

**COMPREHENSIVE COMMERCIAL RETROFIT PROGRAMS:  
A REVIEW OF ACTIVITY AND OPPORTUNITIES**

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## **ABSTRACT**

Commercial retrofits have long been a staple of energy efficiency program portfolios. Typical retrofit programs offer set incentives for specific prescriptive measures; many also provide incentives for custom measures that do not fit easily into the prescriptive categories. While these programs have generated substantial energy savings, even greater savings can be realized by addressing the full range of retrofit opportunities in an individual building as well as interactive effects among system components or building systems. To capture these additional savings, some efficiency program operators have launched comprehensive retrofit programs designed to address whole buildings—maximizing energy savings and the associated benefits. These programs recognize the value of a systems approach that goes beyond simple equipment upgrades to identify opportunities in system design, equipment interactions, and building operations and maintenance.

This report reviews experience to date with comprehensive retrofit programs including equipment incentive, standard offer, and building performance programs operating at the national, regional, and state level. Information from program literature, evaluation reports, and interviews with program managers is used to summarize the programs, review impacts, explore what's working and what challenges have been encountered, and offer recommendations to improve the use and effectiveness of these programs.

## **ACKNOWLEDGMENTS**

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## **INTRODUCTION**

Commercial retrofits have long been a staple of energy efficiency program portfolios. Indeed, lighting upgrades formed the backbone of early efforts to garner energy savings in the commercial building stock; these efforts were supplemented with programs targeting heating, ventilation, and air conditioning (HVAC); motors; controls; and other measures. Typical programs offer set incentives for specific prescriptive measures such as upgrades of T-12 lighting systems to T-8 systems. Many also provide incentives for custom measures that do not fit easily into the prescriptive categories, such as a refrigeration system custom-designed for the customer's facility. While these programs have generated substantial energy savings, they are not designed to identify the full range of retrofit opportunities or all the unique opportunities available in an individual property, nor do they account for interactive effects among system components or building systems. In response to these limitations, some efficiency program operators have launched comprehensive retrofit programs designed to address whole buildings—maximizing energy savings and the associated benefits. Other utilities have added features to their existing programs to encourage more comprehensive projects. These programs recognize the value of a systems approach that goes beyond simple equipment upgrades to identify opportunities in system design, equipment interactions, and building operations and maintenance.

At this point, there are a number of programs supporting comprehensive retrofits that have been operating for three or more years. In this report, we look at these programs to see what we can learn from their experiences, and also review some older programs for useful lessons. We summarize comprehensive commercial retrofit approaches to date, review program impacts, explore what's working and what challenges have been encountered, and offer recommendations to improve the use and effectiveness of these programs. We cover national, regional, and state initiatives using information culled from program literature, evaluation reports, and interviews with program implementers.

## **BACKGROUND**

Many retrofit programs are organized according to equipment or end-use with little emphasis on overall building performance, system optimization, or interactions among building systems. Customers typically enter the program with a specific retrofit project in mind—often a planned replacement or single system retrofit that they have identified. Contractors bringing projects to the program often focus on those end-uses in which they are most experienced. In these cases, opportunities to capture additional savings by addressing multiple end-uses or considering potential interactive effects are lost. Comprehensive retrofits seek to capture these opportunities to maximize energy and cost savings—often providing a range of additional non-energy benefits in the process. The non-energy benefits further improve program cost-effectiveness and overall attractiveness to customers (Pearson and Skumatz 2002).

A comprehensive approach to retrofits also makes sense from a financial standpoint. By bundling low- and high-cost measures into one project, effective measures that may not meet a customer's financial requirements (e.g., payback or internal rate of return) on their own can

qualify as part of a package of measures. Larger projects also offer opportunities for cost savings since when the interactions among measures are considered, additional cost savings often result (e.g., a lighting upgrade can reduce the size of the HVAC system).

## **BARRIERS**

Despite the benefits to be gained from comprehensive retrofits, a number of barriers have limited implementation of more comprehensive projects as well as greater program activity in this area. On the demand side, it can be difficult for utilities and service providers to get customers to focus on the benefits of more comprehensive retrofit projects, particularly when customers have a more limited project or specific replacement in mind. If energy savings are not a priority, if there is no internal champion to push for a project, or if there is a limited understanding of the benefits, a comprehensive retrofit project can be a tough sell. Split incentives in commercial real estate properties and high investment hurdle rates in the private sector overall present additional barriers. In many cases, energy efficiency services providers may have a hard time identifying the appropriate decision-makers or navigating the chain of command to get projects approved.

Other supply-side barriers inhibit service providers from pursuing more comprehensive projects. For example, service providers may have limited experience with the very high efficiency technologies program sponsors support or their experience may be limited to only one or two end-use or equipment types and they may be reluctant to spend the time and effort to develop more complex projects involving additional contractors. Measurement and verification (M&V) requirements or new financing approaches may also limit interest among customers and service providers alike. For program operators, comprehensive programs are harder to administer due to their complexity and the need for greater hand-holding with customers and participating contractors.

## **PROGRAM APPROACHES**

### **Historic Experience**

In the 1980s and early 1990s, a number of utilities sponsored comprehensive retrofit programs targeted to large commercial customers as part of their portfolio of demand-side management (DSM) programs. Common program elements included energy audits; preparing specifications and soliciting bids; financial assistance in the form of loans, grants, or rebates; and operations and maintenance (O&M) or other follow-up services.<sup>1</sup> Utilities often targeted these programs to their largest customers through direct marketing by account managers. Extensive contact and assistance throughout project implementation resulted in high participation rates among the targeted audience. The high quality of services provided by the utilities coupled with often substantial financial incentives (typically covering all costs of the audit and utility services as well as 50 to 100% of measure costs) yielded high per-project energy savings and made these programs attractive to customers. However, the high

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<sup>1</sup> Specifics on programs operated by Southern California Edison, Boston Edison, Northeast Utilities, and Puget Sound Power & Light can be found in Nadel, Pye and Jordan (1994).

level of utility involvement and cost did not allow the programs to reach a large number of customers and, as utilities cut back their DSM spending in the mid-1990s, these programs were severely cut back or discontinued.

### **Recent Experience**

More recently, efficiency programs around the country have developed different approaches to capture energy savings in existing commercial buildings. While a few stand-alone commercial retrofits programs do exist, most have added new features to existing equipment retrofit programs to encourage more comprehensive projects. Other programs are focusing on whole building performance. In general, current programs can be described as:

- Elements of *equipment incentive programs* covering prescriptive and custom measures. Some programs have explicitly added special features or requirements for comprehensive retrofits; others cover comprehensive projects (and even hope to see more of them), but have not included particular features supporting them. In some cases, these programs interact with energy analysis programs that provide financial incentives and/or technical assistance for building energy studies and project feasibility studies designed to identify capital improvements and opportunities for better building O&M.
- *Standard performance contracting (or standard offer) programs* designed to encourage customers to work with energy efficiency service providers (energy service companies [ESCOs] or others). Like the conventional incentive programs just described, these programs may or may not include specific features or requirements to encourage comprehensiveness.
- *Building performance programs* that promote a whole building approach to maximize energy savings and non-energy benefits by addressing equipment upgrades, O&M improvements, and retrocommissioning, as appropriate. While these programs tend to concentrate on building O&M, there is room for addressing comprehensive retrofit opportunities within the whole buildings approach.

### *Equipment Incentive Programs*

Comprehensive retrofits are typically conducted under the “custom measures” option in traditional prescriptive incentive programs or through specialized custom programs designed to address customized equipment upgrades. Some innovative approaches have been added to these programs to encourage the completion of more comprehensive retrofits. Examples include:

- Increased incentive levels for more comprehensive projects. Utilities in New Jersey offer a 10% bonus on each incentive for projects that incorporate multiple end-uses within six months, Wisconsin Focus on Energy customers are eligible for an additional 30% Comprehensive Bonus Incentive, and Efficiency Vermont negotiates a higher incentive for more comprehensive projects.
- Interaction with energy analysis offerings to identify larger-scale opportunities. For example, Seattle City Light’s Facility Assessment Service offers multi-resource

efficiency audits to drive implementation of retrofit projects and Wisconsin Focus on Energy provides feasibility study grants to identify comprehensive projects for its Custom Incentives program.

- Requirements calling for consideration of full system impacts and interactions as a condition of the incentive program (e.g., chiller programs that require review of opportunities for chiller downsizing through lighting upgrades, pump and fan optimization, envelope improvements, etc.).

The primary goal of these programs is typically resource acquisition for energy savings and/or peak demand reductions, although some incorporate elements of market transformation programs. Programs in this category include:

- Efficiency Vermont Business Programs
- National Grid—Energy Initiative
- New Jersey SmartStart Buildings
- Northeast Utilities Custom Services Program
- Seattle City Light Energy Smart Services
- Wisconsin Focus on Energy Business Programs

This list is by no means exhaustive; rather it represents programs for which information is readily available and those that participated in interviews for this project. Table 1 summarizes elements of these programs. More detailed program descriptions can be found in the appendix.

