The need for a better approach to business energy management: engaging decision makers

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Abstract

Many programs have achieved success in stimulating companies to increase their purchase, installation, and use of energy-efficient equipment (e.g., fluorescent lighting, premium efficient motors). However, few can claim having moved companies to manage energy efficiency as an ongoing part of their practices, procedures, and culture.

Recently, a program has been developed and implemented in the UK, Australia, Canada, and the U.S. that is aimed specifically at educating and motivating corporate decision-makers in this direction. This program targets senior management; it not only engages their interest and concern with energy-related issues, but also guides them to set priorities based on a structured gap analysis, and to establish and commit to a plan of action. By focusing on the business needs of the target companies and gaining executive commitment to a structured, systematic implementation plan, it motivates these companies both to seek immediate savings and to a process for continuous improvement that includes sustainable long-term energy efficiency.

This paper illustrates specific aspects of the program, the way it helps drive outcomes in participating companies, and its implementation by government and utilities. In addition, the paper discusses needed changes in program evaluation methods to systematically monitor and value the cost-efficiency of this type of intervention which a) does not focus on equipment efficiencies, b) directs clients to other providers of energy efficiency services, c) helps build the infrastructure for such services, and d) motivates long-term energy reductions through the adoption of a sustainable energy-savings ethic in ongoing corporate planning and decisions.

Introduction

Energy management and demand side management (DSM) programs for commercial and industrial customers have typically been dominated by a focus on technology and paid very little attention to how energy use integrates into the way the business is managed. They generally follow an approach for achieving energy savings that entails conducting energy audits to find specific projects with cost-effective savings potential and then installing pieces of equipment to capture those savings. This may achieve quick and visible outcomes, but often the savings are not sustained over time because basic practices are rarely established as part of these projects to ensure that this happens. For example when a compressed air savings program is implemented, very few companies go the extra steps of documenting a routine maintenance program, training staff how to implement it, installing compressed air metering to track ongoing efficiency of the systems and establishing a basic monitoring and reporting system.

This approach has serious consequences for efforts to achieve energy efficiency:

- Most companies in the U.S. do not have management practices in place that will allow them to consistently and sustainably improve their energy efficiency. Based on detailed interviews with senior management, only 15 percent of 500 U.S. companies (using over

$US 100 000 per year of energy [approximately 87 700 Euro], and most over $US 500 000/year [approximately 438 500 Euro]) had established systems for managing energy, capable of driving improvements in energy performance.

- The DSM/energy management field is dominated by engineers and engineering approaches to achieving (and measuring) outcomes, often precluding more effective approaches compatible with broader business practices.
- DSM programs have largely become ways to subsidize energy-efficient technologies to such a degree that the equipment can be installed despite a lack of management focus or interest in energy efficiency.

In contrast, the approach that will be described here, the One-2-Five® Energy program, offers the following advantages to improve energy efficiency in the business community:

- For large non-residential energy consumers, the One-2-Five Energy process involves the top management of companies in energy management. This overcomes the all-too-frequent practice by which energy management is made the responsibility of a site engineer who lacks the authority to enact system- or measure-level changes and cannot approve requisite budgets.
- Rather than just modifying hardware, this process integrates with existing business systems for managing quality, safety, and plant reliability (i.e., lean manufacturing, Total Quality Management, ISO 9001 and 14001, etc.). Energy management is made "part of the way we do business" and changes corporate systems and culture, thus helping to achieve continuous improvement in energy use.
- The process utilizes international expertise reflecting industry best practices in energy management and takes advantage of local market knowledge.
- It delivers long-term market impact. The One-2-Five Energy process facilitates market transformation through:
  - Increased management understanding of energy use/savings impacts across the entire organization;
  - Identification of the company's competitive position based on comparative analysis from an extensive benchmarking data base, segregated by industry;
  - Definition of critical next steps for progress towards industry best practice; and
  - Encouragement of an established long-term corporate commitment using continuous progress tracking capabilities.

