systems or materials that improve existing performance
- Technology transfer studies
- Demonstration and commercialization projects.

The amount of funding is usually capped at a set dollar amount or percentage depending on the type of project. Following acceptance and completion of a project, NYSERDA will perform project EM&V, and disseminate project results and final reports. The program has led to the commercialization and improvement of such disparate products as efficient furnaces, LED lighting, Combined Heat and Power (CHP) systems, and power sources used in Apple iPods.

5.14.4. Program Comparison

The following table compares the programs across key program features.

Table 21: Comparison of R&D Programs

Program Feature	Nevada Power Market and Technology Trials	CA Statewide Emerging Technologies Program	NYSERDA R&D Program
Market Segment	Various	Cross-cutting	Cross-cutting
Measures	Includes whole building, HVAC	Includes lighting, HVAC, and refrigeration, industrial processes	Includes whole building, industrial processes, and systems; also includes supply side, transportation
Services Offered	Co-funding; evaluation, measurement, and verification (EM&V)	Review and assessment of emerging technologies, technology demonstration projects	Co-funding and evaluation of feasibility studies and demonstration projects across sectors of technology types
Customer Acquisition	None	None	None
Delivery Method	R&D projects are chosen through an RFP process, consisting of a Project Screening Document	Customer "pull"—promotion of technology through account reps; or technology "push"—promotion of new technology through a targeted demonstration site	Proposals received through a Program Opportunity Notice (PON) usually issued every 2-3 years
Technology/Tools			
Delivery Process	Nevada Power: (1) Chooses among proposals and funding amount per project (2) Tracks progress annually and measures savings (3) Decides whether to re-fund	Technology committee: (1) Reviews various technologies according to utility, government, industry recommendation (2) Decides on demo projects (3) Promotes promising technologies for inclusion in utility programs	Proposals received for: (1) Feasibility studies (2) Demonstration projects (3) Other projects Projects receive funding for 2-3 years, after which NYSERDA conducts EM&V and displays results and possible replication
Special Features		Long-running statewide program with stable funding, also allows individual utility actions	Funding available for a variety of projects across all sectors, along with case studies
Incentive Structure	None	None	

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Program Feature	Nevada Power Market and Technology Trials	CA Statewide Emerging Technologies Program	NYSERDA R&D Program
METRICS			
Budget	\$400,000	\$11,000,000	\$18,527,062
Participation	10-13 projects per year	SCE will conduct 45 technology assessments over three years	

Best Practice Notes

- Emerging technology programs should include research and industry input, and conduct cost-sharing demonstration projects
- Utilities should focus R&D programs on technologies that achieve cost-effective savings and fit within a broad portfolio of programs
- A key element to an R&D or emerging technology program is a clear strategy for mainstreaming successful technologies into the utility's portfolio.

5.14.5. Additional links

- California Energy Commission—Public Interest Energy Research Program (PIER)
<http://www.energy.ca.gov/pier/index.html>
- Nevada Power
<http://www.nevadapower.com/>
- California Statewide Emerging Technologies Program
<http://www.sce.com/NR/rdonlyres/426CE953-D871-4FC3-8FF3-FFCC5CAA5046/0/SCE2515EMERGINGTECHNOLOGIES.pdf>
- NYSERDA R&D Program
http://www.nyserda.org/programs/Research_Development/default.asp?i=28

**Evaluation of Energy Efficiency at E.ON U.S.
Proposed Programs and Program Gaps**

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6. Conclusions

Our review of the existing E.ON DSM portfolio, as well as a number of programs under consideration by E.ON leads us to the following conclusions:

- E.ON's current portfolio of programs is well-managed and achieves high customer satisfaction. However, it is difficult to assess the cost-effectiveness of the current programs.
- E.ON's current programs are perhaps "over-weighted" towards the residential sector. Over 80 percent of current funding goes to these programs. This weighting is almost the opposite of what we would expect to see *if* the portfolio was designed to acquire cost-effective energy efficiency resources. However, it may well reflect the nature of the collaborative process in Kentucky and a relative lack of interest in DSM programs on the part of commercial customers.
- E.ON's current portfolio would appear, at first, to be "over-weighted" towards demand response and load management. However, this weighting may be appropriate in light of the Company's historical rates and avoided costs.
- The Company is running an effective and popular weatherization program that is competitive with other utilities' weatherization programs.
- The Company's two audit programs are based on approaches that are labor-intensive—a fact that will likely hurt cost-effectiveness. Most utilities have moved away from on-site audits, at least for the residential sector. On the commercial side most of the audit recommendations and follow-up actions involve lighting. Typically, on-site audits are not required, and few utilities subsidize them, for the purpose of flagging lighting upgrade opportunities in larger commercial buildings. Lighting contractors typically will provide such services. Smaller commercial customers often will not have the resources (time or money) to follow-up on audit recommendations and often direct install programs are more effective with this sector. Specifically:
 - For the residential program:
 - Upgrade the audit tool/technology utilized by contractor, consistent with the Summit Blue recommendation.
 - Consider incorporation of a "whole-house" approach. Home performance programs look at a building throughout the lifecycle and strive to encourage cost-effective home improvements. Programs begin with a home performance evaluation, similar to an energy audit. Potential program measure and service add-ons could include blower-door tests/air-sealing packages, HVAC diagnostic/tune-ups, programmable thermostats, and additional lighting measures, including occupancy sensors.
 - For the commercial program:
 - Consistent with the Summit Blue recommendation, update and improve the audit tool/technology used by contractor—update audit forms to ensure comprehensive and systematic audit. Consider replacing Excel-based audit with a web-based system.
 - Consider adding energy benchmarking (EPA ENERGY STAR Portfolio Manager http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager) or energy modeling programs to portfolio of programs for commercial customers in addition to or in place of commercial audits.
 - Consider a two-tiered system, providing simpler audit services for small commercial clients, and more comprehensive benchmarking services for large commercial clients.

Conclusions

- Risk is not a major concern for the portfolio despite over-weighting given that E.ON does not have savings targets. However, if such targets were chosen, we believe the portfolio carries substantial performance, technology and evaluation risk as it currently stands.
- E.ON's residential load control suite, and particularly its advanced Responsive Pricing/Smart Metering pilot, represents a significant innovation and may provide an exciting platform for an integrated energy efficiency and demand response program. This program places E.ON squarely in the top tier of utilities exploring advanced demand response technologies.
- IF E.ON chooses to set energy and/or demand savings goals, certainly its current portfolio and most likely even the proposed portfolio will exhibit gaps. Recognizing that it is *inappropriate to simply port programs from one jurisdiction to another*, most top quartile utilities will have some or all of the following programs in their portfolios:
 - Residential HVAC diagnostics and tune-ups
 - Residential lighting and appliances rebates
 - ENERGY STAR New Homes
 - Prescriptive and/or commercial rebates
 - Broad-based education and information programs
 - Hard-to-reach customer programs, particularly direct install of measures in the low income, multi-family and small commercial sectors.
 - Commercial benchmarking and retro-commissioning.
- Top-tier utilities also frequently have developed targeted market programs to reach deeper within specific sub-sectors. However, these programs tend to require more management attention and are more expensive if only due to recruiting costs, than the more simply-structured Prescriptive and Custom incentive programs.

A substantial body of best practice exists on which E.ON could rely should it elect to pursue any of these programs as part of its portfolio. We do urge the Company to carefully consider its portfolio objectives prior to developing a longer-term strategy. What we see as portfolio gaps are a direct function of how we have chosen to view portfolio objectives; a different view will yield different perspective on gaps and appropriate strategies for filling those.

Appendix A:

Detailed Program Information Sheets

The following Appendix is a reference section of program sheets providing more detail on utility programs mentioned in the body of the report. This Appendix is ordered by program type described in the report. Where applicable, we include a program sheet from an existing or proposed E.ON program to allow for comparison to other utilities' programs. A complete list of programs reviewed at E.ON and at other utilities is included in Appendix B.

Residential Audit Programs

- E.ON Residential Conservation Program
- HomeSense Program, Golden Valley Electric Association
- NYSERDA Assisted Multi Family Building Audits
- California Youth Energy Services Residential Audit

E.ON—Residential Conservation Program

Program Overview

- Type—Audit.
- Sector— Single-family homes, condominiums, and apartments with individual HVAC and water heating.
- Goal—To provide single family residential customers an on-site home energy analysis by a qualified energy audit contractor. To complete 6,000 audits between 2001-2005.

Program Description

- Program delivery mechanism—E.ON hired Honeywell to complete the full energy audits inside and outside of the home. Customers apply, E.ON sends info to contractor, and contractor contacts the customer to arrange a time for the audit. The audit contractor checks the building, windows, doors, furnace, water heater, insulation, and other areas, as needed.
- Services included—Honeywell may install several energy saving devices on site at no charge—such as faucet aerators and low-flow showerheads and CFLs.
- After the audit, customer receives detailed report that provides list of energy-saving measures appropriate for the home and estimated costs to apply those measures. Often recommendations include: low-cost/no cost recommendations, envelope, appliance, HVAC, lighting, and domestic hot water measures.
- E.ON relies on self reporting in follow up surveys to calculate total estimated savings due to Honeywell and customer led installations.
- Target customer sector—KU and LG&E residential customers who own or occupy single family homes, apartments and condominiums with the ability to implement energy efficiency changes.
- Challenges—Call-back surveys did not collect entirely accurate picture of actions taken by customers post-audit. Financing service was not widely utilized by participants.

Program Performance

- Participation = 9,208
- Estimated kWh saved = 2,697,944 kWh
- Energy savings per audit = 218 kWh
- % of audits resulting in installations = Less than 5%

Program Financing

- Total Cost—\$2,049,707
- Cost per first year savings—\$760
- Incentive Cost—\$1,913,678
- Admin Cost—\$136,029
- Cost per participant = \$223
- TRC = 0.32
- Utility Cost Test = 0.32
- Energy audit costs \$15 to the customer
- Customers may opt to use third party financing to implement recommendations that have a higher capital cost.
 - Only 17 customers opted for this financing service. Poor participation prompted E.ON to terminate this option in 2004.

Program Actors

- Eligibility—KU and LG&E residential customers.

Program Marketing

- Promoted through brochures, direct mail, and the quarterly newsletter to customers.
- Mailed brochures will include a mail-back application for the home energy audit.

Sources

- DSM Filing 2000
 - Summit Blue Evaluation of WeCare Program
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NYSERDA Assisted Multi family Building Program Energy Audits

Program Overview

- Type—Audit Program
- Sector—Multi-family Housing Units
- Goal—The Assisted Multi-Family Building Program applies a whole building design approach to multi-family housing units that receive public assistance to recommend energy efficiency measures.

Program Description

- Uses specialized software to perform energy audits that produce a suite of recommended improvements, which serve as the basis for capital planning with building owners.
- Most of the improvements can be used to finance the capital work through specially designed lending instruments that utilize energy savings to finance debt.
- Uses a "gap funding" approach in which NYSERDA funds are given as a grant as a last resort.
- Program contractors first determine how much a property owner can afford to pay on his/her own, either through cash or a loan. Where there is a gap between the cost of work and the amount available from the property other local, state, federal and utility programs are tapped. When those sources are exhausted and if a gap remains, NYSERDA provides the difference.
- As a result of this financing approach, the program has leveraged \$3 for every \$1 invested by NYSERDA. Comparable programs realize a \$1: \$1 leverage ratio.

Program Performance

- Market Penetration (2000-2002) = 293 properties participated in the program with 1,436 buildings, representing 85,298 housing units
- Energy Savings (2000-2002) = 58.5 million kWh and 128,300 MMBtu annually
- Cost Savings (2002) = projected to save the average utility-paying tenant \$115 each year
- Energy Savings per property = 199,659 kWh
- Energy Savings per housing unit = 686 kWh
- Non-Energy Benefits: better lighting, improved ventilation, reduced indoor air pollution, and safer buildings.

Program Financing

- Total Cost—\$90,390,000
- NYSERDA assumed \$22,588,000 of total program costs.
- The New York State Weatherization Assistance Program covered \$3,121,000
- Other programs covered \$1,951,000
- Total costs of capital
- 2001- \$15,903,807
- 2002—\$74,542,658
- 2003—\$156,940,000

Program Actors

- NYSERDA, program contractors, the property, local, state, federal, and utility programs

Program Marketing

- No information listed

Sources

- National Economic Research Associates and ICF Consulting for Commonwealth Edison Company, Review and Assessment of Frameworks for Delivering Energy Efficiency Programs. (2005). P.74.

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HomeSense Program—Alaska Golden Valley Electric Association (GVEA)

Program Overview

- Type—Audit
- Sector—Low Income Residential
- Goals—To offer a broad-based and effective client education program focusing on energy efficiency and demand side management through electricity audit services.
- Funded entirely from GVEA members

Program Description

- Program delivery mechanism—On-site audit services by energy specialists
- Target customer sector—Low income Residential utility customers
- GVEA provides electricity audits to utility residential customers and also provides funds for installation of selected energy efficiency measures such as water heater insulating blankets and CFLs.
- Beyond installations, program also offers educational materials on-site.

Program Performance

- Participation (1992-2005)—3,840 households
- kWh saved; kW saved—28,000,000 kWh and reduced load by 1,500 kW
- Energy savings per participant served = 7291 kWh per household (28 million kWh / 3,840 households)
- Cost-effectiveness—Cost of conserved energy is 4.4 cents/kWh. Cost of HomeSense Program is \$810/kWh

Program Financing

- Program Annual Budget = \$55,000
- Program financers—GVEA members

Program Actors

- Eligible participants—Customers who qualify for the State of Alaska's Low-Income Weatherization Assistance Program receive HomeSense services at no cost
- Eligibility requirements—household incomes between \$22,275 for single person household—\$42, 837 for family of four or upward.

Program Marketing

- Through print, broadcast advertising and public presentations

Sources

- ACEEE, Meeting Essential Needs: The Results of a National Search for Exemplary Utility-Funded Low-Income Energy Efficiency Programs (2005). Available at: <http://aceee.org/pubs/u053.pdf?CFID=1902315&CFTOKEN=52600158>

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California Youth Energy Services (CYES) Residential Audit

Program Overview

- Program goals—To provide education and audit services to residential customers in Berkeley and Oakland, CA and low-cost hardware installation services for select electricity and gas energy efficiency measures.
- Program type—Residential Audit
- Program sector—Single Family, Lower and Moderate Incomes

Program Description

- Program delivery mechanism—Implemented by the non-profit Rising Sun Energy Center. Program originally anticipated partnering with Lawrence Berkeley Lab in developing the Home Energy Saver web site to provide households with customized energy usage analysis and energy-saving recommendations. www.homeenergysaver.lbl.gov However, program was actually conducted by hand in the field. Not stated why.
- Target customer sector—Low to Moderate Income Single families in Berkeley and Oakland California.
- Services provided to program participant—The program provides low-cost hardware installation services to targeted households as an incentive towards receiving education and audit services. Energy audits are used to identify opportunities for improvements in household energy efficiency. Audit process also provided opportunities to discuss leave behind informational materials on local, state-wide and PG&E information on rebates or services.
- Direct install services include hot water, heating, and lighting measures.
- Unique characteristics of the program—CYES trains and employs over 70 youth participants to educate residents and install energy and water conservation equipment.
- Participant homes that requested measures installed received materials free of charge. Materials were installed onsite by CYES auditors.
- CYES also provided three services at cost for residents such as programmable thermostats, retractable clotheslines, or pipe insulation.
- CYES began as a "partnership" program that PG&E undertook.

Program Performance

- Participation—1,034 audits performed
- 2,065 homes received information and educational materials;
- 2,127 participants received energy-efficient measure installations. received energy-efficient measure installations
- kWh saved—354,915
- kW saved—33.78
- Energy savings per participant served (kWh) –343
- Energy savings per participant served (kW) –0.03

Program Financing

- Not provided in report

Program Actors

- PG&E, California Youth Energy Services, Rising Sun Energy Center, participants

Program Marketing

- Not provided in report

Replicability/Applicability

- Depends on supporting and available infrastructure from sponsoring agencies.

Sources

- Evaluation, Measurement, and Verification of City of Berkeley—CA Youth Energy Services Program. Prepared by Summit Blue Consulting. (2006).
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Commercial Audit Programs

- E.ON Commercial Conservation Program
- Ameren Commercial End Use Audit Program
- Northeast Utilities Custom Services Program

E.ON—Commercial Conservation Program

Program Overview

- Type—Audit
- Sector—Commercial customers
- Goal—To engage commercial customers to perform an energy audit inspection to reveal ways they may conserve energy and reduce energy expenses. Encourage customers to install recommended measures.
- Goal—To complete 480 audits per year.