**Table 1: Summary of Equipment Incentive Programs Discussed**

Equipment Incentive Programs	Efficiency VT	National Grid	NJ SmartStart	Northeast Utilities	Pacific Corp	Seattle City Light	WI Focus on Energy
Energy audit/assessment services — incentive to cover cost — provided by utility	X		X	X	X	X X	X
Design assistance	X	X	X	X		X	
Equipment incentives — custom measures — comprehensive bonus	X X	X X	X X	X	X	X	X X
Limits on lighting only projects					X		
Eligible measures — lighting — HVAC — controls — motors and drives — refrigeration — other	X X X X X X	X X X X X X	X X X X X X	X X X X X	X X X X X	X X X X X	X X X X X
Minimum facility size/demand			minimum annual savings of 50,000 kWh or average demand reduction of 20 kW	350 kW monthly demand; HVAC 30 tons; chillers 100 tons	20,000 sq. ft.		
Commissioning requirements		X			X		

### *Standard Offer Programs*

A number of Standard Offer (or Standard Performance Contract) Programs were launched in the 1990s to build a competitive and sustainable market for energy services. In their original incarnation, these vendor-driven programs supported both the ESCO model as well as energy efficiency services providers (EESPs) relying on more traditional fee-for-service business models (e.g., contractors, engineers, vendors, etc.). These programs encompass both resource acquisition and market transformation goals, although some have shifted to focus predominately on resource acquisition in response to local needs.<sup>2</sup>

Like the equipment incentive programs described above, some standard offer programs have adopted elements to promote comprehensive retrofit projects. For example, Bonneville Power Authority (BPA) encourages retail utilities to limit incentives for individual measures as a way to discourage cream-skimming and promote more comprehensive measures (Scanlon 2004). PG&E has moved to limit the use of incentives for lighting retrofits through its Standard Performance Program, shifting these projects to its prescriptive incentive program or limiting the portion of comprehensive project incentives allowed for lighting. Under the Texas Standard Offer Program, projects that obtain more than 65% of savings through lighting measures receive a reduced incentive. Others programs have all the necessary components to offer comprehensive retrofits to interested customers, but are not set up to specifically encourage or require them—some may consider a shift in this direction in the future (Horton 2004).

Sample programs are listed below with program elements summarized in Table 2. For more detailed program descriptions, see the appendix.

- Bonneville Power Authority Commercial and Industrial Standard Offer
- California Nonresidential Standard Performance Contract Program (NSPC)
- NYSERDA Commercial and Industrial Performance Program (CIPP)
- Texas Commercial and Industrial Standard Offer Program

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<sup>2</sup> In recent years, many of these programs have loosened measurement and verification (M&V) requirements (to allow calculated savings instead of measured savings for many measures) and have seen an increase in the number of customer self-sponsored projects. As the emphasis on promoting performance contracting has diminished, many programs increasingly resemble traditional rebate programs. For a discussion of the implications of this shift for market transformation, see the discussion in Rufo, Prah, and Sumi (2002).

**Table 2: Summary of Standard Offer Programs Discussed**

Standard Offer Programs	BPA Standard Offer	CA Standard Performance	NYSERDA	TX Standard Offer
M&V				
— measured savings		X		X
— calculated savings	X	X	X	X
Limits on lighting only projects		X		X
Eligible measures				
— lighting	X	X	X	X
— HVAC	X	X	X	X
— controls	X	X	X	X
— motors and drives	X	X	X	X
— refrigeration	X	X	X	X
— other	X	X	X	X
Minimum facility size/demand		500 kW (for large NSPC)	50,000 kWh annual savings	100 kW (or 250 for multiple sites); minimum 20 kW project savings
Commissioning requirements				

*Building Performance Programs*

In contrast to incentive and SPC programs, building performance programs start with a whole buildings perspective for reducing building energy consumption. As a result, these programs tend to stress building O&M and a systems approach to customers considering and implementing necessary equipment replacement and retrofits. Market transformation is a primary goal for most building performance programs; the programs seek to educate building owners about the benefits of optimized building energy performance and drive demand to support a robust building services industry. While these are not comprehensive retrofit programs *per se*, these initiatives deserve discussion here because of their potential to reduce building energy consumption by identifying retrofit opportunities within the larger context of overall building performance.

The U.S. Environmental Protection Agency (EPA) promotes a whole building performance approach in its ENERGY STAR Buildings Program. Through the program, building owners can benchmark their facilities’ energy performance using the ENERGY STAR energy performance rating system to suggest where there may be opportunities for improvement. ENERGY STAR offers additional informational resources and tools to help owners identify the most promising opportunities.<sup>3</sup> The program recommends a comprehensive approach for identifying and implementing building performance improvements that maximizes energy and cost savings. Key components of this strategy include:

- Assessing opportunities;
- Reducing heating, cooling, and electrical loads through retrocommissioning, lighting upgrades, and supplemental load reduction (e.g., plug loads and building shell measures); and

<sup>3</sup> More information, program resources, and tools are available on the ENERGY STAR website at [www.energystar.gov/index.cfm?c=business.bus\\_index](http://www.energystar.gov/index.cfm?c=business.bus_index)

- Upgrading HVAC systems with new, high efficiency equipment (including fans, pumps, and controls, not just chillers) that incorporate downsizing opportunities from previous load reduction activities (EPA 2001).<sup>4</sup>

A number of regional and local programs are leveraging the ENERGY STAR brand by incorporating elements of the ENERGY STAR Buildings Program into their offerings. NSTAR offers customers an incentive and assistance in benchmarking facility performance using the energy performance rating system. Projects identified through the process can be channeled into the utility's retrocommissioning and/or equipment incentive programs. The Northwest Energy Efficiency Alliance and NYSERDA are among a number of other programs using the ENERGY STAR energy performance rating system in scoping studies prepared for potential building tune-up and retrocommissioning projects. These programs are described in greater detail in the appendix.

## **COSTS AND SAVINGS**

Potential savings from a comprehensive approach are impressive. Evaluations of first-generation comprehensive retrofit programs report whole building energy savings of 11 to 26% of pre-retrofit consumption compared to 8 to 13% savings for comprehensive lighting retrofits that did not include other end-uses (Nadel and Geller 1995; Nadel, Pye and Jordan 1994). Results from one chiller retrofit program that included a comprehensive approach to install additional efficiency measures reported whole building energy savings of 14% at an average cost of \$4.50 per square foot of floor space (Fryer and Leach 1995).

An analysis of 678 ESCO projects completed between 1982 and 2000 found median project costs of \$2.50 per square foot for institutional projects and \$1.40 per square foot for private sector projects (Osborn et al. 2002). The notable difference in project costs is due to the higher number of measures installed in institutional projects, which tended to be more comprehensive. The study also looked at energy savings from a selection of the projects. In 94 projects incorporating lighting and non-lighting measures, median electricity savings were 23% of *total facility* electricity use; in 63 lighting-only projects, median savings totaled 47% of *lighting* electricity use (Osborn et al. 2002).

Our review of earlier programs found reported costs of saved energy from comprehensive retrofit programs ranging from \$0.02 to \$0.05 per kWh saved. One exception was the Boston Edison Design Plus program (nicknamed "Cost Plus") that had significantly higher costs related to its very limited marketing, extensive service offerings, and grants paying 50% of all measure costs. When several of the targeted customers dropped out for various reasons before implementing any retrofit measures, the cost of initial marketing and services was not balanced with resulting energy savings (Nadel, Pye, and Jordan 1994). In these historic programs, utility costs were similar to total resource costs given the limited customer investment in the projects (Nadel and Geller 1995). The ESCO survey (Osborn et al. 2002)

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<sup>4</sup> The 2001 ENERGY STAR Building Manual is currently undergoing revision and a substantially reworked version of the manual will be released in 2005. The new manual will better link building benchmarking with whole building performance and continuous improvement practices (Nadel 2004).

estimated a median benefit-to-cost ratio of 1.6 for institutional projects and 2.1 for private sector projects.

Per-project energy savings data is not widely available for the newer programs surveyed for this study. In some cases, measured savings data is not yet available; in other cases, the use of the calculated savings approach makes it more difficult to derive robust project energy savings estimates. A compilation of energy savings data from projects in current retrofit programs would be very useful. In a recent analysis of integrated chiller retrofits,<sup>5</sup> annual energy savings from replacement of a 550-ton chiller were estimated at 55% (more than 550,000 kWh) compared with energy savings of 37% for a simple chiller upgrade (Sachs 2001). Recent data on six chiller projects completed through National Grid's Comprehensive Chiller Initiative in 2003 report average energy and demand savings of 1,078,669 kWh and 242 kW per project (National Grid 2004). While these savings may not be typical for average comprehensive retrofit programs, it illustrates the extent of additional savings available from comprehensive retrofits.

## **WHAT WORKS AND WHAT DOESN'T**

Our review of relevant literature and program materials and discussions with program staff provided a wealth of information on the most successful elements of comprehensive retrofit programs, activities that have proven less effective, and some remaining challenges to program delivery. This section summarizes lessons learned in four main areas: (1) assessment of opportunities; (2) trade ally relationships; (3) appropriate incentives; and (4) program administration.

### **Assessment of Opportunities**

The extensive building energy audits common in the early days of DSM have largely been supplanted by less rigorous energy analyses and facility assessments. This shift reflects the recognition that many detailed energy audits end up on the shelf with little or no implementation of recommended measures. While experience to date shows that a one-size-fits-all approach to assessing energy savings opportunities is not an effective approach, some level of energy analysis is important in identifying opportunities for energy savings—particularly for comprehensive projects. Rather than requiring extensive audits for every project or eliminating analysis requirements for all projects, tailoring the requirement to meet the needs of the customer can result in more successful projects while making the most of program dollars. This approach was recommended in a recent best practices study prepared for the state of Wisconsin (PA Consulting Group 2003) and is borne out by our interviews with program implementers. For example, Efficiency Vermont typically offers a facility walk-through to assess project opportunities; however, they will help fund a full-scale audit for customers that express a high level of commitment and agree to implement recommended measures (Pilliod 2004).

