4. COMMERCIAL AND INDUSTRIAL PROGRAMS

The key informants nominated 30 programs for resource acquisition in the commercial and industrial sector. These include programs for up-front auditing, equipment rebates, new construction, and technical assistance for industrial customers plus two international programs that support voluntary actions by commercial and industrial firms. We completed summaries for 21 programs. Eight of the programs were dropped because they were not at all transferable to the Energy Trust, or they were market transformation programs, or because the program was similar to another program where a summary was completed. One summary could not be completed.

One of the findings from this set of programs is that most of these programs have been operated for many years. The Oakland-Energy Efficiency Design Assistance program is a recent offering, which emerged in 2001 as a local program option in response to the west coast energy crisis, plus two efforts (HVAC Modeling and Quotas for Motors) that emerged in 2000 as part of market transformation efforts in California show promise, but had very short histories.

The lessons learned in the first six months of program operation were not really available to us during these interviews for the long-term programs. What is clear is that these programs have evolved over the course of their operation; the evolution tends to primarily occur in response to regulatory requirements and associated budgetary changes. But the programs have also changed in response to customer and trade ally input.

Table 7 provides an outline of the 21 programs in the order they are offered in this chapter.

Table 7

PROGRAMS IDENTIFIED FOR THE COMMERCIAL INDUSTRIAL SECTOR

ORGANIZATION	PROGRAM	TYPE	LOCATION
Ameren	Commercial End-Use Audit Program	Audit Program	Missouri
California	California Efficiency Express Program	Equipment Rebate	California
Energy Center of Wisconsin	Daylighting	New Construction	Wisconsin
National Grid	Chiller Program	Equipment Rebate	Northeast
National Grid	Commissioning	New Construction Services	Northeast
National Grid	Design 2000	New Construction	Northeast
National Grid	Industrial Technical Assistance	Industrial Technical Assistance	Northeast
New York State Energy Research and Development Authority	FlexTech Program	Small and Medium C&I Energy Studies	Northeast
Northeast Energy Efficiency Partnership	Cool Choice – Commercial HVAC	Equipment Rebate	Northeast
Northeast Utilities	Commercial Retrofit RFP Program	Large Commercial Retrofit/Bidding program	Northeast
Northeast Utilities	Energy Conscious Construction	New Construction	Northeast
Northeast Utilities	Industrial Consulting Services	Industrial Technical Assistance	Northeast
Northeast Utilities	Small Business Program	Small Commercial Retrofit	
Oakland	Energy Efficiency Design Assistance	New Construction	California
Sacramento Municipal Utility District	Compressed Air Services	Equipment Rebate	California
Southern California Edison	HVAC Modeling Tools	Equipment Modeling	California

ORGANIZATION	PROGRAM	TYPE	LOCATION
			Continued
Southern California Edison	Quotas for Motors	Motor Rebates	California
Xcel Energy	Colorado Custom Efficiency Program	Large Commercial Retrofit/Bidding Program	Colorado
Xcel Energy	Minnesota Custom Efficiency Program:	Commercial & Industrial Custom Rebates	Minnesota
INTERNATIONAL			
Netherlands	Long-Term Agreements with Industrial Firms	Voluntary Retrofit Programs	International
United Kingdom	Energy Efficiency Best Practice Programme	Voluntary Technical Assistance	International

COMMERCIAL AND INDUSTRIAL PROGRAM SUMMARIES

Ameren: Commercial End-Use Audit Program

Name of Organization: Ameren Corp. (formerly Union Electric)

Name of Program: Commercial End-Use Audit Program

Name of Contact: Steve Kidwell, Manager, Strategic Projects

Phone and Email: 314.554.2943; skidwell@ameren.com

Why Nominated

This program was nominated as an example of an end-use audit program that has achieved measurable savings over the length of its implementation period.

Program Description

This program has never been a rebate program, nor prescriptive in nature. The objective was to improve the information for customers so that they could make good decisions on their own, with high quality advice from the utility, based in turn on high quality modeling. Both new building design and retrofits were covered.

The important program success factor was putting resources into sound engineering—after finding in early evaluations that the audits were more guesses than based on sound engineering analysis. This involved requiring good modeling, impact assessment, auditing, and data collection—which are not cheap. In addition, Ameren checked progress throughout each project and conducted a full evaluation to check end-use data against the models.

Supporting elements included certification of the contractors delivering the services, a pre-developed quality control (QC) plan, and maintaining good, consistent customer relations.

A typical project required approximately 14 months from initial sign-up through planning, negotiation, and installation.

(This program was phased out over the past two years. Ameren's emphasis now is on a demand buyback program (not energy efficiency). The demand buyback program is integrated with optional curtailments and the use of a customer energy exchange.)

Incentives

The direct incentives were based on payback, as determined from DOE2 modeling. An initial walk-through was subsidized, as was more detailed modeling, the results of which were provided to the customers.

Program Marketing

Customers were brought to the utility through large architectural and engineering firms and by an engineer involved with quality control (QC) for these sorts of projects. In addition, the Company sponsored seminars for key account executives who targeted appropriate customers and marketed the program to them through personal contacts.

The program was targeted to hospitals, large office buildings, and shopping malls given that buildings of substantial size and anticipated savings were criteria for inclusion.

Customer Service

The core of the program is working with the customer and providing information that will help him or her to make sound decisions about building design. Specific elements include walk-through audits, modeling, and QC support.

Staffing and Contractors

Ameren has 1.5 FTE assigned to the program. Most of the program effort was outsourced. The delivery was largely accomplished by six contractors (two did most of the projects) who were trained and certified on DOE2. (Note that certification for this must be renewed on a regular basis, thus ensuring that those trained maintain their skill level and are up-to-date regarding their information.) Moreover, the QC person—who had done DOE2 modeling for buildings system analysis—was considered a key asset of the program.

Trained contractors are the program delivery agents. They provide the audit and modeling services. However, as indicated, the actual implementation decisions at each stage of a project are in the hands of the customers. In addition to program support and contracting services, the utility staff ensured the quality of the program delivery.

Participation and Savings

Rate is N/A, since no clear idea as to the base number of appropriate projects. Moreover, given the cost of the program and the intensive hands-on nature of the contacts, it does not seem feasible to assess this sort of program in terms of participation rates.

The annual penetration varied widely over time. It should be noted that this sort of program requires considerable start-up time. It is likely that 2-3 years will be needed before program effects are seen, given the time required for the projects addressed to advance from initial planning through program marketing to installation, and given the relatively low hit rate for participation of targeted facilities (as discussed below).

The utility carried out end-use metering to assess the fit of the end-use data to the models. Adjustments were made to future modeling on the basis of what was learned, thus constantly improving the realization rate. The load factor of the facilities was approximately 70 percent, based on metering.

Overall, about 200 customers were touched—about one in ten went all the way through the process, whereas others may have stopped with something like a simple lighting retrofit.

The utility carried out end-use metering to assess the fit of the end-use data to the models. Adjustments were made to future modeling on the basis of what was learned, thus constantly improving the realization rate. The load factor of the facilities was approximately 70 percent, based on metering.

A formal evaluation, which included some metering, found approximately 30 MW in total savings, over about 8,000 MW identified in the modeling. [Comment: Thus, a very conservative estimate of MWh savings, given that some of these facilities such as hospitals operate 8,760 hours, would be 7,665 MWh per year—30 MW *x* 10 hours of operation pr day *x* 70 percent load factor.]

Budget

At the height of the program, the budget was between $2 MM and $3 MM per year. Overall, including subsidies for the walk-throughs and the modeling, approximately 60 percent of the budget went to incentives. The remainder went to salary and support services.

Changes to Program

The Company learned that it is important not to over-model. Program cost savings can be achieved by developing only those baselines that are truly relevant to the climate. It is also useful to get a feel for what is actually needed—which is likely to be more "tweaking" of the model rather than development of models *de novo*. In addition, the Company learned how do negotiate QC for these projects; greater experience led to significant cost savings.

Keeping Costs Down

As noted above, it is important to avoid over-modeling. In addition, the program should use only contractors who are truly committed to the program. This helps focus the program resources where they will be used most effectively and maximizes the success of the program.

Another issue that must be carefully attended to is the contracting process, given the crucial role of the outsourcing and the fact that numerous parties are involved. It is important to review the sign-offs on each phase of the project so at to be able to trace the path of responsibility for what happens at various steps and minimize finger-pointing for any problems that arise. (For example, although contractor efforts were generally good, some blueprints were read incorrectly—with negative consequences.)

Monitoring and Evaluation

Some end-use metering (see above). Customer satisfaction was tracked less formally, though several process and impact evaluations were conducted during the mid-1990s.

Transferability to the Energy Trust

There is no reason to believe any of the factors discussed would differ across service territories. The focus on well trained and certified engineers to do the audits would not be difficult to replicate in Oregon. Early audit only programs had fewer capable engineers to draw upon. A key requirement for the Energy Trust would be to develop either internal or contracted administrative staff capable of providing technical quality control over the auditing process to ensure that audits were of high enough quality to be acceptable and persuasive to the customers.

California: Efficiency Express Program

Name of Organizations: All investor owned utilities in California; originally designed by PG&E in 1980s and early 1990s; operated by PG&E until 1999; statewide 2000-2002.

Name of Program: Efficiency Express

Name of Contact: Sam Cohen, Energy Solutions

Phone and Email: 510.482.8386; sam@energy-solution.com

Reason for Nomination

The Efficiency Express program was nominated for best practice because the program is perceived to be efficient and effective, the program provides rebates for commercial and industrial customers with replacement or retrofit applications. (Note: from 1998-2000 PG&E included a distributor-stocking element for motors and package AC that covered both new construction and retrofit, but this was a fairly minor portion of the program.)

The current statewide program is viewed by some as operating less cost effectively than the former utility operated program primarily due to program changes resulting from the energy crisis in 2001 and due to the focus in recent years on hard-to-reach customers. In addition, the statewide effort appears to be less aggressive than when the program was operated by a single utility. This write-up focuses on the program design issues prior to 1999, but provides more recent savings and incentives information.

Program Delivery

The program delivery is primarily through trade allies. PG&E prior to 1999 and all of the California investor owned utilities since 1999 develop a list of standard rebate amounts for measures. This is revised annually to ensure that cost effective savings were obtained. The applicant applies after project installation with a rebate form and itemized invoice for the project. Customers can elect to receive the rebate directly or have it sent to the contractor. Trade allies are the main marketers for the program, but limited utility account representative time is also available to promote the program. Rebate applications are reviewed by the field office

coordinator (one per district) and processed by a fulfillment contractor. The program manager resolves unusual problems, can approve the installation of measures not on the rebate form. In past years, payment was made within two to four weeks by PG&E but has been taking longer since it shifted to a statewide program. A sample of projects are inspected and verified.

Incentives

Incentive amounts vary somewhat each year. The application forms for the lighting, HVAC, refrigeration, agricultural and motors measures, shown in Appendix C, show the wide range of measures covered. In addition, there are application forms for LED and Gas equipment. A maximum of $25,000 per customer will be paid in incentives in 2002 and no customers over 500 kW are eligible.

Program Marketing

The utilities inform trade allies of the program modifications each year. When PG&E developed the program they worked closely with trade allies to review changes to the forms and the measures, this has been more difficult with the statewide program. The utilities post the program information on their website, including brochures and applications. Utility account reps also discuss the program with customers, but trade allies conduct the major marketing effort.

Customer Service

A 1-800 number to the Energy Solutions Center is provided to assist customers in finding contractors and in getting questions answered.

Staffing and Contracting

PG&E had one program manager at about .7 FTE, one contract consultant (Energy Solutions) at about 1.5 FTE and one incentive coordinator in each of 12 divisions at .5 FTE plus a part time incentive clerk. A fulfillment contractor provides invoice processing and payment services and customer service is offered through the utility customer services center. An M&V contractor conducts inspections on a sample of projects. With the statewide program staffing is similar though there is no longer a contract consultant to the program.

Participation and Savings

Based on 1999 data for PG&E, program penetration is .78% of C&I load. C&I load is 73% of total PG&E load, the program incentive was $.008/lifetime kWh with an incentive basis up to 70%, though for lighting measures these are far less than 70% according to Tumidaj et al, 2002. Estimated savings for 2002 program year are 155,382,003 kWh, 29,288 KW and 8,761 therms. (CPUC 2002)

Budget

The annual budget for PG&E's Express Efficiency program in 2002 is $11.9 million (of a statewide total $23.8) with .3 allocated to M&V for the program. (CPUC 2002)

Key issues for Program

The program is considered to be very efficient from the trade ally and customer perspective. The goal in designing the program in the 1990s was to ensure stable funding, limited changes year to year, slowly ramp incentive levels down and tighten eligibility, provide 24 hour turn around on questions and pay invoices within 2-4 weeks.

Key Issues for Cost and Program Control

- Can front load (i.e., do larger sample of) M&V on new vendors to ensure that they are meeting program requirements; once they do sampling is satisfactory.
- Reduce the value of the incentives for measures with high free-rider rates or eliminate those measures entirely.
- Change measures on list to include new technologies that are being adopted.
- Work with trade allies to refine and modify the program each year so that they are able to implement the new program as efficiently as possible.
- Use a fund reservations process. This type of process, in which contractors can reserve funds prior to implementing a project, provides certainty to the trade ally that funds will not be exhausted when a project is

completed and allows the utility both to assess progress in meeting goals and objectives and to minimize free riders.

Monitoring and Evaluation

The program has had several evaluations include process evaluations during the program redesign phases in the early and mid 1990s and impact evaluations periodically.

