

# **New York Energy \$mart<sup>SM</sup>**

## **Standard Performance Contracting (SPC)**

### **Program Assessment**

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## EXECUTIVE SUMMARY

NYSERDA's Standard Performance Contract (SPC) program is the largest single initiative within the **New York Energy \$mart<sup>SM</sup>** portfolio of energy efficiency programs. Its original three-year budget was close to \$48 million and represented more than 35% of the total \$124 million three-year energy efficiency program budget. This report presents information on performance contracting-type energy efficiency programs and assesses the **New York Energy \$mart<sup>SM</sup>** Standard Performance Contract (SPC) program in the context of other performance contracting-type programs throughout the United States. A combination of primary and secondary research was conducted to identify strengths and weaknesses of various programs and to assess the extent to which SPC programs are helping to create a sustainable energy services industry.

Secondary research activities consisted of review of fourteen documents related to the design, planning, implementation, and evaluation of performance contracting programs in the states of New York, California, Wisconsin, New Jersey, Texas, Colorado, and Massachusetts.

The following similarities among programs were identified from the secondary research:

- Standard performance contracting programs use a payment system based on monitored, post-installation savings as opposed to traditional demand-side management (DSM) method of pre-payments based on estimated savings. SPC programs also rely on energy efficiency service providers to market and develop projects, as opposed to heavy support from program administrators.
- In addition to energy savings, most programs identified market transformation as a key goal (*i.e.*, programs attempt to expand the role of energy services companies (ESCOs) in delivering energy efficient products and services directly to end-use customers and help build a sustainable energy services industry).
- Comprehensiveness of measures (*i.e.*, not just lighting installations) is a key goal in all programs. Most programs target comprehensiveness by differentiating pricing/incentives levels.
- Nearly all programs report lower participation levels than anticipated. In most cases, second and third generation programs are experiencing increased success.
- Barriers to program participation include: (1) complexity of measurement and verification (M&V) requirements, (2) time lags associated with performance contracting provisions, and (3) lack of customer awareness.

The following differentiating features were identified from the secondary research:

- Some performance contracting programs deal directly with the ESCO, while others deal directly with customers.
- NYSERDA's SPC program offers a supplemental incentive of \$4,000 per ton of NO<sub>x</sub> emissions reduction.
- Colorado and Massachusetts used a DSM-bidding model. Massachusetts selected ESCO proposals based on lowest cost and a number of non-price attributes.<sup>1</sup>

Problems with participation was noted in nearly all of the performance contracting-type programs reviewed and were verified during primary research interviews with performance contracting industry experts. The factors identified as contributing to lower than expected participation were:

- The extended sales process arising from performance contracting provisions.
- The degree and complexity of required M&V.
- A general lack of customer awareness and understanding of performance-based energy services.

This report also presents results from six sets of telephone interviews that were conducted between June 30 and July 27, 2000. Targeted respondents included program administrators, industry experts, ESCO representative, and customers.

The following is a summary of the interview results:

- Respondents identified both energy savings and market transformation as key goals for performance contracting-type programs.
- There was agreement that performance contracting programs across the country have all experienced low initial participation and limited program progress, attributable to various factors, including program complexity, M&V requirements, incentive levels, and limited customer outreach efforts.

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<sup>1</sup> Bidding programs, by establishing "winners," limits the number of ESCOs that can successfully compete for business and therefore may not contribute to the market transformation goals of SPC-type programs.

- Customers and ESCOs participating in the **New York Energy \$mart<sup>SM</sup>** SPC program gave it high marks for overall satisfaction, quality of service, and program effectiveness. Incentives were identified as key factor in participation. Limited marketing was identified as an important weakness.
- ESCOs noted and appreciated the high level of NYSERDA staff support and involvement. Participating customers, on the other hand, were not familiar with NYSERDA. Instead they relied on the ESCOs to explain and deliver the program.
- Some of the non-participating ESCOs indicated that they were not convinced that performance contracting is worth the hassle, but would consider participating if the right project came along.
- Factors identified as barriers to program success were (1) hassle associated with understanding performance contracting requirements, (2) getting such arrangements approved, and (3) savings uncertainty, both from the customer and ESCO perspectives.
- Other barriers identified include: need for additional marketing, insufficient market research information, confusion surrounding electric utility industry deregulation, and the current positive state of the general economy.
- There was a shared view that energy efficiency services should move away from centralized, utility-sponsored programs, and toward more fee-for-service arrangements.
- Concerning the role of performance contracting in the evolving ESCO market, interviewees suggested that its role should be less than originally envisioned, with performance contracting being one of many mechanisms used by ESCOs to deliver energy efficient products and services to end-use customers.
- The need for more NYSERDA marketing of benefits and customer outreach was the recommendation identified most often. Other common suggestions included: assistance with measurement and verification, market characterization and research on ESCO and customer needs; reduced paperwork and streamlined application processes; certification programs; and better linkage with other energy efficiency program offerings.

NYSERDA has made several changes that directly address the problems that all SPC-related programs have encountered. These changes have had a positive effect on program activity as indicated by the marked improvement in the number of applications (96) received in Year 2 of the program. By August

2000, program subscription is expected to exceed its revised budget. NYSERDA is considering restoring a portion of the funds that were removed from the program earlier in the year.

The findings from the primary and secondary research suggest that performance contracting programs are having limited, but important, success in helping to create a viable energy services industry. By continuing to share lessons learned with program designers and evaluators in other states, and by staying focused on performance contracting within the broader context of its use as a tool in helping to build the industry, it is likely that performance contracting-type programs will continue to be a useful mechanism for delivering energy efficient products and services to end-use customers.

## INTRODUCTION

Through a combination of primary and secondary research efforts, including interview and case study activities, this evaluation effort assesses the **New York Energy \$mart<sup>SM</sup>** Standard Performance Contract Program (SPC) in the context of other SPC programs throughout the United States. Research has been conducted to identify strengths and weakness of particular programs and to address the following questions:

- What challenges face administrators of standard performance contracting programs in various states?
- How are administrators of the **New York Energy \$mart<sup>SM</sup>** Standard Performance Contract program meeting these challenges?
- Are SPC programs creating a sustainable energy services industry?

Documents from multiple states were reviewed and summarized (1) to gain insights into the strengths and weaknesses of performance contracting-type programs, (2) to identify similarities and differences among programs, and (3) to help answer the three questions identified above. Secondary research activities included:

- Review of market research materials available on the NYSERDA SPC program.
- Review of studies, papers, and evaluations already written or conducted on SPC-type programs in California, New Jersey, and Wisconsin and in other states that address program goals, market barriers and progress to date. A total of fourteen documents were identified and reviewed as part of this secondary research effort. These documents are listed in the references section.
- One-page summaries of each document were created to identify the key topics, key findings, and conclusions or recommendations of the authors.

In addition to this secondary research, a number of primary data collection activities were performed. Six sets of interviews were conducted to capture information on performance contracting program design, implementation, performance, satisfaction, key market barriers, the energy services industry, and the role that performance contracting plays in transforming this market. The following administrators, industry experts, ESCOs, and customers were targeted for these interviews:

- **New York Energy \$mart<sup>SM</sup>** SPC program staff and consultants (6)
- Performance contracting and energy services industry experts (6)
- **New York Energy \$mart<sup>SM</sup>** SPC program participating ESCOs (7)
- **New York Energy \$mart<sup>SM</sup>** SPC program participating customers (7)
- ESCOs not participating in **New York Energy \$mart<sup>SM</sup>** SPC program (5)
- Customers not participating in **New York Energy \$mart<sup>SM</sup>** SPC program (4)

Six telephone survey and interview guides were developed, using the Wisconsin guide and other existing guides as starting points.<sup>2</sup> Interview guides were largely qualitative, and designed to be complementary to one another, as well as to previous NYSERDA interview guides, and applicable across an array of programs.

Thirty-two telephone interviews were conducted between June 30 and July 27, 2000. Assistance in identifying and recruiting potential interviewees was provided by NYSERDA SPC program staff. The purpose of the in-depth interviews with NYSERDA staff, consultants, and performance contracting/energy services industry experts was to obtain data on:

- Program theory, goals and objectives
- Program planning process
- Program performance
- Market barriers
- Long-term view of ESCO market and role of performance contracting in that market
- Recommendations for SPC program improvement

Telephone surveys with participating and non-participating customers and ESCOs provided supplemental information regarding New York-specific market barriers and allowed for an assessment of the **New York Energy \$mart<sup>SM</sup>** SPC program's strengths and weaknesses and overall performance.

## **Case Study**

A case study of one participating customer, Motorola, was developed by Science Applications International Corporation (SAIC)<sup>3</sup> to detail the program and its impacts on one participating customer. A

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<sup>2</sup> On behalf of the Wisconsin Focus on Energy (FOE) program, Hagler Bailly conducted a study of the FOE's Energy Efficiency Performance Program (EEP). Their "Interview Protocol for First Wave of Interviews with EEP Sponsors" was used as one starting point for development of the telephone survey/interview guides in this research project.

<sup>3</sup> SAIC is one of three consultants retained by NYSERDA to provide technical services for the SPC program.

copy of this case study is included as Exhibit B of this report.

## SECONDARY RESEARCH FINDINGS

This section contains an overview, by state, of performance contracting-type programs, noting key similarities and unique program features.

### New York

NYSERDA's **New York Energy \$mart<sup>SM</sup>** Standard Performance Contracting program had an original three-year budget of \$48 million. Between a January, 1999 kickoff meeting with 60 ESCO representatives and the June 30, 1999 deadline for applications for Round 1 of the program, ten applications were received for a total of \$1.8 million. Due to slower than anticipated level of activity during this period, approximately \$14 million of the SPC program budget was redirected to other Energy Efficiency Services programs and to the Low-Income and Research and Development program areas.

Several changes were made to the program in an effort to boost ESCO participation for Round 2: (1) higher incentives rates; (2) reduced application fee; (3) supplemental incentive of \$4,000 per ton of annual NO<sub>x</sub> emission reductions; (4) simplified M&V requirements; and (5) minimum project size reduced from 200 mWh to 50 mWh. These and other program modifications resulted in a significant increase in participation. By the end of Round 2 (June 30, 2000), the program had 106 applications totaling over \$29 million in incentives and \$72.7 million in anticipated co-funding. The program is sponsoring projects from multiple sectors (52 institutional, 32 commercial, 19 industrial, and 3 residential). Estimated annual energy savings from these projects is 179 million kWh. In addition, the number of participating ESCOs rose from seven in Round 1 to 39 by the end of Round 2. While it is estimated that approximately 10 of the 39 are large ESCOs, this level of activity illustrates a significant advancement toward the goal of the development of a strong energy services industry in New York state.

### New Jersey

The Standard Offer (SO) program of Public Service Electric & Gas (PSE&G) of New Jersey is one of the earliest, and perhaps the largest, DSM efforts of this type. PSE&G developed its Standard Offer (SO) program as a product of the consensus policy framework developed by major stakeholders in New Jersey which outlined the viability of energy efficiency measures and the financial mechanisms of those measures. The SO program initially consisted of two different phases, SO-1 and SO-2. SO-1 began in May 1993 and targeted an initial total savings goal of 150 mW of summer prime period demand reduction. This phase officially ended on December 31, 1995. SO-2 began in mid-1996 and included a substantial reduction (more than 27%) in price payment levels to reflect updated and reduced estimates

of utility avoided costs for electric supply<sup>(11)</sup>. PSE&G's SO-3 offered a 20 mW block of electricity and 3 million therms of gas savings and was otherwise identical to SO-2. Applications for SO-3 were accepted from December 1999 to July 2000 by which point it was oversubscribed and closed.

New Jersey's SO incentives are equal to 100 percent of PSE&G's avoided costs and are paid out each year over the 10 to 15 year term of the contract. The SO-3 kWh incentives range from 2.06 cents for the spring and fall to 13 cents for summer peak periods. These rates are paid out each year for the full term of the contract based on M&V savings.

For the first five years of the SO program operation, the commercial and industrial (C/I) sectors accounted for 859 projects installed (with a total of 5,078 separate facilities). For this time period, the SO program is estimated to account for annual energy savings of approximately 1,100 gWh and summer prime period demand reduction of 200 mW.<sup>(7)</sup> The actual level of participation for the residential sector was disappointingly low. The total savings impact is projected to be only 2% to 3% of the total for the C/I sectors.

SO-1 was very highly regarded by ESCOs and customers, reached a broad variety of business types, and had some inclusion of non-lighting measures. However, SO-2 had a dramatic fall-off in participation, was widely criticized, and became almost exclusively focused on large lighting projects. The large reduction in price paid for savings under SO-2 was the most important reason cited by ESCOs for their decision to leave the program. It was reported that although the SO programs are credited with helping to establish the ESCO industry in New Jersey, if the subsidies were to end, the industry would likely be limited to certain niche markets.<sup>(11)</sup> The same authors concluded that an SPC-type program should continue for large C/I but that different program approaches are needed for other markets.<sup>(11)</sup>

### California

Building on the New Jersey experience, California designed a performance contracting program that addressed the major problems that arose in New Jersey.<sup>(11)</sup> This included using standardized M&V protocols, a separate program specifically for the residential sector that included higher incentives, and incentive-based pricing to encourage non-lighting measures. The program began statewide in early 1998 and is administered by California's three largest electric utilities.