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<sup>5</sup> Integrated chiller retrofits take a systems engineering approach rather than focusing on the chiller itself. Projects include a review of whole building systems to identify opportunities to reduce loads from lighting, fenestration, pumps and fans, and resized cooling towers and thereby to downsize the chiller.

In addition to its value in identifying retrofit opportunities, an energy analysis report approved by the utility or other program sponsor provides buy-in for ESCO- or EESP-sponsored projects, in turn bolstering customer confidence in the assessment and related savings projections. This has been a valuable component of the California SPC program (Marthews et al. 2002; SCE 2004).

Coupling incentives for whole building energy assessments with equipment incentives also pays off. Some programs offer to cover 50% of the cost of the assessment upfront; the incentive grows to 100% if recommended measures are implemented (e.g., Northeast Utilities), whereas others explicitly use an energy assessment program to feed equipment incentive programs (e.g., Wisconsin Focus on Energy, NYSERDA, and Seattle City Light). Energy assessments can also identify opportunities for O&M improvements that should be implemented prior to equipment retrofits to improve overall building performance. Seattle City Light includes O&M measures in its Facility Assessments—implementation of recommended O&M measures is included in project action plans prior to installation of retrofit measures and O&M measures also qualify for incentives.

Non-energy benefits are widely recognized and used to market commercial energy efficiency programs. Studies of non-energy benefits and their value to program participants are providing data to help program implementers target specific packages of measures to specific market segments (Pearson and Skumatz 2002). Program implementers should explore ways to incorporate non-energy benefits and their value into the opportunity assessment for comprehensive retrofit projects.

### **Trade Ally Relationships**

Trade allies are key to the success of commercial retrofit programs, particularly standard offer programs and others that rely on trade allies to bring customers to the program and to carry out project implementation. Listening to trade allies and including their legitimate concerns and needs is crucial to an effective program design. Educating the appropriate trade allies on what the program has to offer and why comprehensive projects make sense for their customers and their own bottom line can play a big part in ensuring program success. Building strong relationships with trade allies can encourage them to work with the program and adapt more readily to changes in program design, incentive levels, and so on.

Tools to help trade allies identify and sell building performance improvements (including comprehensive retrofits, where appropriate) can also improve program participation and increase energy savings. The ENERGY STAR Buildings Program offers many useful tools to assist building owners and contractors; many program implementers are incorporating these tools into their own suite of program materials and offerings. The Northwest Energy Efficiency Alliance has developed a toolkit of resources for service providers participating in its Building Performance Services Initiative. A number of utilities offer ongoing training and seminars to acquaint building services professionals with their programs as well as emerging technologies and new techniques.

Experience has shown the benefits of working with ESCOs or other EESPs to sell comprehensive projects to customers. In a survey of New York CIPP participants, 90% of

respondents reported that information and advice from building service professionals was a crucial factor in their decision to participate in the program (NYSERDA 2004). And in the case of California's Nonresidential Standard Performance Program, when the number of self-sponsored projects completed under the program grew (as M&V requirements were eased), the number of multiple end-use projects steadily declined (Marthews et al. 2002). Building services professionals are often better qualified to identify opportunities for more comprehensive projects, while customers are more likely to move forward with a single retrofit project they have identified.

### **Appropriate Incentives and Requirements**

Getting the most out of a comprehensive retrofit program depends in part on attracting customers to participate by getting the incentives and requirements right. This is particularly important when comprehensive projects are included in broader incentive programs that cover more limited retrofits as well. As noted above, to encourage more comprehensive projects, a number of programs have introduced additional incentives for comprehensive retrofits or set limits on incentives for single-measure retrofits or multi-measure retrofits for a single end-use (especially lighting). Another approach that has been proposed is to offer higher incentives for emerging technologies and higher payback measures rather than determining incentive levels by end-use as a way to increase adoption of these technologies (SCE 2004). While it is too early to draw a clear picture of the effect on the number of comprehensive projects completed, these approaches appear promising.

Requirements for a comprehensive approach are particularly critical in chiller replacement projects. Addressing other loads at time of chiller replacement allows for downsizing of the system, maximizing the energy savings and overall cost savings to the customer. National Grid and Public Service Gas & Electric (which offers the New Jersey SmartStart Buildings program in its service territory) offer special programs to encourage a comprehensive approach to chiller system retrofits and optimization. And, as mentioned above, the ENERGY STAR program also targets chiller replacement as a key opportunity for more comprehensive retrofit activity.

To ensure that the retrofit yields the maximum energy savings and performs optimally, some programs require or encourage proper commissioning of newly installed equipment. National Grid requires third-party commissioning of comprehensive projects receiving more than \$100,000 in incentives. PacifiCorp reduces incentives by 10% if proper commissioning is not completed. These requirements increase the likelihood that utilities get the maximum energy savings from their investments.

At this point, it is worth reiterating the value of using building energy assessments to drive implementation of comprehensive projects. This can be accomplished in several ways (e.g., providing 50% of the assessment cost upfront and the full cost upon implementation of recommended measures, and offering the energy assessment free-of-charge to feed projects into equipment incentive programs).

Experience from several standard offer programs demonstrates that full-blown M&V requirements don't work for all measures. In response to concerns from customers and EESPs, many programs have adopted a calculated savings approach. While calculated savings may not provide the verification of savings needed for more highly customized projects, it has proven to be a popular and effective method for more standard measures (e.g., many lighting retrofits). PG&E has found that more of its customers are using the calculated savings approach than M&V even though the utility offers a 10% lower incentive for these projects.

### **Program Administration**

Our program review also revealed lessons for administration of comprehensive retrofit programs. First, in a limited budget environment it makes sense to focus program efforts on specific market segments. For example, a number of states have guidelines to encourage comprehensive retrofit projects in state facilities making institutional customers good targets for comprehensive projects.

Placing a special emphasis on comprehensive chiller retrofits can capture large energy and cost savings. However, a chiller replacement program should be housed within a broader custom measures program or whole building performance initiative due to the limited number of large chiller retrofits in a service area in any given year. National Grid has been very pleased with the success of its comprehensive chiller retrofit program, which typically supports only five or six projects per year. The chiller initiative is managed as part of the utility's larger Energy Initiative Custom Program.

Several of the programs surveyed reported that they are typically oversubscribed. In response, customers and EESPs rush to submit project applications during the first few months of the program year even though many of these are in the very early planning phases and are not completed during the program year, if at all. The rapid subscription of a program leads to uncertainty among customers and EESPs about the availability of program funds when they have projects ready. As a result, EESPs may be reluctant to market the program to their customers. While some programs have been able to increase the amount of incentives available to help, others do not have the resources to expand their incentive offerings. As an alternative, program funds can be allocated throughout the year to minimize these problems. Smaller programs, such as Efficiency Vermont, can select which projects to accept on a more ad hoc basis according to program resources and specific project characteristics. Larger programs, such as California's SPC program, must develop clearly defined criteria and eligibility rules.

### **RECOMMENDATIONS**

Comprehensive retrofits of commercial buildings hold the potential for significant energy savings. By tapping into a more complete range of available savings opportunities, comprehensive projects can yield greater energy and cost saving and improve building performance and customer satisfaction. A number of recommendations for effective program

design emerge from our review of retrofit programs and the lessons learned from program experiences.

- *Consider retrofits within the broader context of overall building performance.* Interest in whole building performance is growing among building owners, building services providers, and the energy efficiency community. Building performance improvements present an attractive opportunity to garner energy and non-energy benefits of interest to a wide range of customers. Approaching retrofit projects within the larger context of how a building is performing overall can provide a more complete picture of the best opportunities for energy savings whether from O&M improvements, enhancements to the existing building shell, load reduction strategies, equipment upgrades, or some combination of measures.
- *Pre-screen facilities to determine whether retrofit or retrocommissioning is the appropriate first path.* An initial pre-screening to gather basic information on key building attributes (size, age of equipment, use of EMS, etc.) can help determine whether capital improvements are worthwhile or if enhanced O&M service, building tune-up, or retrocommissioning is a more appropriate investment. The ENERGY STAR Portfolio Manager and other tools are widely available for project screening.
- *Tailor level of energy analysis to fit customer needs.* More sophisticated customers may need only a walk-through assessment to review their retrofit plans while others may need a full-blown energy audit to determine how to proceed with energy improvements in their facilities. Flexibility in this area can reserve precious program dollars for the worthiest candidates, while better meeting the needs of each individual customer.
- *Make incentives dependent on a building systems approach.* To further encourage a whole buildings approach, financial incentives should be reserved or increased for projects where a comprehensive analysis of building systems is used.
- *Incorporate non-energy benefits in program marketing, including an estimate of savings value where feasible.* Our understanding of non-energy benefits and their value in building upgrades has expanded in recent years. The non-energy benefits of retrofit projects should be used in program marketing and when feasible, an estimate of the savings value for specific projects should be developed.
- *Direct efforts to specific target market segments.* Particularly when program resources are tight, targeting those market segments presenting the greatest opportunities for energy savings and the highest likelihood of program success will yield the biggest bang for the buck.
- *Require commissioning of newly installed systems.* Proper commissioning of new equipment helps ensure the systems meet the customers' expectations for performance and energy savings. Incentives and other program support should be contingent on commissioning.
- *Allocate program incentives over the entire program year.* To encourage participation throughout the year and provide greater certainty to customers and EESPs, incentives should be allocated over the program year to avoid a rush and full subscription within the first few months of the program year. This is particularly important for programs working to develop a robust energy services industry.