Transferability to the Energy Trust

The program design is definitely transferable; the design model is as well (to work closely with trade allies). Incentive levels and standard measures need to be determined relative to the planning goals for the Energy Trust. The smaller scale of an the Energy Trust version of this program would probably require around .5 FTE to manage the program, .5 FTE technical consulting support, and 1-2 FTE for clerk or contracted fulfillment house support to manage rebate processing. In considering incentive levels, the Business Energy Tax Credit in Oregon should be considered; there is no analogous credit in CA.

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Energy Center of Wisconsin: Daylighting

Name of Organization: Energy Center of Wisconsin (the Energy Center)

Name of Program: Daylighting

Name of Contact: Abby Vogen

Phone and Email: 608.238.8276 x 122; avogen@ecw.org

Why Nominated

The daylighting program offered by the Energy Center was nominated because it has had a broad affect on daylighting education and training practices across the nation.

Program Delivery

This program is a mix of implementation, demonstration and research, so structured in order to support the activities in the field. The target group is architects and engineers (A/Es). They need support that will allow them to implement daylighting projects. This means education and training, technical assistance and possibly financial support to cover the time that is involved and information that will address the risk of creating designs that are ineffective or not cost-efficient. A key element, therefore, is "Second-look" design assistance. Education and training is a key component as well. Training includes full day technical training and "lunch and learns" that can serve technical audiences and the more general education needs of the non-technical audience (decision-makers, etc). In addition, every effort is made to ensure that the daylighting elements are integrated with the rest of the project design. The program promotes an integrated design approach.

The development of demonstration sites in existing buildings is an important element. Those they do have are extremely popular, because people want to see the applications and "kick the tires." But it is very difficult one to pull these off, compared to affecting new construction, for reasons noted below.

Note that this program is highly integrated with the High Performance Buildings component of the Wisconsin Focus on Energy effort, since daylighting elements can contribute so strongly to the overall savings goal.

Incentives

Includes design assistance and technical grants (depending on the needs of the program region). Up to $10K per project is now available to cover what might be called learning-curve time. (The financial incentives are new, provided by the state's public benefits funding.) Assistance with energy modeling—to cover the time and the direct costs involved. This also provides feedback to the program as a whole, regarding which designs are effective and which are not. In addition, training is provided to help the A/Es market daylighting projects to their clients.

Program Marketing

First, given the budget available, it's targeted. Second, the specific focus is on professional organizations. Media used are brochures and the website, as well as limited direct mail and direct outreach. In addition, Abby and her staff get on conference and seminar programs for the targeted audiences; they work with leading sites in the regions of interest; and they develop articles for publications that reach the targeted professionals. No use of mass media; too much ramp-up time would be needed and the audience reached would be quite different (and less directly appropriate) as well as being cost-prohibitive.

Regarding the relationship with professional organizations: The program was ramped-up relatively quickly in Wisconsin—it was put into place, with considerable excitement, over about six months, through developing relationships with local chapters of ASHRAE and AIA (American Institute of Architects).

Retrofits are considered if they can provide a good demonstration/education opportunity or if they include multiple systems (lighting, windows, etc.). Generally, however, they are less attractive than new construction since they tend to offer less potential and entail more worry about ROI. There is definitely the problem with retrofit applications with first cost in these situation because you lose the ability to "cost trade" across systems to achieve a no to low net increase in project costs.

Demo sites for retrofits also involve the problem of how nonstandard these are—each one is different from all others.

New projects are often rejected if they are "too far along," since the opportunities for savings shrink as design decisions are made. It may be considered if it offers good potential as a demonstration of as an educational opportunity. Finally, it is crucial that there be buy-in from the building owner—which is generally easier to obtain early in a project.

Customer Service

Most immediately, the technical consultants provide "Second look" design assistance. In addition to the technical consultants, support is provided through an 800-number. Also, regional information is being added to the website. At a broader level, the program is being made available to other regions through organizations in those areas (e.g., NYSERDA, Efficiency VT). Accordingly, Abby and her staff invest in "training the trainers."

There is a very strong emphasis on customer service, especially turn-around time for any information requests or processing technical assistance. The "speed of business" is crucial to interact effectively with projects.

Staffing and Contractors

The Energy Center assigns 2.5 FTEs to daylighting plus 8-10 technical consultants who are available on an "as needed" basis. Abby suggests that there be at least a ½-time person in each area served.[11] (Overlap is helpful, because it ensures that someone is available, even if one consultant is heavily committed or otherwise occupied.)

"Ownership" is important; it both inspires a sense of legitimacy and provides an assurance to the A/E that the support will be there when needed. The local presence also ensures that the regional organization gets credit for the effort and removes the possible sense that some "national" program, unaware of local codes, etc., is being imposed. Finally, the local presence allows for immediate response to A/Es in those areas.

Consultants deliver the technical support to the A/Es who are actually working on a project. Energy Center staff administers the program and trains the trainers. They also provide the program design elements, allocate the funding, coordinate education and training and outreach, and disseminate the program to other regions.

[11] "Area" here refers to the locale that can be effectively served by a technical consultant, not to an entire region, such as WI or NY.

Participation and Savings

There is no empirical baseline, of course, for the energy use of new construction projects. What the program seeks is estimated savings for the project design of at least 20 percent compared to local ASHRAE standards.

The program was officially initiated at the state AIA conference in May 1999. However, about 18 month were spent on program design and development, including about 12 months for market assessment studies.

To date, the program has led directly to 50-60 projects that have gone from initial verification to full-blown construction, using the design assistance or other program components. This does not include any spillover as a result of A/Es who have attended trainings and incorporated daylighting design elements.

There is no information on kWh savings at this time (but a study is in progress).

Budget

The annual budget is scalable. It has ranged between $100K and $400K (omitting the costs of staff in individual localities—the use of which is highly recommended, as noted below). About 10-15 percent of the budget goes for incentives—this is growing as the program matures. Formal evaluation is not included in this amount; handled through separate funding.

Key Issues for the Program

Now looking more at top-lighting as well as side-lighting designs. Part of looking for what is most "cost-friendly" within the current practices of the region; newer products have made top-lighting more economical than it was earlier. This strategy not only helps "sell" the program; it also keeps the project costs down, since sensitivity to the problem of first costs is crucial to affecting design practices.

Keeping Costs Down

Attempting to limit marketing costs through use of a website. Also minimizing administrative costs through less investment in qualifying the projects and holding kickoff meetings. Additional savings through use of memoranda of understanding (MOUs) rather than formal contracts—more user-friendly and less need to go back and forth regarding specific details. [Comment: Note the tradeoff between reduced

costs and reduced hassle for participants—thus, increasing the likelihood of participation—and increased certainty of savings.]

Monitoring and Evaluation

Most particularly, the program follows up with A/Es who attended training sessions to identify any reasons that they have not designed or implemented projects. What additional barriers have they encountered? How could these be addressed? It also continually seeks qualitative feedback from participants. Most difficult problem is attempting to track spillover beyond the specific projects that have been funded or received design assistance.

Transferability to the Energy Trust

The Alliance currently offers access to daylighting analysis through the daylighting labs in Portland and Eugene. Thus this aspect of the Energy Center approach is already available, What could also be transferred is the means by which the Focus on Energy and Energy Center link additional financial support for project analysis, this could provide an example for how the Energy Trust can link to the Alliance daylighting effort.

National Grid: Chiller Program

Name of Organization: National Grid

Name of Program: Comprehensive Chillers Program

Name of Contact: Fran Boucher, National Grid

Phone and Email: 508.421.7299; francis.boucher@ngrid.us.com

Why Nominated

The National Grid Comprehensive Chiller program was nominated because it convinces customers who are installing new chillers to make other efficiency upgrades to their facilities at the same time, thus maximizing savings and avoiding lost opportunities.

Program Design

The National Grid Chillers Program is part of the company's Design 2000 *plus* Program, which covers not only new construction, but also renovation and replacement of "end-of-life" equipment; the chillers program falls under the "end-of-life" category. A National Grid customer who is replacing a chiller (300 tons or more) near the end of its useful life may take advantage of either a custom incentive intended for a complex single C&I end-use, or a comprehensive incentive, which calls for whole-building efficiency improvements at the time of chiller replacement. The idea is to get large C&I customers to do more than the minimum efficiency improvements at a time when they have to make major changes in their building systems. Examples of other improvements that may be part of a comprehensive chiller approach include lighting retrofits, upgrading a cooling tower, or converting from constant to variable air volume. The comprehensive package is specified through an engineering study, and varies from facility to facility.

Incentives

Incentives under the comprehensive chiller approach are higher than with the custom approach. Installation of an efficient chiller by itself would warrant an incentive of up to 50% of the incremental cost above a standard-efficiency chiller or

a buydown to a two-year payback, whichever is less. A stand-alone lighting project under the prescriptive approach (the third type of incentive, in addition to custom and comprehensive) would be eligible for a 40% rebate. With a comprehensive approach, however, National Grid would pay for up to 90% of both the entire lighting project and the incremental chiller cost, or a buydown to a one-year payback, whichever is less. (In practice, the incremental chiller cost paid for has never been more than about 85%.) National Grid also pays for 50% of the engineering study with the comprehensive approach.

Marketing

The program is marketed largely by the National Grid's account managers. Over time, an increasing marketing role has been played by engineering firms attracted by the fees for conducting the engineering studies, and by ESCOs attracted by the large incentives ($500,000 to $2,000,000). There are no separate printed materials for the program other than application forms.

Customer Service

Customer service is handled through National Grid's account managers, who monitor the process through on-site visits.

Staff and Contractor Responsibilities

National Grid's staff involvement includes: the program manager; all of the company's account managers (there are 40 in Massachusetts), who devote 40% of their time to energy efficiency, including other programs; and a technical representative for each of the eight districts, who is responsible for managing the contracted technical study, qualification, and implementation for all custom measures. Contractors involved in the program include the engineering firms that conduct the engineering studies; there are 23 under contract, of which eight or nine conduct 75% of the work. Other contractors involved in the program are mechanical contractors, who install the measures; they are not at all involved in selling or promoting, and are selected and paid by the customers.

Participation Rates

Since the program began in 1996, the participation rate has been about five facilities per year, although there are eight in process in 2002. The size of the

target population is unknown, and realization rates are not calculated separately, but only as part of Design 2000*plus*.

Budget

The budget is not broken out separately from those of Design 2000*plus* or Energy Initiative. However, assuming five installations per year with an average incentive of $1,000,000, the budget would be $5,000,000 for implementation only.

Keeping Costs Down

With the increase in participation in 2002, in order to keep costs down, National Grid is considering making the required measures for participation even more comprehensive than before, and possibly paying lower incentives—e.g., no more than 75% of incremental costs for the entire project.

Reasons for Success

However, the size of the incentive has been a reason for the program's success. In previous years, with lower incentives, marketing was more difficult and participation dwindled. Other reasons for its success include its timeliness—that is, it happens when a customer is already making a major capital decision. Such a capital investment can often be paid for through energy savings. Some measures provide benefits that are not counted in electricity-based payback calculations, such as an energy management system controlling a fossil fuel-fired heating system. Sometimes the other measures provided exceed the value of the chiller, which almost makes the chiller free.

The methodical analysis approach, starting with heat-creating loads, then dealing with HVAC auxiliary design, and then the chiller, allows for design of the new system around the loads, allowing for a better design and sometimes a smaller chiller.

Quality Control/Assurance

If a project is over $100,000, a commissioning process is required, involving an on-site inspection of the installation and operational performance requirements, such as set points on energy management systems, and also including documentation during the design and installation process. Twenty percent of the incentive is

withheld until performance has been verified and documented. Commissioning is also sometimes applied for less expensive, but complex, jobs.

Transferability to the Energy Trust

The transferability of this program would depend on there being sufficient numbers of 300+ ton chillers in Oregon to make it worthwhile, and would also depend on fuel costs and typical hours of operation for cooling equipment. Given that eastern Oregon is hotter, the program might work better there than in western Oregon.

National Grid: Commissioning

Name of Organization: National Grid

Name of Program: Commissioning

Name of Contact: Kevin Keena

Phone and Email: 508.421.7279; kevin.keena@us.ngrid.com

Why Nominated

This program was nominated because it is widely cited as the best example of commissioning, which assures that energy-efficient equipment for which customers receive large incentives is properly designed, installed, and operated, and therefore also assures that the installation achieves targeted savings.

Program Summary

National Grid's Commissioning Program supports customers on large, complex energy efficiency projects by reviewing, verifying, and documenting the three phases of the construction process: design, installation, and operation. Commissioning is part of National Grid's Design 2000*plus* Program—which covers not just new construction, but also renovation, remodeling, and failed-equipment replacement—and the Energy Initiative Program, which covers retrofits. If a project involves over $100,000 in incentives, a commissioning process is required, involving an on-site inspection of the installation and operational performance requirements, such as set points on energy management systems, and also including documentation during the design and installation process. Twenty percent of the incentive is withheld until performance has been verified and documented. Commissioning is also sometimes applied for less expensive, but complex, jobs in the $40,000 to $100,000 incentive range.

Program Delivery and Staffing

There is one program manager, who works with National Grid's account managers and technical specialists. There are also contractors with one employee each who perform technical evaluations. National Grid tries to get involved as early as possible with a project, with the account manager identifying projects that may

require commissioning. A specialist contractor then performs a technical evaluation of the design, which results in a minimum requirements document that the customer signs, then periodically visits to see how the equipment is installed, and then collects operational trending data after startup to see if it is operating according to specifications.

Incentives

There are no incentives paid through this program, although National Grid pays 75% to 100% of commissioning costs; 100% is paid if commissioning had not been discussed up front with the customer. Twenty percent of the entire project incentive is withheld until commissioning is complete; for weather-dependent installations such as chillers, this can sometimes result in a delay of several months.

Program Marketing

National Grid's account managers market commissioning as a benefit of the Design 2000*plus* and Energy Initiative Programs. There have also been workshops about commissioning put on by DOE and by consulting firms.