Program Description

- Program delivery mechanism—E.ON hired E-Max to market the program and to conduct the audits. E-Max on their own elected to offer follow up installations. Customer applies, E.ON shares info with contractor, contractor contacts customer to set up audit.
- Target customer sector—Utility Commercial class customers
- After audit, customer could choose to have E-max complete installations, make installations on own, or choose not to make any installations. E-max and Summit Blue and E.ON developed a set of survey instruments to gain feedback on the program and track any installations made by the customers on their own.
- Recommended measures—energy efficient lighting, air conditioning retrofit, water heater retrofit, set back thermostats, energy management systems, timer systems, and many others.
- Program offers interest buy-down on third party financing of energy audit improvements.

Program Performance

- Participation = 4,533 audits representing 84 million SF
- kWh saved = 14,052,257 kWh
- Energy savings per audit = 2924 kWh
- Total Demand Savings = 3354 kW
- Demand reduced per participant = 0.77 kW
- % of audits resulting in installations = 2.3% of audits resulted in installation with E-max
- 100% of those that installed measures included some sort of lighting efficiency measure.

Program Financing

- Gross Cost—\$3,698,892
- Incentive Cost - insignificant
- Admin Cost—\$96,174
- Admin Cost/kW—\$28
- Cost per Participant—\$816
- Cost per kW = \$1,096
- Cost per first year savings (\$/MWh) = \$0.26
- TRC 0.93
- Utility Cost Test 0.93

Program Actors

- Utility, E-max (contractor), Commercial customers,

Program Marketing

- E-Max solicitation , commercial newsletters, website and E.ON business service center

Sources

- E.ON DSM 2000 Filing
 - Summit Blue Report of Commercial Conservation Program
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Ameren: Commercial End Use Audit Program

Program Overview

- Program goals: Provide high level energy advisory services to enable customers to make sound energy management decisions, in terms of both commercial building retrofits and new construction design. (Program is no longer offered.)
- Program type: Audit, energy consulting services.
- Program sector: Commercial.
- Financing approach: The initial facility walkthrough was subsidized, as were subsequent energy modeling efforts. Direct measure incentives were also offered based on payback as determined by DOE2 modeling.

Program Description

- Program delivery mechanism: The program used six implementation contractors certified in DOE2 modeling for building systems analysis (two contractors completed the majority of projects). Participating contractors were required to have DOE2 certification, and to renew that certification on a regular basis.
- Target customer sector: Large commercial customers such as hospitals, office buildings, and shopping malls.
- Services provided to program participant: Energy advisory services provided through the program included energy audits, building systems energy modeling with DOE2, energy savings impact assessments, and data collection to verify actual energy savings. The typical project lasted 14 months from start to finish.
- Unique characteristics of the program: Ameren conducted end-use metering to verify whether actual energy savings matched anticipated savings based on modeling. To continuously improve the program's realization rate, the program's future modeling efforts were adjusted based on the results of such data collection efforts.
- Key steps/challenges involved in the development of the program: There is a long lead time associated with this type of program in terms of initial planning, program marketing, and installation. Ameren estimates that it takes 2-3 years for program effects to be seen. There was also a relatively low hit rate for targeted facilities. Contracting oversight and QC of implementation contractor work is essential, including signoff of each phase of work.
- Key factors that led to the portfolio's success or failure: The most critical component of program success was devoting adequate resources to ensure a high level of quality in the engineering services provided. Quality control was ensured through the pre-development of a QC plan, certification of contractors delivering program services, and maintaining good, consistent communication with customers throughout project implementation. Ameren also conducted a full evaluation of each project to check actual results against modeled data.

Program Performance

- Participation: Approximately 200 customers were contacted, with 20 customers completing the full program process, and others implementing only a simple project such as a lighting retrofit.
- kWh saved; kW saved: Total savings for the program were estimated at 7,665,000 kWh per year with peak demand savings of 30,000 kW per year.
- Energy savings per participant served: (Based on 20 participants.) Energy savings per participant were 383,250 kWh and demand reduction was 1,500 kW per participant.

Program Financing

- Gross cost of program: \$2 million—\$3 million per year (utility cost only).
- Utility incentives: Approximately 60% of gross budget, or \$1.2-1.8 million per year. Includes subsidies for modeling and walkthroughs.
- Utility administrative costs: Approximately 40% of gross budget, or \$800,000-\$1.2 million per year.

Program Actors

- 3rd party involvement: participating contractors

Program Marketing

- Customers were referred to the program through large architectural and engineering firms. The utility also sponsored seminars for account executives to educate them about the program, and were able to target customers for marketing through direct contacts.

Sources

- Energy Trust of Oregon, Best Practices From Energy Efficiency Organizations and Programs. (2002).
Available at: http://www.energytrust.org/library/reports/Best_Practices/index.html?link_programs_reports_lin1Page=3

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Northeast Utilities: Custom Services Program

Program Overview

- Program goals: Promote economic development by providing intensive energy advisory services to large commercial and industrial customers.
- Program type: Audit and energy consulting services
- Program sector: C&I
- Financing approach: The Custom Services offering encompasses two key programs: (1) Process Reengineering for Increased Manufacturing Efficiency (PRIME) and (2) Tailored HVAC. PRIME is an operations and maintenance program designed to streamline work processes, eliminate waste, and save energy through value-stream mapping and flow analyses. Tailored HVAC offers an engineering study to help customers make informed decisions regarding large HVAC equipment installation and replacement. The utility pays half the up-front cost of an Energy Audit and refunds the other half once the recommended energy efficiency measures have been implemented. The utility also provides incentives up to the full incremental costs associated with the installation of the higher efficiency equipment.

Program Description

- Program delivery mechanism: Utility staff conducts an initial facility walkthrough to determine the potential for the applicable program component. Contractors are hired on a project-by-project basis to implement eligible projects, with eleven contractors used on a regular basis and an additional 6 to 8 contractors used on a project-specific basis.
- Target customer sector: Manufacturing facilities with demand of 500 kW or greater.
- Services provided to program participant: Provides energy audits and cash incentives to large commercial and industrial customers who want to save energy by upgrading the efficiency of their electrical equipment and/or streamlining work processes. The program can address an entire facility (Energy Audit) or specific equipment (Focused Study). For PRIME participants, consultation services involve a series of weekly half-day meetings for 8 to 10 weeks to walk management and workers through the necessary operational and process changes.
- Unique characteristics of the program: Provides a high level of advisory services to targeted customers. In providing energy advisory services through PRIME, the program involves both the customer's management and operations staff to ensure buy-in.
- Key steps/challenges involved in the development of the program: In the early years of the program when there were relatively few projects, the program offered assessments of conventional energy efficiency opportunities as well as the PRIME and Tailored HVAC opportunities. However, as program participation has grown, administrative burdens necessitated referring leads on conventional energy efficiency opportunities to other Northeast Utilities programs as appropriate.

Program Performance

- Participation: There were 400 participants in 2002, out of an eligible population of approximately 100,000 C&I customers.
- Energy savings:
 - 35,350,000 kWh (annual 2002)
- Demand reduction:
 - 7,200 kW (2002)
- Energy savings per participant served: 88,375 kWh
- Demand reduction per participant served: 18 kW
- Cost-effectiveness:
 - \$1,450/kW (2002 total cost-effectiveness—utility + customer)
 - \$1,319/kW (2002 utility cost-effectiveness)

Program Financing

- Program financers: Due to the economic development aspects of the program, it is able to leverage funds from state department of labor and department of community and economic development.
- Utility cost (incentives and administrative):
 - 2001: \$9.8 million
 - 2002: \$9.5 million
 - 2003: \$9.7 million
- Customer cost (incremental measure cost less rebate):
 - 2001: \$994,000
 - 2002: \$950,000
 - 2003: \$975,000
- Amount available through cost recovery mechanism: The program receives funding from the State Conservation Fund in Connecticut and the Systems Benefit Charge in Massachusetts.

Program Actors

- 3rd party involvement: A key component is the partnership with the local Manufacturing Extension Program, part of a nationwide program under the National Institute for Standards and Technology, which helps to market the program. MEP has been essential in opening doors to the manufacturers.
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Program Marketing

- The program is marketed through utility account executives and the Manufacturing Extension Partnership, as well as through local economic development organizations. The program has also historically benefited from word-of-mouth referrals. Favorable media coverage has been generated by the economic development aspects of the program (the program has contributed to manufacturer decisions to locate in the utility service area).

Sources

- Energy Trust of Oregon, Best Practices From Energy Efficiency Organizations and Programs. (2002). Available at: http://www.energytrust.org/library/reports/Best_Practices/index.html?link_programs_reports_lin1Page=3
 - ACEEE, America's Best: Profiles of America's Leading Energy Efficiency Programs. (2003). Available at: <http://www.aceee.org/pubs/u032.htm>
 - National Economic Research Associates and ICF Consulting for Commonwealth Edison Company, Review and Assessment of Frameworks for Delivering Energy Efficiency Programs. (2005).
-

Residential Weatherization Programs

- Tacoma Utilities Residential Weatherization Program
- Cinergy/PSI/Indiana Low-Income Weatherization
- Efficiency Vermont—Low Income Multi Family
- Efficiency Vermont—Low Income Single Family
- E.ON We Care Low-Income Weatherization

Tacoma Utilities—Residential Weatherization Program

Program Overview

- Type—Weatherization Program through Energy Audits
- Sector—Residential
- Goal—the Residential Weatherization Program provides energy audits by in-house experts to improve home insulation and energy efficiency for electrically heated homes built before 1988, including rented homes and owner occupied homes.

Program Description

- Program delivery mechanism—Delivered via in-house staff and weatherization contractors. Program participants schedule audits through central scheduling coordinator.
- The program provides audits to improve home insulation. During the audit, customers are provided with educational information regarding appliances, lighting, and other non-weatherization energy efficiency measures.
- Weatherization services identified by the audit can be performed by qualified contractors selected from a list maintained by the utilities or the customers.
- Financial assistance is available to customers as grant for insulation measures or as a seven-year zero percent interest loan with a set-up fee.
- Liens are placed on each home that receives a loan.
- 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

Program Performance

- Participation—900 audits in 2002
- Energy Savings—4,400,000 kWh over program
- Annual Energy Savings per participant = 3,012kWh
- In 2002, 900 audits were performed and 550 loans and/or grants were awarded out of 145,000 residential customers.

Program Financing

- Total budget = \$1.4 million
- \$400,000 for grants, \$800,000 for loans, and \$200,000 for staffing.
- The average cost per audit is about \$150 and each weatherization job runs \$370 on average.

Program Actors

- Low income customers with residential electric services from Tacoma Power.
- Customers must have good payment history with the utility.

Program Marketing

- The program is marketed through a direct mail campaign that is targeted to specific zip codes in order to group responses for efficient audit scheduling.
- Home parties with “give aways” such as CFLs to generate interest in weatherization services.

Sources

- National Economic Research Associates and ICF Consulting for Commonwealth Edison Company, Review and Assessment of Frameworks for Delivering Energy Efficiency Programs. (2005).
- Energy Trust of Oregon, Best Practices From Energy Efficiency Organizations and Programs. (2002). Available at: http://www.energytrust.org/library/reports/Best_Practices/index.html?link_programs_reports_lin1Page=3

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Indiana Low-Income Weatherization and Refrigerator Replacement Program

Program Overview

- Type—Weatherization Program
- Sector—Low-Income, Single Family
- Goal—This program serves households whose annual income is at or below 125% of the federal poverty guideline. Clients receive services through weatherization, energy assistance, and energy education.
- Financed through Cinergy/PSI and State of Indiana Weatherization Program

Program Description

- Refrigerator replacement program replaces inefficient, high energy use refrigerators with efficient ENERGY STAR rated refrigerators.
- Unique feature: There is a sliding-scale payment system for refrigerators. This allows for a greater number of clients served and larger savings to be realized.
- Unique feature: Partnership with the Whirlpool Corporation to supply ENERGY STAR units.
- Program has shown itself to be very cost effective → the state rolled out the program statewide in 2002.
- Lessons Learned
- Utility funding on sliding scale increases cost effectiveness
- Delivery and coordination with supplier critical
- Testing need to be two hours minimum

Program Performance

- Low Income Weatherization Program
- Savings (1997-2002) = 3,581,513 kWh
- Participants (1997-2002) = 9,231 Households
- kWh Savings per participant = 388kWh (3,581,513 kWh / 9,231 Households)
- Refrigerator Replacement Program
- Savings (199-2002) = 287,340 kWh annual.
- 57% of the homes tested received replacement refrigerators
- Peak demand savings— demand impact is 0.373 kW saved per unit of 85.044 kW for the program
- Participants (2001-2002) = 228 replaced refrigerators out of 398 tested
- kWh savings per replaced refrigerator = 1,260 kWh per year

Program Financing

- Total Administrative Costs = \$15,351
- Total Utility costs for replacement and disposal = \$63,649
- Gross 2003 costs = \$180,000 (\$100,000 paid by utility and \$80,000 paid by the state)
- Funding and program resources are leveraged through the partnership of state, local, and private entities established by Cinergy/PSI.
- Payment for replacement refrigerators is split between the state and the utility based on the savings.
- For 400 kWh minimum savings, utility pays \$100 towards the unit, up to the total unit cost based on savings.
- The sliding scale of utility payments was based on utility avoided costs to get positive results for the utility while minimizing state contribution required.

Program Actors

- Targeted customer segment—low-income residential households. Customers must have Cinergy/PSI account to participate. Refrigerator participants must also own their homes.
- Market participants—Whirlpool Corporation, Indiana Community Action association

Sources

- National Economic Research Associates and ICF Consulting for Commonwealth Edison Company, Review and Assessment of Frameworks for Delivering Energy Efficiency Programs. (2005). P.63
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Efficiency Vermont—Low Income Multi Family

Program Overview

- Type—Weatherization Program
- Sector—Low-Income Multi family
- Goal—The Multifamily Low-Income Program packages energy efficiency measures with the low-income Weatherization Assistance program to present to building owners.
- The initial development of the program was funded through a Rebuild America grant from DOE.

Program Description

- Recommended measures—building shell measures, lighting, appliances, high-efficiency space heating and cooling systems, high-efficiency water heating systems, ventilation, and fuel substitution, where applicable.
- Incentives—offered for comprehensive project including a number of these measures, not on a prescriptive basis.
- A comprehensive approach encourages adoption of all cost effective measures and ensures that measures are installed in which low income residents gain most of the savings, not just building owners.
- Designed a Design Guide for Energy Efficient Multifamily Housing.

Program Performance

- Energy Savings 1997-2002
- Energy savings of 12,289,590 kWh
- Peak demand savings of 525 kW
- 9,210 MMBtu of fossil fuel savings and 23,283 ccf of water savings
- Market Penetration 1997-2002
- 5,937 participants
- Estimated market share estimated at over 90% and almost 100% statewide
- Energy Savings per Participant = 2,070 kWh (12,291 MWh/5,937 participants)
- For retrofit market, program had captured 20-30 percent of existing statewide stock through 2002.
- Program Financing
- Gross Budget = \$1,348,969
- 2001—\$836,149
- 2002—\$1,525,000
- 2003—\$1,123,337
- The initial development of the program was funded through a Rebuild America grant from DOE.
- Program operations were funded by four Vermont utilities from 1997-200. Since March 2000, funding has been received from an energy efficiency utility charge on all Vermont electric bills.
- From 1997—2002, total efficiency upgrade costs were \$5.7 million, with total program incentives of \$1,348,959.
- Vermont Gas and the Weatherization Assistance Program contributed an extra \$475,628 and customers paid \$3,875,413.

Program Actors

- Owners and developers of low-income multifamily housing

Program Marketing

- No information listed

Sources

- National Economic Research Associates and ICF Consulting for Commonwealth Edison Company, Review and Assessment of Frameworks for Delivering Energy Efficiency Programs. (2005). P.73.

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Efficiency Vermont—Low Income Single Family

Program Overview

- Type—Weatherization Program
- Sector—Low-Income Single Family
- Goal—the Low Income Single Family Program (LISF) provides energy efficiency measures for low income customers with Vermont's Low-Income Weatherization program.
- Funding mechanism—system benefits charge on all Vermont ratepayers' electric bills (aka "energy efficiency charge"). Money is collected by utilities, turned to fiscal agent who acts as disperser of funds to Public Service Board

Program Description

- Delivery mechanism—Most of LISF's services are delivered by the five regional WAP agencies. WAP energy auditors assess opportunity for electric efficiency improvements as they evaluate homes for weatherization services.
- Recommended measures—fuel switching, HVAC and thermal shell improvements, installation of efficient light fixtures, and replacement of inefficient refrigerators.
- Custom measures—energy efficiency education, energy bill analysis, and making arrangements with contractors for selected services for customers.
- The program "piggy backs" with existing Vermont WAPs and takes advantage of institutional knowledge.