The One-2-Five Energy Approach

The Program's management approach for working with companies in a region or utility service territory consist of eight steps designed around three main phases. These phases are; a facilitated workshop with a firm's key decision makers, the delivery of a benchmarking process to assess the firm's energy management and procurement processes, and an extended coaching process to facilitate the installation of recommended measures and assist in making the changes to the firm's energy tracking and management processes. After this, the results of the process are compiled as part of a market research analysis and communicated to the wider market segment via a case study approach. Each element of the Program is discussed next.

SELECTION PROCESS

The selection process is a critical part of the program and getting this right is fundamental to delivery of the desired outcomes. The program staff utilizes its extensive experience in applying energy efficiency processes across a broad range of sectors to identify key areas to target initially. Within these sectors, potential participants are identified and the staff, usually in conjunction with the local energy supplier, evaluates their potential candidacy and prioritizes the list. Criteria for selection include (but are not restricted to) size of operation, complexity of operation, industrial or commercial sector, geographic location, and internal knowledge of the total benefits available to the sector.

PARTICIPANT CONTACT, COMMITMENT, AND BUY-IN FROM SENIOR MANAGEMENT

The program staff next contacts each site in line with the priority listing, initially through a telephone discussion with representatives from within the senior management team. This step helps the implementers identify which sites are keen to participate and therefore would benefit from a more detailed discussion of the process. The next step is to make a presentation to the management team on site and describe the program, the opportunities available, the resources that would be available to assist and the commitment to the program required from the site management team. From the responses received during this engagement process, the finalized list of preferred participants (ordinarily about one-third to one-half of those approached) is identified. (A supplementary list of locations is also prepared so these locations can serve as back-up sites should one of the preferred sites drop out of the program for any reason.)

INITIAL DIAGNOSTIC

Program staff then conducts a detailed diagnostic session with management at each of the preferred locations so as to establish the level of development in all areas associated with energy management at the site. This workshop is designed to include a comprehensive review of the systems, processes and procedures that financial decision-makers need to evaluate and justify new energy efficiency measures and track energy expenses. A concerted effort is made to invite all of the key financial decision makers of the firm to ensure that energy management will later become a line responsibility. Typically, the team will include staff at the vice presidential level or higher, covering finance, operations, energy (and sometimes also environment, and engineering/maintenance). Under the guidance of the program representative, the team will discuss and complete an inventory of company practices relating to energy use and energy management in the business. This inventory covers ten key

topic areas, covering twenty aspects of business activity, as illustrated in Figure 1.

As shown, the topic areas include all phases of importance to the functioning of the business, such as plant and equipment, financial management, supply management, and human resources, as well as key aspects of each, such as capital expenditures and the operating budget (within financial management), and purchasing procedures, quality and reliability issues, and load management (within supply management).

The diagnostic session is undertaken over a two-hour period and helps the group build a framework for improvement as well as a clear path for improvement. Over the course of the workshop, the management team answers the relevant questions and responds to check questions assessing the level of company understanding of the relevant issues and auditing the relevant company practices. Through this process and the work of the facilitator, the team generally gains major insights about how energy affects their business and how well they manage energy as a business issue– this is often the very first time that senior managers have discussed energy.

More specifically, during the workshop, current practices in each aspect of energy use and management in the company's operations are graded on a five-star rating system, based on the criteria shown in Figure 2. Thus, an energy-related practice that indicates the company has procedures in place to achieve continuous improvement is rated a "5," while a failure to go beyond having identified the need to reduce energy waste is rated a "1."