Pacific Gas & Electric (PG&E), Southern California Edison (SCE), and San Diego Gas & Electric (SDG&E) are funding energy-efficiency programs through a public goods charge (PGC), 20% of which is being allocated to the Nonresidential Standard Performance Contract (NSPC) program. The NSPC is the largest new program initiative reflecting the California PUC's policy objective of market transformation. The NSPC program is pay-for-performance rather than traditional programs which pay

incentives based only on verification of installation. This program is actively supported by the ESCO industry as a model for ratepayer-funded energy-efficiency programs and it represents one of the largest ratepayer-funded efforts that will be implemented primarily by ESCOs and other types of energy efficiency services providers.

Early results indicate that, unlike the New Jersey program that was heavily weighted with lighting projects, over 80% of the savings in the PG&E and SDG&E NSPC programs are being obtained from HVAC, refrigeration, and other non-lighting measures. It appears that the pricing design that gives increased incentives for non-lighting measures is working to diversify the list of installed measures.

Pricing incentives are based solely on dollars-per-kilowatt-hour-saved and do not vary by time-of-day or season. Residential incentives vary by customer segment, measure lifetime, and SPC program type, and include a price ceiling of 100% of estimated savings to be received by the Project Sponsor. Non-residential incentives are divided based on savings from lighting projects, savings from HVAC and refrigeration projects, and other projects and includes ceilings varying from 100% to 110%. Estimated savings from all projects are required to be at least 200 MWH annually. No incentive is received by Project Sponsors until energy-efficient equipment is installed. Full incentive payments are made only after savings have been measured and verified. Project Sponsors have the option of accepting the utilities' deemed savings values, or proposing their own with supported documentation.

Within four months of program rollout, nearly all of the 1998 budget for the NSPC program was committed (due in large part to a backlog of DSM projects that had gone unfunded for some time), indicating that the program was attractive to ESCOs and other eligible participants.<sup>(11)</sup> As of early 2000, virtually all of the 1998 and 1999 incentives, \$87 million of a total \$89 million, were committed producing an estimated 231 gWh of savings for 1998 alone. The 1998 program attracted 92 customers and 26 energy efficiency service providers (EESPs) and those values rose considerably in 1999 to 255 customers and 69 EESPs.<sup>(1)</sup> Although, based on committed numbers, it might appear that this program is a success, nearly 40% percent of the initial funding commitments have fallen through (*i.e.*, proposed energy saving measures never installed).<sup>4</sup> Reasons for these failures include: minimal requirements for contractors to secure initial funds, and lag times between submission of application and contract approval. These problems are currently being addressed, and some improvements have been noted.

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<sup>4</sup> California, unlike New York, allows customers to apply directly. Many of these customers are unable or unwilling to deal with the M&V requirements and drop out.

## Wisconsin

In July 1998, the Wisconsin Department of Administration launched a two-year pilot energy efficiency program for Northeast Wisconsin.<sup>(1)</sup> The Wisconsin Focus on Energy – Energy Efficiency Performance Program (EEP) is designed to encourage energy service providers to expand their electric and gas energy-efficiency offerings and market share by pursuing performance-based relationships with new and existing customers. The EEP program's goals emphasize privatizing the provision of performance-based energy-efficiency (PBEE) products and services and increasing customers demand for these services. A total of \$4.2 million in incentive funding is available on a first-come, first-served basis or until June 30, 2000.<sup>(10)</sup> This deadline has since been extended to December 31, 2000.

Participating vendors must submit a business plan that indicates market potential and long-term viability and profit potential of proposed service offerings and must offer customers a savings performance guarantee. To alleviate the participants financial exposure due to savings guarantees, the EEP program covers 50% of any performance penalty for the first three years of a contract. Participating vendors that meet or exceed their first year savings guarantee receive an incentive payment equal to 50% of guaranteed annual cost savings for the first three years. Premium performance incentives of 75% of guaranteed annual savings are offered for projects that: (1) target small business customers (< 50 employees), and/or (2) achieve less than 71% of savings from lighting.<sup>(10)</sup>

In order to alleviate the potential market deterrence that rigorous measurement and verification (M&V) requirements can produce, the EEP program does not have independent M&V requirements. To receive incentive payments, the contractor and the 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 completed as negotiated.<sup>(1)</sup> It has been reported that program administrators have had to offer considerable assistance to contractors with their M&V plans but that with the posting of sample plans on the EEP website and continued assistance, the program may reach the balanced trade-off between necessary M&V and market effects.<sup>(10)</sup>

As of May 2000, the EEP program has signed two program contracts with EESPs and is reviewing four other applications. The program has also approved business plans from six other participants. This slow growth has been attributed to the fact that the majority, seven out of eight, of the early project sponsors have never offered performance-based energy services before getting involved with the program. This illustrates that the program is having the intended effect of diversifying the market of EESPs, however it has also resulted in significant program resources being allocated to working with the new entrants. While it is anticipated that more experienced EESPs will be able to effectively market energy efficient products and services on a performance-contracting basis, the documents reviewed noted some concern as to whether the northeastern Wisconsin region offers sufficient potential to attract such experienced

EESPs.<sup>(10)</sup>

### Texas

As part of the Integrated Resource Planning (IRP) process, TXU Electric developed the Texas Energy Efficiency Matters (TEEM) standard offer pilot program and began implementation in March 2000. If successful, other Texas utilities will use the pilot as a model. The program objectives include: (1) an energy efficiency incentive program available to all customer classes, (2) encouraging private sector delivery of energy efficiency products and services; and (3) stimulating investment in energy efficient technologies to reduce TXU's peak capacity requirements.<sup>(11)</sup>

The program will operate during a two-year transition period (2000-2001) with a budget of approximately \$14 million for financial incentives. There are two separate programs: the Small Air Conditioner Distributor Program and the Large C/I Retrofit Program. Incentives are to be paid on a first-come, first-served basis. The Large C/I program is a standard offer program paying incentives at a fixed \$/kwh rate for verified annual energy savings. There is a pre-approved list of measures (plus flexibility subject to peak savings and minimum 10 year measure life goals) and fuel switching is acceptable.

The approach to M&V was a key aspect of TXU's strategy to create a simple and streamlined process. There are three levels of M&V with varying requirements: (1) deemed savings - stipulated based on engineering estimates; (2) simple M&V - involves some level of metering but relies primarily on pre-set savings calculation formulas; and (3) Full M&V - detailed process including metered savings or computer simulations (1). With the program initiated in March 2000, it was too early for program progress to be reported within the literature reviewed for this study.

### Colorado

Public Service of Colorado (PSCo) is operating its fourth DSM bidding program which began in 1994. It should be noted that while the DSM bidding-type programs in Colorado and Massachusetts (discussed below) fall under the general category of performance contracting, they are fundamentally different from the other SPC programs discussed in this report. DSM bidding involves a utility company bidding out blocks of energy (kWh) and/or capacity (kW) savings through a Request for Proposal (RFP) process and typically awarding the contracts on a date certain, based on bid price considerations and other specific criteria of the program.<sup>5</sup> Conversely, SPC-type programs award contracts based on specific energy efficiency projects, with standard incentives for particular measures and customer classes. While they

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<sup>5</sup> Bidding programs, by establishing "winners" limits the number of ESCOs that can successfully compete for business and therefore may not contribute to the market transformation goals of SPC-type programs.

will have a cap on the savings and associated funding levels, SPC projects are typically not awarded all at once (*i.e.*, open solicitation period where qualified projects are approved on a first-come-first-served basis).

The current PSCo program has a budget of \$15 million and awarded contracts in early 2000 to fifteen contractors and eight customers. The primary goal of the program is to achieve cost-effective, peak period demand savings.<sup>(1)</sup> Bid proposals that include mature technologies that have been tested in specific applications are preferred. Although payments are based on average demand reduction during summer peak period, proposals producing greater energy savings are given more consideration. Bidder's marketing plans were reviewed and preference was given to those that demonstrated an in-depth understanding of target markets & provided mechanisms to curb free-ridership. M&V is to be performed by a third party contractor, but the program does not preclude sponsors from conducting their own M&V.<sup>(1)</sup> No program progress has been reported within the literature reviewed for this study.

### Massachusetts

Three Massachusetts utilities, Boston Edison Company, Commonwealth Electric Company, and Cambridge Electric Light Company, have used performance contracting as a delivery mechanism for energy efficiency programs as part of their Integrated Resource Management (IRM) programs.<sup>6</sup> Boston Edison Company provides one excellent example. Like the Colorado program discussed previously, this Massachusetts utility's effort was a DSM bidding program, fundamentally different from other SPC programs discussed in this report. In 1996, Boston Edison issued a request for proposals from energy service companies to provide a comprehensive mix of energy efficiency products and services to residential and commercial/industrial customers. A kWh bid block was identified for each of the following markets: residential retrofit, residential lost-opportunity, small C/I retrofit, large C/I retrofit, and C/I lost opportunities (totaling over 100,000 mWh of annual energy savings for installation over a two year period - approximately \$50M in total utility/ratepayer funding commitment). A separate block was set aside for customer-generated proposals (CGP).

All proposals were evaluated on both price and non-price elements, and blocks were filled with the goal of securing long-term savings at the lowest possible cost. Winning bidders would enter into a long-term contract (up to 10 years) with the utility and payments would be made to the ESCO (or directly to the customer in the case of CGP arrangements) based on verified savings either on a "pay as you go"

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<sup>6</sup> One of the performance contracting experts interviewed as part of this project's primary research efforts noted that Western Massachusetts Electric Company (WMECo) is currently implementing a performance contracting pilot program within their service territory. However, no written information was available for review in time for completion of this study.

approach (*i.e.*, quarterly payments over the 10 year contract period) or on a "lump sum" basis after at least 2 years of verified savings. The responsibility for measuring and verifying (M&V) energy savings fell on the ESCO with the utility's role limited to spot checking and sampling installations to provide additional certainty that savings existed prior to making payments/processing invoices. Strict penalty clauses for non-delivery of savings and for missed milestones were included in the contracts.

To date, the program has yielded mixed results. Although all ESCO blocks were filled, the time between RFP release and contract award was quite long (*i.e.*, nearly two years in some cases). Contract negotiations and review/acceptance of M&V protocols were a significant time drain. Approximately one dozen separate ESCO proposals were received, including Boston Edison's own energy service company subsidiary. Five separate ESCOs were awarded contracts, also including the utility's own ESCO subsidiary. Comprehensiveness of measures was quite respectable with a good mix of lighting, HVAC, motors and refrigerator applications. Complications due to industry restructuring activities and the introduction of new utility market transformation-type energy efficiency programs, in addition to difficulties experienced by the winning ESCOs in marketing to customers, have caused delays in measure installation and the harvesting of contracted energy savings. Substantial savings, however, are being realized, and the ESCO industry's value and business base has continued to grow within the state.

### **Overview of Standard Performance Contracting Programs**

Similarities among programs include:

- Most programs identified energy savings and market transformation as key goals.
- Comprehensiveness of measures is achieved through differentiated incentive levels. Furthermore, many programs use price differentiation to target key customer sectors (*e.g.*, smaller commercial customers).
- Nearly all programs have lower participation levels than originally envisioned. In most cases, second and third generation programs being implemented within each state, are built upon lessons learned and are anticipating increased progress toward program goals.
- Measurement and verification (M&V) of installed measures were identified as an important element of all programs. However, the level/complexity of required M&V were also identified as a key barrier to program participation.
- Lack of customer awareness of performance contracting and complexity of contracting provisions were identified as barriers to program participation.

The following are a few differentiating features:

- Certain performance contracting programs require a contract to be executed between the program administrator and the ESCO, while others require a contract directly with the customer. Requiring a contract with the customer is viewed by many as a barrier to program participation.
- In an effort to increase participation and awareness in the environmental benefits associated with energy efficiency, NYSERDA's SPC program offers a supplemental incentive of \$4,000 per ton of annual NO<sub>x</sub> emissions reduction.
- Colorado and Massachusetts have used a DSM-bidding model. Fixed incentives were not used in the Massachusetts program, instead ESCO proposals were selected based on lowest cost and a number of non-price attributes.

Additional program features and progress indicators of each of the performance contracting-type programs discussed above are presented in summary form as Exhibit A of this report.

### **Challenges Facing Administrators of Standard Performance Contract Programs**

Problems with participation and program progress have been noted in nearly all of the SPC-type program reports and evaluations reviewed. The initial slow progress of New York's SPC program is documented in previous Outcome Tracking reports and other NYSERDA program status reports and evaluation publications. Similarly, six months into their program, Wisconsin only had one vendor with an approved application.<sup>(10)</sup> The Massachusetts DSM-bidding program also experienced substantial time lags in bringing in contracted energy savings. While California received strong initial demand for participation, as much as 40% of those projects were cancelled due to ineligibility, inaction following initial commitment, or difficulty in obtaining customer co-funding.<sup>(5)</sup> Two primary factors contributing to low participation were identified as (1) the application process, and (2) the measurement and verification procedures.

