

Public Benefit Charge Funded Performance Contracting Programs – Survey and Guidelines

Steven R. Schiller, Schiller Associates
Charles A. Goldman, Lawrence Berkeley National Laboratory
Brian Henderson, New York State Energy Research & Development Authority

Environmental Energy Technologies Division
Ernest Orlando Lawrence Berkeley National Laboratory
University of California
Berkeley, California 94720

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ABSTRACT

This paper discusses the evolution of performance contracting programs that are included in energy efficiency activities supported by Public Benefit Charge (PBC) funds. Between 1998 and 2002, on the order of \$400 million of ratepayer funds are or expected to be committed for these programs in California, Colorado, New York, Texas, and Wisconsin. We summarize several programs that encourage performance-based contracting either through standard performance contracting (e.g., California, New York and Texas), demand-side bidding (Colorado) or contractor support programs (Wisconsin). The programs are selected in part to illustrate differing program objectives as well as the relationship between goals and program design. Our major findings and recommendations are:

- (1) Performance-based programs can be an effective mechanism for encouraging new, energy efficiency projects between energy efficiency service providers (EESP) and customers in large commercial/industrial markets, although they must be carefully designed so as not to impose contracting mechanisms that will ultimately not be accepted by either contractors or customers.
- (2) Based on experiences in California, *standard performance contracting* programs should not be pursued in single-family residential markets; and innovative approaches and program designs are needed in small commercial/industrial markets if performance-based programs are to succeed.
- (3) Measurement & verification (M&V) efforts in these programs should focus on ensuring effective use of public goods funds and tracking of aggregate program impacts, rather than requiring that stringent M&V protocols be used over the economic lifetime of measures installed at each project. We believe that rigorous M&V at project sites can still be effective in reducing performance uncertainties associated with certain high-efficiency technologies (e.g., controls), although M&V should be significantly simplified for other energy efficiency technologies where there is a wealth of existing data on savings.

Introduction

Between 1987-1997, ~30 utilities successfully conducted demand-side management (DSM) bidding programs in which energy efficiency service providers (EESP) bid prices for

blocks of energy and/or demand savings as part of a competitive resource solicitation.¹ We estimate that about \$650 – \$1,000 million were paid by utility ratepayers in these DSM bidding programs, which resulted in ~500-550 MW of peak demand reductions (Goldman and Kito 1995; RER and Goldman 1998). Due to concerns from the energy service company (ESCO) community that DSM bidding programs often involved high transaction costs for bid preparation, lengthy periods for contract negotiation, and access to program funds limited to a few “winning” bidders, the concept of a “standard offer” was developed. In New Jersey, the Standard Offer program design included a standardized contract and program rules. Qualified participants could apply on a first-come, first-served basis subject to a capacity block limit (i.e., 200 MW) and received posted prices for delivered energy savings through agreed to measurement and verification (M&V) protocols over contract terms which varied between 5-15 years.

With the advent of electricity restructuring and emergence of Public Benefit Charge (PBC) funds for energy efficiency in various states, these programs have continued to evolve, partially in response to changing public policy objectives. For example, in California, the Public Utilities Commission (CPUC) articulated a vision that promoted the development of a competitive, energy efficiency services industry, which included explicit support for an SPC design, as an objective for achieving energy efficiency goals during the transition to a restructured electricity industry (Xenergy 1999). In California, Texas, New York, and Wisconsin, public utility commissions or state agencies that are administering energy efficiency programs have emphasized that program funds should be used to facilitate customer interactions with private sector providers as part of a shift away from heavy reliance on utility staff developing projects. In some cases, regulators directed the administrators of PBC funds to “outsource” program activities to Energy Efficiency Service Providers (EESP). In response to these policy shifts, program administrators in these four states have proposed that significant amounts of funds be used to promote performance contracting in large commercial/industrial markets. Standard performance contract (SPC) programs have been targeted to specific market segments, such as smaller commercial customers (e.g., California) or targeted at local providers that have not traditionally utilized performance contracting in their business (e.g., Wisconsin).

In this paper, we summarize and discuss programs that encourage performance-based contracts between customers and EESP either through standard performance contracting (California, New York, and Texas), DSM bidding (Colorado), or a business development and risk sharing program for EESPs (Wisconsin). These programs are distinguished from other types of PBC programs by two principal elements:

- Incentive payments in “pay-for-performance” programs are paid based on documented performance (i.e., energy savings) for some period after project installation (as distinguished from rebate programs in which incentive payments are typically based on pre-installation estimates of savings);
- A program goal that includes use of private sector EESP as the predominant mechanism for marketing and development of projects, versus heavy reliance on support from a program administrator, whether a utility or public agency.

¹ About 50 solicitations were issued by utilities between 1987-1988 that included DSM bids either as part of an integrated supply/demand solicitation or separate DSM solicitation; ~30 utilities made awards to and successfully negotiated contracts with ESCOs or customers.

From a public policy perspective, these programs are important, in part, because they represent one of the largest ratepayer-funded efforts (~400 million budgeted in these four states between 1998-2002) that offer strategies to develop and expand the infrastructure of companies that provide energy efficiency. In the next section, we describe each program, focusing on program goals, key design features, and initial results. Programs are selected in part to illustrate the range of program objectives articulated for performance-based programs. We then discuss several key policy and program design issues and offer recommendations associated with performance-based programs.