The results are then (confidentially) benchmarked against other peer firms with similar usage characteristics (often because they are members of the same standard industrial classification, or SIC code) and annual expenditures, from a data base of 850 organizations that have participated in this process over the past two years. (This is something that firms find particularly useful, both in comparing their performance with industry peers and in measuring their progress over time.) Thus, each site is benchmarked against other sites within the sector, and across sectors – information that provides valuable drivers for improvement and can be leveraged into the improvement process. Moreover, the software developed for exploring and recording the company's responses is also used to elicit the users' perceptions of the importance of each of the aspects to the success of the business. The addition of this information provides a structured gap analysis (i.e., a systematic comparison between what is needed for success in each relevant area and what currently exists). In turn, this defines the critical action areas for the specific user, based on the company's priorities.

Participants find this a powerful process because they can see outcomes in a couple of hours. Indeed, a report can be delivered on the spot. (The core of an illustrative company report is shown in Figure 3.) However, the report is generally delivered in a separate feedback session, together with the benchmarking report within a week. This timing allows the program representative to capitalize on the immediacy of the report while taking the opportunity for some customization of recommendations based on discussions with senior management. The feedback session then normally serves as the beginning of a formal planning process to establish the first 90-day plan for implementing recommendations for improvement.

Figure 1. *Areas and aspects of company operations assessed.*

Figure 2. *Star rating system.*

The results are thus used to develop a specific set of recommendations to address the most important areas in which low ratings were observed. It thereby leads directly into a planning exercise to establish group ownership and timelines for improvement.

SITE PLANNING

The planning and assignment of responsibilities process entails a verification of the diagnostic effort, to ensure that the answers provided during the session are an accurate reflection of normal operating practice. In addition, the team undertakes a brief review of company operations, with the sole purpose of identifying key technical projects for implementation. Both the technical projects (identified during the site planning process) and management improvements identified by the diagnostic are combined into a structured energy management plan which includes identification of site personnel responsible and a timeline for implementation. The