Customer Service

Customers usually do not call during the commissioning process; if they did it would usually be handled by the account manager.

Participation Rates

National Grid conducts about 30 commissioning projects per year; this level has been fairly consistent since the program started in 1993-1994. Estimated savings from commissioning are in the 5% to 10% range; savings are not calculated directly since commissioning is part of other programs.

Budget

The budget for the outside contractors used in commissioning is $250,000. The average project costs $7,500, and the largest costs $15,000.

Keeping Costs Down

The best way to keep costs down for commissioning in and of itself is not to check every detail of a project; if estimated savings are not being achieved, then commissioning can look deeper. However, since commissioning saves money and makes sure that expected savings are being achieved, cutting back too much would be "penny wise and pound foolish." Commissioning may also examine impacts beyond rebated equipment, such as controls on a chiller, which may help justify the cost effectiveness of a project.

Customer Satisfaction

National Grid has not examined customer satisfaction with commissioning *per se*. Customers are generally satisfied, especially facilities management and maintenance people, but higher-ups occasionally find the commissioning process to be intrusive and disruptive.

Monitoring and Evaluation

Evaluation is included under other programs. However, sometimes impact evaluations identify intended savings that are not being achieved, which could have been caught during commissioning; for this reason the program may be expanded. For example, there is now a pilot retro-commissioning program in which commissioning can be done after the installation of equipment.

Reasons for Success

The program is successful because of up-front marketing that sells it as a customer benefit, because of good in-house staff to direct commissioning agents, and because 20% of the project incentive is withheld until commissioning is complete, which motivates the customer to comply.

Transferability to the Energy Trust

There is no inherent issue in transferring this program to Oregon, though it is noteworthy that commissioning is part of the larger Design 2000 new construction program, not a standalone program. The incentive structure and use of technical firms for commissioning would fit well with new construction efforts the Energy

Trust might initiate. The Alliance and PECI offer support for commissioning but not the incentives provided by National Grid.

National Grid: Design 2000

Name of Organization: National Grid

Name of Program: Design 2000*plus* Program

Name of Contact: Michael McAteer

Phone and Email: 508.421.7225; mcateer@us.ngrid.co

Why Nominated

National Grid's Design 2000*plus* program saves energy and creates long-term market-transforming effects by influencing architects, engineers, and the building design community to incorporate energy-efficient design, strategies, and equipment into the early design phase of commercial and industrial projects, thereby raising the energy efficiency standards of normal commercial building practice. For large, complex projects, Design 2000*plus* includes a commissioning component to assure that systems operate according to their design. Design 2000*plus* has been widely emulated in the energy efficiency industry, largely because it is straightforward to set up and operate, and because customers and trade allies have been responsive.

Program Summary

National Grid's Design 2000*plus* program targets time-dependent opportunities for the installation of energy-efficient equipment in the new construction, renovation, remodeling, and failed-equipment replacement markets. The program's goal is to make energy efficiency options an integral part of the design process. Program components are rebates for energy-efficient equipment installation, technical information and assistance, and commissioning services for large complex projects. There are three different types and levels of measures: prescriptive, custom, and comprehensive. Prescriptive measures are those not requiring detailed engineering; covered measures include energy-efficient lighting, premium-efficiency motors, HVAC equipment, and variable-speed drives. Custom measures require detailed engineering analysis, and are initiated on a separate application form, which allows more site-specific and comprehensive energy-efficient measures not

available through the prescriptive application approach; these projects generally involve site-specific measures such as process, refrigeration, controls, and/or other industrial applications. Comprehensive measures involve whole-building efficiency using the Comprehensive Design Approach, which includes computer simulation of a building's energy use for new construction or renovation applications; it maximizes the opportunities to build in energy efficiency during the design stage of the building process.

Program Delivery and Staffing

National Grid's commercial and industrial energy efficiency staff—who are responsible for Energy Initiative (retrofit) and Small Business Services (direct install for small C&I customers) as well as Design 2000*plus*—comprises: eleven people at the headquarters level; 40 account managers (Massachusetts only) who market to large C&I customers and who spend 40% of their time on energy efficiency; and a technical representative for each of the eight Massachusetts districts, who is responsible for all custom measures, including estimating savings and supervising the work of outside engineering experts.

Technical assistance is provided by 23 engineering firms under retainer, of which 8 or 9 provide 75% of the services; there are two to four principal engineers per firm. Eleven firms act as project expediters, providing a turnkey service to help customers to identify energy efficiency opportunities in their facilities and install energy-efficient equipment eligible for rebates in National Grid's programs. Two firms perform ballast recycling. There are also four firms involved in supply chain management—that is, getting bids for aggregated pricing.

Incentives

Incentives for prescriptive measures cover approximately 40% of the incremental cost above standard-efficiency models. For custom measures, incentives are up to 50% of incremental cost, or a buydown to a two-year payback, whichever is less. The comprehensive approach provides incentives of up to 90% of the incremental cost, or a buydown to a one-year payback, whichever is less. National Grid also makes financing available to cover the portion of the project customers have to pay.

Program Marketing

The program is marketed primarily by National Grid's account managers, with headquarters staff providing case studies, customer profiles, descriptions of

services, and a web site. At this point in the program, customers know about the program and often approach account managers. The technical consultants and ESCOs have also taken on a larger role in marketing as the program has matured.

Customer Service

The account managers provide customer service; it is their responsibility to track customer progress in the program. To do this, they use account management software to make sure they stay current with customers.

Participation Rates and Savings

In 2001 there were 762 participants in Design 2000*plus* in Massachusetts. About 90% of new construction projects go through the program. Of existing customers, more than 50% have participated in one or more of National Grid's programs, including Design 2000*plus*. Annual savings through Design 2000*plus* are approximately 41,000 MWh, lifetime savings are about 700,000 MWh, and summer peak demand savings are about 6,000 kW.

Budget

The annual budget for Design 2000*plus* is about $14 million, of which about $11.5 million is for incentives, $1.5 million is for technical assistance, $100,000 is for advertising, and the remainder is for payroll.

Keeping Costs Down

One way to reduce costs has been to develop engineering templates based on past studies, which can be used in similar projects. National Grid has also tried to develop internal technical expertise and perform work in-house if possible.

A change in data management has also reduced costs. National Grid had used an Ingres system, but has migrated to an Oracle-based system and reengineered their business practices. Results include the minimization of data transfers, and the use of electronic signatures.

Program Changes

One key change in the Design 2000*plus* Program is the maturity of the market. At first customers did not accept energy efficiency as a business objective, but have become more receptive because of the program's track record. At first, 70% to 80% of measures installed were prescriptive, but now the proportion is about 25%; the majority are now custom and comprehensive measures.

Until 2001, National Grid could meet all demand for the program, and could never spend all of its budget. Starting in 2001, however, the rate for public benefit funds has gone down from 3.2 to 2.5 mils at the same time that customer demand has gone up, so the focus is now shifting to the most cost-effective projects, especially time-sensitive projects to avoid lost opportunities. Among C&I customers, that means a shift from Energy Initiative (retrofit) and Small C&I to Design 2000*plus*. Even so, the infrastructure for those other programs has been developed, customer receptivity has been cultivated, and all customers pay into the efficiency fund, so National Grid does not want to cut off those other programs; there is recognized need to balance the priorities of retrofit and new construction in light of reduced funding.

Customer Satisfaction

National Grid has formally tracked customer satisfaction, and has found 90% to 100% of Design 2000*plus* customers to be satisfied.

Monitoring and Evaluation

For quality control, the data system tracks measures installed, savings, incentives paid, vendors participating, customer information, and facility characteristics. For quality assurance, an important part of Design 2000*plus* for large, complex projects is commissioning, which involves review, verification, and documentation of design, installation, and operation phases to make sure that newly installed systems are operating according to specifications.

Evaluation, which is outsourced, has included customer surveys, pre-post metering, free ridership, spillover, etc.

Reasons for Success

Design 2000*plus* is successful because National Grid's account managers are attuned to customers' needs, and are effective in identifying opportunities for electric and thermal energy savings and in brokering solutions. There is also a built-in infrastructure that can deliver seamless solutions, including capable people both inside and outside the company, such as technical specialists who can be called on for specific applications and industries. The substantial rebates are an important inducement to participation. Commissioning is important because it proves that the systems are operating as promised.

Transfer to the Energy Trust

Key issues in transferring this program to the Energy Trust need to focus on the delivery mechanism. National Grid relies on internal staff to market the program, the Energy Trust would need internal staff or a program administrative team that could market the program in a comparable manner to utility account reps who are assigned to targeted customers to work with these customers on a variety of energy related issues, not just energy efficiency. Other aspects of the program, the incentive determination process and the use of technical assistance are fully transferable.

National Grid: Industrial Technical Assistance

Name of Organization: National Grid

Name of Program: Industrial Systems Optimization Service

Name of Contact: Tom Caughlin

Phone and Email: 508.421.7239; Thomas.cahuglin@us.ngrid.com

Why Nominated

The Industrial Systems Optimization Service (ISOS) helps industrial customers develop creative strategies to meet multiple objectives, integrating the pursuit of energy savings and other critical goals. Some projects are initiated strictly for their electricity-saving potential, but do not have enough to pass cost effectiveness screening tests; ISOS helps identify other, non-energy savings that can be counted toward savings and thus qualify the projects for rebates. Other projects are initiated to solve specific problems, and ISOS helps identify solutions that happen to save electricity and other resources, and thus also qualify for rebates.

Program Summary

National Grid's Industrial Assistance Optimization Service identifies opportunities for meeting multiple objectives in industrial facilities, including not only electricity savings, but also thermal energy savings, waste stream reduction, increased productivity, material cost savings, and environmental improvements. The electricity savings are pursued through the Energy Initiative (C&I retrofit) and Design 2000*plus* (new construction, renovation, and measure end of life) Programs. ISOS provides technical assistance to industrial customers (and recently, to commercial customers for large HVAC projects) to help quantify these other benefits, which then may be counted toward savings in cost effectiveness screening tests.

Program Delivery

National Grid's technical representatives contract with a technical assistance engineer specializing in a particular industry to perform a study to identify electric and non-electric benefits associated with a given equipment installation. National

Grid has had to find different consultants with process expertise in specific industries to do this work. National Grid has also worked with state and regional manufacturing organizations, and is exploring relationships with federally funded manufacturing productivity consulting organizations.

Incentives

National Grid pays for 50% of the engineering study cost, with the customer paying the other half. There are no other incentives paid through this program; regular incentives are paid for electricity savings through Energy Initiative or Design 2000*plus*. However—unique to Industrial Assistance Optimization Service—if the electricity savings are insufficient to qualify for a rebate on their own, the project may receive a rebate anyway—prorated to the electricity savings—if the electric savings plus the non-electric savings meet a societal cost test. Rebate amounts have ranged from $13,384 to $350,000.

Program Marketing

National Grid's account managers market the program. They decide whether to do a study or not and whether to use the ISOS channel for the study (i.e., formally consider benefits other than electricity in cost-effectiveness screening), using their judgment as to whether it would persuade a customer to move on a project. So far, National Grid has conducted all studies that have been requested.

Customer Service

Account managers are responsible for customer service, since these are large customers they have ongoing dealings with.

Staff and Contractor Responsibilities

See above under Program Delivery and Program Marketing.

Participation Rates

National Grid conducts 15 to 19 studies each year, of which about 10 become projects; others are sometimes deferred, and may also eventually become projects, while others move ahead solely on the basis of electricity savings. The savings are included with Energy Initiative and Design 2000.

Types of customers have included facilities in the glass, soy product, lobster trap, wire brush, plastic tableware, dairy, metal forging, wastewater treatment, corrugated cardboard, toy, circuit board, and pulp/paper industries. While the program is targeted at medium to large industrial customers, many of the participants are on the smaller end, because they do not have the expertise to conduct the studies on their own.

Budget

The budget in 1999—the first full year of operation—was about $150,000, all of which went to pay for studies. The 2002 budget is $135,000, of which only about half is expected to be spent—not because there will be fewer studies, but because costs are lower, and some studies will be paid for out of other funds. Staff salaries and incentives are paid for out of other program budgets.

Keeping Costs Down

Costs have gone down because customers have changed their thinking and have come to accept the program and the reality of the non-energy benefits. As a result, while initially the program required a lot of in-person "hand holding," recently customer contact can largely be handled through phone calls.

Customer Satisfaction

Included under other programs.

Monitoring and Evaluation

Included under other programs.

Reasons for Success

The program documents for customers the merits of energy-efficiency programs beyond electricity savings, and gets them to think about the relationship between energy savings and other objectives. In the course of a study, the National Grid account manager, technical rep, and technical assistance engineer draw out the needs of the customer to find where to look for savings of various types. They use the customer as an expert, and help them put together a case to present to the CFO for buying a new piece of equipment.

Transferability to the Energy Trust

This program should transfer to the Energy Trust quite well, depending on the type, size, and vintage of industrial facilities in the area. The program is likely to work best among relatively small industrial customers whose facilities have not been updated recently and who do not have the internal expertise to conduct environmental and productivity studies on their own. However, National Grid's program manager points out that some industries with larger facilities, such as pulp and paper, could be a good fit if they are process-intensive. Bio-pulping in the pulp and paper industry, as demonstrated by the Energy Center of Wisconsin, could save electricity and natural resources, and prevent pollution. The ISOS approach would not be appropriate for the pulp and paper industry in Oregon, however, if these facilities regularly conduct sophisticated environmental and productivity studies on their own.

New York State Energy Research and Development Authority: Flex-Tech Program

Name of Organization: New York State Energy Research & Development Authority (NYSERDA)

Name of Program: FlexTech

Name of Contact: Brian Henderson; Director, Energy Efficiency Services

Phone and Email: 518.862.1090 x 3305; bmh@nyserda.org

Why Nominated

The Flex-Tech program was nominated because NYSERDA has evolved an innovative way to provide energy analysis services to small and medium sized nonresidential customers outside of a utility environment.