California's Non-Residential SPC Program

Program Objectives

The SPC programs in California have both resource acquisition and market-transformation related objectives. The utility Program Administrators were required under California's policy rules to propose a portfolio of programs that were cost-effective from a societal perspective. The SPC program, as the largest program (~20% of funds statewide in 1998 and ~28% in 1999) and one which was targeted to large commercial/industrial customers, was expected to be an important contributor to the overall cost-effectiveness of the portfolio because of its ability to capture near-term savings. Defining the market transformation (MT) goals of the SPC program is more of a challenge, largely because there was not an explicit discussion or consensus among the program's utility Administrators, the California Board for Energy Efficiency (CBEE), and stakeholders. The program's evaluators summarized the MT goals by suggesting that the program should contribute to the creation of a self-sustaining market for energy efficiency products and services that captures all or a portion of the cost-effective opportunities in end-user facilities (Rufo et al 1999). Possible market effects of the program include changes in the marketing practices (e.g., bundling of both energy efficiency and energy commodity, increased installation of measures less frequently installed through traditional rebate programs) and business characteristics of participating EESP. Possible market effects for customers include improved confidence in EESP as credible providers of energy efficiency services, improved confidence in savings from efficiency measures, and increased knowledge and awareness of performance contracting (Xenergy 1999).

Program Design

EESP or customers enter into a standard contract with the program administrator in which they receive posted prices for annual energy savings achieved in the areas of heating, ventilation, and air conditioning (HVAC), refrigeration, lighting, and other end uses (Goldman et al 1998; Rubinstein et al 1998). In the 1999 large C/I program, incentive payments for lighting (5.0 cents/kWh), AC & Refrigeration (16.5 cents/kWh) and motors & other measures (8.0 cents/kWh) are made to participants in three installments, based on

demonstrated annual savings over a two-year M&V period. Standard M&V protocols are used to determine the actual savings. The program requires a performance contract between the Program Administrators (California's investor-owned utilities) and Project Sponsors (either EESP or customers), although there is no requirement that an EESP enter into a performance contract with a customer as a condition of participation in this program. Information on these programs can be found on several web sites, such as <http://www.scespc.com/>.

Results

Table 1 provides summary results and activity levels for the SPC program for 1998 and 1999.

Table 1. California SPC Program Results and Activity Levels

Activity Level	1998 Program	1999 Large C/I Program	1999 Small Business C/I Program
Overall Program Budget (Million \$)	\$42	\$68.3	\$10.6
Total Funds Available for Incentives	\$33.8	\$~53-55	NA
Total Incentive Funds Committed (Million \$)	\$33.8	\$35.2	\$2.1
Estimated Annual Savings (GWh) based on Applications with accepted BPAs	231 GWh	NA	NA
Unique customers (number of sites)	92 (605)	122	133
Energy efficiency service providers	26	32	37

Sources: Rufo et al 1999; Rufo, 2000; CPUC 2000.

With respect to the resource acquisition objectives of the program, we offer the following observations:

- In 1998, there was strong demand for participation into the Program and program incentive funds were fully subscribed. Moreover, a significant amount of the savings were derived from non-lighting measures. However, the initial program evaluation also estimated a net-to-gross ratio of about 0.53 for the 1998 program. (Xenergy 1999).
- In 1999, on a statewide basis, the program incentive funds were significantly under-subscribed for the large C/I market (~65%). Results varied significantly by utility with SCE committing 98% of their budget, while PG&E and SDG&E committed about 27% and 18% respectively (CPUC 2000). Several contributing factors are fairly self-evident, while others are more speculative and will hopefully be clarified by the 1999 program evaluation. First, the combined 1999 statewide program budget for the large and small SPC program was almost double the 1998 budget. Moreover, the start of the 1999 programs were delayed by 3-4 months due to delays in regulatory decisions and approvals, so effectively the programs operated for only 7-8 months of the year. Second, the explicit targeting of a portion of program funds (\$12 million) to the small business market was regarded as a pilot, which did not yield significant impacts in the first year (\$2.1 million in funds committed). Third, at least in PG&E's service territory, there was an established and competing DSM bidding program in place. Fourth, there was a

significant backlog of projects awaiting a program in 1998 and that by 1999 the natural time required for project development in the target market performance contracts (6 months to two years) may have overtaken this backlog.

- One byproduct of the 1999 SPC program being under-subscribed is that the utility's forecast of estimated benefit/cost ratios for the program are optimistic because that portion of the programs' administrative costs which are fixed (e.g., program marketing, program managers) must be spread over a small base of savings.

With respect to the market transformation goals of the program, we would offer the following observations, based mainly on findings from their evaluation of the 1998 program (Xenergy 1999).