Program Performance

- Participation (2000-2005)—4,315 customers served
- Energy Savings (2000-2005)—9,350,605 kWh
- Energy Savings per Participant = 2,167 kWh (9,353 MWh/4,315 customers)
- \$s Savings per Participant (2000-2005) = \$234 per year
- All electric efficiency and fuel switching measures are screened in the state's cost effectiveness tool and must generate a 1.0 benefit-cost ratio.

Program Financing

- Direct Program Costs = \$4,604,800
- Total Resource Benefits estimated \$4,995,396
- Customer Incentives Efficiency Vermont = \$2,828,100, WAPs = \$294,800
- Cost per MWh saved = \$494/MWh
- Program financiers—Efficiency Vermont, Vermont WAPs

Program Actors

- Low Income Single Families, Efficiency Vermont, Vermont WAPs.
- Eligibility—No income criteria, primary enrollment mechanism is through the WAP process. Anyone on the electric grid and eligible for WAP services is automatically eligible for LISF.

Program Marketing

- No information listed

Sources

- "Low Income Single Family Service," Meeting Essential Needs: The Results of a National Search for Exemplary Utility-Funded Low-Income Energy Efficiency Programs. From ACEEE, September 2005. p, 25.
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E.ON—WeCare Low Income Weatherization Program Details

Program Overview

- Type—Weatherization
- Sector— Low-income customers living in single family housing, and apartments and condos where ability exists to implement energy efficiency measures.
- Goal—To reduce the energy consumption of low income customers by providing energy audits, energy education, perform blower door tests, and installing extensive weatherization and energy conservation measures.

Program Description

- Program delivery mechanism—In-house evaluations and inspections
- Target customer sector—High use, Low-income customers: customers with over 1800 CCF of gas or over 16,000kWh of electric. Household income must be at or below 125% of federally established poverty level.
- Services provided—Contractor will provide energy audits, gas safety inspection, energy education, perform blower door tests, and install weatherization and energy conservation measures on qualified homes at no cost. Customers may also receive air sealing measures, attic insulation, receive water heater insulation blankets, waterbed insulated covers, low flow showerheads, and compact fluorescent lighting at no cost.
- Participants receive a walk through inspection and energy education. Process will usually take two hours.
- A program tracking database will support program implementers and evaluators track the program.

Program Performance

- Total We Care Participation— 4916 participants in total program (2001-2006)
- Total kWh saved—6,838,156 kWh
- Total Energy saved per participant = 1,391 kWh
- LG&E (2001-2005)
- Participation = 3097 customers
- kWh saved = 5,269,423 kWh
- Energy savings per participant served = 1701 kWh
- KU (2001-2005)
- Participation = 738 customers
- kWh saved =1,571,960 kWh
- Energy savings per participant served =2129 kWh

Program Financing

- Gross Cost—Actual expenses (2001-2006) = \$7,207,072
- Program cost per participant = \$1466
- Admin Cost—\$150,080
- Audit Cost to participant = \$0
- Cost per first year savings = \$1,053
- Incentive Cost—\$7,049,920
- TRC = 0.23
- Utility Cost Test = 0.23

Program Actors

- Eligibility—Income of 125% of the federal government-defined poverty level or less.

Program Marketing

- Honeywell contacts LIHEAP enrolled customers and information is provided on corporate website

Sources

- DSM Filing 2000
 - Summit Blue Evaluation of WeCare Program
-

Load Management Programs

- E.ON Demand Conservation Program, Residential Market
 - We Energies Energy Partners Program
 - Nevada Power Company Air Conditioning Load Management Program
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E.ON Demand Conservation Program, Residential Market

Program Overview

- Program goals: Reduce peak demand by enabling E.ON to interrupt service to residential customers' central air conditioners and electric water heaters, pool pumps.
- Program type: Load management
- Program sector: Residential
- Financing approach: E.ON supplies and installs necessary equipment. Customer receives an annual incentive of \$20 for participating in the program (switch option only).

Program Description

- Program delivery mechanism: E.ON installs load control switches or thermostat at participating customer facilities. Each switch has unique address to allow maximum flexibility in equipment cycling.
- Target customer sector: Residential customers with central AC.
- Services provided to program participant: Installation of necessary load control equipment. Incentive for participation.

Program Performance

- Participation: 109,870 devices connected
- Potential demand reduction: 113,166 kW
- Demand reduction per participant served: 1.03 kW³⁰
- Cost-effectiveness:
- Cost per participant: \$211
- Cost per kW: \$204
- Administrative cost per kW: \$2

Program Financing

- Gross cost of program: \$23.1 million (2001-2006)
- Administrative costs: \$230,796 (2001-2006)
- Incentive costs: \$6.15 million

Program Actors

- Utility, participating customers, installation contractors

Program Marketing

- 2000 DSM Plan budgeted for development of program brochure
 - [Direct mail, telemarketing, web, bill inserts.
-

³⁰ From GoodCents evaluation, this is the peak demand reduction potential for AC control. Calculation of demand savings potential assumes all participating customers have AC control equipment. No data are available on peak demand reduction potential from pool pumps.

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We Energies Energy Partners Program

Program Overview

- Program goals: Reduce peak demand by providing an incentive to residential customers for allowing service to central air conditioners to be interrupted for up to 6 hours.
- Program type: Load management
- Program sector: Residential
- Financing approach: The program provides an annual incentive of up to \$50, depending on the control strategy selected by the customer.

Program Description

- Program delivery mechanism: Customers can enroll by mail, telephone, or online. If installation of load control devices is necessary, We Energies uses trained electrical contractors to perform the work. The average time between the enrollment order and completed installation is approximately 32 days. We Energies initiates a load control event using a radio frequency signal.
- Target customer sector: Residential customers with central AC.
- Services provided to program participant: Installation of necessary equipment for participation; financial incentive.
- Unique characteristics of the program: We Energies uses the Microvision market segmentation strategy to identify subsegments of the market most likely to participate in the program, boosting the response rate to program marketing and minimizing customer acquisition costs. Customers can choose to participate in one of three load control strategies: (1) 100% cycled off for 4 hours; (2) 100% cycled off for 6 hours; and (3) 75% cycled off (45 minutes per hour) for up to 6 hours. The program has been popular with customers, exceeding its demand reduction goal while spending just over half of the original program budget.

Program Performance

- Demand reduction: 6,322,000 kW (2005-2006)
- Cost-effectiveness: \$0.19/kW
- Results of cost effectiveness tests used in program planning:
 - Total Resource Cost test: 1.16
 - Utility Cost test: 1.31
 - Rate Impact Measure test: 1.30

Program Financing

- Gross cost of program: \$1,218,759 (2005-2006)

Program Actors

- Market participants: Utility, customers, electrical contractors.

Program Marketing

- The primary marketing effort has been a series of direct mailings to targeted residential customers to solicit participation. Direct mail campaigns are initiated in the spring so that installations can be completed before the peak summer season, and each mailing is conducted in several waves to ensure a rapid enrollment and installation process.

Replicability/Applicability

- This program is similar to E.ON's existing Demand Conservation Program.
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Nevada Power Company Air Conditioning Load Management Program

Program Overview

- Program goals: Reduce peak demand by providing an incentive to residential customers for allowing service to central air conditioners and pool pumps to be interrupted.
- Program type: Load management
- Program sector: Residential
- Financing approach: The program provides an up-front one-time incentive of \$25, plus free installation of load control equipment. NPC is experimenting with offering the thermostat itself as the incentive, with no additional dollar payment.

Program Description

- Program delivery mechanism: Customer enrolls in program; utility arranges installation of load control equipment.
- Target customer sector: Residential single family homes with central AC, with a plan to deploy the program in the small commercial market in future.
- Services provided to program participant: Installation of necessary equipment for participation; one-time financial incentive.
- Unique characteristics of the program: NPC has extensively tested alternative load control technologies (duty cycle switches and one-way and two-way communicating thermostats), selecting 2-way programmable thermostats as the preferable technology for broader deployment due to the following factors: setback feature takes thermal loading into account, maximizing the demand reduction while limiting indoor temperature excursions (leading to higher customer satisfaction and lower churn); oversized AC units do not cause lower demand reduction as would be the case for switches; lower cost of installation; customers familiar with the technology, and it an easy "sell" to get them to replace an existing model with a model that has enhanced features; thermostat offers value-added features for the customer such as Web access for thermostat control, which means it may be possible for the thermostat itself to be the primary incentive (eliminating additional up-front incentive payment).

Program Performance

- Participation: 24,000 (2001-2006)
- Energy savings: 414,641 (2001-2006)
- Demand reduction: 24,000 kW (2001-2006)³¹
- Energy savings per participant served: 1 kW (2001-2006)³²
- Results of cost effectiveness tests used in program planning:
- TRC: 1.13
- Utility Cost test: 1.45
- RIM: 1.38

Program Financing

- Annual program budget for 2006, based on installation of 6,000 additional controls:³³
- Total budget: \$3,229,000
- Incentive budget: \$1,400,000
- Administrative budget: \$1,829,000

Program Actors

- Third party involvement: thermostat installers; possible trade ally involvement in marketing (HVAC and DIY channels) based on 2007-2009 program plan.
- Market participants: utility, installers, trade allies (potentially)

Program Marketing

- Future program marketing efforts will include marketing the program through HVAC and DIY trade allies.

Replicability/Applicability

- This program model is similar to E.ON's current Demand Conservation program in terms of implementation; the main difference is in incentive structure.
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³¹ The cumulative demand reduction at the generator is 24,000 kW. The emergency short term load reduction (load shedding) amount is 50,000 kW.

³² EM&V of installed systems have shown that per-participant demand reduction (for AC) is 0.768 kW for switches, and 2.5 kW for programmable thermostats.

³³ No data are available on historical program costs.

Residential New Construction with ENERGY STAR Programs

- Center Point-Texas ENERGY STAR Homes Program
- Wisconsin Energy Conservation New Construction
- Efficiency Homes Midwest—ENERGY STAR Homes Program
- Vermont ENERGY STAR Homes Program

CenterPoint Oncor- Texas ENERGY STAR Homes Programs

Program Overview

- Program goals—To increase consumer awareness of and demand for ENERGY STAR homes while increasing the building industry's willingness and ability to construct ENERGY STAR homes. To achieve peak demand reduction and energy savings through sales of ENERGY STAR homes.
- Program type—New Construction
- Program sector—Homes
- Funded from the rate base as approved by the PUC as a result of Senate Bill 7 or deregulation

Program Description

- Program delivery mechanism—offer incentives to builders, not home energy rating system raters. By so doing, the program can adopt successful integrated advertising campaign co-funded by builders over 50 percent of marketing costs.
- Target customer sector—Home builders
- Program designed to encourage residential builders to raise their building criteria to a HERS value of 86.
- Services provided to program participant—Incentives to home builders to support ENERGY STAR throughout the new construction market. The program recruits builders and home raters; trains raters, builders, sales staff, lenders, realtors, etc; establishes processes for certifying and documenting homes built to ENERGY STAR requirements.
- Key factors that led to the portfolio's success—certification and documentation process for ENERGY STAR homes and independent protocols to ensure that the raters are providing high quality and consistent support to buildings. Believes that giving incentives to builders, not HERS raters is most effective. Builders are more motivated by advertising and promotion than by the dollar incentives offered by the program (i.e., the value of the ENERGY STAR brand is greater than the incentive paid to the builders).

Program Performance

- Participation—(2000-2003) 33,103 homes constructed
- kWh saved—(2002) 37,758,000 kWh
- Peak demand savings—(2002) 17,136 kW
- Energy savings per participant served—2,283 kWh of annual energy per ENERGY STAR home
- Peak demand savings per home—1.68 kW

Program Financing

- Gross cost of program
 - (2001)—\$2.3 million
 - (2002)—\$5.5 million
 - (2003)—\$7.7 million
- \$600/kW (2002)

Program Actors

- Center Point Energy, Oncor, builders, HERS raters

Program Marketing

- Advertising and consumer seminars

Replicability/Applicability

- T.B.D.

Source

- "Texas ENERGY STAR Homes Programs." ACEEE, America's Best: Profiles of America's Leading Energy Efficiency Programs. (2003). Available at: <http://www.aceee.org/pubs/u032.htm>. Also used research from ongoing EE Programs research.

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Wisconsin Focus on Energy: ENERGY STAR Homes Program

Program Overview

- Program goals—To generate demand for Wisconsin ENERGY STAR homes
- Program type—Residential new Construction
- Program sector—Homes

Program Description

- Program delivery mechanism—main office staff is 4 professionals and .5 for a marketing person. There are 7 full time subcontractors who act as regional coordinators, developing relationships with local building community. Experts visit the home site after framing looking for unintentional holes that may lead to air leakage. After installation, Homes Consultant reviews home for installation coverage. When home is complete, Wisconsin ENERGY STAR homes inspects the home to certify that construction quality standards were met.
- Target customer sector—adults with household annual income of over \$50,000 who are either planning to build a home or in the process of building a new home. Targets home builders as well.
- Services provided to program participant—WECC provides general assistance to customers. Role is often to provide objective advice rather than promoting a particular product or manufacturer. Offers discounts and cash-back rewards for certified Wisconsin ENERGY STAR homes.
- Unique characteristics of the program—in addition to meeting ENERGY STAR requirements, the program has added requirements including construction site visits, shell air tightness, and equipment standards.
- Challenges—It is important that builders can and do make their own case for building homes that qualify for the program. Wisconsin Energy Conservation Corporation, the program implementer, tried to hold seminars for a group of builders, but a one-on-one approach has proven more effective. Managing growth and the cost of conducting site visits also challenges.
- Important to success—demonstrate to the building community that it can readily adopt the practices involved.

Program Performance

- Participation—(1999-2002) 1572 Certified Homes
- kWh saved- (1999-2002) 781,836 kWh
- kW saved—115.72KW
- Energy savings per participant served—497 kWh ; 0.07 KW

Program Financing

- Gross cost of program—\$2.3 MM in 2002
- Admin budget—\$300,000
- Incentives—\$650,000
- Cost of site visits—\$390,000
- Program development—\$500,000
- Marketing—\$400,000
- Incentives—Offers discounts and cash-back rewards for certified Wisconsin ENERGY STAR homes. WECC covers 2/3 of cost of certifying home that qualifies. The outlay is approx. \$750, which includes modeling and plan review.
- Cost sharing—with 3rd parties, manufacturers, retailers, etc.

Program Actors

- Developed in partnership with Wausau Homes, Pittsville Homes, and Terrace Homes

Program Marketing

- Marketing plan—customer seminars held in evenings. Marketing to buildings is accomplished through local home-building associations. Program managers need to become "insiders" and attend monthly meetings and events.
- Marketing materials—interested builders are given a discussion of standards and then is asked to sign an agreement committing the project to meet ENERGY STAR standards in return for program support.

Replicability/Applicability

Source

- Energy Trust of Oregon, Best Practices From Energy Efficiency Organizations and Programs. (2002). Available at: http://www.energytrust.org/library/reports/Best_Practices/index.html?link_programs_reports_lin1Page=3 and ACEEE, America's Best: Profiles of America's Leading Energy Efficiency Programs. (2003)

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Energy Efficiency Homes Midwest

Program Overview

- Program goals—To sell builders and raters on the marketing advantage of ENERGY STAR-labeled homes
- Program type—New Construction ENERGY STAR Homes
- Program sector—Residential

Program Description

- Program delivery mechanism—5 firms employing total of 20 HERS raters in Indiana
- Target customer sector—HERS rating firms and builders
- History—program started in Indiana in 1993 as Five Star Home Program. In 1998, Indiana Energy Office provided \$250,000 grant to form Energy Rated Homes Midwest, a non-profit business intended to privatize and encourage the growth of HERS rating industry. The former director of that org left for Energy Efficient Homes Midwest, a for-profit company
- Incentives—no incentives to homes or builders
- Key factors that led to the portfolio's success—efforts and perseverance of HERS rating firms in marketing efforts to builders.