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**REFERENCES**

- [EPA] U.S. Environmental Protection Agency. 2001. *ENERGY STAR Building Manual*. Washington, D.C.: U.S. Environmental Protection Agency, Office of Air and Radiation.
- Fryer L. and D. Leach. 1995. “Lessons Learned and Results from Early Program Implementation.” In *Proceedings: Delivering Customer Value, 7<sup>th</sup> National Demand-Side Management Conference*, 262–266. Palo Alto, Calif.: Electric Power Research Institute.
- Horton, R. (New York State Energy Research and Development Authority). 2004. Personal communication with E. Mendelsohn and J.T. Amann. August.
- Marthews, A., K. Minc, J. Larkin, R. Ridge, M. Rufo, and P. Landry. 2002. “Evolution of a Program: Four Years Evaluating Nonresidential Standard Performance Contracting in California.” In *Proceedings of the 2002 ACEEE Summer Study on Energy Efficiency in Buildings*. 4.233–242. Washington, D.C.: American Council for an Energy-Efficient Economy.
- Nadel, S. and H. Geller. 1995. *Utility DSM: What Have We Learned, Where Are We Going?*. Washington, D.C.: American Council for an Energy-Efficient Economy.
- Nadel, S., M. Pye, and J. Jordan. 1994. *Achieving High Participation Rates: Lessons Taught by Successful DSM Programs*. Washington, D.C.: American Council for an Energy-Efficient Economy.
- Narel, T. 2004. “ENERGY STAR Building Manual: Building Performance with ENERGY STAR.” Presentation to the CEE Program Committee Meeting. December 2.
- National Grid. 2004. *2003 Energy Efficiency Annual Report: Massachusetts Electric and Nantucket Electric*. September. Submitted to Massachusetts Department of Telecommunications and Energy, Division of Energy Resources. Northboro, Mass.: National Grid.
- [NYSERDA] New York State Energy Research & Development Authority. 2004. *New York Energy Smart Program Evaluation and Status Report: Final Report Volume 2*. May. Albany, N.Y.: New York State Energy Research & Development Authority.
- Osborn, J., C. Goldman, N. Hopper, and T. Singer. 2002. “Assessing U.S. ESCO Industry Performance and Market Trends: Results from the NAESCO Database Project.” In *Proceedings of the 2002 ACEEE Summer Study on Energy Efficiency in Buildings*. 5.233–245. Washington, D.C.: American Council for an Energy-Efficient Economy.
- PA Consulting Group. 2003. *Focus on Energy Public Benefits Evaluation, Business Programs: Best Practices Report*. Prepared by KEMA-XENERGY and PA

Consulting. Madison, Wis.: Wisconsin Department of Administration, Division of Energy.

Pearson, D. and L. Skumatz. 2002. "Non-Energy Benefits Including Productivity, Liability, Tenant Satisfaction, and Others: What Participant Surveys Tell Us about Designing and Marketing Commercial Programs." In *Proceedings of the 2002 ACEEE Summer Study on Energy Efficiency in Buildings*. 4.289–302. Washington, D.C.: American Council for an Energy-Efficient Economy.

Pilliod, J. (Vermont Energy Investment Corporation). 2004. Personal communication with E. Mendelsohn. September.

Rufo, M., R. Pahl, and D. Sumi. 2002. "Nonresidential Performance Contracting Programs: Assessing the Market Transformation Dimension." In *Proceedings of the 2002 ACEEE Summer Study on Energy Efficiency in Buildings*. 6.267–282. Washington, D.C.: American Council for an Energy-Efficient Economy.

Sachs, H. 2001. *Criteria for Assessment of New Equipment Research for CEE: Chiller Retirements and Replacements, Draft 4.0*. White Paper. Washington, D.C.: Washington, DC: American Council for an Energy-Efficient Economy.

Scanlon, T. (Bonneville Power Authority). 2004. Personal communication with E. Mendelsohn. September.

[SCE] Southern California Edison. 2004. *2002 Statewide Nonresidential Standard Performance Contract Program Measurement and Evaluation Study: Process Evaluation and Market Assessment Report*. March 25. Prepared by Quantum Consulting. Rosemead, Calif.: Southern California Edison.

## APPENDIX: DESCRIPTIONS OF SURVEYED PROGRAMS

### Equipment Incentive Programs

#### *1. Efficiency Vermont Business Programs*

*Sponsor: Efficiency Vermont/Vermont Energy Investment Corporation*

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#### **Program Description**

Efficiency Vermont delivers project support to businesses in Vermont through direct outreach to businesses and working relationships with vendors, distributors, suppliers, and contractors. The organization's role as an independent energy efficiency utility (i.e., a utility that does not sell electricity or gas) gives it a lot of flexibility in program design and allows them to customize each project because it does not have to follow strict rules in delivering energy savings. Current offerings for existing commercial facilities include custom services, prescriptive incentives, walk-through assessments, trade partner support, and financing assistance. Prescriptive incentives are offered for lighting, motors, unitary HVAC and economizers, vending machine controls, LED traffic signals, small refrigeration systems, and transformers. Custom projects cover these equipment categories and any other upgrades that prove cost-effective including insulation, windows, and more. All customers are eligible to participate; however, the utility has a goal of 40% of commercial projects serving small customers with consumption less than 40,000 kWh/year.

Technical assistance is a key component of all custom projects. Efficiency Vermont does not typically fund or provide detailed energy audits; rather, they conduct walk-through facility assessments to identify opportunities and develop recommendations in the belief that such assessments are more effective than expensive energy audits that end up on the shelf.<sup>6</sup> By working closely with customers, Efficiency Vermont can provide financial incentives and other types of financing to offset incremental costs, reduce the initial costs of the project, and improve the project's cash flow over time. In addition, it is able to offer flexible incentives to leverage more comprehensive projects (i.e., the incentive increases with comprehensiveness), to respond to the company's economic situation and the facility's baseline efficiency, and to account for installation of particularly innovative measures.

#### **Program Operations**

Efficiency Vermont's operations are funded through an energy efficiency charge on ratepayers' electric bills. The organization pursues a market-based approach to meet the state's resource acquisition goals (electricity and peak demand) as well as the organization's longer-term market transformation objectives. As of the end of 2003, more than 1,000 businesses had participated in Efficiency Vermont's custom services initiative, and more than 1,000 additional customers received prescriptive incentives.

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<sup>6</sup> In rare cases, when a customer expresses a strong commitment to a project and agrees to implement the recommendations, Efficiency Vermont may provide funding to help cover the costs of a more in-depth audit.

Efficiency Vermont operates under a three-year contract with the Vermont Public Service Board. The current three-year budget for commercial sector services is approximately \$24.4 million for 2003–2005. Annual energy savings from commercial sector programs totaled more than 36.2 GWh (including both new construction and existing buildings) in 2003. For 2004, the goal for energy savings from existing commercial building initiatives was 21 GWh with a budget of \$1.8 million in incentives.

### **Sources**

Efficiency Vermont. 2003. *2004 Annual Plan*. October 31. Submitted to the Vermont Public Service Board. Burlington, Vt.: Efficiency Vermont.

Efficiency Vermont. 2004. *2005 Annual Plan*. October 31. Submitted to the Vermont Public Service Board. Burlington, Vt.: Efficiency Vermont.

Efficiency Vermont. 2004. *A Vermont Tradition of Efficiency—Efficiency Vermont: 2003 Annual Report*. Burlington, Vt.: Efficiency Vermont.

Pilliod, J. (Efficiency Vermont). 2004. Personal communication with E. Mendelsohn. September.

## **2. National Grid Energy Initiative Custom Program**

*Sponsor:* National Grid (Massachusetts Electric, Nantucket Electric, Narragansett Electric, and Granite State Electric)

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Francis Boucher, National Grid USA

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[www.nationalgrid.com/usa/environment/energy\\_efficiency/index.shtml](http://www.nationalgrid.com/usa/environment/energy_efficiency/index.shtml)

### **Program Description**

National Grid's Energy Initiative Custom Program targets projects in existing commercial and industrial facilities and is open to all non-residential customers. The custom component of the Energy Initiative program covers projects that do not fit into the program's prescriptive track—process equipment upgrades, specialized HVAC upgrades, unique motor systems, and newer technologies not yet approved for prescriptive incentives. The program educates customers and energy efficiency service providers on new design and equipment and encourages their adoption through a program of training, technical assistance, and financial incentives covering 50% of the total costs of installation. To maximize energy savings, the program also supports commissioning of new and existing systems and equipment. A simplified, “mini-commissioning” process is required for all custom projects; for projects receiving more than \$100,000 in incentives, full third-party commissioning is required. National Grid has developed an Accelerated Application Process to update the rebate calculation criteria and otherwise streamline the application process to encourage greater participation in the program by large customers.

While the Energy Initiative Custom Program does not require comprehensive retrofits in general, one program initiative, the Comprehensive Chiller Initiative, targets interactive measures that represent good opportunities at the time of a planned chiller replacement (e.g.,

lighting measures). To qualify, customers must implement at least three load reduction measures in conjunction with chiller replacement. The Comprehensive Chiller Initiative offers rebates to cover 90% of incremental costs or to buy equipment costs down to a one-year payback. The program is marketed directly to customers, vendors, and contractors in National Grid's service territory. Seminars and training sessions are also offered to bolster these direct marketing activities.