All program assessments noted that reducing the lag time between customer application and contract approval is a primary challenge in increasing program participation. The delay in contract approval has been attributed to the following factors: (1) customer education of program and performance contracting; (2) decision time for vendors/customers considering participation; and (3) extended sales process due to performance contract provisions.<sup>(10)</sup> The Wisconsin program noted that vendors/ESCOs displayed a high degree of apprehension toward entering into a performance-based, risk sharing agreement with customers. Aggressive education and marketing efforts were cited as critical to statewide

expansion of the Wisconsin program.<sup>(10)</sup>

The second prominent factor noted in nearly every program document reviewed, is the complexity of M&V requirements associated with performance-based projects. Although they vary significantly from program to program, complexity of M&V is consistently stated as a primary barrier to increased participation from both the ESCO and customer perspectives. In an effort to alleviate the negative effects of rigorous M&V requirements, the Wisconsin program offers a flexible approach to M&V. However, allowing the vendor/ESCO and customer to develop their own M&V plans requires more knowledge of what is necessary than most vendors/ESCOs possess. Further assistance from the administrators and an example M&V plan posted on a Wisconsin website has aided in program progress.<sup>(10)</sup> In the California programs, it was also noted that the M&V complexity prevented the ESCOs from aggregating smaller customers.<sup>(5)</sup> The Texas program has made it a primary goal to offer M&V that is simple, streamlined, and cost-effective, however it is too early in the program to determine the success of this strategy.<sup>(1)</sup>

Another factor limiting program participation is a general lack of customer awareness and understanding of performance-based energy services. In reference to the California programs, lack of information on efficiency, savings potential, and high efficiency technologies was identified as a major barrier.<sup>(5)</sup> Moreover, it was emphasized that it is important that information reach the decision makers as well as the property managers and engineers.<sup>(5)</sup>

Two other potential barriers were identified: (1) narrow role performance contracting programs play in building a vibrant energy services industry; and (2) limited information on the ESCO industry. Rather than viewing performance contracting programs as **the key approach** for developing an energy services industry, some authors suggest the use of performance contracting as **one of many tools** available to ESCOs (*i.e.*, a tool that is best used by customers where financing is the major barrier to project acceptance). Lack of information on the energy services industry was noted as a barrier to better program design.

### **Changes Made to the New York Energy \$mart<sup>SM</sup> Standard Performance Contract Program**

During the planning process, NYSERDA established the following goals for the Standard Performance Contracting program:

- Provide up to \$15 million per year in incentives that leverage four to five times that amount in electrical efficiency improvements and produce annual energy savings of 115 million kWh and associated NO<sub>x</sub>, SO<sub>x</sub>, and CO<sub>2</sub> reductions.
- Sponsor 300 standard performance contracts from multiple sectors including institutional (120 contracts), commercial (120 contracts), and industrial (60 contracts).

- Increase the number of energy service companies that market energy and offer energy-efficiency services from seven in 1998 to twenty-one by the end of the program cycle in 2001.
- Leverage \$200 million in private funding for electric efficiency measures by the end of the program cycle in 2001.

The **New York Energy \$mart<sup>SM</sup>** program has experienced many of the same challenges faced by other states. In response, NYSERDA made the following changes:

- Increased incentives by an average of 65% over initial rates, bringing the incentives closer to the planned 20 to 25% of project cost.
- Reduced the ESCO's refundable Detailed Project Application fee to 2.5% of estimated incentives from 5%.
- M&V for lighting projects was simplified and sample M&V plans for lighting and other measures were made available to reduce the uncertainty. Further simplification of M&V requirements are being considered for Round 3.
- Allowance of non-electric conversions to promote diversity of projects and technologies.
- The maximum share of incentive funding that may be awarded to a single ESCO was increased to 25% from the program's initial 10% limit. This could potentially attract more national ESCOs and promote larger projects.
- Lowered minimum project size to 50 mWh (down from 200 mWh) to increase participation of smaller customers and to complement the higher incentive levels offered to the smaller customers.
- Increased outreach efforts to ESCOs and customers through promotional materials, press releases, meeting presentations, print advertising, and email updates; NYSERDA is aggressively addressing this critical barrier.
- Offered separate incentive to ESCOs for NO<sub>x</sub> reductions.

These changes have had a positive effect on program activity as indicated by the marked improvement in both applications received (96) and approved (36) in Round 2, and by the fact that the SPC program has fully subscribed its reallocated budget. Moreover, these projects reflect a well-balanced group of customers (with the exception of a low turnout for the multifamily sector) and a diverse range of measures: motors/other 50%, cooling 17% and lighting 33%. In addition, the number of ESCOs participating has risen to 39, up from just 7 in Round 1.

From the experiences of other SPC-type programs and the demonstrated increase in participation, it appears that the changes have been very effective and should be maintained or improved upon in Round Three. Specifically, continuing to focus on strong marketing efforts and further simplifying M&V

requirements, as intended, should yield additional increases in NYSERDA's SPC program participation.

It appears that NYSERDA's **New York Energy \$mart<sup>SM</sup>** Standard Performance Contract (SPC) program has learned much similar program efforts. Careful attention was paid to incorporate features and improve upon key design criteria and delivery elements. In addition, the program's managers are responsive to ESCO and customer concerns.

### INTERVIEW FINDINGS

Interviews were conducted to gather information on performance contract program design, implementation, performance and satisfaction, and to identify key market barriers. Also, the interviews sought opinions on the broader energy services industry market and the role that performance contracting plays in transforming this market. Interviews took from between 15 minutes to nearly two hours depending on the complexity of specific questions (*i.e.*, telephone survey as opposed to in-depth interview, open ended question versus yes/no answer or rating scale response), and the level of knowledge and interest of each interviewee. The following audiences were targeted for these interviews (key research categories covered within each interview group are highlighted in the table below):

	Theory, Goals and Planning Process	SPC Programs in General	NY SPC Program	Market Barriers	Long-Term View	Recommendations
SPC Staff and Consultants	X		X	X	X	X
Industry Experts	X	X		X	X	X
Participating ESCOs			X	X	X	X
Participating Customers			X	X		X
Non-participating ESCOs			X	X	X	X
Non-participating Customers			X	X		X

- **New York Energy \$mart<sup>SM</sup> SPC Program Staff and Consultants** - a total of six individuals contributed to these interviews (four NYSERDA SPC program staff and 2 individuals contracted to assist in initial design of the SPC program). These interviewees were identified by NYSERDA staff as key players involved in development and implementation of the Standard Performance Contracting

program and included: NYSERDA Program Directors, a Senior Project Manager, Associate Project Manager, and Consultant Program Designers.

- Performance Contracting/Energy Services Industry Experts - six in-depth interviews were conducted with leading experts on performance contracting programs and the energy services industry. These respondents averaged 15 years experience in performance contracting and/or the energy services industry and were involved in projects all over the country. Their geographic areas of work included California, Wisconsin, Texas, New Jersey, and other states. Their involvement spanned evaluation efforts, work on utility programs, and ESCO-side involvement.
- New York Energy Smart<sup>SM</sup> Participating ESCOs - seven ESCO employees participated in these telephone surveys. The average length of employment at their present company was three and one-half years, with the firms having been in business for an average of five years.<sup>7</sup> Respondents reported having over 17 years, on average, of experience in the energy services industry. The size of these firms (with one exception) ranged from four to 85 employees with an average of around forty. While three firms reported that they had no offices in New York, others reported having between 12 and 75 employees working in the State. Annual sales estimates ranged from \$1.5 million to over \$30 million, with revenues coming from performance contracting, electricity and gas sales, and other services, such as fee-for-service offerings.
- New York Energy Smart<sup>SM</sup> Participating SPC Customers - seven customers participated in these telephone surveys (eight, including the SAIC case study participant). These customers had been in business for a minimum of twenty years, and represented industrial, retail and public entities ranging in size from 35 employees to over 40,000. Except for the public entities, all respondents had a national presence and, in some cases, an international one. Respondents were at various stages of participation in the SPC program. Two customers were still in the process of having the contract signed, while another indicated that their contract had been in place for over two years.
- Non-Participating ESCOs - five telephone surveys were conducted with ESCO representatives who were not participating in the NYSERDA SPC program. The average length of the interviewees' employment at their present company was while the firms had been in business for an average of five years. In average, experience in the energy services industry was 12 years. The size of the firms polled ranged from 24 to 5,000 employees. One firm reported having no office in the State, others reported having one office with between 2 and 50 employees working in New York.
- Non-Participating Customers - five telephone surveys were conducted. The objective was to

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<sup>7</sup> One exception was a large well-known company who estimated the age of their firm at around 100 years old.

interview customers who were aware of NYSERDA's SPC program but had chosen not to participate. Respondents included three industrial customers, one retail customer and one municipal. Size and kWh usage at these establishments ranged from medium to larger sized firms. Except for the one municipal customer, all interviewees had other firm locations in New York and across the country.

This section summarizes key findings from the interviews. Findings are grouped by research category: (1) program theory, goals and objectives, and program planning; (2) SPC programs in general (3) New York's SPC program and impact; (4) market barriers; (5) long-term view of ESCO market; and (6) recommendations.

### **Program Theory, Goals and Objectives, and Program Planning**

Two groups of interviewees addressing the topic of program development were the **New York Energy \$mart<sup>SM</sup>** program staff and consultants and performance contracting/energy services industry experts.

#### Program Staff and Consultants

*Program Theory/Logic.* Respondents summarized the program logic as follows:

- This is a resource acquisition and market transformation program using performance contracting as a mechanism to demonstrate to the public that energy efficiency can pay for itself.
- A performance contract is not required between the customer and ESCO, only between NYSERDA and the ESCO.

One respondent explained the SPC program theory as follows: *"providing financial incentives, intended to stimulate the number of transactions which provide energy efficiency savings, will result in a more vibrant market and help to 'prime the pump'."*

Another respondent contrasted the program's 20 to 25% incentive level of total cost of measures installed against New Jersey's 90 to 100% level explaining that: *"the 20 to 25% is consistent with the program theory that a lower incentive can be as successful in encouraging projects as higher incentives. The program incentive structure helps with leveraging of private funds. It also facilitates transactions, helps to overcome barriers, and 'builds a buzz' used for technology transfer."*

*Goals and Objectives.* Respondents identified goals of the SPC Program as both resource acquisition and market transformation: *"Key goals were to transform ESCO market in the State of New York."*

*Secondary goal is to achieve cost-effective energy savings.*” Similar goals identified included:

- Develop a strong energy efficiency services industry in New York State (market transformation),
- Implement to achieve kWh savings (resource acquisition),
- Promote ESCOs to provide both efficiency and commodity services,
- Encourage ESCOs to offer energy efficiency as a value-added service, and to
- Demonstrate performance contracting as an effective financing mechanism.

The goals, objectives and program theory are viewed as being reasonable and generally well understood. However, as noted by one respondent: *"defined well, but some confusion on understanding SPC on customer end (they think it limits them to performance contracting arrangements only) causes some tension."*

*Program Planning Process.* All staff/consultant interviewees described the SPC program planning process as a collaborative effort where NYSERDA staff, and their technical consultants met with New York Public Service Commission staff and an extensive working group to *"gather program parameters, layout design goals, produce program rules and procedures manual."* Input was actively pursued and accepted throughout the planning and implementation process to ensure effective program design and to make modifications where needed to maximize likelihood of achieving key goals.

Respondents agreed that the process for addressing program issues and making changes was good. One noted that: *"continuous feedback and assessment allows NYSERDA to adapt quickly to changing market conditions."* However, another one added: *"it seems to be a reactive approach rather than pro-active. NYSERDA should permit ongoing market research in order to make more timely program changes in the future."*

### Industry Experts

*Program Theory, Key Goals and Objectives.* Respondents identified goals of the SPC Program as both resource acquisition and market transformation: *"encouragement of investments in energy efficiency projects and to stimulate the market and attempt to get more providers into performance contracting."*

Other thoughts on performance contracting goals and program theory are illustrated below:

- *"Typically, resources acquisition is a key goal. Performance contracting provides accountability through M&V requirements and brings together the public policy benefits of monitored savings (verifies results) with the customer guarantee of M&V (reduces risk)."*
- *"It is important that savings and incentives flow on the same schedule. However, this also raises public policy problems due to the long-term aspect of performance contracting and the changing/evolving nature of public policy. The long-term payment of incentives makes it difficult when public entities want to change direction because funding has already been allocated."*
- Another respondent sees a wide range of goals from market transformation goals in California, to narrowly defined resource acquisition goals in Colorado. He sees *"few commonalities in the goals from state to state; rather it appears that the status of electric deregulation is the driver. He does "not feel that programs are clearly defined, understood or clearly articulated."* There is also general disagreement, he feels, on program designs.

Program Planning Process. Respondents favored a collaborative process, such as a formalized advisory process with public meetings.

## **Performance of Standard Performance Contracting Programs in General**

### Industry Experts

One respondent summarized SPC program results across the country:

- California -- Southern California Edison is very successful due to marketing efforts, the two other utilities [Pacific Gas and Electric and San Diego Gas and Electric] are not as successful.
- Wisconsin -- the geographic area of the pilot is not well suited for performance contracting because there is not enough industry to support the program.
- Colorado -- unsuccessful due to bidding problems.
- Texas -- not really started yet.
- New Jersey -- successful, but utilities are not supportive of continuing the programs.

- New York -- fully subscribed after a few modifications.
- Massachusetts -- starting up with Western Massachusetts Electric Company pilot.