- *Did the NSPC program stimulate the market for performance contracting?* - In 1998, based on a sample of participating customers, fee-for-service was the most common contractual arrangement (61%), while energy performance contracts and "other" accounted for 21% and 15% respectively. Almost all EESP and customers report that the program did not lead them to adopt different contracting practices. The program may have contributed to some minimal increase in performance contracting in the California market. The program's evaluators developed a very rough estimate that the program may have generated about ~40-45 GWh of net performance contracting business relative to their rough estimate of the market prior to the program (~436 GWh) (Xenergy 1999).
- *Can we observe near-term market effects from the program?* – Based on analysis of 1998 results, the program's evaluators concluded that the overall weight of the evidence suggested that the program was generating few near-term market effects, although they acknowledged that for many indicators, insufficient time had elapsed to make a more definitive determination.
- *Changes in the breadth and depth of EESP?* The initial results here are mixed. There were 17 EESP unique to the 1998 Large C/I Program, 23 unique to the 1999 Program, and 9 that participated in both program years. This represents a total of 49 unique EESP across program years. However, EESP indicated in interviews that the program is too small relative to the size of the California market to have a major impact and that the current structure of the program tends to favor traditional ESCOs. In the 1999 small C/I SPC program, there were 37 EESP that participated; most of whom are not active in the large C/I SPC program. Activity levels in the small C/I market are still quite low compared to the size of the market.

New York's Energy Services Industry Program

The New York Public Service Commission, through Opinion No. 98-3, designated the New York State Energy Research and Development Authority (NYSERDA) as the third-party, non-utility fund administrator of a \$176 million 3-year initial public benefits program funded by a System Benefits Charge. The Energy Services Industry program, with a 3-year authorized budget of ~\$50 million, is the largest program in NYSEDA's portfolio of 29 energy efficiency, research and development, low-income and environmental disclosure initiatives. The Program consists of two elements: Standard Performance Contract (SPC) Program (\$47.7M) million and Financial Packaging Services (\$2.25M). More information on the programs can be found at <http://www.nyserda.org/499pon.html>.

Program Objective

The Energy Services Industry Program is designed to facilitate the development of a strong energy services industry. As the electric industry in New York State moves through deregulation towards retail competition, the programs would hopefully encourage energy service companies to offer energy efficiency as a value-added service to customers along with electric commodity sales. The program is also designed to address several common barriers, including the lack of information particularly in the institutional sector, the customer's aversion to risk, and limited financial resources to implement energy efficiency.

In June 1998, NYSERDA convened an advisory committee of State and national associations that represented energy service companies and energy marketers, including National Association of Energy Service Companies (NAESCO), the National Energy Marketers Association, and the New York Energy Efficiency Council, to obtain assistance in developing program planning criteria. Initial market surveys indicated that seven ESCOs, working primarily in schools, were involved in performance contracting in New York. The programs were launched in early 1999, with the hope of leveraging up to \$400 million in capital construction for approximately 300 customers.

Program Design

The SPC Program offers fixed-price incentives for documented energy savings achieved by installing energy efficiency measures as specified in a standard agreement. Only ESCOs can be project sponsors and receive incentive payments; customers *cannot* apply directly to the SPC Program. Incentive payments are performance-based and vary according to technology and actual savings achieved and documented according to a set of M&V Guidelines. The M&V Guidelines follow the International Performance Measurement & Verification Protocol (IPMVP), except that the New York Public Service Commission specifically eliminated the use of Option A - Stipulated Savings. Incentives are paid out 40% upon installation and the balance over a two-year measured performance period.

The Financial Packaging Services activity is specifically designed to encourage institutional sector customers to explore the opportunities of energy performance contracting with ESCOs and was intended to "feed" customers into the SPC program. The program provides financial incentives to cover up to 50% or \$50,000 of expenses (e.g., comprehensive energy audit, legal, or consulting services) for developing an energy performance contract for school, hospital, local government buildings.

Results

By June 1999 after 6 months of offering the SPC program, only 10 applications for a total of \$1.3 million were received compared to a first year budget of \$14 million. The Financial Packaging Service had awarded incentives to 48 institutions. In July 1999, NYSERDA convened the advisory committee to review ways to enhance participation in the programs. The consensus was that the programs concepts were sound but the incentives were too low and the M&V requirements were perceived as too stringent and expensive to implement. The 10% cap on program incentives (i.e., market share cap) for individual

ESCOs was also seen as discouraging ESCOs from making the investment needed to participate in the New York market. In October 1999, NYSERDA responded and modified the SPC program in the following areas: increased the cap on maximum amount of funds that could be received by an individual ESCO, increased the incentive pricing levels for savings from energy-efficient technologies from ~15% to ~25% of project cost, provided an additional incentive for NO_x reductions (\$4000/ton), provided sample M&V plans for various technologies, and conducted a marketing effort.

As of May 2000, 28 ESCOs, including four energy marketers, were participating in the SPC Program vs. seven companies during the previous year. A total of 55 project applications have been received for incentives totaling \$13.3 million. If successfully developed, these projects are expected to leverage ~\$50 million in energy efficiency investments. The program has produced electricity savings in non-lighting end uses: 48% in lighting, 31% motors and 21% cooling. Project activity is spread among several large C/I market segments: 36% for schools, 25% commercial buildings, 22% municipal, 11% industrial and 6% multi-family. ESCOs are also beginning to aggregate smaller customers in developing projects: one project involves 49 food service markets and another involves 128 dairy farms. NYSERDA also has 133 institutions participating in the “feeder” Financial Packaging Services program that would hopefully lead to Standard Performance Contracts.