### **Program Operations**

Funding for the Energy Initiative program comes from a systems benefit charge levied on customers of Massachusetts Electric and Nantucket Electric in Massachusetts, Narragansett Electric in Rhode Island, and Granite State Electric in New Hampshire. The Energy Initiative has an overall budget of approximately \$25 million per year for prescriptive and custom projects; approximately \$2 million of this budget is allocated to the Comprehensive Chiller Initiative. Custom projects make up a small portion of completed projects each year (30% of all projects and a total of only six comprehensive chiller projects in 2003 in Massachusetts), but account for half of expenditures and half of program energy savings (55% in 2002).

In 2003, electric savings from 785 Energy Initiative Program projects in Massachusetts and Rhode Island (data from New Hampshire was not available for this report) totaled 56,890,000 kWh with demand savings of 6,632 kW. Average savings per project are 65,000 kWh at an average cost of about \$34,000 per project (including single- and multi-measure projects). Comprehensive chiller projects yield much higher savings. Six comprehensive chiller projects conducted in 2003 had total energy savings of 6,472,011 kWh and peak demand savings of 1,454 kW, an average of 1,078,669 kWh and 242 kW per project.

### **Sources**

- Boucher, F. (National Grid USA). 2004. Personal communication with Eric Mendelsohn. September.
- McAteer, M. (National Grid USA). 2004. Personal communication with Eric Mendelsohn. September.
- National Grid. 2003. *2002 DSM Performance Measurement Report: Massachusetts Electric and Nantucket Electric*. July. Submitted to the Massachusetts Department of Telecommunications and Energy. Northboro, Mass.: National Grid.
- National Grid. 2004. *2003 Energy Efficiency Annual Report: Massachusetts Electric and Nantucket Electric*. September. Submitted to Massachusetts Department of Telecommunications and Energy, Division of Energy Resources. Northboro, Mass.: National Grid.
- National Grid. 2004. *2003 DSM Year-End Report for Narragansett Electric Company*. May 7. Northboro, Mass.: National Grid.
- Tumidaj, L., F. Gordon, G. Smith, and C. White. 2002. "Commercial and Industrial Retrofit Rebates: What Does It Take?" In *Proceedings of the 2002 ACEEE Summer Study on Energy Efficiency in Buildings*. 4.327–4.338. Washington, D.C.: American Council for an Energy-Efficient Economy.
- York, D. and M. Kushler. 2003. *America's Best: Profiles of America's Leading Energy Efficiency Programs*. March. Washington, D.C.: American Council for an Energy-Efficient Economy.

### **3. New Jersey SmartStart Buildings**

*Sponsors: New Jersey Board of Public Utilities, Office of Clean Energy  
New Jersey electric and gas utilities<sup>7</sup>*

*Contact: Office of Clean Energy*

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*[www.njsmartstartbuildings.com](http://www.njsmartstartbuildings.com) (for program information and materials)*

*[www.njsmartstartbuildings.com/main/contact\\_us.html](http://www.njsmartstartbuildings.com/main/contact_us.html) (for participating utility contact information)*

#### **Program Description**

Commercial and industrial customers in New Jersey are eligible to participate in the state's SmartStart Buildings program. Through the program, customers can receive prescriptive incentives for a pre-qualified list of approved measures and comprehensive design assistance for new construction and substantial renovations. Of greater interest here are the custom measures, multiple measures bonus incentive, and chiller optimization components of the SmartStart program. These components were designed to allow for more comprehensive, creative, and integrated projects than those covered by prescriptive incentives or for projects that involve less than comprehensive design. Customers may request a technical assessment of energy efficiency measures including HVAC systems, refrigeration, and process end-uses—utilities will share the cost of the study (on a 50/50 basis) up to a maximum utility cost of \$10,000 (or more for large, complex projects with significant energy savings potential). The technical study or custom measure application provides estimates of energy and demand savings and project costs used to determine the viability and eligibility of the project and incentives to be awarded. Qualifying electric projects must yield annual energy savings of 50,000 kWh or average demand reduction of 20 kW; gas projects do not have to meet a set threshold, but are approved on a case-by-case basis. Custom incentives cover cost-effective measures up to 80% of project incremental costs or an amount equal to a 1.5-year payback to the customer, whichever is less.

In addition to the Custom Measures incentive, customers that install two or more efficiency measures from the eligible categories (lighting, unitary HVAC, chillers, gas heating and/or cooling, gas water heating, motors, variable frequency drives, and/or custom measures) receive a 10% bonus incentive above the regular custom or prescriptive incentive level. Customers looking to replace an existing chiller plant of 500 tons or more are also eligible to participate in the Chiller Optimization program. This component of the SmartStart Buildings program provides technical assistance, prescriptive incentives for chiller replacement, and additional incentives for ancillary enhancements (e.g., fans, pumps, motors, controls, etc.) and lighting system improvements. Beyond capturing additional energy savings from the ancillary and lighting measures, the program was designed with a long-term goal of building

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<sup>7</sup> Participating utilities include Conectiv Power Delivery, Jersey Central Power & Light, New Jersey Natural Gas, NUI Elizabethtown Gas, Public Service Electric and Gas, Rockland Electric Company, and South Jersey Gas.

the infrastructure for market-based comprehensive treatment of major HVAC replacement projects.

### **Program Operations**

New Jersey SmartStart Buildings is funded through a statewide System Benefits Charge and administered by each electric and gas utility in their respective service territories. The program was launched in 2001 with initial approval for four years of operations through 2004. The program consists of C&I Retrofit, C&I New Construction, and New School Construction and Retrofit. In 2003, the C&I Retrofit program accounted for the largest component of the program in terms of expenditures, participants, and energy savings. Program expenses of \$25.1 million (82% of \$30.6 million total) were used to serve 3,818 participants (91% of total). Annual energy savings from the program amounted to 179,679 MWh and 34,659 kW (each 91% of total) and 70,277 Dekatherms (80% of total).

### **Sources**

- Hoernlein, R. (Public Service Gas & Electric Company). 2004. Personal communication with E. Mendelsohn. September.
- New Jersey Office of Clean Energy. 2004. *2003 Annual Report: A Year of Continued Growth, A Year of Significant Change*. Trenton, N.J.: New Jersey Board of Public Utilities, Office of Clean Energy.
- New Jersey SmartStart Buildings Program. 2004. "Program Guide." Available at: [http://www.njsmartstartbuildings.com/main/allies\\_manual/index.cfm](http://www.njsmartstartbuildings.com/main/allies_manual/index.cfm). Accessed December 19.

#### **4. Northeast Utilities (Conn L&P and WMECo): Custom Services Program**

*Sponsor:* Northeast Utilities (Connecticut Light & Power, Western Massachusetts Electric)

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### **Program Description**

Through the Custom Services Program, Northeast Utilities (NU) offers commercial and industrial customers technical assistance and financial incentives for upgrades that improve the efficiency of electrical equipment. Technical assistance is provided through comprehensive facility audits (energy audits) or detailed assessments of specific equipment (focused study). NU offers targeted assistance to customers planning the purchase or replacement of large HVAC equipment through the Tailored HVAC Services component of the program. Custom Services are available to all commercial and industrial customers, although the program is primarily targeted to customers with an average monthly energy demand exceeding 350 kW or, for the Tailored HVAC program, customers with HVAC equipment of 30 tons or larger, or chilled water systems over 100 tons.

NU pays 50% of study costs up-front; if the customer installs recommended efficiency measures, NU refunds the customer's 50% share upon installation. Participating customers are also eligible for cash incentives to offset the incremental cost of the cost-effective

measures identified. Qualified measures include lighting, motors, HVAC, and process improvements in manufacturing facilities based on electricity savings (kWh) and demand impact (kW). The program does not include specific requirements or incentives to encourage comprehensive retrofit projects; however, Tailored HVAC Services has been credited with helping comprehensive projects move forward and improving HVAC design practices in the region.

### **Program Operations**

Northeast Utilities' programs in Connecticut are funded through the State Conservation Fund; in Massachusetts, programs are funded through the state's System Benefits Charge. Launched in 1996, the Customer Service Program had served close to 2,700 customers by the end of 2002 in a territory servicing 10,000 commercial and industrial customers. Cumulative energy savings over this period exceed 272,000 MWh with peak demand savings of 61.5 MW. Total program budget averaged around \$10.6 million per year from 2001 to 2003; utility costs represent 90% of total program costs. All cost and savings numbers include both commercial and industrial sector savings. Benefit-cost ratios for the program have been over 2.0.

### **Sources**

Kuraitis, P. (Connecticut Light and Power Company). 2004. Personal communication with E. Mendelsohn. September.

York, D. and M. Kushler. 2003. *America' Best: Profiles of America's Leading Energy Efficiency Programs*. March. Washington, D.C.: American Council for an Energy-Efficient Economy.

### **5. PacifiCorp Energy FinAnswer**

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[www.pacificpower.net/File/File5076.pdf](http://www.pacificpower.net/File/File5076.pdf)

[www.utahpower.net/Navigation/Navigation926.html](http://www.utahpower.net/Navigation/Navigation926.html)

### **Program Description**

The Energy FinAnswer program offers engineering support and cash incentives/financing for equipment retrofits (in facilities of 20,000 square feet or larger) and new commercial construction or major renovations. Through the program, PacifiCorp covers the cost of a preliminary energy study and pre-installation verification. More complex measures are subject to commissioning requirements that must be paid for as part of project implementation. At least 50% of project savings must be attributable to non-lighting measures.