Program Delivery

The objects of this program are twofold: First, to provide small and medium-sized companies with the ability to get energy studies completed. A particular focus is institutional customers, who often are not aware of where they can go to get the assistance needed. The program also targets New York City in an effort to ensure the sufficiency of power there. (In general, larger commercial and industrial companies have internal resources that allow them to capture or contract for the energy savings available, if interested.) The program provides peer review of savings opportunities that increases customers' confidence in appropriate opportunities and provides some financial incentive to initiate the study process.

The second objective is to increase the capacity of energy service companies in the State. And it is by addressing this objective directly that the first objective is also served. The process is to identify companies that will provide a variety of credible, pre-approved energy-efficiency services to the small and medium-sized market at competitive rates. On a three-year cycle, NYSERDA advertises for companies that are interested in participating in the program. An effort is made, in the solicitation, to target particular technologies in specific customer segments (a matrix approach) and to ensure geographic coverage of the state. The procurement process helps insulate the program from potential charges of anticompetitiveness.

The selected firms (35 are currently on retainer, selected form 80-90 proposals) must agree to a competitive price level and to promote and market energy efficiency to their customers. (This may include cogeneration projects.) In turn, NYSERDA will not only provide the company's name as one of several approved options to customers who ask for recommended contractors, but will also cover one-half the cost of a proposed study (thus helping to overcome an important barrier to initiating a project). (Some on-site scoping may also be provided at no cost to the customer.) Once this is completed and the study passes review, the energy service provider must develop a one-page agreement with the customer, describing the work to be completed, the relevant timeframe, and the budget. Bonuses are available if the customers are in a designated economic development zone or are involved in the ENERGY STAR® buildings certification process.

NYSERDA also has a parallel program with an open solicitation for customer-initiated projects. This allows interested end-users to come in with their own contractor if that is an issue for them. (Brian believes this may allow for some free ridership, but suggests that, on balance, this may be an acceptable cost.)

NYSERDA also offers orientation meetings to the selected firms, providing training and information on current approaches to increase their capabilities. Recent topics have included commissioning and computer modeling.

Incentives

As indicated above, NYSERDA offers the selected contractors an advantage in marketing, financial assistance to overcome the initial study cost barrier, and useful training opportunities.

Program Marketing

Leads are obtained from local economic development organizations, trade associations, and chambers of commerce. In addition, NYSERDA coordinates with other organizations through such means as providing relevant case studies for their newsletters. It will also meet with associations and occasionally place ads in trade journals addressing specific segments and technologies. For example, dairy farms may be targeted for variable speed drives; industries may be targeted for process improvements. Finally, NYSERDA works with some of the state's investor-owned utilities (IOUs) either through voluntary relationships or contracts to brief the IOUs' account representatives about the opportunities or provide training seminars.

The customers themselves, based on their own payback criteria, determine the projects actually completed. NYSERDA does not impose any fixed requirements. Because the initiative lies with customers, there is no focus on balance across customer segments or technologies. However, some consideration is given to ensuring that there is statewide coverage.

The NYSERDA staff rejects a considerable number of the projects submitted for consideration for such reasons as lack of feasibility as designed. Many others fall out as the contractor and the customer review timing and budgets.

Customer Service

NYSERDA will hold a pre-study meeting with the customer, to ensure mutual understanding of what will follow. It will also review the contractor's draft report, and then pass it on to the customer. If required, they will also help to clarify the assumptions involved and will sit with the customer to review these where needed. Finally, NYSERDA will recommend its low-interest loan program to customers for whom this will be appropriate and helpful in moving the project forward.

Staffing and Contractors

NYSERDA assigns 3.5 to 4.0 FTEs to the program. It has grown (doubled) as public benefits funds have become available. As noted, 35 contractors are currently on retainer. The number of staff at each is not tracked.

NYSERDA staff is responsible for identifying the technologies, sectors, etc. where contractors are needed; for advertising the solicitation and the solicitation process; and for selecting contractors to be on retainer. The staff is also responsible for providing information about contractors to customers and, where necessary, helping customers understand the study process and the resulting contract. The contractors are responsible for marketing energy efficiency, making the sales, and implementing the energy efficiency projects.

Participation and Savings

Approximately 300-400 projects are being completed each year. Overall, the staff analyzes some 500-600 plans each year and approximately 200 are in process at any given time.

This annual savings are difficult to assess: The projects supported by this program are often supported by related efforts as well, such as a low interest loan program designed to help customers move forward to take advantage of opportunities that have been identified. Accordingly, the attribution of savings is a complex issue.

Approximately 900 projects have been supported across the last three years. On average, the program achieves approximately $4/year in savings for each $14 of capital investment.

Budget

The annual budget is approximately $4 MM per year, to support studies that average around $10,000 each. The great majority of funding is used to support the studies conducted by approved firms. The remainder covers program administration and a modest amount of marketing. Evaluation is supported by a separate NYSERDA budget.

Key Issues for the Program

The program is developing new components at this time. In particular, it is working on services that will help customers—particularly school districts—ready themselves for a competitive energy supply market. In addition to supporting contractors for special technologies and building studies, NYSERDA is now including contractors who can carry out rate analyses and provide aggregation services.

Keeping Costs Down

The program has developed and now applies rules of thumb regarding typical costs and the savings that are possible on customer energy bills. Moreover, it will not support design work (which is relatively expensive for the savings that can be realized). Some cost savings are also achieved by standardizing the paperwork and the processing. Finally, only minimal amounts are spent on marketing.

Monitoring and Evaluation

NYSERDA does track customer satisfaction and other evaluation results, which are available and can be shared. (Contact Paul deCotis at NYSERDA, if desired.) The current information will be supplemented by more formal evaluations in the near

future. Additional approaches include developing initial baselines, installing metering, using protocols for performance-based programming, and commissioning. As noted earlier, these evaluations are conducted under a separate budget.

Transferability to the Energy Trust

Unlike utility program this program has among the highest potential for transferability to the Energy Trust. The key, as with the Ameren utility audit program is retaining good consultants who can make energy studies convenient for institutional customers. Simplifying the process for them reduces their internal time requirements and thus enables them to participate in these programs. Facilitating the interaction between these consultants and customers through various means, including the development of standard forms and eliminating the requirement for a model audit, is important and helps provide opportunities for economic development. Providing quick turn-around on reviews is an important adjunct to the streamlining effort.

Other key features to consider in replicating success include keeping the program flexible and ensuring and emphasizing the review by an unbiased third party. Regarding this latter point, he emphasizes that the internal staff contributes considerable value as a cadre of experts who are highly credible and cannot be easily taken in by weak or inappropriate analyses.

Northeast Energy Efficiency Partnership: Cool Choice – Commercial HVAC

Name of Organization: Northeast Energy Efficiency Partnership (NEEP)

Name of Program: Cool Choice Program

Name of Contact: Jon Linn

Phone and Email: 207.338.9705; jlinn@neep.org

Why Nominated

This program was nominated because it successfully sells customers up to CEE Tier 2 Commercial AC equipment; because it provides similar application forms, messages, and rebates across 14 utilities in five states; and because it involves an educational component for installation practices.

Program Summary

The Cool Choice Program, coordinated by Northeast Energy Efficiency Partnerships, Inc. (NEEP), is jointly sponsored by 14 electric utilities in Connecticut, Massachusetts, New Jersey, Rhode Island, and Vermont. The program provides cash rebates to commercial and industrial customers to help defray the costs of buying energy-efficient HVAC (cooling) systems.

Program Delivery and Staffing

The staff involved in Cool Choice includes: the NEEP program manager, who spends about one-fourth of his time on the program; and at each utility, a program manager devoting one-tenth to one-fourth of his or her time, plus an administrative staff person also devoting one-tenth to one-fourth of his or her time. Contractors include a marketing communications specialist who built the website and prepared the materials; three people at this firm work on Cool Choice. There is also an implementation contractor employing four circuit riders who are responsible for outreach to contractors and distributors, which involves providing information, technical support, and sales training; occasionally, if necessary, they will also meet with the customer, and help with rebate applications. One of these four circuit riders deals with higher-level people at chains to influence decision making about

multiple systems. The actual installations are done by HVAC contractors, who are paid by the customers.

Incentives

Incentives are designed to cover 100% of incremental costs for purchasing and installing an energy-efficient air conditioning system rather than a standard-efficiency system, up to 30 tons. Qualifying equipment and rebate levels are as follows in Table 8.

Table 8

QUALIFYING EQUIPMENT AND REBATE LEVELS

QUALIFYING EQUIPMENT AND REBATE LEVELS					
AIR CONDITIONING SIZE		TIER 1 MINIMUM SEER/EER FOR INCENTIVE	TIER 1 INCENTIVE $/TON	TIER 2 MINIMUM SEER/EER FOR INCENTIVE	TIER 2 INCENTIVE $/TON
Tons	Btuh				
UNITARY AC AND SPLIT SYSTEMS					
<5.4	<65,000	12.0 EER	$55	13.0 EER	$92
>=5.4 to 11.25	>=65,000 to 135,000	10.3 EER	$38	11.0 EER	$73
>11.25 to 30	>135,000 to 375,000	9.7 EER	$43	10.8 EER	$79
AIR-TO-AIR HEAT PUMP SYSTEMS					
<5.4	<65,000	7.8 HSPF & 12.0 EER	$125	N/A	N/A
>=5.4 to 11.25	>=65,000 to 135,000	10.3 EER	$38	11.0 EER	$73
>11.25 to 30	>135,000 to 375,000	9.7 EER	$43	10.8 EER	$79
WATER SOURCE HEAT PUMPS					
<=30	<=375,000	12.0 EER	$45	14.0 EER	$81
NEW IN 2002 DUAL ENTHALPY ECONOMIZER CONTROLS *NEW IN 2002*					

All	All	N/A	$250/Unit	N/A	$250/Unit

As the table shows, there are two tiers of rebates; these two tiers correspond to CEE's specs. New Jersey has already incorporated Tier 1 as code, and the entire program may well eliminate the Tier 1 rebates in the near future.

Program Marketing

The program is marketed to contractors and distributors through circuit riders. There is also a broader marketing effort involving mailings to customers and contractors, presentations, association meetings, and trade shows. Of the $800,000 marketing budget, $600,000 goes to circuit riders and $200,000 goes to broader marketing. The latter is likely to go up in the near future to facilitate a shift toward market transformation.

Customer Service

The implementation contractor has an 800 number for customer service; if there is a major problem it will be referred to the utility.

Participation Rates and Savings

There were 2000 units rebated in 2001, out of an estimated 20,000 units sold. There were 500 to 600 rebated units in 1999 (a partial year), and 700 to 800 in 2000. There has not been a study to determine savings, but estimates are 10% savings for each Tier 1 unit, and an additional 10% for Tier 2. Given that about 70% of units are Tier 2, total savings are estimated to be about 17%. However, this does not take free ridership into account.

Budget

The total budget for Cool Choice is about $2,000,000, including $800,000 for marketing/ implementation, $1,000,000 for rebates, and $200,000 for utility and NEEP administration.

Keeping Costs Down

Costs are thought to be very low to begin with, and in fact are expected to go up with an increase in marketing.

Customer Satisfaction

There has not been a formal assessment of customer satisfaction, although contractors appear to be very satisfied with and really appreciative of the program.

Monitoring and Evaluation

There was a process evaluation conducted on the 1999 (partial year) program; there has not been an impact evaluation.

Reasons for Success

The program is successful because it has a useful and persuasive set of program materials, good outreach to the full range of market players, and because utilities' names are attached, providing credibility to customers and contractors.

Transferability to the Energy Trust

Considerations as to whether the program should transfer well to the Energy Trust include cost effectiveness due to the weather, and the state energy code. If the weather is not hot enough in Oregon to justify similar rebates, the program might not be as successful. Also, the state energy code may define a different baseline, such that incremental costs could be higher or lower.

Northeast Utilities: Commercial Retrofit RFP Program

Name of Organization: Northeast Utilities subsidiary Connecticut Light and Power

Name of Program: Large Commercial Retrofit RFP Program

Name of Contact: Colin Odell, Senior Program Administrator

Phone and Email: 860.832.4941; odellc@nu.com

Reason for Nomination

The commercial retrofit RFP program was nominated as an innovative solution to identifying and funding large C&I retrofit project. The program in earlier forms as the Energy Assistance Program (EAP) was frequently emulated.

Program Overview

NU's RFP Program is an innovative energy efficiency program for large commercial and industrial customers and third party service providers that allows the customer or third parties representing a customer to bid for energy efficiency financial assistance to design and implement projects custom tailored to their needs. Using an RFP format, the bidder determines the level of financial assistance – within program cost-effectiveness guidelines – necessary to design or implement projects and compete against other projects for available funding. Customers can create their own design or partner with an engineering consultant, contractor or other energy efficiency service providers.

Program Delivery

The program is more analogous to a government grant program than a typical performance based contracting program. Bidders can be customers or third party contractors. Four times a year the utility issues a notice of the available funds and requests bids. Once bids are received they are ranked according to financial assistance requested, benefit/cost ratio, non-quantifiable benefits and installation timeframe. A quality assurance review is also made on the bids by an energy engineering consulting organization. Qualified bids are then funded in rank order until the available funds are extinguished.

Potential bidders are provided a bidding package through the utility website (http://www.cl-p.com/clmbus/target/indexrfp.asp). The package contains the RFP, forms for project, site and measure information and a cost effectiveness model. Bidders must demonstrate that their project passes the benefit/cost ratio calculated by the model.

Any measure that saves electrical energy – without fuel switching – is eligible for consideration.