Although program participation is increasing, averaging ~\$2 million in incentives awarded per month during 2000, NYSERDA does not expect all available funds to be awarded by early 2001 as the ESCO market continues to slowly mature. The development of competitive electric markets has also been slower than anticipated in New York and the hoped for synergy between commodity competition and efficiency services is not yet occurring. Thus, NYSERDA shifted \$12 million out of the SPC Program into other energy efficiency, research & development, and low-income programs to cover anticipated shortfalls in funding and unmet needs in other programs. NYSERDA expects to replenish this reprogramming to the SPC Program when SBC funding is renewed after June 2001.

TXU Electric TEEM Standard Offer Pilot Programs

Prior to the passage of Texas Senate Bill 7 (SB7), which mandated electric utility deregulation in Texas, TXU Electric (TXU) had already begun to design standard offer (SO) programs for its service territory, as part of the integrated resource planning (IRP) process.³ The SO initiative took on more urgency as TXU realized that early deployment of SO programs would provide valuable implementation experience to help meet the legislative requirements of SB7 (i.e., meet 10% of annual demand growth through energy efficiency by January 1, 2004). The Texas Energy Efficiency Rules (PUCT 2000) emphasize SO programs and low cost M&V for performance contracting programs. In March 2000, TXU began implementing its TEEM (Texas Energy Efficiency Matters) standard offer pilot programs; other Texas utilities may use the pilot as a model if it is successful.

Program Objectives

³ We regard standard offer programs and standard performance contracting programs as synonymous conceptually, although program design may vary.

The program objectives include:

- Having energy efficiency incentive programs available to all customer classes;
- Encouraging private sector delivery of energy efficiency products and services;
- Stimulating investment in energy efficient technologies most likely to reduce TXU's peak capacity requirements during 2000 and 2001; and
- Creating a simple and streamlined program process to stimulate strong program participation.

Program Design

The programs will operate during a two-year transition period (2000-2001) with a budget of ~\$14 for financial incentives. TXU is offering two separate programs: (1) the Small Air-Conditioner Distributor Program, and (2) the Large Commercial and Industrial Retrofit Program. Both programs pay incentives on a first-come, first served basis for installation of high-efficiency equipment that exceeds industry-accepted efficiency standards (including ASHRAE Standard 90.1-1989, Energy Star, or similar designations) at TXU distribution customer sites. More information on the program can be found at www.txuefficiency.com.

The Small Air-Conditioner Distributor Program is designed as a market transformation program which offers incentives in the form of rebates to distributors of split-system and packaged air-conditioning equipment with under 20-tons of cooling capacity. This program mainly targets the residential and small commercial market sectors, but is open to any application of qualifying equipment. Participating distributors agree to sell a minimum of 100 high-efficiency units in either retrofit or new construction installations. Incentives are paid based on documented increases in sales over their prior year sales. With this program an existing product and service network is used to address these market sectors.

The Large Commercial and Industrial (C&I) Retrofit Program is a standard offer program targeting equipment retrofits in large commercial and industrial facilities. Incentives are paid at a fixed \$/kWh rate for verified annual energy savings. TXU has assembled a pre-approved list of energy efficiency measures, however sponsors are welcomed to propose any measure for consideration, providing they can demonstrate the measure meets program qualifications (i.e., provides peak demand savings, has a minimum 10-year service life, etc.). Measures that involve fuel switching from electric to gas are also acceptable. A customer may serve as their own project sponsor, so long as they meet program qualifications.

Measurement and verification

The approach to measurement and verification of savings was a key aspect of TXU's strategy to create a simple and streamlined process to stimulate participation by EESP. TXU was particularly concerned about the cost-effectiveness of M&V. Their goal is to ensure that the relative cost associated with determining the actual level of energy savings is balanced against the value of expected energy savings from a particular measure. The TXU pilot programs include three distinct approaches, representing increasing levels of detail and rigor:

deemed savings,⁴ simple M&V,⁵ and full M&V⁶. The method chosen depends upon the availability of evaluation data from previous programs for particular equipment, the predictability of equipment operation, and the benefits of the M&V method chosen relative to the costs associated with that particular method. TXU may provide assistance to sponsors in selecting an appropriate M&V method for each project prior to signing the standard contract.

Wisconsin's Energy Efficiency Performance (EEP) Program

In July 1998, the Wisconsin Department of Administration (DOA) launched a two-year pilot energy efficiency program for Northeast Wisconsin called "Focus on Energy." The Energy Efficiency Program (EEP) Program is part of the Focus on Energy initiative and has a budget of \$5 million (Farinaccio 2000). Recently, the Wisconsin Legislature approved legislation authorizing public purpose programs for energy efficiency (and also low-income and renewables); DOA regards the pilot as a potential model for one of the statewide public purpose programs for energy efficiency.

Program Objectives

The EEP Program was designed to encourage both national and local energy efficiency service providers (EESP) to expand their service offerings and market share by pursuing performance-based relationships with new and existing commercial and industrial customers. The program's objective is to stimulate market transformation rather than resource acquisition. With this goal in mind, the program offers a shared performance risk and a financial performance incentive to service providers willing to undertake one of the following three goals: (1) deliver performance-based energy efficiency products or services that have not been previously offered to new or existing customers, (2) deliver performance-based energy services to new customer or market segments that have not been previously targeted, or (3) deliver performance-based energy services through the utilization of new distribution strategies, marketing channels, or teaming alliances. More information on this program can be found at (www.wifocusonenergy.com)

Program design and target market

EESP must demonstrate the viability of their proposed business models by submitting a business plan that includes an analysis of the market potential of its proposed service offering to targeted customers within the pilot territory as well as the long-term viability and profit potential of the proposed service offering. Eligible EESP include lighting and HVAC

⁴ With deemed savings, energy savings for certain measures are stipulated in advance of installation based on typical operating characteristics, nameplate ratings from manufacturers, etc.