Participating Utah Power and Pacific Power customers in Utah and Washington State receive \$0.12/kWh of annual energy savings and \$50/kW of average monthly peak demand savings, paid upon completion of a post-installation project inspection. Incentives are subject to a cap at 50% of eligible measure cost and cannot reduce the simple payback time of the project to less than one year. Customers may decide not to perform the recommended commissioning;

however, failure to follow the commissioning requirements will result in a 20% reduction of project incentives. Utah Power customers in Idaho and Pacific Power customers in California and Wyoming are eligible to receive project financing from Pacific Power. The financing agreement allows customers to repay their utility for project costs through a monthly charge added to their utility bill with a competitive interest rate.

The energy study is designed to encourage participants to take a more comprehensive view of their facility upgrade project, install all recommended measures, and receive the maximum available incentive. However, there are no requirements or additional incentives for comprehensive programs.

### **Program Operations**

The Energy FinAnswer program was launched as a new construction program in 1989 and was expanded to include energy efficiency retrofits in existing buildings in 1991. The program serves Utah Power customers in Utah and Idaho and Pacific Power customers in Washington, Wyoming, and California. In addition, Pacific Power continued to manage the program for its customers in Oregon under the first two years of Oregon efficiency program transition from utilities to the Energy Trust of Oregon (2001 to 2003).

Although recent evaluations of program savings were not available, PacifiCorp anticipates total savings of approximately 125 aMW from the program (including retrofits and new construction) during the 2005-2014 period. Savings projections include:

- 43,800 MWh in Idaho in 2004, growing to 48,180 MWh/year from 2005 through 2012;
- 8,760 MWh/year in Washington;
- 8,760 MWh/year in Wyoming for 2004 through 2006, growing to 10,950 MWh/year from 2007 through 2012;
- 5,250 MWh/year in Idaho; and
- 2,190 MWh/year in California.<sup>8</sup>

The total estimated cost of the program is \$12.5 million in 2004.

### **Sources**

Pacific Power. 2005. Energy FinAnswer program brochure. Available at: [www.pacificpower.net/File/File5076.pdf](http://www.pacificpower.net/File/File5076.pdf) Accessed January.

Utah Power. 2005. Energy FinAnswer program brochure and overview. Available at: [www.utahpower.net/Navigation/Navigation926.html](http://www.utahpower.net/Navigation/Navigation926.html) Accessed January.

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<sup>8</sup> Savings estimates for California represent the combined total of all retrofit programs, not just Energy FinAnswer.

## **6. Seattle City Light Energy Smart Services**

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### **Program Description**

Through its Energy Smart Services Program, Seattle City Light offers commercial and industrial customers a range of technical assistance services and financial incentives. Technical assistance services include free Facility Assessments conducted by the utility's own Energy Management Analysts or consultants hired by Seattle City Light. Customers receive a report that reviews their energy use patterns and offers recommendations for energy efficiency measures and upgrades along with calculated estimates of project energy savings and funding available from Seattle City Light. For more complex retrofit measures, Seattle City Light provides funding for an in-depth energy analysis conducted by a consultant selected by the customer. Both programs are used to feed projects into the utility's financial incentive programs, particularly the Standard Incentive and Custom Incentive programs. In addition to capital measures, the facility assessment and energy analysis are used to identify O&M measures. A separate O&M pilot project has also been launched.

Seattle City Light offers standard incentives for specified lighting, HVAC, and motor technologies. Custom incentives are offered to cover measures (electric only, no fuel-switching allowed) that are not covered by incentives including (but not limited to) HVAC and industrial controls, daylighting, high efficiency transformers, elevators, variable speed drives in industrial applications, and high-efficiency industrial process equipment. Custom and standard incentives are calculated on a project-by-project basis; funding levels are agreed to along with the scope of work in a contract between Seattle City Light and the customer. Incentives include any O&M measures required for systems affected by energy conservation measures installed through the program. Limited funding for other O&M measures may be available at a reduced incentive level of \$0.01 per annual kWh saved.

Custom incentives are calculated based on estimated annual electric savings and the expected service life of the equipment. Seattle City Light will pay incremental costs up to 70% of total project cost. To encourage customers to install a more comprehensive set of measures, multiple measures can be combined to calculate the cost cap if it makes the project more attractive to the customer.

### **Program Operations**

Seattle City Light launched the Facility Assessment Service in 1998 (originally as the Operations and Resource Assessment). The service is available to all commercial and industrial customers and is scaled to match the needs of each customer based on its annual energy consumption—most audits and energy savings have come from customers in the 500,000 to 3 million kWh per year range. An evaluation of the first two years of program operations (1998–1999) looked at a sample of 96 projects served and found the facility assessments had identified 23 million kWh of potential electric savings of which 9 million

kWh of savings were realized through implementation of recommended measures during the first year following the assessment.

Financial incentives from Seattle City Light were used to pay for some part of most measures; however, 23% of measures were entirely self-funded by customers. The program also identified significant water and natural gas savings opportunities. Lighting, HVAC, and controls were the measures most commonly recommended, respectively accounting for 38%, 22%, and 10%. Capital measures represented 84% of recommended measures; the remaining 16% were O&M. The number of projects implementing multiple measures was not tracked.

The Facility Assessment Service has proven very cost-effective with levelized cost per kWh saved of 19 mills/kWh for Seattle City Light and 13 mills/kWh for the customer. Benefit-cost ratios for electric, water, and gas costs and savings were 2.6 for the utility and 3.0 for customers.

### **Sources**

Seattle City Light. 2002. *Energy Smart Services Program Manual*. September 30. Seattle, Wash.: Seattle City Light.

Van Holde, D., J. Shaffer, M. Schuldt, and P. Cochrane. 2002. "The Facility Assessment Service: An Effective Design for Commercial and Industrial Multi-Resource Audits." In *Proceedings of the 2002 ACEEE Summer Study on Energy Efficiency in Buildings*. 4.339-4.350. Washington, D.C.: American Council for an Energy-Efficient Economy.

### **7. Wisconsin Focus on Energy Business Programs**

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### **Program Description**

Wisconsin Focus on Energy designed the Feasibility Study Grants and Custom Incentive programs to encourage commercial customers to consider and implement comprehensive (multi-measure) retrofit projects resulting in long-term, in-depth energy savings. To this end, the programs promote a systems approach rather than targeting individual technologies or system components. Furthermore, the program seeks to nurture a robust and competitive market for energy efficiency services in Wisconsin by strengthening the relationships between end-use customers and energy efficiency service providers. The program aims to meet Focus on Energy goals of resource acquisition (both demand reduction and energy savings) and market transformation.

The program is open to commercial, industrial, agricultural, local government, church, or nonprofit entities that are customers of a utility participating in Focus on Energy. Completion of a retrofit project progresses through these steps:

1. Interested customers must enroll as a Focus on Energy Partner or work with a Focus on Energy Ally to be eligible for program incentives. As a Partner, the customer is assigned to work with a Focus on Energy Advisor.
2. The customer submits an application for approval.
  - a. For feasibility study grants, the customer submits an application along with a proposal for the study from the firm conducting the study. Once approved, the study may be completed. Focus on Energy staff may inspect the facility to verify the information submitted. If implementation of the retrofit project is initiated within 90 days of completion of the feasibility study, the customer is eligible to apply for the Custom Incentives program.
  - b. If no feasibility study is undertaken, the customer submits a project application including the type of measures to be installed along with project cost and annual savings estimates.
3. Based on the project application or feasibility study results, Focus on Energy notifies the customer of the level of incentives that will be provided.
4. Customers implementing multi-measure projects designed to improve whole building energy efficiency may be eligible for an additional 30% payment as a Comprehensive Bonus Incentive.

### **Program Operations**

Wisconsin Focus on Energy is funded through the state's public goods charge covering the 85% of ratepayers served by investor-owned utilities. Municipal utilities and co-ops have the option of buying into Focus on Energy programs. The annual statewide budget for the Focus on Energy Business Programs for program year 2005 is \$12 million, including all business sector programs (i.e., commercial, industrial, agricultural, etc.). For the past program year, commercial sector programs yielded an estimated 19 million kWh of electricity savings, 5,400 kW demand savings, and 525,000 therms of gas savings.

### **Sources**

- Focus on Energy. 2004a. *Focus on Energy Business Programs: Custom Incentives Partner Guidelines, Version 3.3*. July 1. Available at: <http://www.focusonenergy.com/page.jsp?pageId=1171>. Madison, Wisc.: Focus on Energy.
- Focus on Energy. 2004b. *Focus on Energy Business Programs: Feasibility Study Grants Partner Guidelines, Version 1.2*. July 1. Available at: <http://www.focusonenergy.com/page.jsp?pageId=1171>. Madison, Wisc.: Focus on Energy.
- Sasso, C. (Wisconsin Energy Conservation Corporation). 2004. Personal communication with Eric Mendelsohn. September.
- Wisconsin Division of Energy. 2004. *Focus on Energy Public Benefits Evaluation, Quarterly Report (Contract Year 3, Quarter 4) with Annual Overview*. September 17. Available at: [http://www.doa.state.wi.us/docs\\_view2.asp?docid=3401](http://www.doa.state.wi.us/docs_view2.asp?docid=3401). Madison, Wisc.: Wisconsin Department of Administration, Division of Energy.

## Standard Offer Programs

### *1. Bonneville Power Authority Commercial/Industrial Standard Offer*

*Sponsor: Bonneville Power Authority*

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#### **Program Description**

Under the auspices of its Conservation Augmentation program, BPA offers the Commercial/Industrial Standard Offer to interested utilities BPA's service territory. Participating utilities commit to the program by signing an agreement with BPA and are required to pass all BPA incentive funds through to their customers. The primary goal of the program is resource acquisition to expand BPA's firm resources and, to a lesser degree, demand reduction.