Program Performance

- Participation—In 2001, 1500 out of 30,000 new homes built in Indiana (5%) were ENERGY STAR-labeled.
- Energy savings per participant served—\$450 per house per year

Program Financing

- Gross cost of program
- Program financiers—no money coming from utilities or government anymore

Program Actors

- 3rd party involvement: HERS rating firms and builders

Program Marketing

- HERS rating firms dealing directly with builders to sell them on the marketing advantage of ENERGY STAR homes (personal calls, booths at trade shows, involvement in builder's associations.
- Marketing to customers—builders using ENERGY STAR label in literature and ads

Replicability/Applicability

- The Indiana model is effective as a way to build the rating infrastructure. Greater program service through marketing support, training and so forth might be required to drive home production.

Source

- Energy Trust of Oregon, Best Practices From Energy Efficiency Organizations and Programs. (2002).
Available at: http://www.energytrust.org/library/reports/Best_Practices/index.html?link_programs_reports_lin1Page=3
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Vermont ENERGY STAR Homes

Program Overview

- Program type—New Construction ENERGY STAR Homes
- Program sector—Residential customers in Vermont
- Funded by Systems Benefits Charge paid by all electric ratepayers

Program Description

- Services provided to program participant—marketing support, including cooperative newspaper and real estate guide ads, signage, and marketing materials; plan review and recommendations to achieve high-performance homes through one-on-one builder and subcontractor training and ongoing technical assistance; proposed and as-built energy savings; pre-drywall site inspections; blower door testing; financial incentives; ENERGY STAR homes labeling; Vermont Residential Energy Code compliance certificate.
- Strategy centers on use of home energy ratings and ENERGY STAR label.
- All participants are required to obtain a minimum 5-star energy rating and install at least four energy-efficient lighting fixtures.
- Unique characteristics of the program—along with incentives, Efficiency Vermont sponsors an annual conference, "Better Buildings by Design." Conference brings together building professionals to share expertise building and designing high-performance homes.
- History—Vermont Gas Systems has operated a successful new homes program since 1993. By the late 1990s, the program had achieved 50-70% annual participation rates for new homes using Vermont gas service. Moved typical energy efficiency for homes from 3-star HERS rating to 5-star HERS rating by 2000. In 2001, Vermont Gas Systems and Efficiency Vermont partnered to develop a single, integrated statewide service that provides unified marketing, simple participation, and one well-organized standard for efficiency.

Program Performance

- Participation—In 2000-2001—587 Labeled Homes
- kWh saved—In 2000-2001—1,701,000 kWh
- Energy savings per participant (2000-2001) = 2,897

Program Financing

- Utility incentives—range from \$160 to over \$1500. Incremental incentives of \$15 for each additional EE lighting fixture surface mounted and \$25 for each recessed lighting fixture. "Lighting and appliance" bonus of \$700 for installation of 10 qualifying light energy-efficient fixtures and three labeled ENERGY STAR appliances.

Program Actors

- Program sponsors—Efficiency Vermont, Vermont Gas Systems, Washington Electric Cooperative, and Burlington Electric Department

Program Marketing

- Cooperative newspaper and real estate guide ads, signage, and marketing materials

Replicability/Applicability

- Unique history might preclude transferability. The program's reliance on measure incentives is less and less common

Source

- "Vermont ENERGY STAR Homes" ACEEE, America's Best: Profiles of America's Leading Energy Efficiency Programs. (2003). Available at: <http://aceee.org/utility/5bstarhomesvt.pdf> Also used research from ongoing EE Programs research.

Residential HVAC Programs

- New Jersey Clean Energy Collaborative
- NYSEERDA Keep Cool, NY Air Conditioner Turn In
- CheckMe! Residential High Efficiency Heating Program

New Jersey Clean Energy Collaborative

Program Overview

- Program goals—Designed to transform the residential HVAC market
- Program type—HVAC rebate program
- Program sector—Residential customers with central air conditioners or heat pumps in New Jersey
- Financing approach—State-wide systems benefit charge

Program Description

- Target customer sector—residential customers in New Jersey with central air conditioners or heat pumps
- Services provided to program participant—Incentives and rebates for purchase of energy efficient equipment as well as sizing and installation; consumer marketing campaign on key elements of efficiency; direct marketing to HVAC distributors through 'outreach coordinators'; training of HVAC contractors on key elements of quality installations; ENERGY STAR sales training to contractors; and promotion of HVAC technician certification.
- Description—designed to transform residential HVAC market through incentives, consumer and distributor and contractor marketing, installation and ENERGY STAR training for contractors, and promotion of HVAC technician certification.
- Unique characteristics of the program—First program in the country to tie rebates to purchase of efficient equipment AND to the documentation of proper sizing and installation, including airflow and refrigerant charge.

Program Performance

- Participation (1999-2002) = 66,000 participants; (2002)= 17,963
- kWh saved (1999-2002) = 52.8 million kWh; (2002) = 14,000,000kWh (projected)
- Peak demand savings (199-2002) = 47,520 kW; (2002)= 12,461 kWh(projected)
- Energy savings per participant served = 800kWh per participant (total program)
- Peak demand savings per participant served = 0.72 kW per participant (total program)

Program Financing

- Gross cost of program—
 - 2001: \$11.2 million
 - 2002: \$17 million
 - 2003: \$13.5 million

Program Actors

- Customers, HVAC distributors, retailers, outreach coordinators, technicians, utility.

Program Marketing

- Direct marketing to HVAC distributors through "outreach coordinators"
- Aggressive consumer marketing campaign on key elements and benefits of efficiency

Replicability/Applicability

- Became a model for many other programs such as those at Long Island Power Authority, National Grid, California, Texas, and the Midwest.

Source

- "Cool Advantage—New Jersey Clean Energy Collaborative." ACEEE, America's Best: Profiles of America's Leading Energy Efficiency Programs. (2003). Available at: <http://www.aceee.org/pubs/u032.htm>

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NYSERDA Keep Cool, New York Program

Program Overview

- Program goals—Encourage customers to purchase new ENERGY STAR room air conditioners and turn in old, inefficient ones, to help reduce electric load during summer months
- Program type—Equipment purchasing/bounty for turning in old room air conditioners
- Program sector—Residential
- Financing approach—Systems benefit charge

Program Description

- Program delivery mechanism—implemented by Aspen Systems Corporation, under contract with NYSERDA
- Target customer sector—NY Residential
- Services provided to program participant—Provides \$75 bounty for turning in old, inefficient working room air conditioners when purchasing a new ENERGY STAR unit.
- Unique characteristics of the program—Includes public awareness campaign aimed at influencing residential customer's behavior and purchasing decisions.

Program Performance

- Participation (2000-2002)—217,721 units were sold through the program.
- kWh saved (2000-2002) = 45 million kWh. (With spill over effects = 59 million kWh)
- Peak demand savings from direct impacts = 45,000 kW; (Peak demand savings from spill over effects were 62,000 kW)
- Energy savings per participant served = 207 kWh per unit (271 kWh per unit with spill over effects)
- Peak demand savings per participant served = 0.2 kW per unit
- In addition to direct energy savings benefits, served as catalyst for retailers and manufacturers to promote ENERGY STAR room air conditioners to all customers.

Program Financing

- Gross cost of program—2002 budget of \$20 million
- Program financiers—state systems benefit charge. Co-sponsored by Long Island Power Authority and New York Power Authority.

Program Actors

- Stresses importance of maintaining closer relationships with all program partners, especially retailers and manufacturers.
- Co-sponsored by Long Island Power Authority and New York Power Authority.

Program Marketing

- Marketing awareness plan key to program success
- Marketing developed by DDB, Bass & Howes, under contract with NYSERDA

Replicability/Applicability

- Relatively standard program design that could be replicated. Such programs, however, need to be carefully designed to avoid large free rider population.

Source

- "Keep Cool, New York." ACEEE, America's Best: Profiles of America's Leading Energy Efficiency Programs. (2003). Available at: <http://www.aceee.org/utility/2bkpcoolrdnys.pdf>
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CheckME! Residential High Efficiency Heating Program

Program Overview

- Program goals—Provide air conditioner diagnostic and repair system in a more efficient and accurate way to deliver peak reductions and energy savings
- Program type—Air conditioner diagnostic and repair program
- Program sector—Residential
- Financing approach—Funded by numerous utilities and energy organizations

Program Description

- Program delivery mechanism—Actual tests performed by HVAC distributors/installers; Proctor Engineering Technician in-house evaluations coupled with phone in test results for accuracy.
- Target customer sector—Light commercial and residential AC/heat pumps
- Services provided to program participant—Field trained HVAC technicians perform diagnoses in the field, verified by centralized computer expert system. After performing tests with standard equipment, technician phones in test readings to CheckMe! Call center, where data is analyzed by computer and recommendations are made on refrigerant charge and airflow.
- Unique characteristics of the program—Calls from field technicians to CheckMe! Call center. Takes 3 minutes and 100% human interaction. After repair, technicians call in final set of results to ensure proper repairs.
- Key factors that led to the portfolio's success—computerized statistical analysis of each technician's data, paperless simplicity, immediate data capture, human support, results certificate and education for every customer, and customer satisfaction survey and investigation for poor evaluations.
- Customer certificate showing test results enhances technician-customer interaction and gives customer sense of control over veracity of repairs

Program Performance

- Participation (1998-2002) = 103,742 diagnostic runs. (2002) ■ 53,268
- kWh saved (2002)—33,107,166
- Peak demand savings
 - (1999-2002) = 45,341 kW
 - (2002) = 26,486 kW
- Energy savings per participant served = 622 kWh per run (2002)
- KW savings per participant—0.5 kW (2002)
- 98% repair accuracy and customers rate the service good to excellent 96% of time.

Program Financing

- Gross cost of program
 - 2001 budget = \$2,169,000
 - 2002 budget = \$4,476,000
 - 2003 budget = \$6,302,000
- \$169/kW
- Program financers—numerous west coast utilities and energy organizations

Program Actors

- HVAC installers/dealers are trained in the CheckMe! System. The technicians run the diagnostic tests and Proctor Engineering staff analyze the results and provide them to the customers
- Proctor Engineering manages the programs under contract to utilities and other program sponsors
- The program relies on trained/certified HVAC technicians employed by HVAC dealers

Program Marketing

- No information provided.

Source

- "CheckMe!" ACEEE, America's Best: Profiles of America's Leading Energy Efficiency Programs. (2003). Available at: <http://aceee.org/utility/2cckmeprocen.pdf>

Residential HPwES Programs

- Wisconsin Energy Targeted Home Performance with ENERGY STAR
- NYSERDA Home Performance with ENERGY STAR

Wisconsin Energy—Targeted Home Performance with ENERGY STAR

Program Overview

- Program goals—To assist qualifying limited-income Wisconsin residents in making energy efficiency improvements to their homes.
- Program type—ENERGY STAR Homes Program/Weatherization
- Program sector—Low-Income
- Funding source—State benefits system

Program Description

- Program delivery mechanism—Program consultants implement program at minimal costs to homeowner. Mostly delivered through existing local low-income weatherization network.
- Target customer sector—Limited income Wisconsin residential customers (150-200% of the federal poverty level)
- Services provided to program participant—insulation of attics, sealing of air leaks, update/upgrade equipment, and install energy efficiency equipment. Participants first receive home energy assessment and then several measures may be installed, such as insulation, sealing of air leaks, upgrade equipment install EE saving devices. Participants must allow installation of all measures recommended.
- Participant pays 10% copay. WECC uses existing Weatherization program infrastructure. Targeted Home Performance with ENERGY STAR is primarily delivered through local low-income weatherization network. In areas where weatherization agency does not provide weatherization services, the program works with "Home Performance with ENERGY STAR consultants."
- Participants first receive home energy assessment that reviews and analyzes household energy use and associated building systems for performance.

Program Performance

- Participation—served 641 households
- Energy savings per participant served—810 kWh/year/participant; 262 therms/year
- Cost-effectiveness—1.11 TRC

Program Financing

- Gross cost of program—\$3.2 million
- Average participant contributes \$528.

Program Actors

- Eligibility—1) electric utility customer participating in Focus on Energy 2) meet income guidelines; 3) reside in an eligible dwelling type
Renters may be eligible but rental owners must agree to pay energy assessment fee plus of \$150 plus 10% copay.

Program Marketing

- No information provided.

Source

- "Targeted Home Performance with ENERGY STAR. Wisconsin." Meeting Essential Needs: The Results of a National Search for Exemplary Utility-Funded Low-Income Energy Efficiency Programs. From ACEEE, September 2005. p. 112
-

Evaluation of Energy Efficiency at E.ON U.S.
Appendix A: Detailed Program Information Sheets

NYSERDA—Home Performance with ENERGY STAR

Program Overview

- Program goals—To offer comprehensive retrofit packages for customers considering energy efficiency improvement for existing single to four family homes
- Program type—Home Performance with ENERGY STAR
- Program sector (e.g., Low-income, Single family, Multi-family, etc)

Program Description

- Program delivery mechanism—training contractors to subsidize energy efficiency upgrades.
- Unique characteristics of the program—Approach is to build an industry infrastructure of accredited firms and certified technicians and create consumer demand for energy –efficient services.
- NYSERDA builds an infrastructure of accredited technicians by supporting Building Performance Institute (BPI). BPI accreditation and certification are required for contractors who wish to participate in the program. Program offers and subsidizes cost of training to assist contractors in preparing for BPI certification tests.
- History—prior to 2001, there were few home improvement contractors in New York who understood and implemented building science “as a house system”

Program Performance

- Participation—1,198 households. 395 jobs in process. Recruited 212 certified technicians and 97 accredited firms.
- kWh saved; kW saved—690,255 kWh and 47.27 Billion Btus in annual energy savings
- Peak demand savings—540 kWh and 37 MMBtus.
- Energy savings per participant served—576 kWh per household

Program Financing

- Gross cost of program—\$16.7 million
- Program financiers—Customers contributed over \$17.6 million to program costs. Contractors committed over \$750,000.
- Total of \$35 million invested into program

Program Actors

- Households, NYSERDA, BPI, contractors

Program Marketing

- “Call to action” marketing campaign utilized television, radio, newspaper, direct mail, co-op advertising, public relations, and special events.

Source

- “Home Performance with ENERGY STAR: A New York Smart Program.” ACEEE, America’s Best: Profiles of America’s Leading Energy Efficiency Programs. (2003). Available at: <http://www.aceee.org/pubs/u032.htm>

Residential Lighting Programs

- E.ON Residential Lighting Energy Efficiency Program
- Northeast Utilities Lighting

E.ON Proposed Residential Energy Efficient Lighting Program

Program Overview

- Program goals—Encourage residential customers to use energy efficient lighting to reach energy efficiency goals
- Program type (e.g., Weatherization, Audit, etc.)
- Program sector (e.g., Low-income, Single family, Multi-family, etc)

Program Description

- Program delivery mechanism—existing Residential Conservation program
- Target customer sector—residential utility customers.
- Services provided to program participant—program would piggy back on existing Residential Conservation program as the delivery channel and provide customers with wide selection of CFLs at below retail pricing

Program Performance

- Estimated Participation (2005-2011)= 25,200 customers
- Cost-effectiveness, with Evaluation, Measurement and Verification (EM&V)—Program is cost effective with a TRC of 1.14 and Participants test of 6.91.

Program Financing

- Gross cost of program (2005-2011) = \$38,500

Program Actors

- Relationship between the utility and the customer
- 3rd party involvement
- Market participants—manufacturers, retailers, trade associations, etc.
- Stakeholders involved and roles

Program Marketing

- \$24,000 market for advertising and marketing over program
-

Evaluation of Energy Efficiency at E.ON U.S.
Appendix A: Detailed Program Information Sheets

Northeast Utilities Lighting Catalog

Program Overview

- Program goals—Market transformation for the residential lighting market
- Program type—Residential lighting
- Program sector—Residential
- Financing approach

Program Description

- Program delivery mechanism—NU has two program administrators devoted to the program.
- Catalog can be ordered through the mail, through an 800 number, or over the internet.
- Target customer sector—residential customers and retailers
- Services provided to program participant—Program includes a catalog sent to all NU's residential customers in Connecticut, Massachusetts, and New Hampshire. The Mail and on-line catalog complements the availability of energy-efficient lighting through retailer.
- NU works with manufacturers to persuade them to develop aesthetically pleasing fixtures.
- Incentives vary by state. CT provides \$3 per CFL (if cost is \$5 or more), \$10 per exterior fixture, and \$20 per torchiere (if cost is \$40 or more).
- Key factors that led to the portfolio's success—Nu works with manufacturers to make fixtures that are attractive—and aesthetics are one of the main barriers to increased sales of EE fixtures.