⁵ A simple M&V approach may involve short-term testing or long-term, metering but relies primarily on pre-set savings calculation formulas.

⁶ Full M&V refers to M&V methods that involve, for example, whole building billing analysis, calibrated computer simulation, or metered savings of equipment or systems and include a higher level of detail than simple M&V methods. Full M&V is usually only employed where deemed or simple M&V methods are not appropriate.

contractors, energy services companies (ESCOs), architecture and engineering firms, and manufacturers and distributors of energy efficient products.

Since the program is intended to encourage risk sharing and to reward performance, service providers are also required to enter into performance-based contracts with their customers. The minimum guaranteed cost savings specified in a performance agreement with a customer are used to determine the incentive that is paid to the service provider. To achieve the program objective of sustained and leveraged market activity, customers can participate only indirectly, through a contractor.

Measurement and Verification of Savings

In contrast to other performance-based programs, the EEP pilot does not have independent measurement and verification requirements. To receive the financial incentives offered through the pilot program, the contractor and customer are only required to reach an agreement on the scope and type of M&V to be conducted along with notification from the customer that the M&V has been satisfactorily completed.

Program Marketing & Technical Assistance

The EEP Program offers three different levels of support to participating EESP. First, the program provides training and facilitation services in preparing successful marketing and business plans and identifying and developing viable project opportunities. This level of assistance is designed specifically to help the smaller, local service providers who have an existing customer base but little or no experience in performance contracting. Second, the program shares with EESP the risk of offering cost savings guarantees to customers. If a customer's guaranteed cost savings have not been met, the EEP Program will underwrite 50% of the specified performance penalty owed to or withheld by the customer for the first three years of the performance contract period. The program's share of the penalty payment is issued to the EESP in a single, lump-sum payment at the end of the first performance year. Third, if after one year of verified performance, the EESP successfully meets or exceeds the guaranteed cost savings, the EESP receives a performance incentive equal to 50% of the annual guaranteed cost savings for the first three years of the performance contract period. This amount is issued to the EESP in a single, lump-sum payment at the end of the first performance year. Ideally, these payments would be issued annually, but this would increase the program's administrative overhead and was felt to be burdensome for a pilot.

Results

As of May 2000, the EEP program has signed two program contracts with EESP and is in process of reviewing/approving four other additional project applications. The program has also approved business and marketing plans from six other participants – all of whom are actively pursuing customers. EESP participating in the program include vendors, lighting distributors, engineering firms, energy service companies, and HVAC contractors. This diversity indicates that the program's marketing and outreach efforts are reaching a variety of service providers. The current level of participation will yield \$400,000 in annual cost

savings, representing over 10,000 equivalent MWh of savings at an average electric rate of \$0.04/kWh.

For seven of the eight Sponsors in the program, this is the first time they will be delivering performance-based energy services. For this reason, significant program resources have been allocated to working closely with potential and active local contractors, helping them learn how to sell, assess and verify performance-based contracts. Larger EESP will require little assistance in the form of project facilitation. Rather, these EESP view the program as an opportunity to expand their current portfolio of performance-based services to include more comprehensive measures by establishing new teaming arrangements and more customer segments.

As of May 2000, based on the projections submitted by EESP in the program, there is a potential to stimulate over \$2 million in sales revenue in the year 2000, which translates into \$1.3 million in cost savings or an equivalent of 32.5 million kWh for customers.

Public Service of Colorado's (PSCo) "Bid 2001" DSM Bidding Program

Public Service of Colorado (PSCo) is currently operating its fourth DSM Bidding Program, which began in 1994. The current program has a budget of \$15 million and awarded contracts in early 2000 to 15 contractors and 8 customers. More information on the program can be found at <http://www.pscoco.com/SOLUTIONS/BID2000.Asp>.

Program Objective

The program has a primary goal of achieving cost-effective, peak period demand savings.

Program Design

Bid selection criteria used by PSCo included price and factors such as:

- Savings Reliability and Persistence – Bid proposals that included mature technologies that have been tested in specific applications and shown to produce the expected demand savings received preference over those that included new and unproven technologies. Bid proposals that demonstrated a greater persistence (*i.e.*, less likely to fail, be replaced, or not used) also received preference over other bid proposals. Under this approach, large capital-intensive projects, such the replacement of an inefficient chiller, were given preference over measures with a shorter expected lifetime, such as lighting retrofits.
- Energy Savings – While the payment mechanism for this program is based on the average demand reduction during the summer peak period, bid proposals that will produce greater electrical energy savings were given more consideration. While load-shifting measures such as thermal storage were eligible for participation in this program, preference was given to measures that also produced net energy savings.
- Marketing Plan – A review of bidder's marketing plans identified those bidders that demonstrated an in-depth understanding of the target markets and provided mechanisms to limit free-ridership.