The program relies on vendors for marketing to customers. Incentives vary based on the estimated life of the measures installed: for a 10-year measure life, BPA pays \$0.12/kWh of first-year savings or a maximum of 60% of measure costs; the available incentive drops for shorter measure life. The end-user or the utility is responsible for the portion of project costs not covered by BPA. In addition to incentives, BPA offers technical support, web-based tools, and vendor orientation to improve program effectiveness. Independent technical review is required for each project. Finally, each project proposal must contain an M&V plan along with information to demonstrate that verified project savings are likely to persist over the life of the installed measures. In 2003, BPA introduced the lighting-specific Expanded Standard Offer which provides rebate lists and equipment specs for lighting-only projects.

The program does not contain requirements for comprehensive or multi-measure projects. However, participating utilities may incorporate elements to encourage their customers to undertake more comprehensive approaches. This is more common among larger utilities (e.g., Seattle City Light) than the many small utilities involved. BPA does promote a more comprehensive approach in the federal government projects they support (including commissioning of facilities or newly-installed equipment), working through the ESCOs that serve the federal sector in the Northwest. In these projects, BPA has found that a comprehensive approach allows for bundling of high- and low-cost measures, yielding an average cost that allows the full project to move forward.

#### **Program Operations**

The Commercial/Industrial Standard Offer is supported by ratepayer funds. As of 2004, 50 of the 130 utilities in the BPA territory were participating in the program (about half of those eligible when irrigation utilities are disregarded). BPA has established a goal for the Standard Offer program of 100 aMW of savings over the five year period beginning October 1, 2002 with a budget of \$137 million. In the first two years, the program achieved approximately 21 aMW of savings.

## Sources

- BPA. 2005. Conservation Augmentation Program materials. Available at [www.bpa.gov/Energy/N/Projects/Conservation\\_Augmentation/](http://www.bpa.gov/Energy/N/Projects/Conservation_Augmentation/). Portland, OR: Bonneville Power Authority.
- BPA. 2003. "Commercial/Industrial Proposal Requirements." May 23. Available at [www.bpa.gov/Energy/N/Projects/Conservation\\_Augmentation/](http://www.bpa.gov/Energy/N/Projects/Conservation_Augmentation/). Portland, OR: Bonneville Power Authority.
- Scanlon, T. (Bonneville Power Authority) 2004. Personal communication with Eric Mendelsohn. September.

## 2. California Statewide Nonresidential Standard Performance Contract

*Sponsor:* Pacific Gas & Electric

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## Program Description

In 1998, California's three investor-owned utilities (PG&E, SCE, and SDG&E) began offering the Nonresidential Standard Performance Contract Program (NSPC). The California Public Utility Commission established the program with the goals of market transformation and development of a self-sustaining energy efficiency services industry (Marthews et al. 2002). Additional objectives include long-term energy savings and demand reduction through implementation of long-lasting energy efficiency retrofits and the introduction of innovative energy-efficient technologies (York and Kushler 2003). In response to the energy crisis in California in 2000 and 2001, resource acquisition and peak demand reduction became more important goals for the program. As a result, the program came to resemble more traditional prescriptive and custom rebate programs as goals of market transformation and support for the energy services industry waned.

The program has two components: the Large NSPC program, serving customers with peak demand of 500 kW or more, and the Small Business SPC program, which serves all other customers. Commercial, industrial, and agricultural customers are eligible to participate. Through the program, end-use customers or energy efficiency services providers can apply for fixed price incentives to help offset the cost of high efficiency retrofits. Incentive levels vary by end-use; lighting measures qualify for lower incentives than HVAC, refrigeration,

and other non-lighting measures. To encourage more comprehensive projects, lighting measures are only allowed in projects where at least 20% of energy savings come from non-lighting measures. In addition, no utility can spend more than 30% of their incentive budget on lighting.

The utilities use a standard contract that provides the fixed price for energy savings (kWh or therm per year) and defines performance measurement protocols (including M&V and/or calculated savings requirements), payment terms, and other program rules. All eligible measures must have an economic life of five years or more. Program incentives are based on engineering calculations, system modeling, or quantitative measurements of energy savings and are paid upon project completion and inspection. In response to early program evaluations, several changes were made to the program to allow the use of calculated savings instead of verified savings for many measures and to streamline the application process. The calculated savings approach has been very popular even though the calculated savings are considered quite conservative and may underestimate savings and, therefore, the incentive payment received.

### **Program Operations**

The NSPC program is funded through California's public goods charge. Program budgets and incentive levels differ for the large and small business components of the program and for each participating utility. Throughout the program's history, industrial customers have made up the largest block of program participants and accounted for the largest portion of savings. Tracking data for the 2002 program year shows that industrial customers are still the largest segment (48%), while commercial customers account for the next largest segment (35%). Participation by institutional customers has dropped considerably from 34% in 1999 to less than 15% in 2002.

A total of 299 customers participated in the program in 2002 with 355 project applications. Reflecting the trend toward more self-sponsored projects, EESP-sponsored projects accounted for only 23% of incentives statewide (6% for PG&E, 27% for SCE, and 53% for SDG&E). Statewide incentive payments totaled \$17.8 million with approximately 11% of savings paid for gas measures. Estimated annual savings from the 2002 program year were 238 GWh and 4.9 million therms. Process improvements accounted for the largest portion of incentives and energy savings, followed by HVAC, lighting, and other measures. Final data from the 2002 impact evaluation is not yet available; however, the 2001 Total Resource Cost test ratio was 4.27.

### **Sources**

- Marthews, A., K. Minc, J. Larkin, R. Ridge, M. Rufo, and P. Landry. 2002. "Evolution of a Program: Four Years Evaluating Nonresidential Standard Performance Contracting in California." In *Proceedings of the 2002 ACEEE Summer Study on Energy Efficiency in Buildings*. 4.233–4.242. Washington, D.C.: American Council for an Energy-Efficient Economy.
- Ong-Carrillo, A. (Pacific Gas and Electric). 2004. Personal communication with Eric Mendelsohn. September.
- Southern California Edison. 2004. *2002 Statewide Nonresidential Standard Performance Contract Program Measurement and Evaluation Study: Process Evaluation and*

*Market Assessment Report*. March 25. Prepared by Quantum Consulting. Rosemead, Calif.: Southern California Edison.

York, D. and M. Kushler. 2003. *America's Best: Profiles of America's Leading Energy Efficiency Programs*. March. Washington, D.C.: American Council for an Energy-Efficient Economy.

### **3. New York Energy Smart Commercial/Industrial Performance Program**

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#### **Program Description**

NYSERDA's Commercial/Industrial Performance Program (CIPP) was launched in 1998 to promote energy savings and demand reduction through capital improvement projects and support growth of the energy service industry in New York State. Through the program, ESCOs and other EESPs receive cash incentives for completion of capital projects yielding verifiable energy and demand savings. Interested participants follow a five-step process: application submission; execution of a Standard Performance Contract with NYSERDA; completion of energy engineering calculations; inspection of site pre- and post-installation; and implementation of an M&V plan developed at the outset of the project. NYSERDA contracts engineering consultants to provide independent third-party review of each project. In addition, these contractors are available to assist participants through each phase of the project from application to final M&V.

The program is open to any commercial, institutional, or governmental customer paying into the state's System Benefits Charge regardless of facility size. There is a minimum project requirement of 50,000 kWh in annual savings. Incentives vary depending on the type of measure (e.g., cooling equipment receives a higher incentive per kWh saved than motors or lighting) based on the cumulative present value of energy and capacity savings over the life of the equipment. Small facilities (i.e., less than 1 million kWh annual energy consumption) are eligible for an additional 20% incentive to encourage activity in this less-served market segment. NYSERDA also offers a bonus of \$300 per kW for electric chillers for the summer peak reduction and emission reduction benefits. Incentives are capped at 50% of project costs; customers and contractors have \$1 million and \$4 million caps, respectively. While it is NYSERDA's hope and intention that ESCOs will develop comprehensive retrofit projects for their customers' facilities, there is no program requirement or reward for a comprehensive approach.

#### **Program Operations**

CIPP is funded through the New York System Benefits Charge levied on customers of the state's six investor-owned electric utilities and administered by NYSERDA. For the eight-year period from the program's launch in 1998 through 2005, estimated incentives of \$126.6 million will be awarded. As of the end of 2003, a total of 715 projects had been approved to receive \$101.5 million in incentives. Estimated annual savings from these projects total 700

million kWh—46% in commercial sector projects, 20% institutional, 18% government, 15% industrial, and 2% other sectors. Verified savings for the 200 projects that had completed the two-year M&V process as of the end of 2003 totaled 346 million kWh/year. Demand savings over this period totaled 166 MW. The total number of participating ESCOs and EESPs has grown from seven in the first program year to 39 in 2000, and 150 as of the end of 2003.

### Sources

- Horton, R. (New York State Energy Research & Development Authority). 2004. Personal communication with E. Mendelsohn. August.
- New York State Energy Research & Development Authority. 2004. *New York Energy Smart Program Evaluation and Status Report: Final Report Volume 2*. May. Albany, N.Y.: New York State Energy Research & Development Authority.
- Quantum Consulting. 2004. “Best Practices Benchmarking for Energy Efficiency Programs: Summary Profile Report: NR51.” [www.eebestpractices.com/pdf/SummaryProfileReport\\_NR51.PDF](http://www.eebestpractices.com/pdf/SummaryProfileReport_NR51.PDF). Berkeley, Calif.: Quantum Consulting.
- York, D. and M. Kushler. 2003. *America’s Best: Profiles of America’s Leading Energy Efficiency Programs*. March. Washington, D.C.: American Council for an Energy-Efficient Economy.