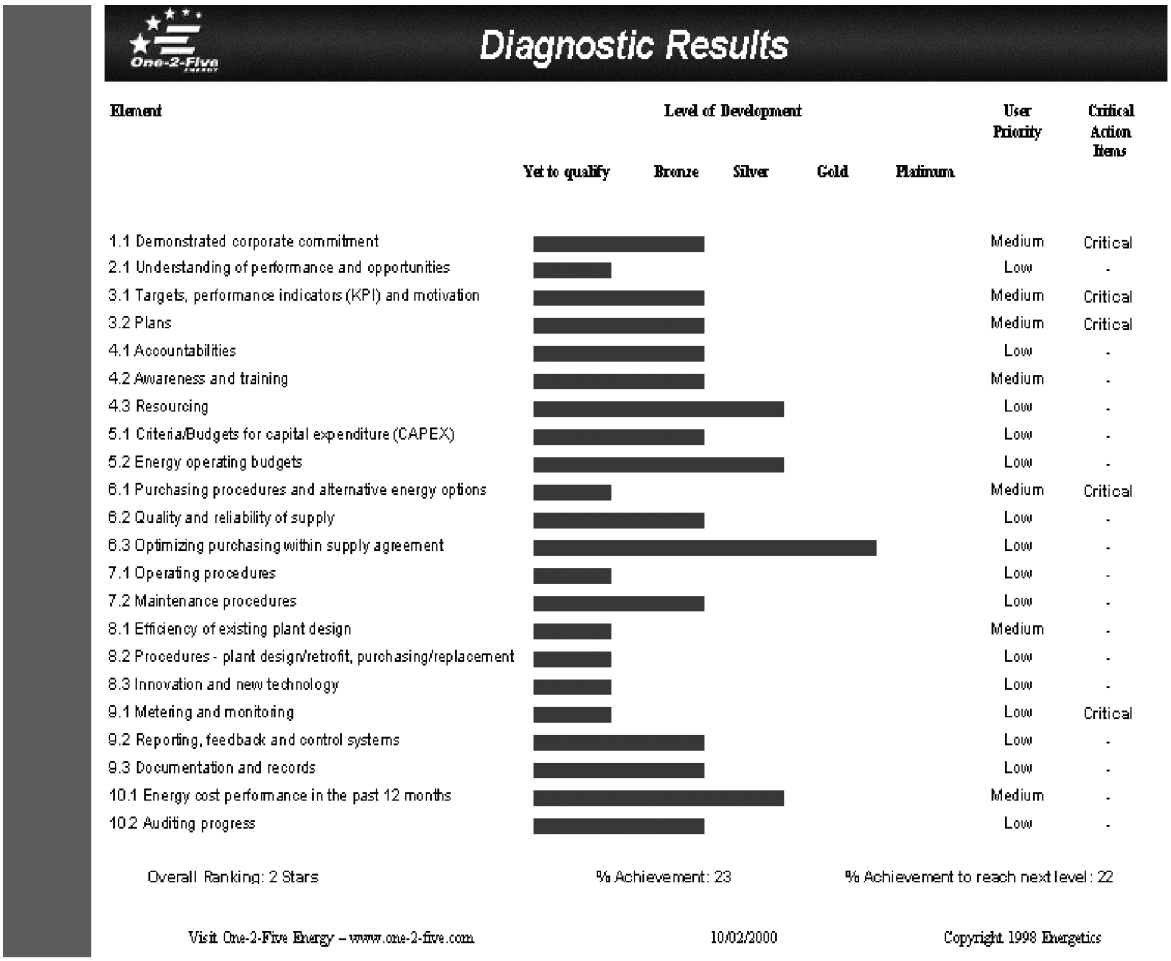

Figure 3. *Illustrative Report of Diagnostic Results.*

aim is development of a *strategic* energy improvement plan, typically with a 2-3 year span, and with clearly defined outcomes for the first 90 days, as well as rolling 90-day improvement activities. This plan is developed in conjunction with the site personnel to ensure maximum buy-in to the process. The site plan must also be endorsed and signed-off by the senior management team, thus achieving the necessary level of exposure and commitment to the process.

SITE IMPLEMENTATION

Program staff act as coaches and guides in this step – not as change managers – as it is essential that the site personnel take ownership of the process as early as possible. As indicated below, the program staff or the host agency or utility may also provide lists of both program referrals and vendor contacts who can provide either the capital or expertise specific to the process or capital improvements being considered. The implementation process is essentially split into two key areas which includes:

- **Technical Project Implementation** – includes the detailed evaluation of the opportunities that have been identified, including any engineering design, and the development of the relevant justification for action, such as the return on investment, as required by the decision-makers. After approval of any capital projects, it is essential that the project be implemented correctly and quickly. This process is followed for all technical projects identified within the first stage of the Plan.
- **Management System Improvements** – involves the improvement in operations and practices around the site and is typically a source of up to 40 percent of the available energy savings. They may involve corporate savings directives, establishing clear accountabilities and performance indicators for energy savings, energy-efficiency plant purchasing procedures, new facility/building energy-efficiency requirements, improved training and competency, etc. These improvements (identified during the diagnostic step) usually involve human interaction to a higher degree than the technical projects, and as a result are, in typical programs, seen as too hard to accomplish. By utilizing the unique process mapped out during this program, the process is broken down into "bite-sized" pieces and the path to improvement is made far easier to travel.

An important characteristic of the program is that it is not combined with a requirement to use a specific vendor of energy-efficiency services or specific energy-efficient products. Any agency or utility using the program is free to recommend its own preferred vendors or to provide participating companies with its list of qualifying products or service providers. Thus, at the simplest level, the agency or utility can support the facilitation of management diagnostic sessions

and leave participants to seek and implement savings on their own, while tracking what they achieve with a repeat diagnostic session at a later time (as discussed below), an approach that has been found to lead to important savings in approximately 10-15 percent of cases.

Alternatively, at the next level of engagement, the agency or utility can provide assistance to users in establishing initial energy plans and then linking them with suitable DSM programs and also with trained contractors for implementation support on a purely commercial basis. This approach allows the program to be used as an account management process, so that the appropriate DSM programs and services are directed to the customer to meet their needs as they develop. This may involve new diagnostic and planning sessions being conducted 2-3 times a year.