Measurement and Verification

PSCo has elected to have measurement and verification activities performed by a third-party M&V contractor (under contract to PSCo), rather than having project sponsors perform their own M&V of savings. PSCo chose this approach for several reasons: (1) it may facilitate broader participation by customers and certain types of EESPs that do not typically operate their businesses on a pay-for-performance basis, (2) it allows more flexibility for the program administrator to conduct the level of M&V that is cost-effective on a project-by-project basis, based in part on the previous performance of project sponsors, and (3) it does not preclude project sponsors from conducting M&V on their projects, with approval from the program administrator who would then review the results.

Results

Based on the bid proposals selected for participation in the program, there is a potential for the 23 winning bidders to reduce PSCo's summer peak demand by 37 Megawatts and save nearly 120 million kWh in annual energy consumption by 2002. In May 2000, PSCo proposed obtaining a total of 125 MW in demand savings over the next five years through implementation of energy efficiency projects. PSCo expects that a substantial portion of this goal will be achieved through DSM bidding.

Key Policy and Program Design Issues

In this section, we discuss several key program design issues affecting performance-based programs.

Program Goals and Evaluation Mechanisms

It is critical for PBC program administrators and regulatory oversight agencies to establish clear objectives for performance-based programs that rely on public purpose funds. Thus far, this issue has mainly been framed in terms of "resource acquisition" vs. "market transformation" objectives, although it may be more constructive to think about the issue in terms of near-term savings vs. long-term market impacts.

Decisions regarding program goals will influence many aspects of program design, including incentive levels. For example, if the primary program goal is "resource acquisition," then incentive payments should be clearly tied to energy and/or capacity savings; program M&V requirements for project sponsors and/or impact evaluations can determine if the savings are "real" and persistent. However, if the primary goal is "market transformation" (e.g., increasing the number and type of EESPs as well as their volume of business), then immediate energy or capacity savings may be secondary. Financial incentives should perhaps be paid based upon successful business development and the implementation of new energy efficiency projects, perhaps by new providers, as in the Wisconsin program.

These programs typically target large C/I markets where there are significant cost-effective energy efficiency opportunities with an active and fairly well developed private sector industry that already offers energy efficiency services to these customers. This situation means that these programs can contribute significantly to resource acquisition

objectives and, because of their strong showing with respect to cost-effectiveness tests, contribute positively towards an administrator's overall portfolio of programs being cost-effective. It also means that administrators and regulators need to ensure that these programs stimulate the further development of a self-sustaining, energy efficiency services industry, and don't undermine or undercut existing private sector activity that is occurring without public funds.

Incentive Pricing

Determining incentive prices and payment structure is a key program design issue for administrators and regulators. Administrators must contend with the self-interest of EESPs and customers that advocate for higher incentive payments during the planning process in attempting to design a cost-effective program that provides incentives sufficient to "move the market." This dilemma was one of the reasons that DSM bidding was initially attractive to regulators because it implicitly relied on competitive market response to establish appropriate incentive payment levels in particular markets. Regulatory oversight and review is essential in SPC programs that set prices through an administrative planning process, in part because administrators may have potentially conflicting motives themselves if they receive shareholder incentives for successful performance based on the programs being fully subscribed.

With the advent of Standard Performance Contract programs, we have moved toward posted prices which are typically determined through a planning process involving the PBC program administrator with review and approval by the regulatory agency. Fortunately, there is substantial experience with DSM bidding (and rebate) programs which has produced a track record of project costs and incentive payments required by ESCOs for performance-based programs in large C/I markets.

The structure of incentive pricing can be critical to achieving program goals. For example, should pricing be based on annual energy savings (cents/kWh) or peak demand reductions (\$/kW) or some combination? If the focus is on societal value to utility ratepayers, then pricing can be differentiated based on time of use (to differentiate the different values of energy saved on-peak versus off-peak). If the program wants to stimulate the deployment of certain energy efficient technologies, then pricing can be differentiated based on end use technology markets (e.g., lighting, HVAC and refrigeration, and other end uses/measures as in California). In this situation, pricing is tiered so that technologies with low market penetration receive higher incentives compared to those that are more widely accepted. This approach appears to have worked well in California.

In setting incentive payment levels for SPC programs, we recommend that administrators and regulators consider market assessments of pricing required to "move the market," historic rebate levels, and information on the share of project cost which would be covered by the incentives for different types of projects. The need for program administrators to meet program or portfolio-wide cost-effectiveness criteria (e.g., the Total Resource or the Utility Cost Test) introduces another important element in determining appropriate incentive levels. Incentive payment levels can also be adjusted over the course of several years in response to program subscription levels.

Setting incentive payment levels is an area where there is room for improvement with more reliance on comprehensive analytical processes. For example, in New York, prices

were initially set by a measure by measure avoided cost analysis without the use of market assessments. In California, incentive levels for the 1998 program were set in a political process of negotiations between utilities and EESP with substantial input from the California Board for Energy Efficiency, but based on limited market assessment information and analysis. In Texas, incentive caps have been set without the benefit of market assessments, and have apparently been heavily influenced by the desire of regulators to limit overall program budgets to a level deemed satisfactory (Public Utility Commission of Texas 2000).