Customers must be above a size threshold, currently 350 kw. Individual proposals must save more than 100,000 annual kWh. Customers may aggregate sites to meet the threshold.

$1.3 million was available during the last bid cycle. $4.2 million of bids were received, all of which passed the benefit/cost test.

Incentives

The bidder, either a customer or third party, sets the incentive required for each proposed project. Bids are awarded after they have been ranked until available funds are fully subscribed. Thus, those bids with the lowest incentive cost required are most likely to be funded.

Program Marketing

The program consists of 4 bidding cycles per year. Announcements of upcoming bidding cycles are made through a website, newspaper legal notices and direct letter to large customers and third parties. Informational meetings and bidder's conferences are also held. Much of the marketing to end users is done by the energy services industry.

Customer Service

The utility provides program information and bidder's packages through their website and large account representatives.

Staffing and Contractors

NU Staffing includes 1 FTE Program Administrator, 0.33 FTE Senior Program Administrator, three part time Field Project Administrators (< 1FTE) handle customer aspects of project administration.

Two energy-engineering firms are used to review bids for quality assurance. This is a small part of both contractors businesses.

NU staff administers the bid process and subsequent incentive agreements. The contracted engineering firms provide technical quality assurance reviews of the proposals. NU staff or QA contractors perform post-installation inspections of all projects.

Participation and Savings

- 29 Projects awarded in 2000
- 49 Projects awarded in 2001.
- Both years >75% of the projects were from third party bids

Note: 2001 was the first full year for program. 2000 CT DPUC approvals for programs was not received until late second quarter and forced the program to only have 2 bidding rounds for 2000.

- 2001 - Annual: 40,444 MWh
- Lifetime: 670,581 MWh

No evaluation has been performed due to the programs infancy.

Annual Budget

$6.9 million in 2001 for CL&P. The program also operates in Western Mass. Electric territory at a $1.5 - 2 million budget range with two bid rounds per year.

The annual budget is a function of market demand. Experience in the smaller Western Mass. Electric territory indicates that $750,000/round in available funding seems to be a minimum needed to attract energy services industry attention.

Key issues for the Program

The program has had a 30-day time frame for the bidder to sign the offer. An additional 60 to 90 day limit for the customer to sign a contract for the work is being considered. These changes are being considered to avoid tying up budgeted funds with projects that do not move forward.

The program is currently being modified to target a congested area in Connecticut and to place additional emphasis on peak kW reduction as well as kWh savings.

Keeping Costs Down

Standardized response materials for the bid process are used to keep administrative costs down.

Funding amount offered in each round must be controlled to assure that only good projects are funded.

Monitoring and Evaluation

The program relies on quality assurance reviews of the bids rather than post installation evaluations. Realization rates will be determined by a sample of installed projects when the program has matured.

Transferability to the Energy Trust

he program concept should transfer easily as it provides a low administrative overhead means to identify and fund nonresidential custom retrofit project. NU will also sell the complete program package and conduct bidder conferences. The program has been sold and implemented in New Hampshire.

Northeast Utilities: Energy Conscious Construction

Name of Organization: Northeast Utilities subsidiary Connecticut Light & Power (NU)

Name of Program: Energy Conscious Construction

Name of Contact: Dave Debrin

Phone and Email: 860.832.4712; debrind@nu.com

Why Nominated

This program was nominated as one of the two best and also similarly run programs for nonresidential new construction. The other comparable program is that offered by NGRID, only the NU program was reviewed as they are very similar.

Program Overview

NU's new commercial construction program, Energy Conscious Construction, is an established and successful program. It reaches better than 85% of the new construction square footage annually. The program has a very high realization rate. It is focused on customized review of the building engineering at the early stages and provides incentives for design and equipment changes that maximize energy savings without sacrificing customer needs.

Program Delivery

Typically the new construction projects starts with the customer hiring an architect. The architect then hires engineers. CL&P relies on the engineers to bring the utility into the picture at an early stage. CL&P provides a brainstorming honorarium to provide an incentive to host a brainstorming session to review initial designs for energy efficiency improvements. The utility also pays for the cost of design changes, provides an incentive to the engineers working on the design changes based on the savings achieved and provides 100% of the incremental energy efficiency costs (subject to certain caps).

The program has a prescriptive track for simple rooftop HVAC, lighting and motor applications as well as a custom track for more comprehensive applications.

The program managers are careful to fully evaluate the savings potential rather than focusing on a simple payment per ECM basis. An example is lighting. A rebate per lamp upgrade, for example, does not take into account actual lighting needs. A more comprehensive approach is to consider the lighting needs to assure that fixtures installed are those that are required.

Incentives

Incentives are 100% of incremental cost. Incremental cost is determined on a case by case basis for custom applications. A list of standard incentives is maintained for prescriptive applications.

In addition, incentives are paid to the design engineers based on the savings achieved.

Program Marketing

The program is marketed through design engineers. The utility regularly updates the engineering firms regarding program features through informal sessions such as lunch meetings.

Customer Service

Customers may consult directly with program staff, but typically the utility works with the engineering design firm with little customer interaction.

Staffing and Contractors

NU has assigned two staff to the program. Two energy-engineering firms are used for custom building modeling. Staff works with the contract engineers, contracting for specific building modeling.

Participation and Savings

There are approximately 60 participants annually with 50 million kWh savings (based on $6.5 million annual budget and 1.2 cents/levelized kWh). The program is evaluated every two years. The most recent realization rate was 99%.

The program has been in operation since 1989. Participation rate has grown from approximately 20 per year to its current 60 projects per year.

Annual Budget

The annual budget is $6-7 million, with approximately 10-15% associated with studies and administration.

Key Issues for Program

The program has had minimal design changes. Mostly continually updating baseline to match current construction standards. No operational changes.

Keeping Costs Down

Key factors for keeping costs down include: Establishing early contact with engineering firm involved in construction design. And establishing customer baseline, i.e. incentives are not based simply on current construction practice versus higher efficiency, but rather on what the customer would otherwise have done.

Monitoring and Evaluation

The program is evaluated on a two-year cycle by an independent evaluation firm.

Transferability to the Energy Trust

The program relies on establishing relationships with engineering firms in the new commercial construction design industry. Establishing these relationships requires a certain level of time and effort. Ultimately, this results in a cost effective delivery mechanism.

Northeast Utilities: Industrial Consulting Services

Name of Organization: Northeast Utilities subsidiary Connecticut Light & Power (NU)

Name of Program: PRIME (Process Reengineering Industrial Manufacturing Efficiency) Industrial Manufacturing Consulting Services

Name of Contact: Alan Campbell, Senior Program Administrator

Phone and Email: 860.832.4718; campbad@nu.com

Why Nominated

The PRIME Services were nominated as an effective program that delivers consulting services on process equipment to industrial customers.

Program Overview

NU's PRIME program is a consulting program that assists manufactures to implement "Lean" manufacturing. Lean is a process assessment approach to eliminate waste in manufacturing. The assessment identifies breakdowns in business planning, business processes and business operations that reduce the efficiency of the operation including energy use. Such breakdowns may include non-value-added steps, unnecessary bureaucracy, poor communication, process inconsistencies and process confusion.

Program Delivery

The program leverages funds from state department of labor and department of community and economic development. The partnership of the utility with these agencies is due to the economic development aspect of the program. Manufacturers have and continue to locate in Connecticut to take advantage of the program.

A key component is the partnership with the local Manufacturing Extension Program. This relationship has taken CL&P several years to fully develop. The MEP opens doors to the manufacturers. Word of mouth of success stories has created significant program growth, from 20 projects in the first year to 35 last year and an expected 55 this year.

A project generally consists of an initial walkthrough to determine the potential and then, if the potential exists, a series of weekly half-day meetings for 8 to 10 weeks to walk management and workers through the lean process changes. Over 90% of the manufacturers that request a walkthrough proceed to a full project. Implementation success and customer satisfaction are very high.

The program also looks for conventional energy savings while with the customer in the field and includes discussions with the customer about the potential to use the other conventional programs. In Connecticut there are a lot of on going PRIME projects so local conservation project administrators and area Account Executives are called in to accomplish the conventional conservation studies and projects. In the beginning of the program when there were very few projects the program also provided the conventional conservation 50/50 cost share studies to the customers, but as the number of Lean projects grew that practice became a nightmare to administrate and was transferred to the conventional programs.

The target customer group is manufacturers with greater than 500 kW demand.

Incentives

The program requires a 50/50 sharing of costs between the customer and the utility, with the customer portion refundable if implementation of recommendations is followed. Total project costs have ranged from $2,000 to $50,000. The average is about $12,000.

Program Marketing

Utility account executives and the Manufacturing Extension Partnership market the program. Since inception the program has benefited from significant word-of-mouth marketing. The economic development aspects have also generated news releases that have been picked up by the press.

Key marketing allies have also been local economic development organizations.

Customer Service

This is a consulting service. During the initial assessment and especially during the training the staff involved both management and labor in the customer's operation. This assures buy-in by both parties. Based on anecdotal evidence, customer satisfaction has been very high.

Staffing and Contractors

NU staff performs the initial assessment contractors deliver the program.

NU assigns 1 ½ FTE to the program. Contractors facilitate the PRIME/Lean program after the initial assessment. Contractors are hired on a project-by-project basis. Eleven contractors are used on a regular basis, with another 6 to 8 on a project specific basis.

Participation and Savings

There were 20 participants the first year, 35 the second and 55 this year. Approximately 2,000 customers have characteristics that would make them eligible for the program. The program is expected to save 1.4 million kWh this year. The post implementation review is conducted via an implementation letter from the customer. The letter uses the customers evaluation metrics, which may or may not be energy focused. The information from the letter is fed back into the original cost-effectiveness model for comparison with original estimates.

Annual Budget

The annual budget is $1 million

Key issues for Program

The program relies on the "Lean manufacturing" program.

Keeping Costs Down

The program is focused on economic development, although each project is justified based on electric cost effectiveness. During the assessment an overall evaluation of the manufacturing process is identified, the percent of the process that can be affected by "Lean management" is then multiplied by the total kWh used to estimate savings potential. The levelized savings are compared against avoided costs, currently about 3.8 cents/kWh to decide whether to go forward with the project.

Monitoring and Evaluation

No external evaluations have been conducted.

Transferability to the Energy Trust

The program is transferable because it is simple and links to an existing national resource. It offers one of the few examples of a program targeted at process improvement. The key is coordination with the Manufacturing Extension Partnership that is a nationwide program under the National Institute for Standards and Technology. NU will sell its program materials for a negotiate price, if desired.

Northeast Utilities: Small Business Program

Name of Organization: Northeast Utilities System (Connecticut Light & Power)

Name of Program: Small Business Energy Advantage

Name of Contact: Matt James

Phone and Email: 860.832.4806; no email provided

Reason for Nomination

This program was nominated as an effective and efficient program for reaching small commercial and industrial customers. Very few programs are being offered for this type of customer and this program was viewed as having built upon many lessons learned.

Program Overview

CL&P's newest innovative energy solution provides cost-effective, turnkey, energy-saving products and services for small business customers who do not have the time, financial resources or in-house expertise to analyze and/or modify their energy usage. There are no up-front customer costs involved. In addition, CL&P will pay up to 50% of the costs for retrofit lighting measures and up to 100% of the costs associated with other eligible, cost-effective, energy-efficient installation services.

To cover the customer's share of the costs, Energy Advantage offers a zero-percent financing option. The loan repayment is based on the estimated energy savings resulting from the energy-efficient measures installed. In effect, small customers will pay about the same amount per month to CL&P as they did before participating in Energy Advantage. And it will be accomplished with only one check. No separate payment is necessary and there is never a need for an initial cash outlay. After the loan repayment period (typically, fewer than two years), the customer reaps the benefits of the energy savings through lower electric bills.

Program Delivery

The program is delivered through trade allies to customers below 100 KW in size. In house staff assigns service territories to individual trade ally contractors, typically lighting and mechanical engineering firms. The trade allies then market the program within their assigned territories. Potential projects are documented using software developed by Northeast Utilities and submitted to the utility for approval. At the completion of the project utility staff conducts an installation inspection and pay the contractor the incentive portion and arrange a zero percent loan for the customer portion, if any.

Incentives

The program is designed so that there are no customer out-of-pocket costs. The program provides an incentive of between 50% and 100% of the retrofit measure costs based on the type of measure. Payment is made to the contractor. Repayment of any customer costs is through a zero percent loan structured such that the energy savings offset the payments. Loan repayment is over two years or less.

Program Marketing

The trade allies market the program. The utility also maintains a website and energy efficiency mailings that include program information.

Customer Service

The utility maintains a 1-800 number in addition to the website and trade ally contacts.

Customer satisfaction is high based on anecdotal evidence. The lack of out-of-pocket costs is very attractive.

Staffing and Contractors

NU has 7 FTE assigned to the program.

Twelve trade allies are each assigned service territories in which to market and deliver the program. The trade ally develops customer leads and projects. Staff reviews the projects and approves implementation. After completion staff conducts inspections and arranges contractor payment and customer loans.

Participation and Savings

The program started in 2000. Participation in 2001 was 500 customers. 2002 is running at double that pace.

No savings data were available. The first evaluation will be undertaken this year.

Annual Budget

The annual budget is $1.8 million of which $500k is admin.

Key Issues for the Program

The utility is working to standardize the incentive levels and to determine the minimum incentive levels necessary for customer participation.

Keeping Costs Down

The main tools for keeping the costs down are standardized incentives and assessment software, and relying on trade allies for marketing.

Monitoring and Evaluation

The first evaluation will be conducted this year.