At the highest level of intensity, the agency or utility can provide partial funding of consultation support to companies that wish to participate and implement a continuous improvement program in their energy practices and performance. This may continue for an extended period with reducing levels of DSM support over time.

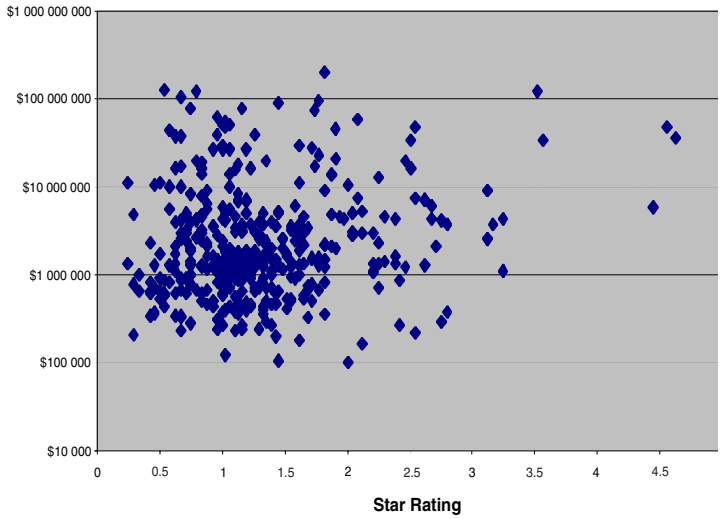

Figure 4. *Star Rating vs. Log Energy Spending (U.S., 750 sites) (Note: A score of 0-1 on the horizontal axis relates to a Star rating of 1 star; a score or 1-2 to 2 Stars etc.).*

VALIDATION

Implemented projects and improved systems must be measured to certify that the goals set in the plan are achieved. This step ensures that the management team sees the benefits associated with the program and continue to throw their weight behind it in the search for additional savings. The program staff helps establish key metrics for measurement and verification, which include global site based numbers such as kWh per unit of production or square foot, as well as individual project measures. This process also provides the essential detail required for the development of project case studies which are extremely important in recruiting additional participants.

REPEAT DIAGNOSTIC

After a period of six to nine months the diagnostic process is repeated at the customer site and the improvements in the systems noted. This process allows progress to be clearly identified and also allows the next set of critical actions to be identified and prioritized.

ITERATIVE SITE PLANNING, SITE IMPLEMENTATION, AND VALIDATION

The steps described earlier are then revisited; with the plan being updated and new actions set, generated and mapped. This is followed with the second stage of implementation, which consolidates the process and builds on past successes. Again validation gives assurance that the desired goals are being achieved.

Sidebar: Energy Use and Energy Management Sophistication

Before moving on, it is important to dispel a recurrent myth about attention to energy management and related issues in the commercial and industrial sectors. Contrary to popular belief, those companies that spend more on energy do not necessarily manage their applications more efficiently than those who spend less, as may be seen in Figure 4, taken from the data base of inventories.

Key Aspects of the Program and the Resulting Evaluation Challenges and Options

Initiation and support of program activities such as One-2-Five generally entails evaluation of their impact and cost-effectiveness. However this approach is implemented, it clearly raises a raft of new challenges for program evaluators. No longer is it sufficient to define program benefits by narrow measurement of direct savings gained by the implementation of a technical project. Not only does the program deliver these direct technology-specific benefits, it also delivers savings from improving penetration and acceptability of other programs, through the impacts of improved business practices. Moreover, these savings accrue on an ongoing basis. Thus, the program saves some energy directly, but it is more important as a stimulus for participation in other components of the energy-efficiency portfolio (i.e., the set of programs offered, which might include technological improvements or management assistance other than those initially installed) and for the sustainable changes in "business as usual" that it engenders. Furthermore, if the program is fully effective, it will also make the participants increasingly self-reliant and capable of driving new future savings without DSM program intervention.