Other experts offered the following views:

- California - *"There is a mixed assessment of whether the program is meeting its objectives. Some say it is too early to tell its effect on the market. The ESCO industry would probably say that it is having an effect. It is leveling the playing field between ESCOs and customers and allowing utilities to take a back seat in the process as compared to the DSM programs. There is a small effect on growth of the industry and new entrants into the market. It may be too early to really tell the effects on the industry."*
- *"With the exception of programs for institutional projects (federal or state), SPC programs seem to be in decline. In Maine and Massachusetts, there is really nothing offered anymore. New Jersey is in doubt of continuing. There is continuing pressure for activity in the small commercial and residential sectors - these groups can be aggregated for a performance contract but activity has been limited to date."*

Concerning performance contracting program strengths, one respondent suggested: *"The open market is a big strength. Compared to one or two companies getting all of the work in the DSM days, this is a big difference."*

One respondent identified a number of weaknesses: *"Administrative rules. Need to rethink procedures. Consultants get in the middle of the programs and complicate things in an effort to keep themselves in business; the Flex Tech consultants are complicating things in New York; NYSERDA's and other agencies' marketing information tends to be random, vague and has no hooks; need to focus on transforming people rather than products or markets; and very little understanding of what drives the decisions of some people to purchase energy efficiency products."*

Another major weakness is marketing:

*"Marketing is the biggest hole. Customers know very little and there has been very little real market research and little or no marketing. Current marketing is too technical and focuses on energy savings and does not motivate customers. The marketing is not targeted to what customers want. Market research is sorely needed to get things moving. Marketing budgets should be 10% of sales but the small margins in the ESCO market (which is just like construction margins) does not allow this level of funding."*

## **New York Energy \$mart<sup>SM</sup> SPC Program Performance and Impact**

### Program Staff and Consultants

NYSERDA staff respondents had this to say about program performance: *"The program failed to meet expectations in its first 6 months. We apparently pushed the program theory that low incentives can be adequate to encourage projects beyond its limits. After a quick retooling and a brief takeoff period, the program is meeting expectations.*

Quality of Service was rated between 8 and 9 (on a scale of 1 to 10, with ten being highest). The following comments were noted: program materials are of high quality, however, they are complicated; interactions with ESCOs have been of high quality; and interactions with customers are more limited. One suggestion was to offer more outreach sooner and to eliminate some of the program complication associated with regulatory compliance (*i.e.*, level of M&V and complications associated with pricing strategies).

Program Effectiveness was rated between 7 and 9 (on a scale of 1 to 10, with ten being highest). The following comments were noted: the participation of over 30 different ESCOs, with the number growing every month, is a strong indicator of success in building the industry; the program needs to be in place longer to have any real effect on changing this market.

A number of program strengths were identified: cost-effective resource acquisition; M&V reliability; builds an energy-efficiency market; responsiveness of NYSERDA staff to address issues with ESCOs and SBC Advisory Group; and reasonably large budget.

The following weaknesses were suggested: perceived complexity; actual complexity; assumed requirement for performance contract with customer; inflexibility of M&V without Option A of the International Performance Measurement and Verification Protocol; and limited aggressiveness in program outreach.

### Participating ESCOs

*Overall Performance and Process Satisfaction.* Respondents rated the **New York Energy \$mart<sup>SM</sup>** SPC program highly (*i.e.*, mean response of 7.6 on a scale of 1 to 10, where 10 is highest). The four highest levels of satisfaction were found in areas where NYSERDA played a role due to staff involvement, program offerings or support (*i.e.*, responsiveness of NYSERDA staff, degree of backing by NYSERDA that can be used for customer acceptance, available technical assistance from

NYSERDA's Technical Assistance Contractors, and opportunity to participate in complementary **New York Energy \$mart<sup>SM</sup>** programs). Areas for improvement included: current program manual and forms, NYSERDA's marketing of program to customers, and level of effort required for program participation compared to program benefits. One respondent noted: *"The manuals are good, but the forms are bad because they could not deal with multiple locations for the same customer. We ended up with [many] individual forms for each of our...sites."*

*Program Marketing.* The 5 out of 7 respondents interviewed were new to SPC programs. They reported hearing about the New York SPC program in various ways. Most remember hearing about it by word of mouth through a colleague or contractor. Respondents did not report any marketing methods that had influence on their participation. No mailings or direct solicitations appear to have made their way to these participants. In fact, one respondent who heard of the program from a colleague said: *"I should have heard about it from other sources, such as mailings or utilities, but I didn't. This program needs to be marketed more."*

*Program Planning.* One respondent was involved in NYSERDA's SPC program planning process and felt that the process worked well and that the changes made were appropriate. Their one suggestion was that a new advertising and marketing agency be hired.

*Reasons for Participation.* Respondents were asked to rate their reasons for participating in NYSERDA's SPC program. The four greatest reasons for participation were: (1) availability of incentives; (2) level of incentives - both of these reasons received a mean rating of 4.0 (on a scale of 1 to 5, where 5 was the highest); (3) the opportunity to increase sales; and (4) having their firm associated with energy efficiency - which both received a 3.7 rating. Respondents did not view "obtaining marketing or technical assistance" or "staying ahead of their competition" as important reasons for participating.

*Awareness/Knowledge.* Regarding information that could potentially be gained through program participation, respondents rated "M&V processes" as the most important (mean score of 3.8 on a scale of 1 to 5, where 5 was the highest). One respondent noted: *"Our company has spent between \$50,000 to \$100,000 on M&V for performance contracts, due in part to the requirements of the SPC program. The SPC program has brought the subject of M&V and its value to the attention of Senior Management. It is felt that M&V is vitally important to the success of performance contracting and that projects that proceed with minimal or no M&V are destined to be caught up in legal battles a few years into the project."*

*Program Impact.* Respondents generally reported that their firms marketed their services and recruited customers through direct sales methods such as networking through existing customer base,

word-of-mouth, and direct mailings. While most respondents did not feel that they marketed their services differently if they planned to bring a customer into the SPC program, one respondent did say that they tended to *"use incentives as the carrot."* Only one respondent noted any different offerings due to participation. This respondent felt that it was easier to sell engineering surveys with the 50% incentive offered under the available NYSERDA programs.

While responses varied greatly as to the percent of business attributable to the SPC program (*i.e.*, 10% to 100%), and as to whether new types of clientele were being brought on board, respondents did agree on some aspects of the program. When asked whether they are establishing a continuing relationship with clients for which they had done SPC projects, all respondents either said yes, or if it was too early to say yet, they expressed optimism that this would occur.

When asked how likely they were to continue participation in the program, all participant ESCOs surveyed said they were very likely to continue program participation. The primary reason given for continued participation was the availability of incentives. However, when asked what impact a withdrawal of the NYSERDA SPC program would have on their continued use of performance contracting, most respondents stated that there would likely be minimal impact.

### Participating Customers

*Overall Performance and Process Satisfaction.* Respondents overall expressed satisfaction with the SPC program. Ranked especially high were satisfaction with incentive amounts and benefits versus the level of effort required. Of key importance is the overall satisfaction score, which rated at a very high 4.4 (on a scale of 1 to 5, where 5 is highest). This 4.4 score is a full point higher than the satisfaction level of participating ESCOs. This could be the result of the higher level of effort required (due to paperwork) for ESCO participation (effort vs. benefits rate only 3.1 by participating ESCO respondents).

Most respondents felt unable to comment on the satisfaction questions relating to NYSERDA because their interaction with NYSERDA was minimal. They did not feel that they had a relationship with NYSERDA or an understanding of their product and service offerings. This is definitely an area of opportunity. Working off the otherwise high satisfaction levels, NYSERDA could create a solid relationship and use these customers to help promote the SPC program in the future and also as a way to promote other **New York Energy \$mart<sup>SM</sup>** programs. One customer said: *"I would be very interested in getting more information directly from NYSERDA."* And another respondent gave a score of 1 (extremely dissatisfied) to NYSERDA's "marketing of the program to customers."

*Program Marketing.* Participating customer respondents reported hearing of the program mainly

through ESCOs or utility company representatives (ConEd and NiMo). One respondent volunteered that the program did not "come to him"; rather he reports having to "go out and look for it." Another customer respondent offered the following information relating to program marketing: *"It would be helpful if NYSERDA kept a mailing list up to date of customers involved or having the potential to be involved in their programs so that they could notify them when modifications are made or new programs come along. NYSERDA needs to do more marketing to customers. The ESCO is counted on for everything. This is not the best situation. If customers were better informed about the programs, they would know what to ask of the ESCOs and determine when they were not taking advantage of all there was to offer."*

Respondents expressed a wide range of responses as to how often they received marketing brochures or sales calls from firms that perform energy efficiency services. Two firms said only a few times a year, one said monthly, and three reported that they were solicited on an almost daily basis. Two respondents felt that the frequency of marketing had definitely picked up as the word hit the street that they were interested in energy efficiency. Another company felt that the pick-up was primarily due to deregulation. *"Recently we have been receiving a lot of information from energy suppliers and service companies, as deregulation has been progressing. There was not much recruitment from ESCOs before deregulation."*

Application Process. Four of seven responding customers felt that the application process went extremely quickly. They estimated the total application time took around three weeks to one month. Three respondents mentioned that while there was a lot of paperwork, the ESCOs took responsibility for most of it and they were left with a pretty painless process. *"There was a lot of paperwork, but the ESCO did most of the work - from my point of view, the process was pretty simple."*

Two respondents however, voiced dissatisfaction with the application process. One of these respondents also noted that while the ESCO handled the paperwork, he felt that the process had been much slower than he had expected. *"The ESCO has taken care of all the paperwork, however I have heard from them that it is very time consuming and cumbersome."* The other felt that the program needs to be more user friendly. He says that after many months there is still no written contract.

Another concern involved the length of time it took to get the process rolling. *"It took two months to get NYSERDA to come out to the site - and it has been over a month since I turned in the application and it is still not approved."* He also felt putting the data into NYSERDA formats was redundant and asked: *"Is this even necessary with ESCO guaranteeing savings?"* Comments such as these suggest the potential need for greater communication between NYSERDA and customers, an issue which NYSERDA is currently addressing.

Reasons for Participation. Respondents were asked to rate their reasons for participating in NYSERDA's SPC program. The four greatest reasons for participation were: (1) availability of incentives - received a mean rating of 5.0 (on a scale of 1 to 5, where 5 was the highest); (2) having their firm associated with energy efficiency (mean rating = 4.3); (3) the opportunity to save on energy bills; and (4) the opportunity to enhance firm's knowledge of energy efficiency opportunities - both of these reasons received a mean rating of 4.2.

The actual decision to participate was made in various ways depending mainly on the type of enterprise involved. Smaller, less bureaucratic organizations often had a single layer of decision-making. On the other hand, some public institutions had to have approval from their board of directors before signing the contract. One thing that most participating customer respondents agreed on was that the first step of the decision-making process was to look at the payback criteria and do a financial analysis of the project.

Respondents rated the likelihood of doing their energy efficiency project, absent the availability of incentives, as being very low.

Awareness/Knowledge. Respondents were asked to rate their knowledge on a range of energy efficient technologies, performance contracting, and renewable energy, both before and after their participation the SPC program. On average, no noticeable gain in knowledge was noted.

Program Impact. The greatest benefits noted by respondents were: increased ability to control energy bills, increased comfort of the workers, and longer durability of energy using equipment (scoring 4.2, 3.7 and 3.3 respectively, on a 1 to 5 scale).

Motorola Case Study. The Motorola case study, prepared by SAIC, provides an excellent example of a satisfied customer and highlights the benefits gained from participation in NYSERDA's SPC program.<sup>8</sup> Following are some key quotes which highlight the far reaching impacts that NYSERDA's SPC incentives had on Motorola in New York State:

*"By applying to NYSERDA's SPC program, the ESCO was able to recover 50% of the capital costs of this project through incentives, and reduce the payback period [for energy efficient building and operation improvements] to under two years."* Measures that were implemented included: control of environmental systems; optimization of air compressor/desiccant systems; chilled water reset; time of day scheduling for ancillary items; and an energy efficient humidification system.

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<sup>8</sup> Exhibit B presents a complete copy of the SAIC/Motorola Case Study.

Participation in NYSERDA's SPC program *"resulted in a project with very positive impacts for all parties as well as the community. These impacts are evident through:*

- *A dramatic reduction in electrical and operating costs as confirmed through the measurement and verification plan*
- *The redirection of savings into efforts to increase productivity and create jobs*
- *Reduced risks in achieving energy savings due to the measurement and verification process and savings guarantee*
- *Improved control of the facility by allowing for short- and long-term management decisions based upon real-time operating information*
- *The smooth transition from accounting on a square footage basis to activity based accounting."*

A quote from Mark Casell, Motorola Facility System Engineering, does an excellent job highlighting a customer's satisfaction with the SPC program:

*"This project was quite comprehensive and complex in nature and required extensive collaboration and teamwork from facility management, staff, Siemens [the ESCO contractor], NYSERDA, and NYSEG. Throughout the project, production remained on schedule, thanks to the leadership from Siemens. Furthermore, NYSERDA's staff facilitated the smooth progression of the project through all the administrative phases of the SPC program. We are now reaping the benefits of this project."*

As mentioned in SAIC's case study, *"The great success of this project has lead to several new projects at Motorola. These include lighting retrofits and industrial process improvements such as high efficiency motors, variable speed drives, controllers and new manufacturing technologies. As for Siemens, the NYSERDA SPC program has motivated an aggressive marketing strategy of performance-based contracts to the commercial and industrial sectors. Siemens has successfully obtained several new contracts as a result, and will continue to market performance contracting to its present and expanding customer base."*

### Non-Participating ESCOs

*Program Marketing.* A majority of respondents had quite a bit of experience with performance contracting. They reported hearing about NYSERDA's SPC program in various ways. Unlike participating ESCOs and participating and non-participating customers, these non-participating ESCOs actually did hear about the program through NYSERDA efforts. NYSERDA mailings were mentioned twice, along with industry meetings (NYSERDA and the New York State Energy Efficiency council). Another source of information was reported as the New York State Energy Efficiency Newsletter.