Program Performance

- Participation—59,000 orders by 54,000 customers in 2001
- Response rate is 3.75% vs. industry average of 2%
- kWh saved—Estimated 140,000,000 product lifetime kWh
- Customer satisfaction—80%

Program Financing

- Gross cost of program—\$3.5 million per year
 - 30% for incentives
 - 3% administration
 - 3% call centers
 - 17% for marketing
 - 45% for design, printing, postage, paper, photography

Program Marketing

- In 2001, catalog was sent to 1.3 million customers among four utilities.
- Other marketing varies by company—print and radio ads, bill inserts, web link ads, and cable network advertising.

Replicability/Applicability

- Energy Trust of Oregon, Best Practices From Energy Efficiency Organizations and Programs. (2002). Available at: http://www.energytrust.org/library/reports/Best_Practices/03_ResidentialPrograms.pdf. And, referenced ongoing ICF research on Energy Efficiency Programs.

Residential Appliance Programs

- Northeast Residential ENERGY STAR Appliances Initiative
- Northwest Energy Efficiency Alliance ENERGY STAR Home Products Program
- E.ON Proposed Residential Smart Thermostat

E.ON Proposed Residential Smart Thermostat

Program Overview

- Program goals—
- Program type—Smart Thermostat
- Program sector—Residential
- Financing approach

Program Description

- Program delivery mechanism—Install a Smart Thermostat that incorporates a radio receiver to react when real-time component of rate is invoked.
- Target customer sector—residential utility customers
- This is a Responsive Pricing/Smart Meter program with a three-tier TOU rate similar to that of other utilities but with a fourth real-time component.
- Unique characteristics of the program:
 - Fourth real time component would be the highest cost period and would be invoked during system peaks.
 - Customers would set heating and cooling temperatures and turn off arge loads based on price of electricity.
 - Companies will conduct a pilot program

Program Performance

- Estimated Participation (2005-2011)—8,400 customers
- Cost-effectiveness, with Evaluation, Measurement and Verification (EM&V)—Program is cost effective with TRC of 1.24 and participant test of 2.84.

Program Financing

- Gross cost of program (2005-2011)—\$337,500
- Installation estimated costs (2005-2011) = \$168,000

Program Marketing

- \$25,000 marketing/advertising budget
-

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Northeast Residential ENERGY STAR Appliances Initiative

Program Overview

- Program goals—Raise awareness of importance and benefits of purchasing energy-efficiency appliances, which reducing or eliminating the rebates.
- Program type—Appliance Initiative
- Program sector—Residential customers
- Financing approach—Funded by systems benefit charge

Program Description

- Program delivery mechanism—marketing/awareness campaign
- Target customer sector—residential owners of clothes washers, refrigerators, room air conditioners and other appliances

Program Performance

- Participation (1992-2002) = 52,681 rebates granted
- kWh saved (1998-2002) = 9,061,142 kWh
- Peak demand savings (1998-2002) = 3,526 kW
- Energy savings per participant served = 172 per rebate (total kWh saved / total rebates)
- Market penetration—customer awareness of the ENERGY STAR label from 6 to 41 % during time period.

Program Financing

- Gross cost of program
 - 2001—\$632,212
 - 2002—\$224,762

Program Actors

- Large number of organizations involved.
- Relies on partnerships and relationships with appliance industry (manufacturers, retailers, buyers' groups, etc) to assist in program marketing and implementation activities.

Program Marketing

- No information available.

Source

- ACEEE, America's Best: Profiles of America's Leading Energy Efficiency Programs. (2003). Available at: <http://www.aceee.org/pubs/u032.htm>
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Northwest ENERGY STAR Home Products Program

Program Overview

- Program goals—To promote a wide variety of ENERGY STAR-qualified home appliances, lighting, windows, and electronic equipment to consumers in the Northwest.
- Program type—Home energy appliances
- Program sector—Northwest Residential

Program Description

- Program delivery mechanism—NEEA works with a contractor, PECl, to increase awareness among the region's consumers about ENERGY STAR and encourage shoppers to choose products carrying the program's label.
- Services provided—Program conducts a wide range of activities to build awareness and acceptance of ENERGY STAR-labeled products including field support for retailers; public relations and media outreach targeted to customers; coordinated utility programs; and cooperative marketing incentives.
- Program uses field services to establish manufacturer and retailer relationships.
- Participates in national initiatives intended to improve the efficiency standards for home products

Program Performance

- kWh saved—by 2010, over 100,000 kWh of electric savings will be realized annually because of the program.
- Market penetration—market share in NW for ENERGY STAR-qualified clothes washers grew from 15% in 2000 to 30% by the end of 2001.
- Number of utilities participating with incentives has doubled since 2000 to 2001.

Program Financing

- Gross cost of program—1997-2001—received \$11.5 million in funding from NEEA. It leveraged \$400 million in energy investments
- Program financiers—NEEA

Program Marketing

- No information available.

Source

- ACEEE, America's Best: Profiles of America's Leading Energy Efficiency Programs. (2003). Available at: <http://www.aceee.org/pubs/u032.htm>
-

Commercial Critical Peak Pricing Programs

- Southern California Edison Critical Peak Pricing Program
- PG&E Fully Automated Critical Peak Pricing Program

Southern California Edison Small C&I CPP (part of California Statewide Critical Peak Pricing Pilot)

Program Overview

- Program goals: Under a pilot program, test the impact of several time-varying rate structures on the electricity usage patterns of small C&I customers.
- Program type: Demand response, critical peak pricing
- Program sector: Small commercial & industrial
- Financing approach: The program offers increased rates during critical peak pricing (CPP) periods and reduced rates at all other times. An additional incentive included a free "smart" thermostat installation.
 - LT20 rate: average standard price of \$0.17/kWh and average CPP of \$1.00/kWh.
 - GT20 rate: average standard price of \$0.16/kWh and average CPP of \$0.60/kWh.

Program Description

- Program delivery mechanism: Based on forecast temperature, utility makes a day-before determination on whether to call a CPP day. SCE customers are notified by direct telephone call, alphanumeric pager, email, cell phone, or fax.
- Target customer sector: Customers with usage below 200 kW with two targeted subsegments: customers with demand below 20 kW (LT20) and customers with demand between 20 kW and 200 kW (GT20).
- Services provided to program participant: Free "smart" thermostat was also offered that would automatically adjust the air conditioning setting when the CPP was in effect. Not all customers elected to install this technology (approximately 30% of LT20 customers did, and 60% of GT20 customers did), and a program evaluation showed that the customers who had the enabling technology showed a much greater reduction in demand under the CPP.

Program Performance

- Participation: approximately 60 LT20 and 80 GT20 customers (summers of 2004 and 2005)
- The average reduction in peak-period energy use for LT20 customers was 4.83%, and the average reduction for GT20 customers was 6.75%.
- Enabling technology (smart thermostats) had a big effect on price responsiveness.
 - LT20 customers with no enabling technology did not show any reduction in peak period energy use, while LT20 customers with enabling technology showed a 13% reduction in peak period energy use.
 - GT20 customers with no enabling technology showed a 4.93% reduction in peak period energy use, and GT20 customers with enabling technology showed a 9.57% reduction.

Program Financing

- Gross cost of program: unknown
- Utility incentives: unknown
- Utility administrative costs: unknown

Program Actors

- Market participants: Utility & customer

Program Marketing

- Unknown

Sources

- CRA International (June 2006). California's Statewide Pricing Pilot: Commercial & Industrial Analysis Update. Prepared for Working Group 3. (Accessed from CALMAC)
 - Quantum Consulting and Summit Blue Consulting (April 2006). Evaluation of 2005 Statewide Large Nonresidential Day Ahead and Reliability Demand Response Programs. (Accessed from CALMAC)
-

Evaluation of Energy Efficiency at E.ON U.S.
Appendix A: Detailed Program Information Sheets

PG&E Fully Automated Critical Peak Pricing in Commercial Buildings

Program Overview

- Program goals: As evaluations of California pricing programs demonstrated that customers have limited knowledge of how to reduce demand under CPP, this pilot program was developed to test the effectiveness of fully-automated CPP demand response systems.
- Program type: Demand response, critical peak pricing
- Program sector: Commercial
- Financing approach:
 - Customers were on TOU rate during non-CPP periods
 - CPP has two rate tiers: Moderate CPP is from noon-3:00 @ 3x on-peak TOU rate, and High CPP is from 3:00 to 6:00 @ 5x on-peak TOU rate

Program Description

- Program delivery mechanism: PG&E's voluntary CPP program operates May 1 through October 31. CPP events triggered by temperature; maximum of 12 per year. Program worked with customers to determine their two-level DR control strategies (for medium and high CPP) and customer Energy Management Control System (EMCS) were programmed accordingly.
- Target customer sector: Large commercial facilities (participants included office buildings, schools, retail chains, a museum, a laboratory, 2 data centers, and a postal facility). Eligibility requirements included: participation in PG&E's voluntary CPP rate; installed & functioning EMCS (web-enabled preferred); interval meter connected to PG&E's DR communications system (InterAct II).
- Services provided to program participant: LBNL provided participants with either the web-service program source code or Internet relay device depending on the EMCS interface option they chose. LBNL provided technical assistance with setting up systems required for automated demand response.
- Unique characteristics of the program:
 - No customer action required at time of CPP event, aside from the option to override the CPP signal if desired.
 - Customers could choose between a number of different devices for communications between the building EMCS and the PG&E DR Automation Server: (1) standard Internet relay device which requires some configuration programming and firewall adjustments (installed cost of \$2,200); (2) Client & Logic with Integrating Relay (CLIR) Box which is a self-configuring Internet relay that can be used in most commercial buildings (installed cost of \$2,800); and (3) Internet gateway device (installed cost of \$12,000-\$25,000 including programming, but customers who selected the Internet gateway option already had the necessary hardware installed).
- Key steps/challenges involved in the development of the program: Program recruitment began in May, which was later than optimal for summer peak demand reduction.

Program Performance

- Participation (2005):
 - 12 facilities
 - 2 million square feet
- Demand reduction
 - Average demand savings for all 12 sites was 1,000 kW during CPP
 - Total demand reduction potential of 2,351 kW from enrolled sites
 - Average demand reduction per facility was 8%, with a maximum demand reduction of 28% at the best-performing facility
- Cost effectiveness:³⁴
 - \$26/kW
 - Average cost per customer: \$4,700

Program Financing

- Total cost of EMCS programming and Auto-CPP communication system installation and configuration: \$61,291
- Utility administrative expenses: Unknown

Program Actors

- 3rd party involvement: Pilot program research was conducted by Lawrence Berkeley National Lab.

Program Marketing

- PG&E Account Managers identified eligible customers; outreach consisted of emails with program flyer and phone calls. Additional outreach through program presentations at relevant meetings/conferences
-

³⁴ Based on total EMCS programming and communication system installation cost of \$61,291 and total demand reduction potential of 2,351 kW.

Evaluation of Energy Efficiency at E.ON U.S.
Appendix A: Detailed Program Information Sheets

Sources

- Lawrence Berkeley National Laboratory (August 2006). Participation through Automation: Fully Automated Critical Peak Pricing in Commercial Buildings. Proceedings of the ACEEE 2006 Summer Study. Available at: <http://drrc.lbl.gov/pubs/60614.pdf>
 - Demand Response Research Center (April 2006). Automated Critical Peak Pricing Field Tests: Program Description and Results. [LBNL Report No. 59351.] Available at: <http://drrc.lbl.gov/pubs/59351.pdf>
-

Commercial Prescriptive Programs

- Nevada Power Company Sure Bet Program
- We Energies/Focus on Energy Prescriptive Incentive Program
- California IOUs Express Efficiency Program

Nevada Power Company Sure Bet Commercial Customer Incentives

Program Overview

- Program goals: Create cost-effective energy savings and demand reductions in the CI&I market
- Program type: Prescriptive rebate
- Program sector: Commercial, industrial, and institutional
- Financing approach: Except for incentives for some capital-intensive measures, incentive levels are generally intended to buy down payback periods to approximately two years. Custom measures are paid at \$0.03/kWh saved and \$100/peak kW reduced. For hard-to-reach customers that rent, incentives are structured to ensure payback within the lease term. Incentives are paid on a one-time basis upon installation of the energy efficiency measure(s).

Program Description

- Program delivery mechanism: Program is implemented by a third party contractor.
- Target customer sector: All commercial, industrial, and institutional customers are eligible to participate. In 2006, 25% of funding set aside for small customers and hard-to-reach customers (primarily Spanish speaking, in low income communities, and customers and renters with annual electric demand below 100 kW) are offered higher incentives as well as turnkey direct installation services.
- Services provided to program participant: The program offers prescriptive incentives for lighting, cooling, motors, refrigeration and vending machine controls. In addition, custom incentives are offered for any measure not covered under the prescriptive program that results in verifiable energy or peak demand savings. The Sure Bet program also offers building optimization services. For hard-to-reach customers, the program offers direct install incentives and services.
- Unique characteristics of the program: Program minimizes lost opportunities by providing prescriptive, custom, and direct install measures, as well as building optimization services.
- Key factors that led to the portfolio's success or failure: Program has been very popular with customers; 2006 program was fully subscribed for large customers by March.

Program Performance

- Participation (2005): 153
- Energy savings (2005): 40,928,341 kWh
- Demand reduction (2005): 5,634 kW
- Energy savings per participant served:
 - 267,505 kWh
- Demand reduction per participant served:
 - 36.8 kW
- Cost-effectiveness
 - Utility cost per kWh: \$0.04
 - Utility cost per kW: \$296.15

Program Financing

- Gross cost of program (2005): \$1,668,516
- Utility incentives (2005): \$1,004,686
- Utility administrative costs (2005): \$663,830

Program Actors

- 3rd party involvement: implementation contractor provides program services.
- Market participants: Utility, customers, implementation contractor.

Program Marketing

- In hard-to-reach market segments, customer acquisition involves door-to-door canvassing.

Sources

- Nevada Power Company (June 2006). Project Data Sheet: Sure Bet Commercial Customer Incentives. (From 2006 IRP filing).

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We Energies/Focus on Energy Prescriptive Program

Program Overview

- Program goals: Motivate commercial, government, institutional and industrial energy consumers to select high efficiency options when making purchasing decisions by providing simple, expedited incentives for selected common cost-effective energy efficiency measures.
- Program type: Prescriptive rebate
- Program sector: Commercial, industrial, and institutional
- Financing approach: Offers set incentive levels for replacement of less efficient equipment on a one-for-one basis with pre-qualified higher efficiency equipment.

Program Description

- Program delivery mechanism: Program is implemented by a third party contractor.
- Target customer sector: CI&I customers of all sizes.
- Services provided to program participant: For broad set of qualifying measures, program offers prescriptive rebate upon project completion. Pre-approval is not required for incentives under \$40,000. Incentive application and documentation must be sent within 30 days of project completion.
- Unique characteristics of the program: Trade allies are an integral component of program marketing and implementation. The program implementer holds frequent trade ally outreach events to inform them about program changes, special incentive offerings, etc. Implementers also work with trade allies to identify groups of customers or market niches to target. Goal is to develop relationships with trade allies so that they incorporate program incentives into their sales process.
- Key steps/challenges involved in the development of the program:
 - As this program is a joint program offered by the utility and the State of Wisconsin's Focus on Energy program, it requires extensive and regular stakeholder communications to coordinate marketing, incentive levels, tracking systems, and EM&V.
 - To increase the share of savings attributed to non-lighting measures, the program has broadened the list of eligible measures to include a broad array of measures such as variable speed drives and energy recovery ventilators.
- Key factors that led to the portfolio's success or failure: Program participation has been boosted by limited-time bonus incentives like the High-Bay Fluorescent Promotion, and the Cool Bonus Rewards Promotion for high efficiency AC.

Program Performance

- Participation: unknown
- Demand reduction (Feb 2005-Dec 2006): 6,293 kW³⁵
- Cost per kW: \$413

Program Financing

- Gross cost of program to date (Feb 2005-Dec 2006): \$2,601,061
- Program budget (2005-2008):
 - Incentives: \$4,800,000
 - Administrative: \$1,200,000

Program Actors

- 3rd party involvement: Implementation contractor
- Stakeholders involved and roles:
 - Franklin Energy is the third party implementation contractor.
 - Trade allies registering with the program are authorized to market the program to their customers.
 - The State of Wisconsin's Focus on Energy program is the joint program implementer.

Program Marketing

- Direct marketing efforts include utility account manager referrals and mail and telephone solicitations. Program is also marketed through trade ally network.

Sources

- We Energies (March 2004). Energy Efficiency Procurement Plan. Compliance Filing Made in Response to Commission Order for Docket Nos. 5-CE-130 and 05-AE-118
- We Energies (June 2005). Energy Efficiency Procurement Plan: Prescriptive Program Revised Implementation Plan
- We Energies (February 2007). Energy Efficiency Procurement Plan, Semi-Annual Report (draft)

³⁵ Gross demand reduction as recorded in We Energies' tracking database; does not include demand reduction attributed to the state Focus on Energy program.