Transferability to the Energy Trust

The program is likely to be as accepted by customers in Oregon as in Connecticut. Transferability in large part depends on two factors: 1) the Energy Trust would need an implementation capability (either in house or contracted) comparable in capability to the seven FTE utility staff that coordinate with contractors and conduct inspections, 2) the Energy Trust would need to assess program cost effectiveness independently to determine if it would be acceptable in the Oregon market. The use of trade allies for implementation and the process of assigning trade allies to portions of the Energy Trust service territory is imminently transferable. NU will also sell their assessment software and consulting services to develop this program design.

Oakland: Energy Efficiency Design Assistance

Name of Organization: City of Oakland, CA

Name of Program: Energy Efficiency Design Assistance

Name of Contacts: Chris Vance, Energy Solutions and Catherine Payne, Oakland Planning Department or Scott Wentworth, Energy Engineer for Oakland Public Works Dept.

Phone and Email: 510.482.4420 x 220; chris@energy-solution.com

Why Nominated

The program was nominated as a very effective, innovative program using municipal government resources to obtain early in the design stage. The program was initially funded for one year (2001) during what turned out to be the energy crisis in CA, and was selected under the special CPUC Summer 2000 Energy Efficiency Initiative. {The program will continue in 2002-03 with continuation funding from the CPUC's Energy Efficiency program.)

Program Delivery

The program seeks to reduce barriers to inclusion of energy efficiency in the design of new nonresidential, multi-family and large-scale single-family buildings. By working closely with the city building, planning and zoning departments to identify projects at the permit stage, the contract engineering firms meet with the project team to review building design plans and/or conduct site visits and audits to identify opportunities and provide technical assistance.

Technical assistance is offered in the form of:

- Site specific engineering analysis of energy efficient options and economic analysis of costs and savings for design alternative
- Prioritized list of design features and building systems that off the best value
- Detailed product and system information for mechanical and electrical designers

- Referrals to utility rebate programs and technical assistance
- Estimates of project specific incentives from utility programs

Projects then use the utility programs for rebates.

Incentives

Tied into utility program.

Program Marketing

- Sales calls to referrals from the city planning, building and zoning permit staff; project team members and BOMA offices
- Program brochures direct mailed to selected developers
- Program brochures and posters in developer oriented locations
- Speaking and tables at trade and professional associations

Customer Service and Satisfaction

The program itself is the customer service by providing developer/owners with engineering and economic analysis of energy efficient design opportunities, as well as improved access to the utility program. The independent M&V report documented unanimous customer satisfaction.

Staffing and Contracting

The city of Oakland had no additional staffing, and used only a small portion of the funds for program marketing costs. The contractors assigned approximately 0.44 FTE to marketing, 0.64 FTE for engineering support. (This assumes the program runs for 12 months.)

Participation and Savings

Participation was 23 projects representing 4.5 million square fee of commercial and industrial space and 800 housing units. Savings estimated at 3.2 million kWh

annually (inclusive of natural gas savings converted to kWh). Annual verified savings of 8,904 therms, 1.8 million kWh, and 322 kW peak summer demand reduction.

Budget

The overall project budget was $300,000 for program outreach and marketing, technical services, IM&V, and City administration and marketing support. The City contracted with an energy efficiency contractor for a total of $237,000 to provide program management, outreach and marketing (approximately $90,000), and technical services (approximately $147,000). The City contracted with an independent IM&V contractor for $37,000. The remaining $26,000 funded the City administration and marketing support (including a mandatory 3% fee for the City's contract compliance office). The IM&V report estimated the incremental measure cost for implementing the design recommendations to be $1,027,504, although these costs were borne by the program participants and not covered by the program.

One innovation that Oakland used was to make the technical contractor's compensation performance-based, as verified by the IM&V contractor. In the pilot year, 25% of the technical contractor's total compensation was on a performance basis.

Key Issues for Program

The program should be seen as a pilot. There were some recommendations from customers to increase some of the technical assistance staff involvement at the site, but otherwise few changes were suggested to improve the program. The target market can be potentially limiting for a given City depending on the number of projects undergoing development and design. This is especially true during an economic downturn when developers become more conservative in their investment decisions. This could affect both the construction dates of proposed buildings, and the degree to which energy efficiency measures will be adopted. Mitigation measures include widening the program eligibility as much as possible geographically and by including the nonresidential building renovation, energy retrofit market.

There is also an advantage in having a single program serve multiple Cities in that many of the fixed costs associated with program, administration and marketing development can be distributed among the participating Cities if one contract was issued to cover multiple jurisdictions, rather than each city/county issuing separate contracts. Direct marketing costs –ads, mailings, etc. would not necessarily have

economies of scale. In addition, most developers work in multiple jurisdictions – not only locally, but also nationally. In the long run it is possible that energy design improvements would be replicated in successor projects

Key Issues for Cost Control

Using existing city resources but focusing them to work with an energy efficiency contractor kept costs low. In order to insure program funds are effectively expended, the level of technical assistance delivered to each customer must be proportional to the project's potential energy savings and to some degree the level of commitment demonstrated by the customer. Otherwise program expenditures may not produce an adequate amount of energy savings to make the overall program cost effective. [See above discussion about the performance compensation element of the technical contractor's budget, which created natural incentives to spend time wisely.]

Monitoring and Evaluation

The CPUC required independent M&V for each funded program. The independent contractor conducted verification of savings for a sample of projects, focusing on those that provide the highest savings contributions. In addition to conducting engineering verification of savings, the contractor interviewed each customer to assess satisfaction to obtain feedback on the program.

Transferability to the Energy Trust

Such a program design could be transferred. Key factors to program success are the fact that the city of Oakland identified the opportunity and willingly created a partnership with the energy-efficiency consulting firm.

According to the program contact: "Program success depends on a minimal level of support from participating Cities. At the very least, planning staff would need to periodically provide contact information for major projects (including key project contact information) undergoing development such that they could be contacted prior to or early in the design stage. At the City of Oakland, it really came down to a fairly small level of effort by a few key planning staff that made the difference in obtaining information on the major development projects. City endorsement of the program also lends credibility and leverage when marketing the program"

Sacramento Municipal Utility District: Compressed Air Services

Name of Organization: Sacramento Municipal Utility District (SMUD)

Name of Program: C&I Retrofit Program

Name of Contact: Steve Rutter, PE; Harlan Coomes

Phone and Email: 916.732.6766, srutter@smud.org; 916.732.5414, hcoomes@smud.org

Why Nominated

The SMUD Compressed Air program services was nominated as a best practice because the approach used by SMUD goes beyond offering Compressed Air Challenge workshops to providing audits and incentives to improve customers compressed air systems.

Program Delivery

Rather than a separate program effort for compressed air, compressed air system improvements are delivered as part of an overall approach to working with commercial and industrial customers. The SMUD planning and evaluation group identify KW and kWh goals each year based on remaining technical and market potential and technology assessments for the commercial and industrial sector. A Compressed Air Initiative is part of the overall strategy to meet the targets. The initiative targets compressed air system services, efficiency upgrades of compressed air equipment and vendor and customer training to achieve the goals. SMUD offers one or two Compressed Air Challenge workshops each year, sometimes jointly with PG&E, and encourages customers and vendors to attend these.

The focus of the initiative is improved efficiency of the compressed air systems of customers. The program can achieve this in multiple ways: vendors have been trained to provide system services not just to sell equipment; customers planning to increase their compressed air facilities are assisted to improve the overall efficiency of the upgrade even if the load increases; audits are conducted to identify system efficiency opportunities and incentive funds are used to achieve those savings; customers and vendors are trained by the Compressed Air Challenge workshops.

Incentives

Incentives available for compressed air vary from year to year based on the goals and the funding available. In 2001 there was more funding available and the incentives and goals were much larger than in 2002. In 2002 they have budgeted about $15,000 that will cover two to three system audits, savings targets are not set for compressed air but the same incentives for commercial and industrial projects are applicable. Incentives range from $225 to 400/KW up to a maximum of 30% of project costs. The overall goals for the commercial and industrial sector are 4.6 MW and 17.2 GWh.

Program Marketing

The program is not really marketed independent of energy efficiency services for commercial and industrial customers. Given the limited funds in any one year, marketing also is limited so that subscription meets the available funds. For instance in 2002 funds were exhausted by June and no marketing could be found on the website as of June 3, 2002.

Customer Service

Customer service is provide via the SMUD 1-800 number and the website. No particular services are offered for the compressed air program other than information and access to a staff.

Staffing and Contractors

Thirty technical staff members deliver the entire set of commercial programs. Approximately 15 are assigned to the largest commercial and industrial customers with the remaining 15 assigned to all other customers. The staff assigned to the larger customers attempt to meet with the customers annually to review opportunities. Audits are conducted and project identified. Staff assigned to the smaller customers generally meet with the customers at the customers request. When the compressed air initiative was first implemented contractors were hired to conduct the audits of facilities. More recently SMUD engineering staff has conducted audits.

Contractors are also used for the Compressed Air Challenge workshop; these contractors are from the DOE pool of contractors.

Participation and Savings

The program targets for 2002 include two audits with implementation of recommendations and one seminar. No specific savings targets have been set, nor are the savings available on a per initiative basis, all C&I program efforts are combined.

Budget

There is no specific budget allocation to compressed air for savings, but in 2002 $15,000 is allocated for two to three audits. In previous years sufficient funds for two to three times more audits were conducted.

Key Issues for Program

The initiative is not treated as a specific program so attention to compressed air systems can respond to the needs of customers. The main issue has been fluctuating resources so the initiative varies each year.

Keeping Costs Down

Nothing specific was noted.

Monitoring and Evaluation

Not specifically evaluated.

Transferability to the Energy Trust

Compressed air services at SMUD is transferable to the Energy Trust, though the scale would probably need to be higher. The key features required for a compressed air services component are the training and the audits and sufficient staff or technical contract support to conduct the audits. The incentive funds are tied to overall goals for C&I savings.

Southern California Edison: HVAC Modeling Tools

Name of Organization: Southern California Edison

Name of Program: Modeling Tools for HVAC

Name of Contact: Henry Lau

Phone and Email: 626.633.7160

Why Nominated

A Southern California Edison modeling tool for HVAC was nominated as a valuable tool for HVAC programs. Mr. Lau knew of no specific HVAC tool, however he described two modeling tools that might be what had been referred to.

Program Delivery

These tools are not specific programs but can be used for program implementation and analysis of HVAC equipment. Therefore there is no discussion of program features in this summary.

Power DOE

Power DOE is a proprietary modeling tool developed by Jeff Hirsh, formerly with Lawrence Berkley Labs, based on DOE 2.2. The model was developed to better analyze case and warehouse refrigeration and kitchens (restaurants). This model is not available publicly. Jeff Hirsh provides the model as a consulting service. He can be reached at 805-553-9000.

Equest

Equest is also based on DOE 2.2. The model was developed to serve California's new construction program. It provides the ability to do savings modeling earlier in the design phase than DOE 2 would allow. Savings can be estimated at the "schematic" level and then refined as the design is finalized. The model is in the public domain. Jan Johnson, California's new construction program manager can be reached at 909-357-6134.

Southern California Edison: Quotas for Motors

Name of Organization: Southern California Edison (SCE)

Name of Program: Quota Systems for Vendors

Name of Contact: Richard Greenburg

Phone and Email: 626.302.8735; richard.greenburg@sce.com

Why Nominated

The SCE quotas for motors vendors program was nominated because it offers a means to expand sales of energy efficient motors beyond free riders and to increase vendor promotion of energy efficient motors to customers who otherwise might not purchase these motors.

Program Delivery

This was a motors program, mostly but not exclusively aimed at the retrofit market. It was originally designed (2000) for market transformation, but—as the California power crisis developed—was re-oriented (2001) toward resource acquisition. It was dropped in 2002, not because of dissatisfaction with the results, but because the political emphasis had shifted completely away from "upstream" programs. In addition, corporate policy for current programs emphasizes maximizing the proportion of funds that go directly to the customer. (The market transformation design entailed non-trivial investment in development of an infrastructure for recruiting and visiting motor dealers, providing them with marketing materials, and providing training, etc.) Program delivery was through a contractor who maintained close contact with each and every participating motor dealer.

Incentives

The key differentiator of this design from the more usual premium-efficient motor programs was the incentive trigger. In the most common program, the customer receives a rebate intended to help buy down the initial cost of a premium-efficient motor. In most "upstream" programs, the dealer is offered an incentive to stock such motors, on the obvious expectation that the dealer will then be motivated to sell those motors. In this program, the dealer could earn an incentive only after

surpassing a set quota of premium-efficient motor sales for the month. (A small payment was made for each sale of a premium-efficient motor up to quota, to cover paperwork, etc. But the incentives for going beyond the quota were much more sizeable.) Quotas were set in the first year (2000) on the basis of historical sales of premium efficiency motors; they were set in the second year (2001) on the basis of the previous program year's sales.

Dealers were free to pass on the savings to their customers through lower prices or whatever other sales mechanisms or specials they found useful in their business model. But they were not required to do so.

Program Marketing

In 2000, the program was first marketed through direct mail and fax, to notify dealers of the opportunity and encourage initial inquiries. This was followed by personal visits by the contractor—first, in response to inquiries, and then as follow-ups with dealers who had not responded. Considerable one-to-one effort was also devoted to chains and franchises, both at the corporate level and at the individual outlet level. Some press releases were prepared and distributed, but mass media would not have contributed to program success. Some use was also made of trade journals, but this does not appear to have been terribly important. (In 2000, additional investment was made in attending and sponsoring dealer meetings.)

Otherwise, all retail dealers in the service territory were eligible. However, to participate, dealers had to sign an agreement and make their historical sales data available and provide copies of customer invoices for the current month's sales of qualifying motors.

Customer Service

Dealers were provided with point of purchase materials, including brochures about the benefits of premium efficiency motors and motors selection guides. These materials were supplemented by personal visits from the contractor's representative to ensure understanding of the benefits of premium efficiency motors, as well as the POS materials and the program. In 2000, dealers were also provided with an 800-number for any problems they encountered and offered training on both technological issues and marketing techniques. (In addition, the contractor's representative provided hands-on data documentation assistance to dealers with limited sales tracking capabilities.)