### 4. Texas Commercial and Industrial Standard Offer Program

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### Program Description

CenterPoint Energy and TXU Electric Delivery each offer a C&I Standard Offer Program in accordance with the standard offer program guidelines established by the Texas Public Utility Commission. The programs provide financial incentives for installation of energy efficiency projects in new and existing commercial and industrial facilities. Any company, contractor, or customer who installs project measures can act as the project sponsor. Projects may be completed in any customer facility with a minimum peak demand of 100 kW or multiple sites with combined demand of 250 kW or more. Projects must achieve a minimum peak reduction of 20 kW to qualify. Fuel switching is allowed. No project sponsor can receive more than 20% of the incentive funds available in a given year, thus the program can run a minimum of five projects per year.

Incentives are paid to the project sponsor based on energy and demand savings at a fixed rate (\$0.068/kWh and \$198/kW for CenterPoint customers; \$0.065/kWh and \$189/kW for TXU) with 40% paid upon installation and inspection, and the remainder paid upon approval of the

final M&V report. Projects that achieve 65% or more of savings through lighting measures receive a reduced incentive. M&V guidelines have been developed for most measures or approaches used in the program. In general, project sponsors are allowed to use a deemed savings approach for many lighting efficiency and controls measures and some cooling equipment and window film applications; a “simple M&V” approach based on engineering calculations and some short-term testing or simple long-term metering is required for chiller projects; and a detailed “full M&V” process using metering, billing analysis, and computer simulation is required for more unpredictable, costly, or innovative measures. While the utilities are interested in seeing more comprehensive projects in the standard offer program, there are no requirements. CenterPoint estimates that no more than 30% of their projects are multi-measure and, of these, it is not clear how many are based on a comprehensive assessment of energy savings opportunities in the facility.

### **Program Operations**

The standard offer program was established in response to the deregulation of Texas’ electric utilities. The program is funded through a surcharge on customers’ electric bills. Under the deregulation statute, each investor-owned utility operating in the state is required to meet 10% of anticipated demand growth through energy efficiency. The deregulation law also calls for utilities in the state to support a competitive energy services industry. As a result, utilities do not offer energy audits, design assistance, or broad outreach or marketing of the standard offer program—all activities that are intended to be offered by competitive energy services providers. The program is primarily marketed through outreach to service providers, although limited marketing is directed to school district, professional organizations, and other customer groups through public presentations.

In 2003, the program achieved energy savings of 46 million kWh from 62 projects in CenterPoint’s territory. Demand savings from the program have averaged 10 MW. The 2005 standard offer program began accepting applications in September 2004 for \$4.3 million in incentives available for projects in existing buildings and new construction. TXU’s goals for 2004 included 102 million kWh in energy savings and 21 MW of demand savings. The program supports 150–200 projects a year, working with 70–80 project sponsors. TXU also launched its 2005 program in September 2004 with a total of \$15 million in incentives.

### **Sources**

- CenterPoint Energy. 2004. Program description, materials, and forms on CenterPoint website at [www.centerpointcisop.com](http://www.centerpointcisop.com). Houston, Tex.: CenterPoint Energy.
- Gregory, K. (CenterPoint Energy). 2004. Personal communication with E. Mendelsohn. September.
- Hanel, J. (TXU Electric Delivery). 2004. Personal communication with E. Mendelsohn. September.
- TXU Electric Delivery. 2004. Program description, materials, and forms on TXU website at [www.oncorgroup.com/electricity/teem/candi/program.asp](http://www.oncorgroup.com/electricity/teem/candi/program.asp). Dallas, Tex.: TXU Electric Delivery.

## Building Performance Programs

### *1. Northwest Energy Efficiency Alliance Building Performance Services*

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#### **Program Description**

The NW Alliance Building Performance Services (BPS) initiative is a pilot market transformation program working to develop a market structure that successfully promotes and supports enhanced building operating performance. To that end, the program is pursuing a two-pronged strategy: increase demand for improved building operating performance through the NW Alliance's target market efforts, while simultaneously building the capabilities of participating market actors to supply appropriate services. BPS operates as a partnership between the NW Alliance, initiative sponsors, building owner/managers, and service providers (e.g., mechanical contractors, building control system providers, equipment manufacturers, commissioning agents, etc.).

The program targets existing medium- and large-sized commercial buildings with more complex HVAC and control systems. During the program pilot, the NW Alliance and its partners are testing a five-phase approach to improving building performance:

- screening to identify good candidate buildings;
- scoping to identify the best opportunities within high priority candidate buildings;
- enhanced O&M practices to recommend and implement improvements to building O&M activities;
- building tune-up to implement cost-effective changes in building O&M practices to reduce building energy use and operating costs; and
- retrocommissioning to ensure that building performance meets owners requirements, optimize the efficiency of building systems and equipment, and train building operators in proper long-term building O&M.

The NW Alliance has developed a Building Performance Toolkit to provide technical resources, guidelines, and other materials to support initiative partners. Although equipment retrofit is not an explicit part of the program design, the program encourages building owners, their staff, and service providers to be aware of and recommend retrofit of obsolete equipment or equipment in need of replacement to prevent failure. In many cases, the project sponsors offer technical and financial assistance to support the customers retrofit needs.

#### **Program Operations**

The Building Performance Services initiative launched an initial test phase in 2002 to try out the BPS approach in 25 buildings. Buildings were selected from each sponsors' service territory—Energy Trust of Oregon, Puget Sound Energy, Seattle City Light, and Snohomish County Public Utility District. The test phase will be used to evaluate the BPS approach, validate owner interest, and quantify energy consumption and savings in the test buildings.

The energy performance of each building in the test phase will be benchmarked using ENERGY STAR's energy performance rating system. Based on the results of the test phase, a larger pilot effort will be launched in 2005. During the pilot, as many as 175 large buildings throughout Oregon, Washington, and Idaho will receive program services.

### **Sources**

Northwest Energy Efficiency Alliance. 2005. BPS Project Overview and Implementation Details. Available at [www.nwalliance.org/projects/projectoverview.asp?PID=73](http://www.nwalliance.org/projects/projectoverview.asp?PID=73)  
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## **2. NSTAR ENERGY STAR Benchmarking Initiative**

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### **Program Description**

NSTAR has developed a unique program to utilize the ENERGY STAR energy performance rating system to engage commercial customers in projects to optimize their facilities' energy performance. NSTAR helps customers rate their building energy consumption using the ENERGY STAR Portfolio Manager. The customer's building energy performance score is used to start a dialog about their building's energy consumption and opportunities for improvement. Following review of the energy performance score, NSTAR conducts a comprehensive assessment of the building and develops a 12-month action plan for implementing recommended measures. NSTAR works with the customer to identify eligible technical assistance and financial resources from other NSTAR programs to help with project implementation.

### **Program Operations**

The ENERGY STAR Benchmarking Initiative is open to NSTAR customers with the following types of facilities: office buildings, hospitals, K-12 schools, supermarkets and grocery stores, and hotels and motels. These categories correspond to the available ENERGY STAR rating tools. As of fall 2004, NSTAR had completed energy assessments and training in 21 out of a total of 22 benchmarked facilities.

### **Sources**

Consortium for Energy Efficiency. 2004. "Commercial Building Performance: Market Update." September. Boston, MA: CEE.

NSTAR. 2005. NSTAR – ENERGY STAR Benchmarking Initiative information. Available at [www.nstaronline.com/your\\_business/benchmark.asp](http://www.nstaronline.com/your_business/benchmark.asp)

## **3. NYSERDA Retrocommissioning Initiative**

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### **Program Operations**

NYSERDA's Retrocommissioning (RCx) Initiative is a pilot market transformation program designed to expand adoption of RCx in New York State. The program conducts targeted outreach to leading commercial building owners and property managers (including the premier commercial real estate firms in the New York metropolitan area) as well as large institutional building owners to improve awareness of the financial and energy benefits of RCx and increase demand for RCx services. At the same time, the program works to expand the availability of qualified RCx service providers in New York through outreach, training, and tools to facilitate their involvement in RCx projects.

To attract customers, the program outreach team conducts executive briefing sessions with interested building owner/managers, business associations, and engineering firms to discuss the RCx process. Building owners are encouraged to work with qualified RCx service providers to screen buildings to determine their potential as RCx candidates. Buildings that pass the screening are eligible for a no-cost scoping study to determine the cost-effectiveness of a full-scale RCx project. NYSERDA offers qualified service providers a \$3,000 incentive to offset the cost of the scoping study which includes preliminary evaluation of building systems and operations and development of a scope of services (task, schedule, and costs) for a full RCx investigation of the building. The final scoping study report follows a standardized reporting format to meet the application requirements for cost-sharing on the RCx project through NYSERDA's FlexTech or Technical Assistance programs.

### **Program Operations**

The RCx Initiative was launched in March 2004 and will run through December 2005. The overall budget for program design, development, administration, and evaluation totals \$400,000 with an additional \$60,000 available for scoping study incentives. During the first year of the program, approximately 25 executive briefings were conducted leading to 10 scoping study applications and three completed scoping studies. More than 150 service providers attended training on the RCx Initiative and scoping study protocol and 19 firms were qualified to participate in the program.

### **Sources**

NYSERDA. 2004. "RCx Initiative Project Description." March. Albany, NY: NYSERDA.