Current evaluation practice finds such an intervention problematic, for the following reasons:

- It does not focus on equipment efficiencies, which can be measured relatively easily.
- It involves direction of participants to other providers of energy-efficiency services, clouding the attribution issue (i.e., identifying who should receive credit for the savings).

- It may help build the local infrastructure for such services, but that is a potential market effect with energy-saving impacts that are both long-term and difficult to isolate.
- It is designed to motivate long-term changes in energy use and energy management, which are again long-term and difficult to isolate and "prove' as emanating from a specific intervention.

How should these effects be clearly identified, measured, and evaluated? They are, after all, "secondary" in that the energy savings are neither immediate (per a resource acquisition program, such as a lamp replacement program, focused exclusively on the first-year reduction in lighting energy consumption) nor a readily circumscribed increase in the penetration of an improved technology (per a market transformation program). What is required is to clarify the underlying logic of such programs as contributions to a comprehensive portfolio, and to use this information to develop guidelines for design and evaluation. One approach is to recognize that the One-2-Five Energy program does not stand on its own, but is part of an agency's or utility's energy-efficiency program portfolio and to evaluate its contribution in that context.

The recent "Framework," (Sebold *et al.* 2001) published by the Pacific Gas &Electric Company, makes a compelling case for recognizing the various objectives of portfolio components and testing their individual logic, but it offers no specifics or guidelines. If senior management and regulatory agencies are to be asked to support interventions such as the program described here – and other infrastructure and research and development investments – it is appropriate and necessary to address their evaluation directly.

In a key section of the Framework report, the authors discuss the importance of establishing and maintaining a balanced portfolio of strategic methods to intervene in the market. "No one approach can work optimally for all markets." (p. 3-21.) These interventions include both those that may be described as primary-effect programs and those that may be identified as secondary-effect programs. Among the final recommendations in that section of the report are some that relate to the selection and support issue and one that relates to assessment. They are:

- "Infrastructure, research, and development contribute strategically to the overall goals of a mixed portfolio and need public benefit funding support.
- "Approach planning… in a strategic and parallel fashion. The underlying logic is for cost-effectiveness…
- "Judge cost-effectiveness at the portfolio level, but pay attention to ways for improving the individual initiatives.
- "Use the goals, barriers, and opportunities in the market to help determine which strategic approach(es) to use."[1]

The following section of the Framework report focuses on the need for a clear and articulated program logic for individual components of the portfolio (e.g., the specific effects to be achieved by each component and the infrastructure required to achieve these effects), but also indicates the need for similar efforts at the level of the overall portfolio. For example, it requires the portfolio designer to describe the mix of strategies needed to achieve the objectives in the specific market targeted, the rationale for allocating resources among the portfolio components, and the overall portfolio logic. The report then returns to the issue of how portfolio cost-effectiveness is to be assessed. Among the conclusions offered are the following:

- "Cost-effectiveness of energy efficiency interventions is best determined at the market level. This follows from the fact that a variety of overlapping interventions may be aimed at a specific market and their effects may be difficult to disentangle. Nonetheless, it also will generally be useful to attempt to assess the contributions of specific interventions to overall cost-effectiveness *in order to support the process of program design and refinement* (emphasis added).
- "Because the focus of cost-effectiveness analysis is at the market level, almost all interventions used for that market should be assessed using the same cost-effectiveness model… Conceptually, the assessment of infrastructure and research and development interventions should also entail the use of the PPT [Public Purpose Test],[2] however, it should be recognized that the nature of these interventions may make the estimation of energy impacts extremely difficult…" (pp. 8-23, 8-24).

In the remainder of this section, we will examine the most important of these points more fully. We will then comment on related approaches in use in other energy-efficiency programs. Finally, we will suggest recommendations for consideration in dealing with the portfolio problem as it applies to the One-2-Five Energy Program.