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California IOUs Express Efficiency Program

Program Overview

- Program goals: Assist small and medium-sized business customers to understand new technologies and install energy-efficient equipment
- Program type: Prescriptive rebate
- Program sector: Commercial
- Financing approach: Rebates for energy-efficient technologies are designed to offset the customer's initial cost. Cash rebates are paid directly to the customer or to the participating vendor as designated by the customer.

Program Description

- Program delivery mechanism: Primary program marketing and delivery efforts have been through trade allies. To ensure cost-effectiveness, each year the utility evaluates the list of prescriptive measures incented through the program and communicates rebate changes to trade allies. Program also complements the Energy Audit Program, as customers who receive an audit know how much energy savings they can expect to receive from the installation of energy efficient equipment, and what rebates they will qualify for.
- Target customer sector: Small and medium-sized commercial customers. In recent years, the focus has been on serving hard-to-reach segments of this sector.
- Services provided to program participant: Rebates and information regarding energy-efficient technologies.
- Unique characteristics of the program: Straightforward, simple program design that facilitates ease of participation, with goal of providing turnaround on rebates with in 2 to 4 weeks. Leverages trade allies for program marketing.
- Key steps/challenges involved in the development of the program: The program was originally launched by PG&E in 1983 and was implemented solely by PG&E through 1999. In 2000 Express Efficiency became a statewide program implemented by all California IOUs. Express Efficiency is currently offered by SCE and SDG&E, but PG&E now serves the target market through its Small Business Rebates program. Statewide implementation and the focus on serving hard-to-reach market segments has decreased program cost-effectiveness somewhat.
- Key factors that led to the portfolio's success or failure: Long-standing program ensured stable funding with minimal changes from year to year, a gradual lowering of incentive levels, and tightening eligibility requirements. Straightforward program design facilitates ease of participation.

Program Performance

- Participation: 8,000 participants, estimated at 5% market penetration (2001)
- Energy savings
 - 300 million kWh (2001)³⁶
 - 155 million kWh (2002)
- Demand reduction
 - 44,000 kW (2001)
 - 29,288 kW (2002)
- Energy savings per participant served (2001):
 - 37,500 kWh
- Demand reduction per participant served (2001):
 - 5.5 kW
- Cost per kW (2001): \$580

Program Financing

- Program cost (utility incentive and administrative costs):
 - 2001: \$25.4 million
 - 2002: \$11.6 million
 - 2003: \$12.3 million
- Customer cost (incremental measure cost less rebate):
 - 2001: \$14.3 million
 - 2002: \$14.7 million
 - 2003: \$15.7 million
- Cost sharing: Trade allies incur costs associated with marketing the program.
- Amount available through cost recovery mechanism: Program is funded through the California public goods charge for energy efficiency programs.

Program Actors

- Stakeholders involved and roles: Trade allies market the program to customers.
-

³⁶ Program offered higher incentives in 2001 due to the California energy crisis.

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Program Marketing

- The program is marketed primarily through trade allies. When the program was implemented exclusively by PG&E, the utility worked closely with trade allies to review annual program changes, application forms, etc. The utilities post program information on their Web site, including brochures and applications. Utility account representatives also discuss the program with customers.

Replicability/Applicability

- The Express Efficiency program design is highly replicable and has been adapted by many utilities around the country.

Sources

- Energy Trust of Oregon, Best Practices From Energy Efficiency Organizations and Programs. (2002). Available at: http://www.energytrust.org/library/reports/Best_Practices/index.html?link_programs_reports_lin1Page=3
 - ACEEE, America's Best: Profiles of America's Leading Energy Efficiency Programs. (2003). Available at: <http://www.aceee.org/pubs/u032.htm>
 - National Economic Research Associates and ICF Consulting for Commonwealth Edison Company, Review and Assessment of Frameworks for Delivering Energy Efficiency Programs. (2005).
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Commercial Custom Incentive Programs

- National Grid Energy Initiative
 - We Energies Custom Program
-

National Grid Energy Initiative, Custom Track

Program Overview

- Program goals: Offer incentives and educate customers and trade allies to promote the installation of energy-efficient equipment in commercial, industrial, and government facilities.
 - Program type: Custom rebate
 - Program sector: Commercial, industrial, institutional
 - Financing approach: Rebates are designed to cover 50% of the installed project cost.
-

Program Description

- Program delivery mechanism: The Energy Initiative program offers both custom and prescriptive rebates for lighting, high efficiency HVAC controls, variable frequency drives, and premium efficiency motors. If a prescriptive rebate does not make sense for given project, the project is routed to the custom track (custom projects currently comprise 55% of annual Energy Initiative program savings). Also, new technologies may be rebated through the custom track, and as experience is gained, a prescriptive rebate for such equipment may be developed.
 - Target customer sector: All non-residential customers are eligible, but program is currently targeting large customers.
 - Services provided to program participant: Installation is the customer's responsibility, but the program offers technical assistance regarding incentive calculation and requirements, and may also provide education/training in support of national/regional market transformation efforts in the areas of O&M, compressed air, and retrocommissioning.
 - Unique characteristics of the program:
 - By offering both prescriptive and custom incentives through the Energy Initiative program, National Grid eliminates artificial program distinctions that might be confusing to customers.
 - Education/training in support of national/regional market transformation for O&M, compressed air, and retrocommissioning
-

Program Performance

- Participation: 5,000 participants out of total market of 10,000 customers (1989-2002)
 - Energy savings (cumulative 1994-2002): 1,600,000 kWh
 - Demand reduction (cumulative 1994-2002): 55,000 kW
 - Cost-effectiveness: unknown (cost and savings data are from different time periods)
-

Program Financing

- Annual program cost:
 - 2000: \$6.5 million
 - 2001: \$11.3 million
 - 2002: \$5 million
-

Program Actors

- Market participants: Trade allies (vendors & contractors), customers in the targeted markets.
 - Stakeholders involved and roles: Trade allies assist with program marketing and sales efforts.
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Program Marketing

- National Grid markets the program to customers through its Account Managers, and also to trade allies and vendors. National Grid offers trainings, seminars, and other direct marketing approaches.
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Sources

- ACEEE, America's Best: Profiles of America's Leading Energy Efficiency Programs. (2003). Available at: <http://www.aceee.org/pubs/u032.htm>
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We Energies Custom Program

Program Overview

- Program goals: To capture cost-effective energy savings opportunities for customers making purchase decisions for equipment replacement or industrial process improvement in existing facilities, for measures not covered by Prescriptive Program rebates.
- Program type: Custom rebate
- Program sector: Commercial, industrial, institutional
- Financing approach: Incentives are structured to overcome first cost barriers; We Energies also underwrites part of the cost of technical assistance services provided (energy audits, focused studies, etc.)

Program Description

- Program delivery mechanism: Program is implemented by a third party contractor.
- Target customer sector: Commercial, industrial, institutional customers not targeted by the State's Focus on Energy program—offices, retail stores, warehouses, churches, state & federal government facilities, and certain industrial manufacturing sectors.
- Services provided to program participant: Rebates based on calculated energy savings; technical assistance that includes: (1) encouraging customers to participate in the One-to-Five program; (2) conducting comprehensive audits to identify energy savings opportunities; (3) conducting focused studies for customers who have already identified an opportunity or need; and (4) providing QA/QC of energy savings estimates produced by third parties.
- Unique characteristics of the program:
 - Offers funding for up-front technical assistance to reduce initial customer hurdles
 - Relies heavily on trade allies for marketing

Program Performance

- Participation: unknown
- Demand reduction (Feb 2005-Dec 2006): 5,167,000 kW
- Cost per kW: \$470

Program Financing

- Gross cost of program to date (Feb 2005-Dec 2006): \$2,450,980
- Program budget (2005-2008):
 - Incentives: \$4,200,000
 - Administrative: \$1,800,000

Program Actors

- 3rd party involvement: Implementation contractor
- Stakeholders involved and roles:
 - Franklin Energy is the third party implementation contractor.
 - Trade allies registering with the program are authorized to market the program to their customers.

Program Marketing

- Direct marketing efforts include utility account manager referrals and mail and telephone solicitations. Program is also marketed through trade ally network.

Sources

- We Energies (March 2004). Energy Efficiency Procurement Plan. Compliance Filing Made in Response to Commission Order for Docket Nos. 5-CE-130 and 05-AE-118
- We Energies (January 2005). Energy Efficiency Procurement Plan. Custom Program Implementation Plan
- We Energies (February 2007). Energy Efficiency Procurement Plan, Semi-Annual Report (draft)

Hard-to-Reach Commercial Programs

- Northeast Utilities Small Business Energy Advantage
- PG&E RightLights Program
- We Energies Commercial Electrical Business Assistance Program
- SDG&E Small Business Energy Efficiency Program
- National Grid Small Business Services Program

Northeast Utilities Small Business Energy Advantage

Program Overview

- Program goals: Provide cost-effective, turnkey energy saving products and services to small business customers that do not have the time, financial resources, or in-house expertise to assess and implement energy efficiency opportunities.
- Program type: Audit and direct installation.
- Program sector: C&I
- Financing approach: Program rebates are paid to the contractor; lighting retrofits receive a 50 percent rebate, while other measures receive up to 100 percent of implementation costs. Qualifying customers can receive zero percent financing to pay their share of the cost over 24 months. The loan repayment is based on the estimated energy savings resulting from the installed measures, and payments are incorporated into the customer's utility bill. Until the loan is paid off (typically less than 2 years), the customer's utility bill will be the same as it was before the measures were installed, so the customer incurs no up-front cost and there is no separate payment required for the energy efficiency upgrade.

Program Description

- Program delivery mechanism: The program is implemented through trade allies, typically lighting and mechanical engineering firms, which market the program within their assigned territories (12 allies are assigned to cover each geographic area). Contractor conducts the energy audit, provides technical advice, designs and installs the conservation measures, and arranges financing with the utility. Northeast Utilities has proprietary software for the trade allies to provide documentation of proposed projects. After approval, the trade allies complete the installation and utility staff conduct a post-installation inspection. Any incentives are paid to the contractor and zero-percent financing is arranged for the customer's component of the project cost.
- Target customer sector: Commercial customers with peak demand of less than 100 kW.
- Services provided to program participant: Program provides the energy audit, installation, rebate, and technical assistance services. Program focuses on lighting, HVAC, and refrigeration measures.
- Unique characteristics of the program: Turnkey approach minimizes burden on the customer; program provides comprehensive service with respect to energy efficiency improvement, from the assessment of opportunities, through installation and financing.
- Key steps/challenges involved in the development of the program: One challenge has been determining the minimum incentive levels necessary to ensure customer participation.
- Key factors that led to the portfolio's success or failure: Program has been successful in serving an underserved market. Customers have responded very positively to the financing option that eliminates up-front costs. Program costs have been kept down through the use of standardized energy assessment software, and relying on trade allies for marketing.

Program Financing

- Utility cost (incentives and administrative):
 - 2001: \$3 million
 - 2002: \$3.6 million
 - 2003: \$3.9 million
- Utility annual administrative costs: \$500,000
- Customer cost (incremental measure cost less rebate):
 - 2001: \$3.6 million
 - 2002: \$3.4 million
 - 2003: \$3.5 million
- Amount available through cost recovery mechanism: In Connecticut, funding is provided through the State Conservation Fund, and in Massachusetts funding is provided through the Systems Benefit Charge

Program Actors

- Small commercial customers, trade allies (contractors), utility
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Appendix A: Detailed Program Information Sheets

Program Marketing

- The program is marketed through trade allies. The utility also maintains a program Web page and conducts periodic informational mailings to promote the program.

Sources

- Energy Trust of Oregon, Best Practices From Energy Efficiency Organizations and Programs. (2002). Available at: http://www.energytrust.org/library/reports/Best_Practices/index.html?link_programs_reports_lin1Page=3
 - ACEEE, America's Best: Profiles of America's Leading Energy Efficiency Programs. (2003). Available at: <http://www.aceee.org/pubs/u032.htm>
 - National Economic Research Associates and ICF Consulting for Commonwealth Edison Company, Review and Assessment of Frameworks for Delivering Energy Efficiency Programs. (2005)
 - Connecticut Energy Efficiency Fund. Small Business Energy Advantage Brochure. Available at: http://www.cl-p.com/clpcommon/pdfs/clmbus/target/SBEA_Brochure.pdf
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PG&E RightLights Program

Program Overview

- Program goals: Achieve cost-effective energy savings by providing turnkey lighting efficiency services to a hard-to-reach commercial market segment.
- Program type: Audit and direct install
- Program sector: Small commercial
- Financing approach: No cost for Quick Saver Package; substantial funding for comprehensive lighting retrofit depending on customer's rate schedule. Approximately 30% of participants receive a comprehensive retrofit for free, and overall between 80-85% of participant costs are covered.

Program Description

- Program delivery mechanism: Program is implemented by a third party contractor, Ecology Action.
- Target customer sector: Commercial customers with demand below 500 kW located in Santa Cruz, Monterey, San Mateo, Santa Clara and San Benito Counties.
- Services provided to program participant: Initial site audit, Quick Saver Package installation (CFLs and LED exit signs), recommendations for comprehensive lighting efficiency measures, subsequent lighting retrofit installations.
- Unique characteristics of the program:
 - Negotiated pricing with local retailers, distributors, and equipment manufacturers to lower program costs and ensure adequate supply of qualified equipment (includes agreement for providing customers with replacement equipment at lowered cost)
 - Quick Saver package offers immediate energy savings, effective participation tool
- Key steps/challenges involved in the development of the program
- Key factors that led to the portfolio's success or failure: Program exceeded its savings and demand reduction goals for 2004-2005, in part due to the generous incentives and turnkey services.

Program Performance

- Participation (2004-2005): 2,488 customers out of potential market of 74,000 businesses.
- Energy savings (2004-2005): 29,832,161 kWh
- Demand reduction (2004-2005): 5,633 kW
- Energy savings per customer: 11,990 kWh
- Demand reduction per customer: 2 kW
- Incentive per customer: \$1,009

Program Financing

- Gross cost of program: Unknown
- Utility incentives (2004-2005): \$2,510,797
- Utility administrative costs: Unknown
- Amount available through cost recovery mechanism: Program is funded by public benefits charge

Program Actors

- 3rd party involvement: Program is implemented by a third party contractor, Ecology Action
- Market participants: implementation contractor; manufacturers, distributors, and retailers selling qualified lighting products.
- Stakeholders involved and roles:
 - Ecology Action implements the program on behalf of PG&E
 - Program staff work with lighting manufacturers, distributors, and retailers to obtain discounted pricing and ensure product availability

Program Marketing

- Marketing plan: RightLights auditors perform most of the marketing, requiring very little money for outside marketing such as call centers, brochures, or additional marketing materials.

Sources

- Quantec (April 2006). Evaluation of the 2004-2005 RightLights Program. Program Number 1445-04. Analysis prepared for Ecology Action. Available at: http://www.calmac.org/publications/Rightlights_report_042106_final.pdf
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We Energies Commercial Electrical Business Assistance

Program Overview

- Program goals: Identify and install electric conservation measures in small businesses, churches and not-for-profit social service organizations
- Program type: Audit, direct install, and rebate
- Program sector: Commercial
- Financing approach: Direct install measures offered at no cost to customer; prescriptive/customer incentives are designed to cover a significant portion of the incremental cost of additional measures.

Program Description

- Program delivery mechanism: Implementation contractor provides all program services.
- Target customer sector: Commercial customers with aggregated peak demand below 100kW; churches and social service agencies. (Public schools, municipal, state, and federal facilities are excluded from participation as they are served by the state Focus on Energy program.)
- Services provided to program participant: Provides outreach and technical and financial assistance to help identify and install electric conservation measures in hard-to-reach market segments.
- Unique characteristics of the program:
 - Combines education, energy assessment, direct installation services with prescriptive/custom rebate.
 - Program minimizes lost opportunities by using same design/approach as a similar natural gas conservation program.

Program Performance

- Participation: Program is currently in the early stages of implementation and is designed to run for approximately one year.
- Planned demand reduction: 700 kW
- Planned cost-effectiveness: \$1,143/kW

Program Financing

- Program budget
 - Total budget: \$800,000
 - Incentive budget: \$610,000
 - Admin budget: \$190,000

Program Actors

- 3rd party involvement: implementation contractor
- Stakeholders involved and roles:
 - Implementation contractor provides all program services
 - Outreach/marketing through neighborhood and affinity-based associations, churches, nonprofits

Program Marketing

- Proactive marketing in targeted communities through neighborhood associations and affinity groups, churches, and not-for-profit organizations. Program may also canvas retail customers.