Target Markets

Performance contracting programs have typically had the most success in large C/I customer markets. Attempts to extend and expand performance contracting programs to small C/I markets have met with much more limited success, at least based on early results in the California Small Business SPC program. With respect to single-family residential and other hard-to-reach markets, we believe that these types of programs should only be utilized if there is an inherent economic logic for contractor services and/or performance contracting in those markets. For the single-family residential market, the existing providers of services are local contractors, distributors and product retailers, such as the local or chain hardware stores and equipment distributors. ESCOs that have entered the market through PBC funded programs have had to set up their own infrastructures, which makes it difficult for them to compete effectively. Over the long term, it probably makes more sense to design single-family residential programs explicitly targeted to attract existing and local contractors, distributors and/or retailers. However, in large multi-tenant facilities, such as public housing, where there are significant institutional market barriers, economies of scale, and major infrastructure investments needed in energy-using equipment, programs targeted at ESCOs may be more appropriate.

Eligible Participants

Program administrators must decide what type of entities will be allowed to participate. Participation options include contractors only, customers only, or both. For programs whose primary objective is “resource acquisition”, we believe it makes the most sense to allow both customers and EESP to participate. This will allow the greatest number of possible project sponsors working to obtain the resource benefits. For programs whose primary objective is to influence the energy efficiency services industry over the long term, administrators should seriously consider limiting the program to contractors, as in the New York and Wisconsin program, in order to encourage the development of a private service provider network. In California’s SPC programs, the decision was made to allow both customers and EESP to participate. This decision was motivated by several considerations, including the sense that allowing customers to be project sponsors would increase the competitive pressure on EESP to share project cost savings with consumers.

Enforcing Performance Contracts between Customers and EESPs: Where is the Energy Efficiency Services Market going?

SPC and DSM bidding programs typically create a performance contracting relationship between the administrator (who pays an incentive) and the EESP or customer (that documents the savings). Thus far, in cases where the EESP sponsors the project, these programs have not mandated the contractual relationship between the EESP and customer (e.g., EESP-customer must sign a performance contract). This approach provides options for customers and contractors to select the contracting relationship that is most effective. For example, in the 1998 California SPC program, ~60% of the customers had a fee-for-service contract with their EESP.

Performance contracting relationship between project sponsor and administrator is a logical and effective means for ensuring proper use of public funds and resource acquisition, but should not be enforced upon private sector contracting relationships. It is important for energy efficiency programs to be compatible with evolving market trends. We observe that the program offerings of many ESCOs seem to be evolving, due in part to their successes over the last decade. First, there is increasing confidence in the savings associated with energy efficiency projects and thus the risk mitigation aspects of performance contracting (and associated M&V) are less prominent. Second, some ESCOs are relying less on performance contracting because customers no longer want to incur the added M&V and transaction costs. In response, some ESCOs now offer regular feedback on the performance of installed projects to customers, but do not necessarily tie that feedback on savings to compensation received by the ESCO for the project. Third, the maturation of the third party finance industry and the effects of an improving economy where companies and public sector are more able to self-fund infrastructure improvements means that ESCOs do less direct financing of performance contracting projects (and more arranging of financing).

Performance contracting is not a goal in itself; it was always a means to achieve other objectives such as overcoming customer concerns about the performance of high-efficiency technologies, concerns about EESPs, and a vehicle to finance capital investment out of a stream of project savings. Given industry trends, performance-based programs should not necessarily enforce one contracting mechanism over another. For example, acknowledging a potential industry trend away from true performance contracting, the Wisconsin EEP program is introducing a non-performance contracting option, this summer, to encourage participation by contractors not ready to enter into performance contracts with their customers.

Role of Measurement and Verification (M&V) of Project Savings in PBC-funded Performance Contracting programs

After pricing, M&V is the most controversial element of performance contracting programs. In contrast to traditional utility DSM rebate programs which typically rely on occasional audits of the installed quantity and cost of measures and program impact evaluations, performance contracting programs also require M&V procedures to be conducted at the project level. This is because each contractor's payment must be based on that contractor's performance, not the average performance of a group of evaluated contractors. As the origins of these programs are rooted in IRP, DSM bidding, and demonstration of resource savings, they have tended to utilize fairly rigorous M&V requirements that comply with Options B or D of the International Performance Measurement and Verification Protocol (IPMVP 1997).

However, many EESP complain that the level of M&V required in these programs exceed what their customers demand. This is aggravated by the fact that a significant number of the contracts between customers and EESPs do not require M&V because they are not performance contracts. This creates a tension between the M&V required in the marketplace between customers and EESP and the M&V requirements associated with ensuring that public funds are paid only for persistent energy or capacity savings. Customers themselves, when acting as project sponsors, almost always complain about M&V requirements, in part because their prior experience with utility DSM is typically through rebate programs.

We identify several areas where M&V can be improved:

- Clearer separation between program accounting, quality control, and impact evaluation activities to demonstrate cost-effective use of public purpose funds and M&V requirements between an administrator and a project sponsor – particularly if the program goal is market transformation versus resource acquisition.
- Clearer and simpler program M&V rules, perhaps with interactive software products (Jump et al 2000).
- More training for contractors on M&V – particularly case study examples.
- More facilitation support to help contractors meet program M&V requirements.
- Consideration of third-party M&V contractors to conduct M&V activities.