ASSESSING IMMEDIATE EFFECTS OF THE ONE-2-FIVE PROGRAM

The most immediate measures typically implemented as a result of participation in the process described in this paper typically relate to operations and maintenance, rather than participation in a designated DSM hardware program offering. Accordingly, although energy savings are initiated by the program contact, the evaluation mechanism is not in place to identify and verify those savings.

What is required, then, so that reviewers can be confident that savings have been realized and that they are reasonably attributable to the contacts and efforts of the program? The following steps, most of which are simply a formalization of processes already in place as part of the program, should be considered.

- To the maximum extent feasible, the program implementers should work with the participant to document current usage and energy-related practices.[3]

1. 2001. Study ID PG&E-SW040. (The project was managed by Chris Ann Dickerson of Pacific Gas & Electric on behalf of the investor-owned utilities of California).
2. The Public Purpose Test was developed in California to determine the cost-effectiveness of certain energy efficiency programs funded through a charge on all electric bills.

- The program implementers should document energy-related operations and maintenance practices and procedures that are identified by the participant as wasteful, as well as:
  - Metered or estimated usage involved;
  - Anticipated savings potential;
  - Changes in practices and procedures;
  - Metered or estimated results of change;
  - Client satisfaction, concerns, future plans.
- (A major change from current program practices is likely to be the advocacy of end-use or sub-area metering where appropriate in the stage of development of the customer's energy management program.)[4]
- The program implementers should share these data with independent evaluators/auditors.
- In addition, program reviewers should consider the use of an independent evaluator to assess the reports from a sample of participating clients and to conduct on-site studies of current practices[5] as well as process interviews with company decision-makers.

The on-site studies would be more in the nature of verifying the implementation and persistence of improved practices than of verifying detailed engineering results of changes. The process analyses should be designed to assess the likelihood that the changes instituted resulted, at least in part, from the intervention and were not likely to be a normal evolution of internal practices. In addition, they should obtain evidence from managers and senior executives that the changes are likely to be sustainable and determine the probability that those changes will be integrated into the company's business practices and that they are likely to lead to additional energy efficiency improvements.

ASSESSING SECONDARY EFFECTS OF THE PROGRAM

This subsection addresses the second stream of benefits from the program, those that result from its support of other components of the energy conservation portfolio, including the replacement or purchase of more efficient equipment. The test of overall portfolio cost-effectiveness requires assessing the present discounted value of the gross benefits and costs realized. The former include the energy benefits in each pertinent time period, the externality benefits (e.g., improved air quality), other resource benefits (gas, water), and other non-energy benefits (e.g., labor savings). Similarly, the costs comprise administrative costs (which include marketing and contract development), the costs of specific measures, externality costs (e.g., disposal of lamps that are replaced), other resource costs, and other non-energy costs (e.g., reduced service levels).

By its nature the program does not directly increase the gross benefits of such interventions. However, it does increase the administrative cost component (the category most appropriate for capturing the costs of targeting, contacting, and marketing the commercial/industrial decision-maker). Thus, the cost effectiveness hurdle for the program is whether it can enlarge the net benefits of the market intervention[6] by increasing the participation rate of targeted customers sufficiently to overcome its administrative cost (assuming the savings per participant are already cost-effective). Accordingly, the appropriate test for whether the program described here contributes positively to the cost-effectiveness of the total program portfolio in a given time period is:

$$\mathbf{A} <= (\mathbf{PR2} - \mathbf{PR1}) * \mathbf{S} \qquad (1)$$

Where:
PR1 is the participation rate for the intervention in the absence of the program
PR2 is the participation rate for the intervention with the program in place
S is the value of the energy savings per participant, and
A is the administrative cost of the program (alternatively, this could be written as the difference between the administrative cost of the portfolio with and without the program)

It may be noted that, if the program is cost-effective, it may also contribute to an increase in the number and variety of participating companies, a separate but often important objective of regulators and executive agencies. One can also construct a scenario in which the administrative costs are greater than the product of the increased participation rate and the savings per participant, but the average savings for the participants are so great that the net benefits remain positive. In other words, some interventions may provide enough value that a policy of achieving economic development or energy independence would favor reducing the overall cost-effectiveness of the intervention (so long as it remains positive) so as to increase the breadth of the effect.