Sources

- We Energies (August 2006). Program Template: Commercial Electrical Business Assistance Program.
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San Diego Gas & Electric Company Small Business Energy Efficiency (SBEE)

Program Overview

- Program goals: Promote energy efficiency improvement among nonresidential customers that have historical low participation rates in other programs that require customers to pay a portion of the measure cost.
- Program type: Audit & install
- Program sector: C&I
- Financing approach: Utility subsidizes cost of energy assessment and direct installation.

Program Description

- Program delivery mechanism: Contracts are awarded to implementation contractors to provide energy assessment and installation services.
- Target customer sector: Nonresidential customers with demand less than 20 kW.
- Services provided to program participant: Customers receive a complete energy assessment to identify installation opportunities. Cost-free direct installation of lighting measures (CFLs, T8 & T5 fixtures, exit signs, occupancy sensors) is provided to qualifying customers.
- Unique characteristics of the program: The program achieves a higher level of participation from renters than for the statewide Express Efficiency program (California IOUs) targeting a similar market, indicating that the program successfully overcomes traditional barriers to renter participation.
- Key factors that led to the portfolio's success or failure: Full subsidization of assessment and installation.

Program Performance

- Participation (2004-2005)
 - 1,572 participants
- Energy savings (2004-2005)
 - 4,207,536 kWh
- Demand reduction (2004-2005)
 - 1,461 kW
- Energy savings per participant served:
 - 2,677 kWh
- Demand reduction per participant served:
 - 0.93 kW
- Cost effectiveness: unknown

Program Financing

- Gross cost of program: unknown
- Utility incentives: unknown
- Utility administrative costs: unknown
- Amount available through cost recovery mechanism: Program is funded by public benefits charge.

Program Actors

- Utility, assessment contractor, installation contractor, small nonresidential customers

Program Marketing

- Unknown

Source

- ECONorthwest, Evaluation of the 2004-2005 Small Business Energy Efficiency Program, San Diego Gas & Electric Company. (2006). Available at: http://www.calmac.org/publications/SBEE_Eval_Report_Final_CMAC.pdf
- Similar (but expanded) program proposed for 2006-2006 programs, Small Business Super Saver. Information available at: <http://www.sdge.com/tm2/pdf/1769-E.pdf>

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National Grid Small Business Services Program

Program Overview

- Program goals: Complete energy efficiency projects in market segment that has substantial barriers to energy efficiency improvement.
- Program type: Audit and direct installation.
- Program sector: C&I
- Financing approach: National Grid pays 80 percent of total project costs, and customer may receive zero-interest financing for the remaining cost for up to 24 months.

Program Description

- Program delivery mechanism: Implementation contractors are selected through a competitive bidding process (typically three contractors are engaged in providing program services at one time.)
- Target customer sector: Commercial customers with average monthly demand of less than 200 kW or annual energy use less than 40,300 kWh. Customers typically have large lighting load relative to total load, and historical reluctance/inability to implement energy efficiency improvements.
- Services provided to program participant: Program targets lighting upgrades, energy-efficient time clocks, photo cells for outdoor lighting, occupancy sensors, programmable thermostats, and refrigeration measures. (In 2003 program provided HVAC testing and diagnostic services but those are not currently being offered.) Customers receive energy audit, results, measure installation services, and financing.
- Unique characteristics of the program: Program provides comprehensive service with respect to energy efficiency improvement, from the assessment of opportunities, through installation and financing. Utility also provides contractor training to support in-field AC diagnostic services.
- Key factors that led to the portfolio's success or failure: Provides comprehensive services to hard-to-reach market segment, offers substantial subsidies for energy audit as well as measure installation.

Program Performance

- Participation:
 - 34,633 (cumulative 1990-2002)
 - 1,676 (annual 2002)
 - 33% of audited facilities elect to install measures
- Energy savings:
 - 2,593,347,000 kWh (cumulative 1990-2002)
 - 13,648,000 kWh (annual 2002)
- Demand reduction:
 - 65,700 kW (cumulative 1990-2000)
 - 4,500 kW (annual 2000)
- Energy savings per participant served:
 - 74,881 kWh (cumulative)
 - 8,143 kWh (2002)
- Demand reduction per participant served:
 - 2 kW (cumulative)
 - 2.8 kW (2002)
- Cost-effectiveness
 - Utility cost per kW (2002): \$221
 - Utility cost per kWh (2002): \$0.07
 - Total cost (utility + customer) per kW (2002): \$1,049
 - Total cost (utility + customer) per kWh (2002): \$0.36

Program Financing

- Utility cost (incentives and administrative):
 - 2001: \$1,483,000
 - 2002: \$993,950
- Customer cost (incremental measure cost less rebate):
 - 2001: \$5,481,399
 - 2002: \$3,728,371

Program Actors

- Small commercial customers, trade allies (contractors), utility
-

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Program Marketing

- Program is marketed by implementation contractors, who contact potential customers by telephone and direct mail. Leads are also referred by utility account executives.

Sources

- ACEEE, America's Best: Profiles of America's Leading Energy Efficiency Programs. (2003). Available at: <http://www.aceee.org/pubs/u032.htm>
 - National Grid. Small Business Program Web site for Massachusetts customers. Available at: http://www.nationalgridus.com/masselectric/business/energyeff/3_small.asp
-

Commercial Targeted Sector Programs

- California IOUs EnergySmart Grocer Program
- Northwest Energy Efficiency Alliance BetterBricks Grocery Initiative

California IOUs EnergySmart Grocer Program

Program Overview

- Program goals: Promote the installation of energy-efficient refrigeration, lighting, and HVAC measures by independently-owned food retailers.
- Program type: Targeted sector, prescriptive rebate
- Program sector: Commercial
- Financing approach: Combination of direct-install measures and financial incentives for low-cost and more extensive retrofit measures.

Program Description

- Program delivery mechanism:
 - Third party contractor (PECI) implemented the program, conducted energy audits, made recommendations, and provided technical and project management assistance.
 - Network of participating contractors were also used to identify and implement low-cost energy saving measures w/out conducting a full energy audit, and also implemented more extensive retrofits identified by PEGI.
- Target customer sector: Independently owned food retailers.
- Services provided to program participant: Program provides information, technical assistance, and financial incentives to promote energy-efficiency upgrades.
- Unique characteristics of the program: Audit process is standardized and streamlined through the use of the GrocerSmart audit tool developed by PEGI. Tool analyzes loads, case types, compressor and condenser configurations, auxiliary loads and climate conditions, and also tracks detailed retailer audit information, interest in opportunities, bids, and the technical review of bids.
- Key steps/challenges involved in the development of the program:
 - Evaluation found that more education was needed for store personnel regarding ASH control systems (particularly in cases where ASH control systems were installed by contractors meaning no energy audit was conducted), and recommended developing a 1-page users guide as a leave-behind.
 - Evaluation found a high failure rate for CFLs in freezer applications.
- Key factors that led to the portfolio's success:
 - Mix of program elements (direct install to more comprehensive retrofits) to reduce participation barriers.
 - Technical complexity and variety of refrigeration systems in the market requires customizable approach to capturing energy efficiency.
 - Use of trade allies to access hard-to-reach market segments (liquor stores & convenience stores), providing contractors with promotional materials as well as training to improve service levels.
 - Streamlined audit process that minimizes customer time commitment.

Program Performance

- Participation (2004-2005):
 - 359 audits completed
 - 1,357 stores completed retrofits³⁷
- Annual energy savings (2005): 54,836,000 kWh
- Cumulative projected energy savings (2004-2023): 548,981,000 kWh
- Annual demand reduction (2005): 12,736 kW³⁸
- Energy savings per participant served: 40,410 kWh
- Demand reduction per participant served: 9 kW
- Cost-effectiveness (2004-2005 program plan)³⁹:
 - \$0.13/kWh
 - \$911/kW
 - \$5,571/participant

³⁷ The number of stores receiving retrofits is greater than the number of stores receiving audits because: (1) some stores implemented retrofits in 2004-2005 that received audits during the 2003 program and (2) trade allies participating in the program actively pursued installation of measures that did not require audits (primarily strip curtains and door gaskets).

³⁸ The evaluation reports annual peak demand reduction of 12,736 MW, but this appears to be a units error.

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Program Financing

- 2004-2005 program budget: \$7,476,534
- Amount available through cost recovery mechanism: Program is funded through the California public goods charge for energy efficiency programs.

Program Actors

- 3rd party involvement: Implementation contractor (PECI) and network of participating contractors/trade allies.

Program Marketing

- PEGI developed promotional materials for trade ally use

Sources

- PWP, Inc. (June 2006). Final Evaluation, Monitoring, and Verification (EM&V) Report for the EnergySmart Grocer Program, 2004-2005. [PEC0002.01]. Submitted to the Energy Division, California Public Utilities Commission
 - California Public Utilities Commission (August 2001). Interim Opinion Adopting Funding for 2004-2005 Energy Efficiency Programs and Studies, Attachment I: PGC-Funded Program Budgets and Energy Savings Targets. [Rulemaking 01-08-028]. Available at: http://www.cpuc.ca.gov/published/comment_decision/31695.htm
 - PEGI. BPA EnergySmart Grocer presentation. Available at: http://www.bpa.gov/energy/n/Utilities_Sharing_EE/Utility_Brown_Bag/ppt/BrownBag-Grocery_10-25-06.ppt#258,1,Slide 1
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³⁹ No data on actual 2004-2005 program expenditures are available.

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Northwest Energy Efficiency Alliance BetterBricks Grocery Initiative

Program Overview

- Program goals: Within targeted vertical markets, the BetterBricks goal is to change energy-related business practices to achieve energy efficiency in building & facility operations as well as building design.
- Program type: Targeted sector, market transformation
- Program sector: Commercial
- Financing approach: Program services and support are provided at no cost to participating customers

Program Description

- Program delivery mechanism:
 - Program manager and market specialist provide direct training/education/information/marketing support to store staff.
 - Key trade allies are trained to promote better energy management for their customers. For example, the program plans to develop a high performance maintenance service package with refrigeration contractors to provide O&M, tune-ups, and retrocommissioning services.
- Target customer sector: Regional grocery wholesalers and larger independent retail chain operators with 5-35 stores. (National chains are not currently targeted through the program.)
- Services provided to program participant: Program is in the process of developing a number of informational tools to promote better energy management practices in target market (most are still in development): (1) benchmarking tool; (2) best practices manual; (3) life-cycle costing; (4) maintenance service package to be offered by trade allies; (5) new construction guide; (6) energy action plan template; (7) education and training materials/services; (8) marketing materials.
- Key steps/challenges involved in the development of the program:
 - Getting the attention of grocery store contacts has been more difficult than anticipated
 - Development of tools and services has taken longer than planned
- Key factors that led to the portfolio's success or failure: The main challenge has been NEEA's slow internal process for developing the planned tools. Relationships have been established with retailers, but few of the proposed tools have been developed or market tested to date.

Program Performance

- Participation: The program has established relationships with 6 regional chains and has had preliminary contacts with 2 national chains
- Energy savings per participant served: The program does not have kW or kWh goals as it is a market transformation program.
- Cost-effectiveness: Unknown

Program Financing

- Gross cost of program: Unknown
- Utility incentives: The program refers participating grocers to utility rebate programs where appropriate.

Program Actors

- 3rd party involvement: The program trains trade allies to promote better energy management practices.

Program Marketing

- Program is focusing initial efforts on working with the 6 retailer chains they have established relationships with. Once those relationships have demonstrated successes, case studies and web-based resources will be developed to promote the approach to non-participating retailers.

Sources

- Research Into Action, Inc. (March 2007). Better Bricks Grocery Initiative: Market Progress Evaluation Report #2. Available at: <http://www.nwalliance.org/research/reports/07-167.pdf>

Targeted Process Programs

- NSTAR ENERGY STAR Benchmarking Program
 - Portland General Electric Existing Building Commissioning Program
 - San Diego Gas & Electric Company Retrocommissioning Program
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NSTAR ENERGY STAR Benchmarking Program

Program Overview

- Program goals: Use facility energy benchmarking as an impetus for implementing energy efficiency improvements
- Program type: Targeted process, benchmarking
- Program sector: Commercial, institutional
- Financing approach: Program provides the following services at no cost to the customer: (1) benchmarking training and support; (2) facility walkthrough and Energy Efficiency Opportunity Assessment (EEOA); (3) ongoing assistance with implementing the recommendations and continued benchmarking efforts; (4) financial incentives through other NSTAR programs. Customers were not required to implement the recommended energy efficiency improvements outlined in the EEOA, but NSTAR targeted customers that were deemed most likely to implement recommendations.

Program Description

- Program delivery mechanism: NSTAR contracted with ICF to provide program design and implementation assistance.
- Target customer sector: Mid-sized commercial facilities that can be benchmarked using EPA's Portfolio Manager benchmarking tool (office buildings, K-12 schools, hospitals, medical offices, supermarkets and grocery stores, hotels and motels, bank branches, courthouses, financial centers, residence halls, and warehouses).
- Services provided to program participant:
 - Individual training on the use of Portfolio Manager and assistance in benchmarking their facility.
 - EEOA walkthrough and report highlighting energy efficiency improvement opportunities and available NSTAR incentives.
 - Ongoing technical and educational support and incentives through other NSTAR programs. (Benchmarking support continues till facility energy use has been benchmarked for one year.)
- Unique characteristics of the program: Guides and assists customers through a comprehensive process, from an initial energy performance rating through the action steps to implement efficiency improvements.
- Key steps/challenges involved in the development of the program:
 - Program originally targeted large customers, but later determined that the program was better-suited to serve consumers in the mid-sized range with less energy expertise and fewer resources.
 - Template for EEOA report had to be simplified to reduce the amount of site-specific customization required.
- Key factors that led to the portfolio's success or failure
 - Leverages ENERGY STAR brand through use of EPA's Portfolio Manager benchmarking tool.
 - Provides tailored individual assistance, guidance, and support, particularly in terms of getting customers to use the Portfolio Manager tool.
 - Reduces lost opportunities by identifying low cost and more comprehensive energy efficiency improvement opportunities.
 - Program provides impartial advice that helps customers evaluate vendor proposals.

Program Performance

- Participation (2003-2006):
 - 64 buildings have been benchmarked totaling 16 million square feet of floor space.
 - 50% of customers have taken action to improve energy performance.
- Energy savings: Unknown
- Demand reduction: Unknown
- Cost-effectiveness: \$0.03-\$0.04/kWh

Program Financing

- Gross cost of program: Unknown
- Utility incentives: Unknown
- Utility administrative costs: Unknown

Program Actors

- 3rd party involvement: Contractor provides implementation support

Program Marketing

- Targeted outreach to customers meeting eligibility requirements. Program Web site.
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Source

- Ed McGlynn, Mike Mernick, Sara Lisauksas (October 2004). *NSTAR's ENERGY STAR Benchmarking Initiative: Results from a Year in the Field.*
 - EPA (February 2007). *Benchmarking: Responding to End-User Interest in Increased Utility Provided Services. Discussion Draft Paper for NAPEE Sector Collaborative on Energy Efficiency*
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Portland General Electric Existing Building Commissioning Program

Program Overview

- Program goals: Achieve energy savings through systematic process of identifying and resolving performance problems.
- Program type: Targeted process, RCx
- Program sector: Commercial & industrial
- Financing approach:
 - PSE covers cost of initial RCx provider assessment that is required for development of SOW (2-3 days of work and includes interviews with building staff).
 - Customer agrees up front to implement all measures with payback of less than 2 years, and is reimbursed for the cost of the RCx services upon completion of these installations.

Program Description

- Program delivery mechanism: Services are conducted by qualified commissioning providers.
- Target customer sector: Commercial & industrial customers are pre-screened based on physical condition of building systems, current energy use, and availability of building data.
- Services provided to program participant: RCx assessment
- Unique characteristics of the program: Program was one of the first RCx programs implemented in the country, but was discontinued due to deregulation.

Program Performance

- Participation:
 - 27 buildings in 2002
 - 47 buildings from 1998–2002
- Energy savings:
 - 6,547,170 kWh in 2002
 - 18,484,169 kWh from 1998-2002
- Demand reduction:
 - 747 kW in 2002
 - 2,100 kW from 1998-2002
- Energy savings per participant served: 242,488 kWh (2002)
- Demand reduction per participant served: 28 kW (2002)
- Cost-effectiveness:
 - \$0.04/kWh
 - \$388/kW

Program Financing

- Gross cost of program: \$290,000 in 2002
- Cost sharing: Customer incurs cost of implementing all savings measures with payback of less than 2 years.