Third party contractors are used for M&V of savings from projects in the PSCo DSM Bidding program. This feature can be important if programs target local contractors, who often have less experience with M&V and perceive M&V requirements as a barrier to entry. A specialized M&V contractor may also be able to provide M&V at a lower cost per project because of economies of scale, particularly compared to customer sponsors that might submit only one or two projects.

- Pricing mechanisms that simplify M&V.

Incentive pricing that varies by end use and/or technology can result in more complex M&V requirements if several technologies are implemented in a single facility. Since the price paid per kWh for each technology is different, end use-based M&V is required versus whole facility M&V. Whole facility billing analysis is typically less expensive than end use or technology-specific M&V protocols. For example, one option is to differentiate incentive pricing based on comprehensiveness; lower incentives are offered lighting retrofits and higher prices are available if at least “X” percent of the savings are from non-lighting measures.

- Use of M&V results to reduce the cost M&V future efforts.

Advances in M&V technologies and guidelines (Kromer 2000) should be utilized to improve the manner in which M&V requirements are set and M&V is conducted. The results of prior M&V efforts can also be used to reduce the rigor required of future efforts. For example, in TXU’s SPC program, deemed savings values are used for common measures; operating hours can be stipulated for lighting efficiency measures,

based on the wealth of data associated with prior studies of fixture operating hours. This proper use of deemed savings and stipulations for certain measures will not inappropriately increase the uncertainty of savings from performance contracting programs.

Outreach and Marketing by Program Administrators

The role of the PBC program administrator in program marketing, outreach and individual customer support, particularly in cases where there is utility administration, has been a contentious issue in some performance-based programs. Regulatory commissions in several states initially limited the role of administrators because they concluded that EESP should be responsible for marketing and outreach, given the policy objective of shifting away from utility delivery of DSM. There was also some concern among ESCOs, retail energy service companies, and regulators that utility staff might favor unregulated ESCO subsidiaries in their marketing or that it would be very costly to monitor utility/unregulated affiliate interactions. Utilities also had little incentive to strengthen the private sector, non-utility, provision of energy services and transfer the role “respected advisor” on energy efficiency from utilities to private energy service providers. As a result, in California, for example, the administrator’s role was initially limited to promoting the program by providing information to customers and EESPs, providing limited training to potential EESPs on program requirements, and developing marketing material to support the program. In states where these programs are administered by public sector agencies, these agencies may have more limited experience (than utilities) marketing energy services directly to customers.

We draw the following conclusions based on experience to date with outreach and marketing by administrators:

- Given that these performance-based programs tend to be complex for customers to understand and contractors to implement, administrators need to assume a fairly strong role in program marketing and outreach, at least initially, assuming that perceived conflicts of interest can be managed or mitigated. In one sense this is a reflection of the maturity, marketing capability, and credibility of the private sector energy efficiency services industry among large C/I customers, which we would characterize as increasing, but not yet totally self-sustaining. There continues to be a need for program outreach, training and some types of project facilitation services (e.g., lead generation) by administrators.
- We find several examples where program budgets were significantly under-spent and participation levels were lower than expected (e.g., NYSERDA’s 1998 and PG&E’s 1999 SPC program) in cases where program administrators assumed very limited responsibilities for program marketing, relying mainly on EESPs. However, it appears that one element contributing to fact that SCE’s SPC program has been virtually fully subscribed in both 1998 and 1999 is that they have been more aggressive in program marketing, customer outreach by utility field staff, and facilitation support. NYSERDA and PG&E are both planning to expand their outreach activities for 2000.
- In terms of program objectives and public policy, Administrators should not be directly involved in the development of individual projects in large C/I markets. However, administrators should be providing program and energy efficiency training, outreach to bring more contractors (and customers if they are eligible participants) into the program,

and provide facilitation support once contractors (and/or customers) have submitted program applications or indicated interest in moving forward with a particular project.

Conclusions

In this paper we have described a number of large performance contracting programs, which rely on electric utility rate payer funds, and discussed key program design issues. In order to maximize the effectiveness of these programs, we suggest the following:

- Program Goals – Clearly define primary and secondary program goals and indicators of success;
- Incentive Pricing - Explicitly link incentive pricing structure to program objectives; rely on market-specific assessments, and historic experience with similar programs in setting posted prices;
- M&V requirements – Program monitoring and verification activities should be focused on ensuring that public/ratepayer funds have been spent effectively; program evaluation should focus on estimating aggregate program impacts; project-specific M&V requirements should be simplified for certain high-efficiency technologies with little performance uncertainty;
- Promotion of Performance Contracting between EESPs and Customers – Given industry trends and customer/supplier preferences, it is not necessary or desirable to enforce or require EESP and customers to enter into performance contracts in order to participate in performance-based programs.
- Eligible markets - Performance contracting programs should be targeted at large C/I retrofit markets; continue to monitor current pilot programs in small C/I markets to determine if this approach has promise;
- Role of Program Administrators in Marketing and Outreach – Administrators can and should play an important role in program marketing, training of and outreach to potential contractors, and project facilitation services particularly during the initial deployment of programs; administrator roles may change and become more limited as programs and markets mature.

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