Clearly, not all terms in Equation 1 are readily measured. Administrative costs (targeting, contacting, and marketing, etc.) can be captured directly as the costs of the program. The per-participant savings can be measured directly as part of the evaluation of other components of the intervention, or agreed to by the parties (based on earlier experience or engineering estimates) during the initial program design phase. In addition, the participation rate with the program in place can be determined directly from program records. But the participation rate in the absence of the program cannot be measured directly.

3. Indeed, in the typical program application, a number of clients who participate in a diagnostic session receive additional support "coaching." For these clients, the program implementer could easily conduct the tasks noted here. To make this effort standard, however, requires additional funding.
4. Again, additional funding is likely to be required if it is necessary to go beyond estimation algorithms. Few facilities currently have sophisticated submetering in place. Moreover, the practical problems of avoiding disruption to the business would be critical to securing client permission. (Indeed, these measurement and verification issues are often crucial barriers to customer participation in energy efficiency programs. It is for this reason that the program typically recommends the use of estimation algorithms and data collected in the normal course of business as an appropriate evaluation technique, particularly in the early stages of client participation).
5. Where possible, it would be valuable to obtain before-after studies of usage by sub-area or end-use. This may not be possible, however, given that the One-2-Five Program does not deliberately target particular end-uses, etc.
6. The gross benefits less corrections for free ridership, etc.

How, then, can an evaluator be reasonably confident that the net effect is positive? The problem is not unique to this arena; it is one that has been addressed in a number of other energy-efficiency programs. Although no one approach is ideal, several offer useful perspectives and the use of multiple approaches can help triangulate an answer and provide some certainty. The following are methods that have been used in comparable situations:

- Examine participation rates of similar programs in past efforts by relevant agencies or utilities,
- Compare participation rates for similar programs in other jurisdictions,
- Obtain expert projections of participation rates through in-depth interviews or Delphi panels,
- Conduct experiments comparing participation rates with and without the program in different commercial and industrial customer segments or different geographic areas.

ASSESSING SUSTAINABILITY OF CHANGES INDUCED BY THE PROGRAM

The third stream of benefits from the program entail determining that the intervention should lead to energy efficiency improvements that are sustainable. As seen in the description of the program, a key objective of the design is to move companies toward sustainable internal efforts to reduce energy use. Thus, insofar as the stream of benefits from the initial administrative costs continues, the savings associated with participation in an initial project is in fact an underestimate of the net benefits of the effort.

Several evaluation questions arise immediately: Can sustainability be measured? If so, how much of the resulting savings can reasonably be credited to the initial intervention? Moreover, even if a high proportion of those savings can be so attributed, should they not be discounted for the time involved before they come into effect?

In keeping with the issue of precise determination of costs and benefits, it may be suggested that the questions just noted are not the most appropriate ones. Rather, the relevant question, at the level needed to make reasonable business decisions, is whether companies that participate in the program do indeed move toward the use of benchmarking, best practices, and continuous improvement in the arena of energy use. If so, the threshold for the third stream of benefits will have been met.

How, then, can the evaluator determine whether program participants have moved toward sustainability? As noted earlier, independent evaluators should identify indicators of sustainability (e.g., the development of written policy statements regarding energy management practices and the creation of mechanisms to monitor internal compliance with those policies); they should then use process analysis interviews and document reviews to assess these and to determine whether they have resulted in continuing attention to energy efficiency and additional improvements. It is only with such systematic monitoring and analysis of changes in management practices that the effectiveness and value of such programs and their advantages over conventional approaches can be demonstrated.

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