Reasons for Non-Participation and Factors Important to Attract Participation. Respondents found the incentive the most important reason to participate, closely followed by the opportunity to increase sales and business base. Respondents did not see the program as an important way to increase expertise or to obtain marketing or technical assistance. Non-participant results were very similar to participating ESCO findings. This is likely due to the fact that respondents for the most part have not rejected the program, but are only waiting for the appropriate time to participate. Here are some of their comments regarding participation status:

*"Our company did not decide **not** to participate. We have been marketing the program to customers and two deals where SPC was included have not proceeded."*

*"Basically, the reason we have not participated is that the deals have fallen apart. We actively marketed the program in late spring of 1999 and will continue to in the future. In a recent project with a Fortune 500 company's headquarters, the benefits to the project of the SPC incentives was negligible. Customers remember the high levels of incentives in the old utility programs and have "sticker shock" even with projects that include the more moderate SPC incentives."*

One ESCO gave this reason for their decision not to participate: *"Our focus is to maintain a regional presence in California and the Midwest. The number of ESCOs in the Northeast does not warrant entering into the market due to increased competition. NYSERDA's SPC program will have no impact on our decision regarding opening an office in the New York area."*

Awareness/Knowledge. Most respondents felt that they were fully aware of the benefits of high efficiency products and services.

### Non-Participating Customers

Reasons for Non-Participation. The main reason provided as to why customers were not participating was lack of information on the program. Even though NYSERDA had these customers in their databases (*i.e.*, complete with copies of ESCO proposal letters to these respondents which included a mention of NYSERDA and potential SPC program incentives), three out of the five respondents stated that they had never heard of the program.

*"I haven't heard of the program, however, I would be interested in obtaining information. Please have NYSERDA send us out some information."*

One respondent relayed an incident concerning a project that they considered for a NYSERDA energy efficiency program. The respondent's gas supplier referred them to a lighting contractor for

installation of energy saving measures. The lighting contractor mentioned NYSEERDA incentives but the respondent was not sure whether it was the SPC program or not. The customer stated that this lighting project did not proceed because: (1) it did not achieve the firm's maximum payback threshold of 18 months; (2) the lighting contractor's costs seemed excessively high (*i.e.*, costs for retrofits including reflectors were three times more than the full replacement cost of the fixtures); and (3) lack of faith in the contractor. It appears that, in this case, if the customer had enough information to call NYSEERDA directly, they may have been able to move forward on a project after getting an independent third party's opinion.

*Program Marketing.* Three of the five respondents had previously participated, or were presently participating in energy efficiency programs provided by the New York utilities. All expressed satisfaction with the previous programs. Three of the respondents had also worked with performance contracting in other states.

Concerning NYSEERDA's SPC program, three non-participating customer respondents reported that they did not remember having heard of the program. Of the remaining two respondents, one customer thought he got a mailing, but mainly heard of the program through a colleague. From these limited responses, it appears as though the program is not well publicized. The final respondent however, seemed to have been well aware of the program and listed a number of ways in which he heard of it (*i.e.*, mailings, an industry meeting-EEI, publications, colleagues, and web sites).

When asked how often they received marketing brochures or sales calls from firms that provide energy efficiency services, responses varied from daily to a few times a year. No recent pattern changes had been observed.

## **Market Barriers**

All six groups of interviewees provided opinions regarding market barriers preventing greater participation in performance contracting programs. The two barriers identified most by respondents across all interviewee groups were: (1) hassle associated with understanding performance contracting requirements and getting such arrangements approved (*i.e.*, will the anticipated benefits justify the time and expenses to work through the process); and (2) savings uncertainty (*i.e.*, from a customer perspective, what the actual energy savings and payback will be; from an ESCO perspective, how actual savings will be measured). A number of other significant barriers were identified including: need for additional marketing; lack of important baseline data and insufficient market research; questions and confusion surrounding electric utility industry deregulation; and the current positive state of the general economy. The following paragraphs highlight key quotes and responses from each of the interviewee groups regarding the topic of "market barriers":

## Program Staff and Consultants

A number of market barriers were identified by the program staff and consultant respondents:

- performance uncertainty: reduced for customers with third party verification that savings estimates are reasonable
- transaction costs: financial incentives reduce transaction costs and encourage customers to move ahead with projects that otherwise fail the customer's cost-effectiveness criteria.
- bounded rationality: the SPC incentives give ESCOs an opportunity to overcome this barrier by adding another benefit that invites a reexamination of project cost-effectiveness
- asymmetry of information: third party review of savings and M&V helps achieve symmetry
- difficulty in understanding performance contracting by both engineering and finance staff
- complexity of performance contracts
- complexity of measures, and quantifying savings
- availability of capital
- search costs

Respondents agreed that these barriers will differ by sector (*i.e.*, commercial, industrial, institutional), by technology types (*i.e.*, weather-related HVAC, lighting), by ESCO type (*i.e.*, local vs. national, niche-driven, vs. RFP driven), and by market perspective (*i.e.*, equipment vendors vs. equipment installers). Respondents also recognized that performance contracting mechanisms may not be the answer to overcoming these barriers in every situation or market sector: *"Performance-based incentives favor sectors with high operating hours." "Performance-based incentives favor more efficient technologies." "SPC program designs favor ESCOs that include M&V as project component." "20% higher incentives encourage smaller projects." "More complicated projects require additional effort."*

One respondent felt that recent marketing improvements will be very useful in overcoming some of the informational barriers.

## Industry Experts

The experts identified three barriers **from the customer perspective**:

- Hassle - customers see performance contracting as too much hassle to get contracts through their organization (scored a 4.2 on scale of 1 to 5, with 6 out of 6 interviewees responding)
- Initial Cost - energy efficiency often has higher initial costs and participants don't want to provide financing and/or don't want to deal with financing issues for this (scored a 4.0 on scale of 1 to 5, with

5 out of 6 interviewees responding)

- Short-Term Focus - customers only care about initial cost not long-run operating costs (scored 3.6 on a scale of 1 to 5, with 5 out of 6 interviewees responding)

The experts identified three barriers **from the ESCO perspective**:

- Hassle - customers see too much hassle to get energy efficiency projects through their organization (scored a 4.3 on scale of 1 to 5, with 4 out of 6 interviewees responding)
- Sales Cycle - amount of time and hassle to get sale of efficiency made versus the additional profit or sales potential (scored a 4.1 on scale of 1 to 5, with 4 out of 6 interviewees responding)
- Short-Term Focus - customers only care about initial cost not long-run operating costs (scored 3.8 on a scale of 1 to 5, with 4 out of 6 interviewees responding)

Respondents overwhelmingly state that obtaining high efficiency equipment was not a problem and did not pose a barrier to preventing higher penetration of energy efficient products and services through performance contracting. Neither did they see it preventing or slowing the development of a vibrant, competitive energy services industry.

Other challenges or potential barriers presented by respondents included:

- Customer education/awareness,
- Credibility issues due to problems with past projects,
- Lack of customer attention due to upbeat economy - as stated by one respondent: *"Energy efficiency is not the top priority for most customers, because energy costs are not a significant percentage of operating costs and the economy is very good.,"*
- Lack of access to decision-maker
- Confusion in a deregulated market
- Expertise not available within the ESCO industry to address the types of processes that certain high technology industrial companies need.

- Marketing - key quotes to support this barrier include: *"Marketing is the biggest hole. Customers know very little and there has been very little real market research and little to no marketing."* *"Current marketing is too technical and focuses on energy savings and does not motivate customers. The marketing is not targeted to what customers want."* *"Marketing budgets should be 10% of sales but the small margins in the ESCO market (which is just like construction margins) does not allow this level of funding."*
- Market research - *"Market research is sorely needed to get things moving."*

### Participating ESCOs

The three greatest barriers identified by participating ESCO respondents, rating 3.9, 3.4 and 3.4 respectively, on a 5 point scale, where 5 was the highest, were: "uncertainty about the actual energy savings that customers might really see; amount of time and hassle to get sale of efficiency made versus the additional profit or sales potential; and customer's view of performance contracting as too much hassle to get contracts through their organization. Respondents overwhelmingly stated that getting the high efficiency equipment from suppliers was absolutely no problem and did not pose any sort of barrier to development of a strong energy services industry and its promotion of energy efficiency. Financing and training in these high efficiency products was also not seen as a problem.

Other challenges or potential barriers presented by the respondents included: uncertainty of deregulation activities hampering decision making; perennial low oil prices; continued monetary support of SPC programs, especially targeted towards industry; establishment of accurate baselines; changing physical environment, and yesterday's utility costs and rate structures being different from today's.

### Participating Customers

There were two noteworthy barriers identified by participating customer respondents: (1) knowledge about measurement and verification procedures; and (2) uncertainty about actual implementation costs - ranking 3.6 and 3.4 respectively (on a scale of 1 to 5, where 5 is highest).

### Non-Participating ESCOs

Two items were identified by respondents as potential barriers. The first barrier dealt with the uncertainty regarding the level of actual energy savings and the paybacks to customers. A second perceived barrier was the amount of hassle required to get performance contracting arrangements through an organization and the sale of efficiency in relation to the potential profit or sales potential. Other challenges presented by the respondents included: length of the contracting period; competition from other ESCOs; bad or

poor performing projects (word travels fast about them); and not being able to count savings for winter heating.

### Non-Participating Customers

Due to the small number of respondents (*i.e.*, only one to three of the interviewees chose to respond to the market barrier questions), these results need to be used carefully. However, when combined with respondents' statements, a picture does begin to emerge about customers' barriers to energy efficient investment. One of the main concerns was the level of effort in relationship to the "actual" savings obtained. Respondents noted that they have very short payback requirements (*i.e.*, 1 to 1.5 years). In order for a project to be approved, it needs to produce quick results. Also, there needs to be a process in place to replicate the project to other firm locations.

Only one respondent identified "consistency of performance contracting with the firm's business philosophy" and "contracting for these services are not consistent with our contracting procedures" as barriers. However, this respondent felt strongly that these were some of the biggest problems concerning the SPC program. They were also concerned with the issue of savings verification. *"The program is too complex and we don't need it because we have the money to do the projects. If they make sense, we do them. Product manufacturers will run savings analyses if necessary and that is good enough for us."*

As a further example of these barriers to participation, this customer related the following experience: *"Any utility program involving a contract is very difficult to get through our management because I cannot sign them. On the other hand if the program requirement is an application, I can go ahead and sign it and the project can go forward much more quickly. Getting contracts through our management is such a burden that I will not get involved if a contract is necessary."*

### **Long-Term View of ESCO Market and Role of Performance Contracting**

Four sets of interviewees offered long-term views of the ESCO market and the role of performance contracting in that market. The following paragraphs highlight key quotes and responses from each interviewee group. There was a shared view that energy efficiency services should be moving to the private sector, and that there is a shift ongoing away from performance contracting and toward more fee-for-service arrangements. Concerning the role of performance contracting in the evolving ESCO market, most respondents suggested that its role should be less than originally envisioned. No particular business model should define the market. Instead, performance contracting should be viewed as one of many mechanisms used by ESCOs to deliver energy efficient products and services to end-use customers.

## Program Staff and Consultants

Respondents agreed that these three categories describe the ESCO market: (1) ESCOs evolved from DSM subcontractors, primarily responding to RFPs, and/or focusing on public institutional buildings (DSM/RFP Driven); (2) ESCOs that seek out niche customers with complex energy end-use needs and equipment, projects often associated with purchase of new capital equipment, which energy savings helps to fund (Niche Driven); and (3) ESCOs associated with specific equipment where their primary goal is to sell equipment they manufacture, use energy services business to ensure that their equipment is specified (Product Driven).

Other categories were identified, including:

- Energy Efficiency Service Providers with focus on small and medium C/I customers
- Audit and audit recommendations companies
- Engineering expertise
- ESCOs as providers of performance contracting - *"the SPC program design best accommodates these ESCOs."*
- ESCOs as energy commodity marketers - *"it remains to be seen whether these ESCOs will be a major source of energy efficiency."* NYSERDA notes that the SPC program is currently working with 5 of these "commodity and energy services" providers.
- ESCOs as providers of energy efficiency services - *"program is attempting to reach this larger market."*

Respondents have generally seen ESCOs providing lighting and HVAC services in the municipal, schools and hospitals (MUSH) market. But this has been changing somewhat: *"New York Power Authority had a program, and still does, which is targeted to schools and is looking to expand into other businesses and sectors."* Commercial/industrial customers now account for 65% of the market - a dramatic shift."

Some respondents felt that the role of performance contracting may be less important than originally envisioned: *"Lighting is not a candidate for performance contracting (off the table)."*

Performance contracting was viewed by NYSERDA respondents as *"filling the gap left when DSM budgets were rolled back. These ESCOs had great success in the public sector, particularly public*

*schools. NYSERDA has had a significant role in developing this market.*" Performance contracting was not seen as being strong in the healthcare market, but it was seen as being utilized in other institutional settings.

Viewed from a broader New York ESCO market perspective (*i.e.*, beyond just those that are involved in performance contracting), respondents were uncomfortable making any estimates of ESCO activity. However, the following ranges were suggested:

- Current number of active local ESCOs: 12 to 15 big active ones; 50 to 100 lighting and others, 5 or 6 big national players operating periodically in New York.
- Some limited growth is expected in these numbers, caused by the introduction of commodity providers, deregulation, and program funding.