Staffing and Contractors

In 2001, 0.5 SCE staff (plus a modest amount of senior management and clerical time) and 1 contractor FTE in Southern California. (Additional administrative support—e.g., incentive processing—was provided by the contractor's home office.)

The contractor's representative was responsible for recruiting and servicing the motor dealers. SCE staff supervised the program and validated the savings algorithm.

The participation rate is N/A for 2001. The number of participating dealers was capped so that the total incentives would not exceed the budget. In 2001, 24 dealers—representing 70 retail locations—were active in this program. (In 2000, 17 dealers were active.)

For 2001, gross energy savings for retrofit motors were estimated at 1,009,000 kWh and gross demand savings at 204 kW. (The net savings estimates were 807,593 kWh and 163 kW.) For 2000, the gross savings were estimated at 919,940 kWh and 184 kW.

The net-to-gross ratio was estimated at 0.80, based on the assumption that 20 percent of the premium efficiency motors sold by the dealers would have been sold in the absence of the program. (In other words, a free rider rate—though the incentives were not given directly to customers.)

Budget

For 2001, the program cost was $390K, including administration costs for SCE. It was considerably higher in 2000, when more was budgeted for program design, marketing the program, providing dealer support, and internal quality control.

Just over $140K was used to cover incentives (about 36 percent). SCE's evaluation is covered through a separate budget. (See also below, re monitoring and evaluation.)

Program Issues

As a result of the shift in California's priorities and other political considerations, the budget for 2001 was severely reduced. As indicated earlier, this resulted in capping the marketing of the program and the number of dealers who participated. [Comment: The long-term effect of changing the program and then phasing it out

seems likely to reinforce the reticence of dealers to join in future "upstream" programs. The history of such shifts was in fact one of the key barriers to enlisting dealers during 2000.]

In 2001, the program was expanded to cover certain motors used for agricultural pumping applications. This was again a political issue, but it did have the effects of expanding the potential base (until the number of participating dealers was capped) and the geographic area covered (as well as the urban/rural mix).

Keeping Costs Down

The contractor reduced marketing and dealer support activities (e.g., an 800-number, more frequent visits by the contractor's representative or his assistant, workshops) in 2001.

Monitoring and Evaluation

Given the "upstream" nature of the program, invoices were reviewed and validated, but there were no inspections of customer installations. As noted earlier, SCE reviewed the savings algorithm provided by the contractor. Qualitative information regarding dealer satisfaction and concerns was gathered and documented regularly in reports of field visits. (In 2000, the contractor was also required to conduct QA/QC and evaluation activities from their budget, and to provide regular updates to SCE. Among the additional activities supported were dealer surveys, workshop assessments, and independent personal interviews with dealers.)

Transferability to the Energy Trust

The program is transferable only if there is sufficient support for dealers, probably circuit riders, and a long-term commitment by the Energy Trust to do the program. The quota trigger for financial incentives entails more administrative effort for dealers than do most customer rebate programs. Hence, this program requires marketing and customer support investments. It also requires that there be dealer trust that there will be long-term support for the program. The advantage is that there is little evidence that straight rebate programs for motors lead to any substantive change in motors purchasing practices, this program does appear to influence practices more broadly.

Xcel Energy: Colorado Custom Efficiency Program

Name of Organization: Xcel Energy, formerly Public Service Company of Colorado

Name of Program: Custom Efficiency

Name of Contact: Bill Gruen, Product Portfolio Manager

Phone and Email: 303.294.2082; william.gruen@xcelenergy.com

Why Nominated

Xcel Energy's Colorado Custom Efficiency program is a demand-side management bidding program. It was nominated as a best practice for bidding, standard offer and performance contracting type of programs. The features that stand out for this program is its efficiency in generating sound projects and good customer response.

Program Delivery

The Custom Efficiency program is a demand-side management bidding program. The program has a goal to purchase 18.5 MW of eligible peak demand reduction, measured at the meter, by 2005. There will be seven RFP cycles beginning December 2001. The cycles are four months apart; bids are due two months after the RFP is released. The first RFP was released December 2001, and bids were due February 2002, the second RFP was released in April 2002 with bids due in June 2002, the third RFP will be released in August 2002 and will be due in October 2002. Each of the seven cycles will seek to award bids for between 3 and 4 MW of eligible demand savings.

The minimum to bid is 10 kW, customers and third parties are permitted to bids. The bidder must complete the five-page RFP form. Once the bidder is selected pre-approval for each specific project is also required. A six-page form is used for pre project approval; a three-page form is subsequently submitted after the project is completed.

Eligibility to submit a bid is limited to specific portions of the service territory and verifiable demand reduction projects, including energy efficiency, fuel switching and load shifting. The key issues for selection are price, percent of committed

projects and a qualitative assessment of bid quality and past performance. The third-party program administrator under contract to Xcel Energy conducts all M&V. In a few cases where a bidder is experienced with M&V and has a performance contract with the building owner, the program administrator will minimize duplication while ensuring that sufficient M&V is done.

Incentives

The bidders are offered a maximum of $530/KW for efficiency and fuel switching projects and $330/KW for load shifting projects. The maximum incentive available per bidder for the first two bid cycles was $450,000. In addition, there is a performance milestone. A payment equal to 50% of the project's estimated average demand savings will be paid upon completion of the post installation report. The remaining 50% (or greater) is paid based on verified demand savings after all M&V activities are completed subject to the project complying with the performance milestone. If not, the bidder forfeits 25% of the incentive.

Program Marketing

Program marketing builds on past experience. This is the fifth demand-side management bidding program offered by Public Service Company of Colorado. Over the past ten years, a list of customers and third parties has been developed and account managers have discussed the program with most customers. E-mail notices are sent reminding customers and third parties about each bid cycle, presentations are made to various meetings by Xcel Energy staff and the program administration, and the website is used to ensure access to information.

Customer Service and Customer Satisfaction

Xcel Energy provides information on the program at their Business Solution Center, 1-800-481-4700; their website, www.xcelenegy.com; and a specific e-mail address for the program, CustomEfficiency@nexant.com.

There has been no recent survey of customer satisfaction, however previous evaluations were conducted and led to many of the changes in the current program. Current anecdotal evidence is that customers and ESCOs like the revised program.

Staffing and Contracting

Xcel Energy has one staff person assigned to the project at about 0.25 FTE. Nexant, Inc. assigned approximately 3-4 FTE to conduct the M&V and program administrative functions.

The program administrator responds to requests for information, does the preliminary screening of proposals and project submittals, and the M&V.

Participation and Savings

The first bid cycle resulted in 20 selected participants with a proposed total of 4.7 MW of eligible peak demand reduction. Of these 20, 8 were customers representing approximately one-third of the projected savings. Xcel anticipates each bid cycle will provide a comparable level of participation and savings.

The cumulative results of both the Bid 2001 Program and the Custom Efficiency Program, through the first quarter of 2002 are estimated at 40MW gross demand savings (inclusive of free-riders) as seen at the generator. Of the 40 MW total at the generator for the two programs, Nextant estimates that about 23 MW will come from Custom Efficiency.

Since the program has just begun there is no estimate over overall savings or overall penetration. However, the peak demand for Xcel Colorado is 5600MW of which about 30% are large C&I customers. The anticipated growth for the 1999-2005 planning period is 1200MW. The overall DSM goals for Xcel Colorado during this cycle (1999-2005) are 124 MW at the generator, of which this program will contribute the 40 MW at the generator.

Budget

The program budget was not provided due to concerns about competitive advantage to potential bidders.

Key Issues for Program

Custom Efficiency is the fifth demand-side management bidding offering by Public Service Company of Colorado/Xcel Energy. The program has been redesigned with each offering and this most recent is considered the most cost effective and streamlined. However, it has built strongly on experience. The lessons learned over

the length of the implementation period have been important both in designing the current program and in providing information that makes it easier for bidders to bid and for the administrator to conduct monitoring and verification (M&V) of project savings.

Key issues for Cost and Program Control

Two factors have contributed to cost control:

1. Contracted M&V so that there is consistency, ability to avoid "reinventing the wheel," costs for M&V are contained, and customers and ESCOs are relieved of the need to do M&V, hence more willing to bid.

2. Streamlined applications that both make it easier for the bidder to bid and propose projects and make it easier for the administrator and utility to select bids and make decisions about projects.

3. Careful price setting based on baseline requirements to avoid paying for free riders and for simple lighting projects.

Monitoring and Evaluation

Evaluations have been conducted on previous versions of the program. An impact evaluation will be conducted on the most recent Bid 2001 Program, but has not been scheduled at this time.

Transferability to the Energy Trust

The bidding program could easily be transferred to the Energy Trust with an energy savings focus instead of a demand reduction focus. The key issue would be a possible increase in M&V costs as energy savings may be more difficult to verify than demand reduction in some circumstances, since there is no program history. (Note the Regional Technical Forum database might provide some of this information.) The program can easily be ramped up or down based on the parameters of the RFP, specifically how many KW or kWh to purchase, the value of the incentive and an assessment of market potential. The Xcel program has operated in some form since the mid 1990s, the remaining market potential is part of the determination of how much savings to seek through the bidding process.

Xcel Energy: Minnesota Custom Efficiency Program

Name of Organization: Xcel Energy (Formerly Northern States Power)

Name of Program: Custom Efficiency

Name of Contact: Kim Lidbeck

Phone and Email: 612.330.5709; kim.lidbeck@xcelenergy.com

Note: *The discussion below refers only to the MN program and not necessarily to any other area served by Xcel Energy. Additional information is available from Company filings with the MN regulators, but some of what is requested is proprietary.*

Why Nominated

The Xcel Energy Custom Efficiency program was nominated as a custom rebate program for commercial and industrial customers with high customer and trade ally satisfaction.

Program Delivery

Xcel Energy offers a custom rebate program to all its commercial and industrial customers, regardless of their size. The Custom Efficiency program encourages customers to bring forward energy efficient improvement ideas that are not covered under Xcel Energy's other flat rebate programs. It covers both electric and gas end-uses and the savings in a non-prescriptive way, although the savings are ultimately assessed in terms of specific end-uses. Rebates are calculated on a case by case basis and are based on kW or MCF savings. Participation in this program is primarily driven by Xcel Energy field sales contact with customers due to the "custom" aspect of this program. It is not as strongly pushed by the trade allies as some of the Company's other flat rebate programs such as lighting, because rebates are calculated on a case by case basis. Pre-approval is required prior to equipment purchase and installation.

The key electric end-uses addressed are lighting, motors, compressed air, refrigeration, and cooling. Both new equipment and retrofits are included. However, a major virtue of the program is that it allows Xcel Energy to work with new

energy-saving technologies and those that are not yet standardized, so long as they will provide benefits to the system and to the customer.

Nonetheless, the program does have downsides and barriers to overcome. First, each application must be screened individually—using hand calculations rather than a generic program, creating a higher labor cost than is found in a prescriptive program. Second, many trade allies do not like the program because of the time required to obtain an answer as to whether a project is approved. Third, the projects involved tend to involve multiple decision-makers, thus necessitating the education of several levels in the customer's organization.

Incentives

The program provides up to $200/kW and $2 per MCF saved. (As indicated below, the Company focuses on kW savings, which are more readily verified. The amount offered for a specific project may be tailored to avoid providing more funding than required to move the customer to action.

Program Marketing

Most of the custom efficiency projects are brought in by Xcel Energy field sales staff. Part of this is due to the fact that it is easier for the trade allies to support flat rebate programs. The challenge is to make customers aware of the program: It is often difficult for a customer to realize that their project may qualify due to the custom aspect of this program.

Marketing tactics to gain participation include: Field sales training, Sales newsletters, Trade newsletters , Customer newsletters, Direct mail, Trade shows, Internet, General advertising campaigns. In addition, the use of case studies has been highly effective when the case studies are industry-specific, which does add to their cost.

Business customers of any size may participate in the program. Potential projects are subjected to various benefit-cost tests based on the state's model; e.g., the societal test. (About 700 are approved in a given year, resulting in about 250 installed projects. Balance among sectors or market segments is not an issue.

Customer Service

When a customer submits a project for pre-approval, engineers determine whether the project qualifies and, if so, the appropriate rebate amount. Trade allies working with the customer may supply energy savings calculations, which Xcel Energy can utilize in this analysis. Both visits by field reps and an 800 number are available for a customer to submit project proposals. Moreover, Xcel Energy may provide some "hand-holding" assistance for the smaller customer who may be uncertain of his or her ability to understand or monitor the contractor. (Customers range from small businesses to companies such as 3-M that have a very educated, sophisticated engineering staff.)

Staffing and Contractors

The number of staff for the program is considered proprietary. Contractors work for customers, not for the program. Xcel staff is responsible for program administration, some marketing support (e.g., preparation of case studies, newsletters, and direct mail), engineering reviews, some additional customer support (see below), and evaluation. Contractors (to the customer, not contractors to the program) are responsible for selling and completing individual projects.

Participation and Savings

The participation rate is not available nor is the customer base available. The total number of projects completed under this program varies by year. In part, this reflects the fact that Xcel does not have specific targets for this program, but for savings over all programs, and these targets vary by year. Moreover, the lead-time for a project is in the range of 18 months, and some projects may be implemented even later.

Other factors also limit annual penetration in this one program as a useful metric. For example, the Company's targets are for overall savings, rather than for specific programs. Moreover, other new programs may start out as custom in nature, but--if the Company receives several repeatable projects (e.g., roofs)—it may then develop flat rebates and file the end-use as a separate program.