Program Actors

- 3rd party involvement: Commissioning providers

Program Marketing

- Marketing plan: unknown

Sources

- ACEEE, *America's Best: Profiles of America's Leading Energy Efficiency Programs*. (2003). Available at: <http://www.aceee.org/pubs/u032.htm>
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San Diego Gas & Electric Company Retrocommissioning Program

Program Overview

- Program goals: Improve the performance of energy-using equipment in existing buildings by focusing on optimizing mechanical equipment and related controls.
- Program type: Targeted process, RCx
- Program sector: Commercial
- Financing approach: Incentive amounts are unknown. Original incentives were based on measure savings; partway through program implementation additional incentives for the process of implementing RCx recommendations were added.

Program Description

- Program delivery mechanism: Implementation contractor (PECI) administered the program, and issued RFP for qualified commissioning providers to provide program services.
- Target customer sector: large commercial building owners and managers.
- Services provided to program participant: RCx investigation of energy savings opportunities; assistance with implementation of RCx recommendations (operational, process, and measure-oriented).
- Unique characteristics of the program: To ensure savings persistence, program process involves establishment of a tracking system in the post-implementation M&V stage.
- Key steps/challenges involved in the development of the program:
 - Program staff noted that RCx programs require long timeline to establish relationships with building owners/managers and sell the process. Program deadline was extended, but some staff felt 2-year timeframe was not enough. Longer timeframes are also needed to accommodate customer budget cycles.
 - Need for customer buy-in at multiple levels (engineering/facility staff as well as executive management).
 - Up-front customer payment was required for investigation; evaluation recommended changing this requirement to increase participation.
- Key factors that led to the portfolio's success or failure:
 - Experienced RCx program administrator that understood what works and what doesn't.
 - Flexibility as each customer's needs are different.
 - Establishing strong commissioning protocols in a useful workbook format for RCx providers, and also providing adequate provider training.

Program Performance (based on 2004-2005 program evaluation)

- Participation: 4 customers
- Annual energy savings: 9,888,836 kWh
- Annual energy savings per participant served: 2,472,209 kWh
- Cumulative energy savings (20-year): 78,985,000 kWh
- Annual demand reduction: 1,465 kW
- Cumulative demand reduction (20-year): 1,560 kW
- Cost-effectiveness: ex-post TRC is 3.933

Program Financing

- Gross cost of program: unknown
- Utility incentives: unknown
- Utility administrative costs: unknown

Program Actors

- 3rd party involvement: program was administered by PECI
- Stakeholders involved and roles:
 - Program administration—implementation contractor PECI
 - Service providers—commissioning providers selected through RFP process (under contract with PECI)
 - Customers—large commercial building owners and managers

Program Marketing

- Marketing approach: SDG&E was originally supposed to market the program through account managers, but this responsibility was transferred to PECI after account managers were minimally engaged. PECI tried a number of marketing approaches. The most successful approach in terms of lead generation was face-to-face networking through the Chamber of Commerce and the San Diego Regional Energy Office. Less successful approaches included direct mail and advertising in a local business journal.
 - Marketing materials: For future programs, PECI recommends developing a customer-oriented Executive Briefing Package that would outline program requirements and benefits, provide local contact information, and a step-by-step outline of program participation and incentives.
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Sources

- Itron (February 2007). PECl San Diego Retrocommissioning Program EM&V: SDG&E Service Area. CPUC Evaluation ID 1381-4. Prepared for Portland Energy Conservation, Inc. Available at: http://www.calmac.org/publications/PECl_RCxProgram_FinalReport.pdf
-

Education Programs

- Nevada Power Energy Education
- Building Operator Certification Program
- Southern California Edison Integrated School-Based Program

Nevada Power Energy Education

Program Overview

- Program goals—Provide resources to affect residential and commercial usage patterns, and improve the market for energy efficient buildings and products
- Program type—Education
- Program sector—Residential, Small Commercial, Commercial New Construction
- Financing approach—funded through DSM bill surcharge

Program Description

- Program delivery mechanism—Appearances at, and sponsorship of, trade shows. Support for builders through ENERGY STAR Homes Program. Creation of professional development classes for small commercial building operators.
- Target customer sector—Residential and commercial
- Services provided to program participant—Opportunities to increase energy savings for residential and small commercial customers. Professional certification for small commercial building operators.
- Unique characteristics of the program—Covers various sectors and sub-sectors. Changes to program made each year to incorporate new technologies, educational methods.
- Key steps/challenges involved in the development of the program
- Key factors that led to the portfolio's success or failure—follow-up with class participants

Program Performance

- Participation—thousands of contacts made at trade shows, multiple classes
- Non-savings program

Program Financing

- Annual budget increasing to \$400,000 between 2007 and 2009
- Sponsorship of trade shows, conferences, and professional certification classes
- Cost sharing—co-sponsorship and organization with business and professional associations
- Amount available through cost recovery mechanism - none

Program Actors

- Nevada Power, and various local organizations
- General public—through home and trade shows
- Business associations—MAP (Management Assistance Partnership) and FOCUS (Facility Operator Certification for Utility Systems)
- Professional associations—Southern Nevada Home Builders Association, US Green Building Council

Program Marketing

- Partnership with Southern Nevada ENERGY STAR Rated Homes joint marketing coalition

Replicability/Applicability

- T.B.D.

Sources

- Nevada Power 2006 IRP Filing—Energy Education project data sheet
-

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Building Operator Certification Program

Program Overview

- Program goals—Teach the basic and advanced skills of building operations and maintenance, building systems, and techniques of energy efficiency to building operators
- Program type—Professional education
- Program sector—Commercial and industrial (building operators)
- Financing approach—Cost-sharing between utilities and students

Program Description

- Program delivery mechanism—Classes
- Target customer sector—Commercial and industrial building operators
- Services provided to program participant—Multi-course program, onsite studies, take-home assignments, three year certification
- Unique characteristics of the program—Two levels of certification with continuing education; training in a variety of building practices; in the Northwest, two organizations serving the differentiated urban and rural markets; high levels of customer satisfaction
- Key factors that led to the portfolio's success or failure—design of program has led to financial self-sufficiency

Program Performance

- Participation—More than 3,600 certifications awarded since 1996
- Penetration—10% current penetration, estimated to reach 40% in 2010 (Northwest)
- Energy savings—20,000 MWh saved annually; 172,000 MWh saved cumulatively between 1997-2000 (Northwest)
- Participant savings - 172 MWh and 1.4 cents per kWh saved per participant (Northwest); 238 MWh saved per participant, and 0.35 kWh/square foot per participant (Northeast)
- Cost savings—\$28,000 saved per participant (Northeast)
- Cost-effectiveness - BC ratio = 7.8 (Northwest)

Program Financing

- Annual budget increasing to nearly \$600,000 in 2005
- Cost sharing—between utilities and students, scholarships also available

Program Actors

- Building operations staff
- Sponsorship by various utilities in the Northeast, Northwest
- Administered by regional energy efficiency alliances and other organizations

Program Marketing

- Marketing plan—includes word of mouth due to high levels of customer satisfaction

Replicability/Applicability

- Currently operating in 17 states

Sources

- ACEEE, America's Best: Profiles of America's Leading Energy Efficiency Programs
 - <http://www.theboc.info>
 - <http://www.neep.org/boc/index.html>
-

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Southern California Edison Integrated School-Based Program

Program Overview

- Program goals—Hardware installations in schools, and promotion of school and community activities that result in other savings
- Program type—Education
- Program sector—Schools
- Financing approach—Funded through CA IOUs' Public Goods Charge

Program Description

- Program delivery mechanism—Incorporation of three existing programs; 1) Living Wise—activities and kits for elementary and middle school students, 2) Green Schools—an Alliance to Save Energy (ASE) program that brings together school staff and students, 3) Green Campus—a similar program for colleges, specifically for dormitories
- Target customer sector—Schools
- Services provided to program participant—Activities and kits for students, energy trainings for school staff and students, audit training to high school and college students, light bulb exchanges, energy saving competitions.
- Unique characteristics of the program—Education program targeted to specific sub-sector. Also includes savings through CFL and low-flow showerhead measures.
- Key steps/challenges involved in the development of the program
- Key factors that led to the portfolio's success or failure

Program Performance

- Participation—1) Living Wise—10,000 students in 2006, 13,000 students in 2007, 17,000 students in 2008; 2) Green Schools—Staff training at up to 50 schools, audit training to 100 students to conduct 250 small business audits, 12,000 CFLs exchanged; 3) Green Campus—1,250 CFLs exchanged
- 3,093,000 kWh saved
- 990 kW saved (at summer peak)
- TRC = 0.30
- PAC = 0.31

Program Financing

- Three-year budget of \$5,000,000 between 2006 and 2008
- Funded through CA IOUs Public Goods Charge

Program Actors

- Southern California Edison
- School districts across utility territory
- School educators and other staff
- Students and their parents
- High school students trained as energy auditors
- College students assisting in the training of high school students

Program Marketing

- Marketing activities performed by SCE and sub-contractors
- Marketing materials made available from other existing programs, like ASE

Replicability/Applicability

- T.B.D.

Sources

- SCE, 2006-8 Final Energy Efficiency Proposed Program Plans
-

Research and Development Programs

- Nevada Power Market and Technology Trials
- California Statewide Emerging Technologies Program
- NYSERDA Research and Development Program

Nevada Power Market and Technology Trials

Program Overview

- Program goals—Assess and test innovative and energy efficient technologies for application in the residential, small commercial, and industrial markets
- Program type—Research and development
- Program sector—Residential, Small Commercial, Industrial
- Financing approach—funded through DSM bill surcharge

Program Description

- Program delivery mechanism—Proposals are received through an RFP process; about 10-13 projects are funded each year.
- Target customer sector—Residential, small commercial, and industrial
- Services provided to program participant—Co-funding, usually between \$3,000 and \$50,000 per project, and evaluation, measurement, and verification (EM&V) of project savings potential.
- Unique characteristics of the program—Covers various sectors and sub-sectors, and includes renewable and water-saving technologies. Collaboration with local research organizations. Examples include demonstration projects for solar adsorption, geothermal exchange, and water-cooled air conditioning systems.
- Key factors that led to the portfolio's success or failure—Collaboration with state of California and its utilities on an air conditioning demonstration project - beneficial since Nevada and California have similar hot and dry climates.

Program Performance

- Participation—10 to 13 projects per year
- Non-savings program

Program Financing

- Annual budget increasing to \$425,000 in 2007, from \$125,000 in 2006
- Amount available through cost recovery mechanism—DSM expenses receive addition 5% return-on-equity

Program Actors

- Nevada Power
- Local research organizations, such as University of Nevada, Las Vegas (UNLV)
- Local companies, such as a plastics manufacturing facility

Program Marketing

- RFP process

Replicability/Applicability

- T.B.D.

Sources

- Nevada Power 2006 IRP Filing—Market and Technology Trials project data sheet
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California Statewide Emerging Technologies Program

Program Overview

- Program goals—Review and assessment of emerging technologies for eventual inclusion in the state's IOUs' energy efficiency portfolio
- Program type—Research and development
- Program sector—Cross-cutting
- Financing approach—Funded through CA IOUs' Public Goods Charge

Program Description

- Program delivery mechanism—Review and assessments of technologies received through a customer “pull”—IOU customer account representatives learn about the technology from the customer, and recommend technology for inclusion in program, or technology “push”—program planners work with customer account representatives to select a demonstration site for a new technology. Program committee meets quarterly to coordinate project activities, and decide which projects proceed to review, assessment, and funding stages.
- Target customer sector—None
- Services provided to program participant—Assessments of emerging technologies. Assessments include feasibility studies, simulation analyses, field demonstrations, controlled environment tests, commercial product development, design methodologies, and tool development. Information dissemination through seminars.
- Unique characteristics of the program—Targeted to greatest potential for savings. For example, Southern California Edison (SCE) is focusing on lighting, HVAC and refrigeration, and industrial process projects.
- Key factors that led to the portfolio's success or failure—Long-standing collaboration with the state-funded research program, Public Interest Energy Research (PIER), focus on technologies that can be adapted into a successful program

Program Performance

- Participation—SCE will conduct 45 technology assessments over the three-year period.
- Non-savings program

Program Financing

- Three-year budget of \$11,000,000 between 2006 and 2008
- Funded through CA IOUs Public Goods Charge

Program Actors

- SCE, other IOUs, CEC and PIER
- IOU customer account representatives
- Customers participating as demonstration sites

Program Marketing

- Information dissemination through SCE seminars

Replicability/Applicability

- T.B.D.

Sources

- SCE, 2006-8 Final Energy Efficiency Proposed Program Plans
-

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NYSERDA Research and Development Program

Program Overview

- Program goals—Co-funding and evaluation of feasibility studies and demonstration projects across technology types
- Program type—Research and development
- Program sector—Cross-cutting
- Financing approach—Funded through New York state's System Benefits Charge (SBC)

Program Description

- Program delivery mechanism—Proposals are received through a Program Opportunity Notice (PON), usually every 2-3 years, with multiple awards. Proposals can also be received through an RFP process, with a single award. Committees consisting of NYSERDA staff, other state agency staff, and business and trade association representatives meet to decide which projects receive funding, and level of co-funding.
- Target customer sector—None
- Services provided to program participant—Co-funding, evaluation of feasibility studies and demonstration projects over a multi-year period. Information dissemination through case studies.
- Unique characteristics of the program—Funding is available for multiple uses, including feasibility studies, product development, technology transfer studies, and demonstration and commercialization projects.
- Key factors that led to the portfolio's success or failure—NYSERDA's original creation as a research and development organization, and current status as the state's energy efficiency administrator allows for collaboration and information transfer from R&D to programs. The R&D program has led to increased efficiency for furnaces, LEDs, and other technologies.

Program Performance

- Participation—varies
- Non-savings program

Program Financing

- Annual budget of \$18.5 million in 2006

Program Actors

- NYSERDA
- Sponsorship by various utilities in the Northeast, Northwest
- Administered by regional energy efficiency alliances and other organizations

Program Marketing

- Information dissemination through case studies

Replicability/Applicability

- T.B.D.

Sources

- NYSERDA website, <http://www.nyserda.org>
-

Appendix B: List of Programs Reviewed

The following Appendix provides a comprehensive list of programs reviewed during the research of this report. Programs are listed by program area, as delineated in the body of the report.

Other Audit and Weatherization Programs

- Alliant Energy Home Energy Audit
- American Electric Power C&I Energy Audits
- Arizona Public Service On-line Energy Audit
- Avista Home Energy Audit and weatherization
- Central Vermont Public Service Energy Audit
- Commonwealth Edison Home Energy Audit
- Duke Energy Small Business On-line Energy Audit and Weatherization
- Minnesota Power Energy Audit
- Xcel Energy Home energy audits
- Vectren Energy Delivery Weatherization Programs
- Eugene Water and Electric Board (Oregon) Residential rebates and loans for weatherization
- “Warm Choice”
- “Energy Savings Partners” Xcel
- “Low Income Gas Program” NSTAR
- “Low Income DSM Programs” EWEB
- “Energy Conservation Helping Oregonians”

Other Appliance Programs

- Sacramento Municipal Old Refrigerator Pickup & Recycling Program
- Utah Low Income Refrigerator Replacement Program
- Southern ComEd Residential Appliance Recycling Program

Other Lighting Programs

- Efficiency Vermont Lighting and Appliance Rebates
- NEEA ENERGY STAR Res Lighting Program

Other Home Performance with ENERGY STAR Programs

- NSTAR Residential Low-Income Program

Other Critical Peak Pricing Programs

- Gulf Power Company GoodCents Select Program

Other Custom Incentive Programs

- Xcel Custom Efficiency Program

Other Hard-to-Reach Commercial Programs

- PG&E and Southern California Edison Small Business Energy Alliance Energy Savers Program
- Southern California Edison Emerging Communities Energy Efficiency Program

Other Targeted Market Programs

- Energy Trust of Oregon Restaurant Energy Efficiency Program
- Nevada Power Cool Control Plus
- PG&E, SCE, SDG&E Commercial Food Service Program

Other Education Programs

- Gulf Power Education programs
- Indianapolis Power & Light Education programs
- Public Service New Mexico Education programs
- NorthWestern Energy (Montana) Education programs
- PG&E Pacific Energy Center
- Pepco, Delmarva Power, and Atlantic City Electric Education programs
- Energy Center of Wisconsin Education programs

Other Research and Development Programs

- California Energy Commission Public Interest Energy Research (PIER) Program