When asked to present a vision of what they would like to see happen to the ESCO market in the next three to five years, NYSERDA staff suggested: greater aggregation of smaller customers; packaged commodity sales and efficiency; more *chauffage*;<sup>9</sup> heavier concentration in HVAC and process improvements; and more non-school involvement.

When asked to present their vision of the developed (transformed) ESCO market, respondents suggested a market where:

- State agencies are comfortable with traditional design/build,
- Niche markets and sectors are facilitated,
- Incentives are reduced and successes are advertized/promoted to get more participation,
- Over 50% of school districts have arrangements with ESCOs,
- Standard products and methods for handling contracts and measurement are promoted,
- Stronger self-policing or professional alliances exist to help assure fairness and standard terms and agreements,

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<sup>9</sup> A specialized type of performance contract that provides for the sale of end uses, for example, chilled water or steam, on an energy unit's basis. These contracts are generally for 20 or more years to allow the ESCO to recover the cost of its initial investment. The ESCO provides for all operations and maintenance during the contract.

- Maintains a place for subsidies, but with focus on education, outreach and awareness, benchmarking, etc.

The percentage of ESCOs relying on DSM/RFP programs are envisioned to decline, while the number of "Niche Driven" and "Product Driven" ESCOs are seen to be increasing in a transformed ESCO market.

Respondents painted the following picture when describing the transformed ESCO market:

- A market where the number of participants was growing (some consolidation of large ESCOs and continued role for small ESCOs),
- Performance contracting just one of many mechanisms used to deliver energy efficiency services,
- Larger combined marketing and marketing by individual ESCOs,
- More marketing in alliance with commodity vendors and retail energy providers as well as independent energy services providers,
- People will still undervalue energy efficiency, so some level of incentives may still be needed.

One respondent suggested it might take 3 to 5 years to achieve this vision.

#### Industry Experts

Respondents painted the following picture when describing the transformed ESCO market:

- *"100% of all customers are concerned about energy efficiency. Open access with no particular business model (i.e., not just limited to performance contracting) - take advantage of communications/metering technology explosion."*
- *"There would be more companies to choose from. We would see ESCOs that are competent in every sector and look more like engineers than bankers and lawyers. Also, ESCOs that offer more comprehensive services and don't outsource as much."*
- *"Would be good if ESCOs would recognize that utilities will not be sponsoring efficiency programs. Energy efficiency services will move to private sector due to its own merits."*

Concerning the size of the future ESCO market, one respondent suggests: *"that if things go on as is, there will be a contraction in the number of ESCOs and the big will get bigger, niche companies will expand. New York might be in good shape due to their support of ESCOs now, but other states may lose out if no system is in place."*

Concerning the role that performance contracting may play in the future ESCO market, three of the six respondents expressed concerns that often performance contracting is overemphasized - especially in the MUSH markets. They also noted that parties without enough experience sometimes put programs together. Following are some of their insights into these issues:

*"A performance contracting program may be unnecessary in many cases. The issue is to define what it is you want to subsidize and then open the market to ESCOs and allow them to approach it however they see fit, through performance contract or not."*

*"The ESCO industry needs the flexibility to serve its customers. Having performance contract-type specs available is okay, but the ESCO should not necessarily have to enter into a performance contracting arrangement."*

*"A performance contracting program cannot dictate the timing of the deal between the ESCO and the customer. M&V criteria are a source of major controversy. Buy-out provisions are also controversial. Also, winner-take-all type offerings by utilities are not industry building."*

Overall, there appeared to be agreement among the experts that there is a shift underway within the energy services industry away from performance-based contracting and toward more fee-for-service arrangements in certain technologies, *e.g.*, lighting.<sup>10</sup>

### Participating ESCOs

Following are some responses to the question of how respondents viewed the energy services industry market in terms of customer sectors, products and service offerings, and how these relate to ESCO performance contracting:

*"I believe that performance contracting initially began with schools and municipalities; then shifted over to commercial/industrial."*

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<sup>10</sup> NYSERDA'S SPC program is compatible with this shift, as it does not require the customer and ESCO to enter into a performance contract. At the program level, the comparison is not "fee-for-service" versus "performance-based," but rebates versus performance-based incentives.

*"The three groups described earlier are a good characterization of the ESCO market. Performance contracting is growing due to a trend in outsourcing. Utility subsidies are the largest and offer the stiffest competition. Also, equipment manufacturers (like Johnson Controls) offer competition. Smaller companies are chasing rebates but are more service oriented and gain more energy savings for their customers."*

*"Performance contracting is a value added aspect of the company. As a primary business function, we sell oil, natural gas and electricity to our customers at the lowest price that we can find. Saving our customers money is first and foremost, if we save energy and reduce pollution in the process then that is even better."*

*"I see the sectors and product/service offerings as Residential - quick, canned programs, mass market; Small Commercial - still quick, one sales call; Large Commercial and Industrial - some customization, some full-service, some performance contracting and ancillary services and MUSH markets which are very competitive and have a high saturation of energy efficiency - but still significant benefits from SPC."*

When asked to give their vision of a "transformed" ESCO market, respondents stated:

- *"We would see more Federal mandates - make these things law and then incorporate."*
- *"Cafeteria style...service...fee-based. Moving away from performance-based."*
- *"It will be a more streamline process. We will see improvements in the ability to communicate with customers as to why the services are valuable."*
- *"Incentive programs should continue. It is encouraging to see incentives associated with NOx reductions. We would like to see more programs that target air pollution credits. Deregulation is a question mark in many people's minds and an important role for NYSERDA."*
- *"Deregulation - electricity price becomes competitive. ESCOs get involvere prrf ppc9(")-2.n8s-0.h NOx*

When asked if they agreed that a shift may be underway within the energy services industry away from performance-based contracting and toward more fee-for-service based arrangements, most of the respondents said yes. However, the shift was seen by one as having a positive effect on the industry, and by another as being cyclical in nature. Two respondents did not agree with this statement and said they did not see this as presently occurring.

Technology updates, information on other NYSERDA programs and performance contracting were seen as the most important activities to help in the development of the energy services industry. Other assistance measures mentioned by the respondents included payment of higher incentives, additional marketing tools (such as program overview explaining benefits), a broader scope of measure inclusion and increased focus on the industrial sector.

Regarding the SPC program's ability to achieve its goals to build the energy services industry, the "participating ESCO" respondents rated the SPC program a mean of 7.4 (on a scale of 1 to 10, where 10 was highest).

#### Non-Participating ESCOs

When asked what they would like to see happen to the ESCO market in the next three to five years, the respondents depicted some of the following scenarios:

*"Focus specifically on quality upgrades including aesthetics and maintenance issues as well as energy efficiency. We are looking at an idea to take over the entire energy infrastructure for the customer and buy out all energy using equipment. We would then enter an own/operate relationship with the customer and sell them conditioned air, specific lighting levels, and other energy end uses rather than kWhs."*

Another respondent sees the industry as evolving into: *"Contractual relationships between the customer and the ESCO with metrics that are business based and more economic in nature than kWh saved or lighting hours. Economic metrics of project success based on what keeps the business thriving. Savings on the overall O&M plan would be included. Essentially taking evaluation to the next level."*

#### **Interviewee Recommendations**

Respondents from all interview groups provided numerous recommendations which are highlighted in the paragraphs below. The need for more NYSERDA marketing of benefits and customer/end-user outreach was the recommendation identified most often. Other common suggestions included: M&V assistance; market characterization and research on ESCO and customer needs; reduced paperwork/streamlined application processes; certification programs; and better linkage with other energy efficiency program

offerings.

### Program Staff and Consultants

To help strengthen the SPC program and to address key market barriers, a number of recommendations were suggested (note - many of these are already being considered/implemented by NYSERDA):

- *"Provide in depth M&V assistance for each ESCO's first project. Second submittals tend to be much easier to assemble."*
- *"Facilitation to help new players entering the energy efficiency services market. However, any program changes should be preceded by a market assessment and/or needs assessment to determine what specific requirements the New York market and New York ESCOs have."*
- *"Perhaps more work with energy user groups (i.e., large energy users, industrial energy buyers, etc.)." "Educational workshops."*
- *"Some standard contracts to customers."*
- *"There is a need for characterization data to help segment market and also interviews of both program participants and non-participants to determine new areas for education and funding assistance." "Additional information on the ESCO market and who their customers are could be helpful."*

Concerning the continued validity of the SPC program's original program theory, goals and objectives, one respondent suggested: *"The original theory and market assessment appear to be on target. The incentive rates for year-1 did not reach the 20 - 25% of project cost that we targeted (i.e., were 10 - 12% of project cost). The incentive rate adjustments have brought us to the targeted ratio of 4 or 5 to 1, and addresses the hassle factor."*

### Industry Experts

Greater development of electric sales market and certification programs, were identified as the two most important activities to help in the development of the energy services industry. Performance contracting, lead assistance, and general marketing to C/I customers were also identified as helping. Other assistance measures suggested by the respondents included:

- Sales training - felt that ESCOs have trouble closing sales
- Market research
- Workshops for customers

- Setting up M&V, and
- Incentives for performance guarantees.

The respondents provided mixed responses when asked if these programs will help to build a vibrant, competitive, self-sustaining energy services industry (part of the original program theory). Some respondents were cautiously optimistic:

*"– Definitely getting the energy savings goal achieved -- may be too early to tell the impact on making a vibrant industry."*

Some felt that performance contracting *"is not going to produce a competitive market"*:

*"Performance contracts are unlikely to be able to stand on their own. Performance contracting is vibrant and competitive when there is access to SBC-type funds."*

*"Performance contracting works with some customers and is part of an overall trend of outsourcing....[but] ...there is no one-size-fits-all solution."*

#### Participating ESCOs

Overall, respondents felt that NYSERDA's SPC program addresses the performance contracting challenges adequately. However, the following suggestions were made:

*"It would be great if we could have a NYSERDA M&V effort - customer would accept NYSERDA results more. However, contractors might have a harder time buying into third party verification. M&V is very complex - client has no background - sometimes sees it as smoke and mirrors - third party (NYSERDA) makes it more palatable to customers."*

*"Need to work on reducing the paperwork and get rid of delays in payments."*

*"Customers still remember when NiMo paid 100% of costs of projects - this is a problem. Could possibly have the Public Service Commission issue some kind of marketing that explains that the days of DSM and freebies is over and that although there are energy efficiency programs in place, they are different."*

Some comments regarding marketing the SPC program include:

- *"Is the program even marketed? If so, I would guess that these efforts could be ramped up"*

*considerably."*

- *"Marketing efforts need to be consistent. NYSERDA needs to have a better relationship with host utilities (work together more). Need to get the word out better to ESCOs and customers."*
- *"A one-pager on how the program works that was designed for upper level management would be extremely helpful. It should also explain why the incentives go to the ESCO instead of the customer."*
- *"Perhaps put some money into customer education and energy efficiency benefits. A real effective marketing campaign might shift standard practice to more efficient installations. Also, market towards design engineers, architects and manufacturers...get them to shift towards energy efficient practices."*
- *"The problem is that we are training clients to respond to rebates (third party funding) rather than real savings (i.e., need to ask if this effort is sustainable after dollars dry up)."*

#### Participating Customers

While respondents overall felt that this was a high quality program, they did provide some suggestions for improvement. The recommendation mentioned by almost all respondents, that would most help the SPC program in its goal to spur the growth of the energy services industry, does not involve making changes to the existing program. Rather, they felt that NYSERDA should work on publicizing the program benefits and raising participation levels. These customers feel that getting the word out to potential clients should not be left in the hands of the ESCOs. Increased marketing and promotion were seen as the number one area for NYSERDA improvement. Following are some key quotes:

- *"NYSERDA needs to ensure that more program information makes it to commercial customers so that they seek out ESCOs. Whenever an ESCO comes in with a program, I am skeptical because of their vested interest in selling their products and services."*
- *"NYSERDA should work on passing on information more effectively. I really had limited exposure to NYSERDA and the program. In fact, other than a 2 to 3 page brochure, all information has come to me through the ESCO."*
- *"Needs more publicity...get the word out more; folks need knowledge of program..."*
- *"Spreading ideas; get the word out about the energy efficiency projects going on. Find applicable projects and get the word out about successes."*

- *"Not enough marketing is done and there is not enough direct NYSERDA contact with customers."*

Other recommendations on the SPC program's design, structure, or operation included some concerns with the way M&V was handled under the program and additional issues concerning the length of application process. *"M&V seems to be overly stringent and the application process is arduous compared to other utility programs."*

### Non-Participating ESCOs

Overall, respondents felt that NYSERDA's SPC program adequately addresses identified barriers. One respondent felt that *"Rebate levels need to be higher - new ones are better, but can still go up 50%."* Other suggestions included:

*"While I have limited exposure to the program, I do feel that the M&V requirements will help in selling future projects by offering independent verification of savings. However, conversely, the watered down M&V requirements for lighting raises concern for the same reason. I am used to more 'robust' M&V."*

*"Need to have better linkage between programs - such as having an energy audit recommend measures for a performance contract and link to the SPC program or have some type of tickler system that would alert across programs (e.g., motors and lighting to SPC)."*

*"Development of energy efficiency industry has been underway - industry already developed. NYSERDA needs to review ease of doing business in New York and with New York utilities. They have seemed to be picking up their marketing effort (i.e., conferences/workshops) - doing a better job lately."*

When asked what types of assistance they felt could most help develop the energy services industry, respondents identified general marketing to C/I customers, information on other NYSERDA programs, lead assistance, and certification programs, as the most important activities. One respondent had this to say regarding potential assistance: *"I often find that we are in competition with some very small companies that do not seem to have the capacity to handle a long-term contract of two or more years - they really don't pass as ESCOs (e.g, 2-man operation). NYSERDA needs to address the qualifications of companies that are participating in the SPC program. Perhaps some kind of certification process, as NYSERDA has done for other programs in the past, could be implemented."*

Another respondent was pessimistic about the SPC program's ability to achieve its goal of developing the energy services industry: *"We went into the program with very high hopes as it was the first statewide program in New York. However, the SPC program does not take a pro-active enough stance with*

*customers. Customers did not know anything about the program and had no clue as to who NYSERDA is." They suggested that the "program needs more direct marketing to customers, specifically about the SPC program. There needs to be a direct relationship between NYSERDA and the customer. Also, incentive levels need to be increased - they are not compelling enough given the onerous contractual obligations."*

Other program enhancement suggestions included:

- Add winter savings to program, or at least acknowledge existence,
- Have a way to standardize projects,
- Set standard for available technologies (*i.e.*, if SEER is available, savings should reflect this),
- Customize M&V procedures to fit the project; and
- Streamline the applications process. Turnaround needs to be on the order of three weeks to be realistic. Customers are *"immediately scared off when they hear application processing times of 120 days."*

#### Non-Participating Customers

Respondents listed "availability of incentives" and "opportunity to save on energy bill" as the most important reasons for possible program participation. More attention is needed in marketing the benefits in these two areas. Other important suggested actions that could encourage participation included the availability of technical assistance, and whether related facility changes were already being planned.