Information on savings was not provided; we were directed to look at filed reports. This program does save considerably in kWh, although the rebates are tied more directly to kW savings since the latter are more readily measured. Based on a recent study of 25 projects, the pre- and post- estimates of savings were "very close."

Budget

We were referred to filings for earlier years for budget numbers. This program is quite cost effective in comparison to other programs. The majority of the program expenditures go to pay rebates. Little is spent on promotion; most of the remaining funds support the up-front review/analysis. (However, the program manager believes that the costs could be much greater—up to 5x—were the engineering support weak.)

M&V is often conducted on large projects and is included in the program budget. M&V is also randomly done on projects; however, Minnesota regulators set no specific number of M&V studies for this program (unlike those in Colorado, who mandate such studies). The topics of study vary in different years, but are often concentrated on those where several projects of a particular type have been approved.

Key Issues for Program

An important issue is simplifying the process, thereby increasing acceptance among trade allies and, consequently, their effort in marketing the program. Currently it can take up to ten days to give them an answer as to whether a project qualifies for assistance—this should be driven down to a one-day turnaround.

Keeping Costs Down

It is possible to reduce costs as a particular technology or design is repeated. This allows Xcel to begin to identify what is repeatable and thus to be "semi-prescriptive," thereby saving money on the analytic effort.

Monitoring and Evaluation

As noted above, M&V studies are conducted on a regular, if not systematic, basis. These may include assessments of the realization rate. A recent study of customer satisfaction has shown that participants are happy with the program. They report that it helped them do something unique within their facility, specific to their industry, and to do so with financial support from outside.

Transferability to the Energy Trust

Xcel Energy staff considers the keys to success for this program include the fact that any customer can participate; that successful projects create strong word-of-mouth endorsements by customers; and that the field staff is very supportive of the effort. The problems that must be addressed in moving such a program forward include the need to maximize support among trade allies, and the concomitant need to increase customer awareness of the opportunity without greatly increasing expenditures on advertising.

An area for concentration are the market channels whereby customers are made aware of and educated about this program. It is crucial to train field staff on what to look for, what might be repeatable across facilities, and where substantial savings might be realized. It is also important to tie the rebates to the program goals and select companies/projects that are large enough to provide savings worthy of the investment of the effort it takes to complete a project.

Key issues for the Energy Trust, however, include the need to rely on field staff to implement the program and to ensure that engineering capability used by customers is sufficient to ensure quality projects.

Netherlands: Long-Term Agreements with Industrial Firms

Name of Organization: Netherlands Agency for Energy and the Environment

Name of Program: Long-Term Agreement Program

Name of Contact: Meindert Booij, Novem

Phone and Email: 31.30.2393417, m.booij@novem.nl

Why Nominated

The Long-Term Agreement (LTA) program was nominated as a best practice because it has been adopted in Finland, Denmark, Belgium, France, Germany, and Japan.

Program Summary

Long-term agreements (LTAs) have become the key instrument in energy conservation policy for industry in the Netherlands. LTAs are primarily agreements between the Government (Ministry of Economic Affairs) and representatives from economic sectors. There are five steps in developing an LTA:

- ***Step 1:*** NOVEM (Nederlandse Onderneming Voor Energie En Milieu, or Netherlands Agency for Energy and the Environment—a government agency) approaches an industrial sector or an individual customer.
- ***Step 2:*** The sector or customer issues a declaration of intent.
- ***Step 3:*** An inventory is conducted of the sector's/customer's energy conservation potential "under the guidance of experts."
- ***Step 4:*** Results are translated into a multi-year plan.
- ***Step 5:*** The parties sign the agreements. As part of the agreement, the government agrees that there will be no other regulations on energy efficiency in the industry, and the industry agrees to reduce energy use.

This route, rather than strict regulations and standards, was taken so that companies and industries could find their own ways to reduce energy consumption;

there had been concern that otherwise, companies might feel forced to leave the Netherlands. The first LTAs were signed in 1992, calling for an improvement of 20% in energy efficiency by 2000 compared to the reference year of 1989.

These LTAs were superceded by the Benchmarking Covenant, signed in 1999, intended for large, energy-intensive industries. LTA2, intended for smaller industrial customers as well as commercial customers, started at the end of 2001. Under the Benchmarking Covenant, the aim of the LTA for a given industry is to be among the world leaders in energy efficiency. The participating companies set this level themselves, with the help of an independent consultant, by means of an international benchmark. In doing so, they compare their processing plants in the Netherlands with similar plants abroad. The Dutch plants need to individually measure themselves against the average energy efficiency of the best region in the world or with the best 10 per cent worldwide (excluding those in the Netherlands).

When defining the world leaders, they also take account of the anticipated efficiency improvements up to 2012. Moreover, the world lead must be redefined every four years. It is not possible in every case to do this using a benchmark—for example, if a unique process is involved or if the foreign plants do not want to take part in the benchmark. In such cases, a best practice-approach is used to define the world lead.

The participating companies must be among the world leaders as soon as possible, but by no later than 2012. Companies indicate in an energy efficiency plan how and when this will happen. The covenant contains criteria governing the rate of investment. Companies must begin by taking the most cost-effective measures, followed by measures that are less cost-effective. If after this they have not reached the world lead, they can from 2008 onwards also use flexible instruments such as trade in emission rights.

LTA2, or small and medium-sized commercial and industrial customers, unlike the previous generation of LTAs, is a single covenant in which various sectors can take part.

Program Delivery and Staffing

The appropriate authority (usually provincial or municipal authorities) will evaluate the energy efficiency plan. Once it has been approved, it will be incorporated into the environmental license. This plan must be reviewed every four years, when the world lead is redefined. Novem spends considerable resources in training local officials in energy efficiency so they can help enforce the agreements.

The Benchmarking Committee is responsible for overall implementation. This Committee contains representatives of all the participating players. The Committee discusses a wide range of general bottlenecks, monitors the progress of the covenant and reports on this to the ministers responsible.

There are 25 full-time equivalent employees at Novem devoted to the Long-Term Agreements, and 12 working on the benchmarking covenant, for a total of 37.

Incentives

There are various subsidies available for participants in LTAs: Energy Conservation Through Innovation, the CO_2 reduction plan, and the Economy, Ecology, and Technology Program. Other incentives are tax credits, such as the Energy Investments Allowance and the Free Depreciation of Environmental Investments regulation. Non-LTA companies can apply for these subsidies. Percentages are subject to EU rules: demonstrations 25 to 35%, R&D 50 to 60%, feasibility studies up to 90%

Program Marketing

Industry associations promote the LTAs among their members. Government and Novem promote it through articles in technical journals and brochures.

Participation Rates and Savings

The average energy efficiency improvement in participating industries in the 1989-2000 period was 22.3%, compared to the target of 20%. This is energy conservation of about 157 petajoules per year. About one-third to one-half of this improvement can be attributed to the LTAs; the rest is due to independent technological developments, environmental legislation, and fiscal and financial incentives. This is according to an independent evaluation conducted by the University of Utrecht.

The participants in the industrial LTAs are some 1,250 corporate establishments and several dozen industry associations and product boards. Together their annual energy use accounts for 547 petajoules, or about 90% of total industrial energy consumption in the country.

Budget

The budget for the Long-Term Agreements is as follows in Table 9.

Table 9

LONG TERM AGREEMENT PROGRAM BUDGET

TYPE OF EXPENDITURE	ANNUALLY
External costs to government of negotiating agreements, including audits	$1 million
NOVEM personnel	$2.4 million
Training and education to improve energy expertise in provinces and municipalities	$3.5 million
Monitoring and enforcing agreements	$0.8 million
Total	$7.7 million

Customer Satisfaction

There does not appear to have been any formal assessment of customer satisfaction, although the high participation rate is taken as a sign of high satisfaction, and there are numerous anecdotal reports of high satisfaction.

Monitoring and Evaluation

The Benchmarking Verification Bureau has been established to monitor the practical aspects of the covenant. This independent bureau verifies for each company all the different stages in the benchmark process. For example, the bureau checks whether the definition of the world lead is adequately underpinned and whether the energy efficiency plan has been properly put together. The bureau also issues advice on this to the participating company and to the local authority.

The University of Utrecht performed an independent evaluation of LTA1 in 1997. Price Waterhouse Coopers performs an audit every four years.

Reasons for Success

LTAs allow industry organizations to bring together members with sometimes conflicting interests and enable them to develop a joint approach for energy efficiency. Consensus—a cultural characteristic of the Dutch that has been documented—is key.

Transfer to Oregon

The fact that the LTA Program takes place in the Netherlands, a country that has approved the Kyoto Protocol, must be seen as a key to its success. Not only at a government level but also at a societal level, the Netherlands appears to have embraced a massive effort to reduce carbon emissions. Further, Dutch society is known for acting through consensus, and the LTAs, being voluntary, depend to a great extent on such consensus and cooperation. The U.S., to begin with, has not ratified the Kyoto Protocol, and even if it had, it is questionable whether entire industries (even in Oregon) would act in unison voluntarily. However, one aspect of the LTAs—training of local officials on energy matters to encourage enforcement—could conceivably transfer to Oregon; this could be especially effective insofar as current practices do not conform to current codes and standards.

United Kingdom: Energy Efficiency Best Practices Programme

Name of Organization: Department of Environment, Food, and Rural Affairs

Name of Program: Energy Efficiency Best Practice Programme

Name of Contact: Iris Rooney,

Phone and Email: +44 (0) 207.944.6682; iris.rooney@defra.gsi.gov.uk

Why Nominated

The UK's Energy Efficiency Best Practice Programme (EEBPp) was nominated as a best practice because it has been copied by Canada, South Africa, New Zealand, Australia, and most recently the European Union. It is cited in international publications as a leading example of an effective approach to energy efficiency.

Program Summary

The Energy Efficiency Best Practice Programme is the UK Government's main program for encouraging energy efficiency among organizations of over 20 people by providing extensive technical information and technical advice. It is intended for commercial and industrial firms (including business transport), services, the public sector, and housing. The program aims to advance and spread good practice in energy efficiency, provide support for energy efficiency R&D, provide a nationally recognized knowledge base on energy efficiency measures, and inform and develop UK policy on climate change, sustainable development, and competitiveness. The program identifies barriers preventing energy efficiency, and generates and disseminates information on energy performance and energy efficiency measures. Strategies are prepared for each key sector of the economy in collaboration with users and representative organizations (e.g., industry trade associations, housing associations, and professional bodies).

Program Delivery and Staffing

The EEBPp has been the responsibility of the Department of the Environment, Food, and Rural Affairs, but has since been transferred to the Energy Saving Trust (for housing) and the Carbon Trust (for all other areas). Internal staffing for the program consists of five people. Private firms also play a major part: the overall

program is managed by Future Energy Solutions, and technical advice related to buildings is managed by BRE, Ltd., which in turn contracts with firms having expertise in a given field to provide site-specific advice.

Information—the key component of EEBPp—is provided through a telephone help line, the Internet, publications, seminars, workshops/conferences, and site energy audits. At the most general level, the EEBPp's publications provide advice for energy efficiency improvements by building type, industry type, and equipment type. Site visits provide more specific information and advice.

Incentives

The publications, telephone help line, Internet services, seminars, workshops/ conferences provided by the EEBPp are free. For more customer-specific advice, an initial site assessment is also provided for free. Beyond that, detailed engineering advice on specific measures is also available; the first two days are provided for free, and the EEBPp will pay for 50% of the remainder up to a maximum of £2,000 ($2,919) for sites with energy bills from £50,000 to £100,000 ($72,980 to $145,960); £5,000 ($7,298) for sites with energy bills from £100,000 to £500,000 ($145,960 to $729,800); and £10,000 ($14,596) for sites with energy bills greater than £500,000 ($729,800). To receive detailed on-site advice, organizations must commit to "act on practical recommendations." The Carbon Trust also has a total £10 million ($15 million) available for interest-free loans, with a maximum of £50,000 ($72,980) per customer. Some grants and tax relief are available through other sources. Also, the UK has started an emissions trading scheme, in which measures instituted through EEBPp could qualify for credit. A new energy tax is also an incentive to save money.

Program Marketing

High-level government officials—at the minister level—promote the EEBPp in speeches; the publicity has been substantial. The EEBPp also produces sector-specific web magazines.

Customer Service

Customer service is inherent in much of what EEBPp does, including the telephone help line, making publications available, etc.

Estimated Savings

Energy savings from the EEBPp are estimated to be worth £800 million ($1.2 billion) annually.

Budget

The budget for the EEBPp is £20 million ($29 million) per year.

Customer Satisfaction

There has been no formal assessment of customer satisfaction, although anecdotal evidence suggests that it is quite high.

Monitoring and Evaluation

The Carbon Trust conducts its own internal evaluation annually.

Reasons for Success

The program is reportedly successful because it provides authoritative and independent information and advice on energy efficiency from the government, which has no incentive to make money off of it.

Transfer to the Energy Trust

The fact that the EEBPp takes place in the UK, a country that has approved the Kyoto Protocol, must be seen as a key to its success. Because the U.S. has not approved the Kyoto Protocol, carbon savings, the primary reason for development of the program in the UK, are not nearly as much of a factor for the Energy Trust of Oregon. In the UK, the penalties for higher energy use in the form of the energy tax, the higher energy prices to begin with, and the public relations benefits of supporting the national carbon policy are all prime motivators that would not hold sway in Oregon.

Also, the development of the databases by industry, building type, and technology may be too large a task for the Energy Trust by itself, as it serves a much smaller customer base than the UK as a whole. Further, the information-based approach offers less certainty of energy savings than would be the case with incentive-based

approaches. While perhaps it should not offered by the Energy Trust, an Energy Efficiency Best Practices Program at the national level could be quite effective in the U.S. To some extent, the benchmarking aspect of defining best practices is already being fulfilled for some building types by the EPA's ENERGY STAR Buildings program.