While respondents did not appear concerned about reliability and verification of savings estimates, one respondent shared the following incident: Problems arose in a recent lighting project because the customer felt that the costs of the project were too high. While the contractor mentioned that there were NYSERDA incentives included, the contractor never gave him the option of calling NYSERDA and verifying the financial or savings aspects of the project. He would have liked to have had the opportunity to go to a third party, like NYSERDA, in that situation but said he wasn't sure who to call. Consequently, he decided against doing the lighting job due to the high costs and also not being able to trust the contractor's cost values. NYSERDA should make better efforts to make its name known to customers.

## SUMMARY AND CONCLUSIONS

Based on the compilation of the various documents, interviews, and the Motorola case study, a summary of key findings are presented below, followed by a review of finding to the three research questions identified in the "Introduction" section of this report.

### Variations Among SPC-type Programs

- SPC-type programs reviewed were based on a "pay-for-performance" philosophy, versus payments based on pre-installation estimates of savings, and rely on energy efficiency service providers to market and develop projects, versus heavy support from program administrators.
- In addition to energy savings, most programs reviewed identify market transformation as a key goal. These programs attempt to use and expand the role of ESCOs in delivering energy efficient products and services directly to end-use customers and help build a vibrant, sustainable energy services industry.
- Comprehensiveness of measures achieved by differentiating pricing/incentives levels. Also, programs use price differentiation to target customer sectors (*e.g.*, smaller commercial customers).
- Nearly all programs have reported lower participation levels than originally envisioned. In most cases, second and third generation programs are seeing or anticipating increased progress toward program goals.
- Measurement and verification (M&V) of installed measures has been identified as an important element of all programs but the level/complexity of required M&V has been identified as a key barrier to greater participation and program progress.
- Lack of customer awareness and extended contract processes have created delays seen as barriers to program participation.
- Certain performance contracting programs require a contract to be executed between the program administrator and the ESCO only, while others use a model which requires a contract directly with the customer. Requiring customer contracts is viewed by both customers and ESCOs as a barrier to program participation.
- In an effort to increase participation and awareness in the environmental benefits associated with

energy efficiency, NYSERDA's SPC program offers a supplemental incentive of \$4,000 per ton of annual NO<sub>x</sub> emissions reduction.

- The programs reviewed in Colorado and Massachusetts used a DSM-bidding model. Standard offer prices were not used in the Massachusetts program, instead ESCO proposals were selected based on lowest cost and a number of non-price attributes.

### **Program Theory, Goals and Objectives**

Interview respondents identified energy savings and market transformation as the two key goals for performance contracting-type programs. By providing financial incentives on a "pay-for-performance" basis, the theory posits that the public will gain insights to help prove that energy efficiency can pay for itself. Concerning the program planning process, respondents identified and favored a collaborative approach, such as a formalized advisory process with public meetings.

### **Program Performance**

There was general agreement that performance contracting programs across the country have all experienced low initial participation and limited program progress. Reasons for this slow initial progress varied, but included: program complexity, M&V issues, incentive levels, and limited program outreach targeted to end-use customers. All respondents involved or participating in the New York SPC program gave it high marks for overall satisfaction, quality of service, and program effectiveness. Incentives were identified as a key strength by all interviewees responding. Lack of information and limited marketing were identified as the most significant weaknesses.

ESCOs identified the level of NYSERDA staff support and involvement as noteworthy and quite important. Participating customers, on the other hand had extremely limited familiarity with NYSERDA. Instead they relied almost entirely on the ESCOs to explain and deliver the program. Some of the non-participating ESCOs are not convinced that performance contracting is worth the hassle, but most would consider participating if the right project came along.

### **Market Barriers**

The two barriers identified most were: (1) hassle associated with understanding performance contracting requirements and getting such arrangements approved (*i.e.*, will the anticipated benefits justify the time and expenses to work through the process); and (2) savings uncertainty (*i.e.*, from a customer perspective, the actual energy savings and payback; from an ESCO perspective, how actual savings will be measured). A number of other significant barriers were identified including: need for additional

marketing; lack of important baseline data and insufficient market research; questions and confusion surrounding electric utility industry deregulation; and the current positive state of the general economy.

### **Long-Term View of ESCO Market and Role of Performance Contracting**

There was a shared view that energy efficiency services should be moved to the private sector, and that there is a shift ongoing away from performance contracting and toward more fee-for-service arrangements in certain technologies. Concerning the role of performance contracting in the evolving ESCO market, most respondents suggested that its role should be less than originally envisioned. No particular business model should define the market. Instead, performance contracting should be viewed as one of many mechanisms used by ESCOs to deliver energy efficient products and services to end-use customers.

### **Interviewee Recommendations**

The need for more NYSERDA marketing of benefits and customer/end-user outreach was the recommendation identified most often. Other common suggestions included: M&V assistance; market characterization and research on ESCO and customer needs; reduced paperwork/streamlined application processes; certification programs; and better linkage with other energy efficiency program offerings.

### **Challenges Common to SPC-type Programs**

Problems with participation and program progress were noted in nearly all of the performance contracting-type program reports and evaluations reviewed and were verified during primary research interviews with the performance contracting and energy services industry experts. Two prominent factors contributing to this lower than expected participation were: (1) the lag time between customer application and contract approval (resulting from the need for customer education of program and performance contracting, required decision time for vendors/customers considering participation, and extended sales process due to performance contract provisions); and (2) the measurement and verification (M&V) procedures.

Other fundamental causes or potential issues limiting program participation noted were: a general lack of customer awareness and understanding of performance-based energy services (*i.e.*, need for more marketing and customer outreach); narrow focus of performance contracting programs' role in building a vibrant energy services industry (*i.e.*, expand to include performance contracting as one of many tools available to ESCOs); and limited availability of information or knowledge on the ESCO industry (*i.e.*, need for additional market characterization, baselines, and research on ESCO and customer needs).

## Changes Made by NYSERDA

The **New York Energy \$mart<sup>SM</sup>** program has experienced many of the same challenges discussed above. In response, NYSERDA has made several changes that address the problems common among SPC-type programs. These changes appear to have had a definite positive effect on program activity, as indicated by the marked improvement in both applications received (96) and approved (36) in Round 2, and by the fact that the SPC program has fully subscribed its budget based on the reallocated incentive funding.

## Role of SPC-type Programs in the Energy Services Market

Based on results from the primary and secondary research activities discussed in this report, it appears as though performance contracting programs are having limited, but important, success in helping to create a viable, sustainable energy services industry. There is a general feeling among the industry professionals interviewed that there is a tremendous market available for energy efficiency services and that the challenge is twofold. First, the industry needs to take full advantage of system benefit charge-type funding in order to increase its business base, but not use this funding as a surrogate for common business activities such as marketing and project development. Second, the ESCO industry must work effectively together as a unit to define its products and services so that ESCOs can focus on marketing rather than defining their industry.

Another concern identified is that performance contracting may be erroneously offered as a panacea for providing energy efficiency services. While it can be very effective, it is only one business model among many. Performance-based projects have worked very well in the public sector and it was noted that this area has an excellent potential for future development. However, as suggested by the following quotes by an industry expert, performance contracting may not be the best approach for private industry;

- *“A performance contracting program may be unnecessary in many cases. The issue is to define what it is you want to subsidize and then open the market to ESCOs and allow them to approach it however they see fit, through a performance contract or not. The ESCO industry needs the flexibility to serve its customers. Having performance contract-type specs available is okay, but the ESCO should not necessarily have to enter into a performance contract.”*
- *“Performance contracting works with some customers and is part of an overall trend of outsourcing....[but] ...there is no one-size-fits-all solution.”*

This research project concludes that, by continuing to share lessons learned with program designers and evaluators in other states, and by staying focused on performance contracting within the broader context of its use as a tool in helping to build a vibrant energy services industry, it is likely that performance

contracting-type programs will continue to be a useful mechanism for delivering energy efficient products and services to end-use customers.

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**Exhibit A**

**Summary of SPC-type Programs Across Seven States**

**Table 1**  
**Programmatic Features of SPC-Type Programs Nationwide**

	<b>NEW YORK</b>	<b>CALIFORNIA</b>	<b>WISCONSIN</b>	<b>TEXAS</b>	<b>NEW JERSEY</b>	<b>COLORADO</b>	<b>MASSACHUSETTS</b>
<b>Program Name / Type</b>	<i>Standard Performance Contracting Program (SPC)</i>	<i>Non-Residential Standard Performance Contracting Program (NSPC)</i>	<i>Energy Efficiency Performance (EEP) Performance Contracting</i>	<i>Texas Energy Efficiency Matters (TEEM) Standard Offer</i>	<i>Standard Offer 1 Standard Offer 2 Standard Offer 3</i>	<i>Bid 2001 DSM Bidding Program</i>	<i>BECo IRM RFP for Conservation Resources DSM Bidding Program</i>
<b>Program Goals</b>	Market Transformation and Energy Savings	Market Transformation and Energy Savings	Market Transformation	Market Transformation and Peak Reduction	Energy Savings, Peak Reduction, and Market Transformation	Peak Reduction	Energy Savings, Peak Reduction, and Market Transformation
<b>Eligible Participants</b>	EESPs	EESPs or Customer	EESPs	EESPs or Customers	EESPs or Customers	EESPs or Customers	ESCOs or Customers
<b>Eligible Measures</b>	Lighting, Motors, Cooling, Other Electric and Non-Electric End Uses	Lighting, Motors, Cooling, Other Electric End Uses, Fuel Switching	Lighting, Motors, Cooling, Other Electric & Gas End Uses	Lighting, Motors, Cooling, Other Electric End Uses, Fuel Switching	Lighting 60% Fuel Switching 27% HVAC, Motors 13%	Lighting, Motors, Cooling, Other Electric End Uses	Lighting, Motors, Cooling, Other Electric End Uses
<b>M&amp;V Requirements</b>	Standard Protocols (IPMVP w/no Stipulated Savings)	Standard Protocols	EESP & Customer Negotiated - No Set Requirements	Focus on Simplicity: Stipulated, Pre-Set Calculations, Standard Protocols	Standard Protocols	Flexible - 3rd party Administered	Responsibility of ESCOs with Published Protocols
<b>Total Program Budget</b>	\$50M Over 3 Years	1998 - \$42M 1999 - \$79M	\$5M 2-Year Pilot	\$10M Over 2 Years Plus \$4M for AC Distribution Program	\$230M From 1993-1997	\$15M over 2 Years	\$50M over 2 Years plus Administrative Costs
<b>Total Incentive Budget</b>	\$45M Over 3 Years	1998 - \$34M 1999 - \$55M	\$4.2M Over 2 Years	\$14M Over 2 Years	Not Available	\$15M over 2 Years	\$50M to be Paid Out Over a Ten Year Period
<b>Level of Incentives</b>	Cooling - 28.8 c/kWh Lighting - 10.5 c/kWh Motors, other - 12.8 c/kWh	AC & refriger. - 16.5 c/kWh Lighting - 5 c/kWh Motors, other - 8 c/kWh	Incentives Based on Measured \$ Savings in Gas & Electric For Year 1	Non-Lighting - 14 c/kWh Lighting - 9c/kWh	100% of PSE&G's Avoided Costs	Not Available	Required To Be At or Below Published Avoided Costs
<b>Minimum Project Size / Savings Level</b>	50 MWH Annual Savings (Reduced from 200 MWH in Year 1)	150 MWH - SCE (7.5 MWH for Small Business Program) 100 MWH -PG&E (was 200 MWH in 1998)	Equivalent of at Least \$15,000 in Gas and/or Electric Annual Savings	200 MWH Annual Savings	Not Available	20 kW Demand Reduction	No Minimum Specified
<b>Strategies For Addressing Smaller Customers</b>	20% Higher Incentives for Customers Using < 1,000 MWH Annually	Set-Aside of 15% of Funding for Small C/I	Incentive of 75% of Annual Savings for Small Business Projects (<50 employees)	Small Air Conditioner Distributor Program	Small C/I and Residential Programs Offered	Not Available	kWh Blocks Set Aside for Targeting Various Customer Segments
<b>Method of Administration</b>	Standard Benefits Charge State Administered	Standard Benefits Charge Utility Administered	Standard Benefits Charge State Administered	Standard Benefits Charge Utility Administered	Utility Administered	Standard Benefits Charge Utility Administered	Utility Administered

**Table 2**

**Progress Indicators of SPC-Type Programs Nationwide**

	<b>NEW YORK</b>	<b>CALIFORNIA</b>	<b>WISCONSIN</b>	<b>TEXAS</b>	<b>NEW JERSEY</b>	<b>COLORADO</b>	<b>MASSACHUSETTS</b>
<b>Program Status / Timing</b>	3-Year Program Year 3 Began July 2000	2-Year Program Completing Year 2	2-Year Pilot Program Year 2 Began July 2000	1-Year Pilot Program Ends September 2000	Standard Offer 1 - 1993 Standard Offer 2 - 1996 Standard Offer 3 - 1999	2-Year Program Began Early 2000	2-Year Program Began in 1996 ESCO Bidding Closed
<b>Progress Against Goals</b>	Year 1 - Undersubscribed Year 2 - Fully Subscribed	Year 1 - Quick Start Year 2 - Undersubscribed Partially Due to Increased 1999 Budget	Slow Start - Only One Application by 1/1/00	Too Early to Report	SO1 - Very Successful SO2 - Lower Participation Due to Reduced Incentives SO3 - Oversubscribed and Closed July 2000	Bids Awarded	Bids Awarded
<b>Number of Projects Committed Incentive Levels</b>	106 Projects Committed \$29.3M in Incentives	347 Projects Committed \$87M in Incentives	33 Projects Committed \$2.6M in Incentives	Not Available	860 Projects Through March 1998 \$230M in Incentives	23 Winning Bidders	5 Winning ESCO Bidders
<b>Mix of Customers (% of Customers Served)</b>	Schools - 20% Commercial - 29% Municipal - 14% Industrial - 18% Healthcare - 8% Multifamily - 3%	1999 - Large C/I - 48% Small C/I - 52%	Manufacturing - 58% Commercial - 12% Food Process - 9% Schools/Mun - 9% Medical - 3% Industrial - 3%	Large C/I Hospitals Restaurant Chains	Large C/I 82% Small C/I 15% Residential 3%	Not Available	Residential Retrofit Residential Lost Opport. Small C/I Retrofit Large C/I Retrofit C/I Lost Opportunity
<b>Number of Service Providers</b>	Year 2 - 39 ESCOs Year 1 - 7 ESCOs Five of the ESCOs Currently Offer Electric Commodity	Year 2 - 69 EESPs Year 1 - 26 EESPs	Year 1 - 8 EESPs	Not Available	162 ESCOs and Customers	15 EESPs 8 Customers	5 ESCOs Awarded Set-Aside for Customer Generated Proposals
<b>Estimated kWh Saved</b>	Years 1 & 2 - 180 GWH	Year 1 - 231 GWH	Not Available (\$1.7M in Guaranteed Savings)	Not Available	1993-1997 1,100 GWH	120 GWH; 37 MW of Peak	Not Available
<b>kWh Saved per Incentive Paid</b>	6.14 kWh/\$	1998 - 6.8 kWh/\$	Projection - 2.4 kWh/\$	Data Not Yet Available	1993-1997 4.8 kWh/\$	2000-2002 8.0 kWh/\$ Est.	2.0 kWh/\$

**Exhibit B**

**Motorola Case Study**

Prepared by

Science Applications International Corporation



# NYSEERDA INCENTIVES ENHANCE EFFICIENCY FOR MOTOROLA

A CASE STUDY PREPARED BY SCIENCE APPLICATIONS INTERNATIONAL CORPORATION AND THE NEW YORK STATE ENERGY RESEARCH AND DEVELOPMENT AUTHORITY

Today, companies increasingly recognize that energy efficiency is a corporate asset. For Motorola, recent cost-effective, energy-efficiency improvements have led to dramatically reduced costs, and improved productivity, profitability, employee morale, and shareholder value. The comprehensive scope of this project was supported by performance-based incentives offered through NYSEERDA's Standard Performance Contract Program.

## A PARTNERSHIP TO ENSURE SAVINGS AND CREATE VALUE

The Motorola plant located in Elma (Erie County) is a 203,000-square foot manufacturing facility that employs 800 New Yorkers. This facility manufactures electronic sensors and controllers for the automotive industry.

Early in its decision to explore plant improvements, Motorola opted for a partnership with an energy service company (ESCO) that would result in facility improvements while reducing energy costs through a guaranteed savings program. Through a competitive procurement process, Siemens Building Technologies, Inc. was chosen as the

ESCO for a five-year, guaranteed savings contract to provide comprehensive services to the facility.

Siemens worked with Motorola engineers to develop a set of cost-effective energy efficiency measures, developed through a detailed approach that included the review of facility layout, systems operations, and the development of baseline energy consumption data and historical profiles. The project scope also required Siemens to install and commission new equipment, as well as meter and verify savings.



The Motorola plant located in Elma, New York.

## **NYSERDA'S STANDARD PERFORMANCE CONTRACT KEY TO PROJECT**

While the savings identified by Siemens were significant, the capital costs for improvements yielded a longer payback than was typical for Motorola's return on investment criteria. By participating in NYSERDA's Standard Performance Contract Program, Siemens was able to recover 50% of the capital costs of this project through incentives, thereby reducing the project cost to Motorola. This program is one of many commercial/industrial energy-efficiency initiatives being offered as part of NYSERDA's **New York Energy \$mart<sup>SM</sup>** Program. The performance-based incentive offered by NYSERDA's Standard Performance Contract Program helped create a viable project with a payback of less than two years. The measurement and verification of savings as required by NYSERDA's program was an added bonus to evaluate both the ESCO's contractual performance, and the customer's energy efficiency performance.

### **NYSERDA SPC PROGRAM**

The Standard Performance Contract Program provides financial incentives paid on a performance basis for performance contracts or construction projects that include cost-effective electrical efficiency improvements. Project incentives are paid based on the measurement and verification of electric savings. The Standard Performance Contract Program is a component of the **New York Energy \$mart<sup>SM</sup>** Program and is designed to help customers develop portfolios of innovative actions to cut energy costs, improve processes, reduce waste, and increase productivity, as the State's electric utilities move to competition. The **New York Energy \$mart<sup>SM</sup>** Program is funded by a System Benefits Charge on the distribution of electricity throughout the State. The **New York Energy \$mart<sup>SM</sup>** programs are available for customers in the

service territories of Consolidated Edison, Central Hudson Gas and Electric, New York State Electric and Gas, Niagara Mohawk, and Orange and Rockland.

### **EFFICIENCY MEASURES IMPLEMENTED**

The cost for the Motorola project was \$893,515 including an estimated NYSERDA incentive of \$446,757. With a projected annual cost savings of \$245,268, and energy savings of 6,507,543 kWh per year, the project is anticipated to pay for itself in under two years and yield an Internal Rate of Return (IRR) of over 35%. The energy-efficiency measures included installing a facility-wide energy management system (EMS) to accomplish these goals:

- Control Environmental Systems – Siemens installed an EMS to control roof-top air-conditioning units, variable air volume units, heaters, and fans. Control strategies include demand limiting on the roof-top units, night setback for each variable air volume box, and roof-top supply-air reset based on actual space temperature requirements.
- Optimize Air Compressor/ Desiccant System – To lower the pressure call set point and to minimize compressor run time, the entire system was interfaced with the SIEMENS EMS to run based on field load while monitoring dew point to provide better moisture control; in addition, an optimal start/stop, load/unload sequence was programmed for each unit.
- Install Chilled Water Reset – Connecting the chiller to the EMS optimized the cooling process by automatically resetting temperature and supervising the system operation.
- Establish Time-of-Day Scheduling for Ancillary Items – The EMS was further tied into various building systems

**“I have been in the guaranteed energy savings field for more than 20 years. I rate this program as the best of its kind with an exceptionally high quality of service by NYSERDA to facilitate participation by ESCOs.**

**NYSERDA's approach to build the ESCO market through incentives is very timely, and offers attractive bottom-line economic and environmental benefits that decision makers can appreciate.”**

**– TOM GARRETT,  
SIEMENS INDUSTRIAL  
BUSINESS DEVELOPMENT  
MANAGER**

such as low-voltage lighting circuits, heaters, pumps, and compressors to control their operation based upon programmed operating schedules and occupancy.

- Install Energy-Efficient Humidification System – An electric-resistance-based humidification system capable of delivering about half of the required capacity was replaced with a novel fog system. The system forces high-pressure water through special stainless steel nozzles that atomize the water into super-fine fog droplets that evaporate quickly into the air. In addition to dramatically reducing electric consumption, this system is anticipated to lower maintenance costs and water usage.

### THE BENEFITS OF PARTNERSHIP

The high level of collaboration and team effort displayed by Motorola, Siemens, and NYSERDA resulted in a project with very positive impacts for all parties as well as the community. These impacts include:

- A dramatic reduction in electrical and operating costs to be confirmed through a measurement and verification process.
- The redirection of savings into efforts to increase plant competitiveness.
- Reduced risks in achieving energy savings due to the measurement and verification process and savings guarantee.
- Improved control of the facility by allowing for short- and long-term management decisions based upon real-time operating information.
- The smooth transition from accounting on a square footage basis to activity based accounting.

- The ability to access performance-based energy and cost savings information by management from any networked computer in the plant.

### OTHER INITIATIVES

In addition to its energy-efficiency efforts, Motorola constantly strives to implement safer and better environmental practices and is ISO 14001 registered. The energy efficiency provided through the performance contracting efforts are in full support of and an integral part of Motorola's ISO 14001 objectives since a reduction in energy use directly translates to reduced power plants emissions. The improvements made to the facility in Elma are successfully reducing its emissions while Motorola also continues a comprehensive paper, plastics, and metal recycling program.

### FUTURE DIRECTION

The great success of this project led to several new projects at Motorola. These include lighting retrofits and the examination of industrial process improvements such as high efficiency motors, variable-speed drives, controllers or new manufacturing technologies.

As for Siemens, the NYSERDA SPC Program has motivated an aggressive

#### PROJECT RESULTS

- \$245,268/yr estimated energy cost savings
- Approximately \$450,000 SPC incentive
- Estimated 35% internal rate of return
- 6.51 million kWh/yr estimated energy savings
- Improved facility operation and control based on real-time operating information



Roof-top air-conditioning units at the Elma facility.

marketing strategy of performance-based contracts to the commercial and industrial sectors. Siemens has successfully obtained several new contracts as a result, and will continue to market performance contracting to its present and expanding customer base.

and help protect the environment, contact:

John Ahearn  
 NYSERDA  
 (518) 862-1090, ext. 3310  
 e-mail: mja@nyserda.org

**FOR MORE INFORMATION**

For more information on how your firm can save energy, improve profitability

Or visit NYSERDA's website at: [www.nyserda.org](http://www.nyserda.org)

<b>SPC PROJECT HIGHLIGHTS</b>		
Business Name and Location:	Motorola; Elma, NY	
Business Type:	Manufacturer of automotive electronics	
Employees:	800 in New York	
Project Implementation Cost:	\$893,515	
NYSERDA SPC Incentive:	\$446,757	
Estimated Annual Energy Cost Savings:	\$245,268	
Simple Payback:	1.8 years	
<b>ANNUAL ENERGY AND COST SAVINGS</b>		
<b>ENERGY EFFICIENCY MEASURE</b>	<b>ELECTRIC SAVINGS</b>	<b>COST SAVINGS</b>
Control of the Environmental Systems	3,061,246 kWh	\$110,717
Optimization of Compressor/Desiccant Chilled Water Reset	1,089,160 kWh	\$38,747
Time-of-Day Scheduling for Ancillary Items	92,061 kWh	\$2,762
Energy-Efficient Humidification System	530,596 kWh	\$20,859
<b>Totals</b>	<b>6,507,543 kWh</b>	<b>\$245,268</b>

**“In today’s manufacturing environment, finding ways to improve efficiency are necessary to remain competitive.**

**Partnering with Siemens and NYSERDA proved to be an economical way of reducing our energy costs. Projects of this nature need a strong and competent management crew that will be partners for the long haul.**

**Throughout the project, production remained on schedule thanks to the teamwork and collaboration of Siemens and Motorola personnel. Furthermore, NYSERDA’s staff facilitated the smooth progression of the project through all the administrative phases of the SPC program.”**

– MARK CASELL, MOTOROLA FACILITY SYSTEMS ENGINEER

<p><b>For further information</b> about New York Energy \$mart<sup>SM</sup> programs, contact NYSERDA’s Communications Department at: (518) 862-1090, ext. 3250; or visit our website: <a href="http://www.nyserda.org">www.nyserda.org</a></p>	<p><b>New York State Energy Research and Development Authority</b>        286 Washington Avenue Extension        Albany, New York 12203-6399</p>
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