

## Section 6

# PROGRAM AND PROJECT SUMMARIES

## INTRODUCTION

This section updates the status of individual **New York Energy \$mart<sup>SM</sup>** program efforts, in terms of early results and progress toward program-specific goals. Several of the programs have nearly surpassed their initial goals while others are still in the early stages of implementation and have little progress to report. Nonetheless, the programs are continuously monitored for performance, and are being modified as necessary to adapt to market conditions and needs, increase participation, and improve results.

The **New York Energy \$mart<sup>SM</sup>** initiative is comprised of 38 different programs. The programs discussed in this section are listed below by major program area in Tables 6-1 through 6-5 in the order in which they appear. Tables 6-1 to 6-5 are presented as a quick reference on program status to date.<sup>1</sup> Of the 38 **New York Energy \$mart<sup>SM</sup>** programs, four are in the “solicitation phase” meaning that they have not yet selected contractors and/or customers. A total of 11 programs are currently in the “design phase” meaning that they have entered into negotiations or have recently hired contractors, and have begun planning for implementation. The remaining 23 programs are in the “deployment phase” meaning that they are being implemented. Several of the individual programs listed in these tables are administered jointly or in close coordination with other programs (*i.e.*, the Residential Appliances and Lighting program and the ENERGY STAR<sup>®</sup> Public Awareness campaign). In these instances, programs are discussed together. The page number in this section where each program summary can be found is also indicated in the following tables.

**TABLE 6-1: Status of Energy Services Industry Programs**

<b>Program</b>	<b>Solicitation Phase</b>	<b>Design Phase</b>	<b>Deployment Phase</b>	<b>Section 6 Page No.</b>
<b>Standard Performance Contract Program</b> \$33.5 million			✓	6-5
<b>Institutional Energy Performance Contracting Assistance</b> \$3.25 million			✓	6-8

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<sup>1</sup> Additional program status information can be found in Appendix C. This Appendix consists of a series of charts showing key process-related milestones in the program development and implementation process.

**TABLE 6-2: Status of Market Transformation Programs**

<b>Program</b>	<b>Solicitation Phase</b>	<b>Design Phase</b>	<b>Deployment Phase</b>	<b>Section 6 Page No.</b>
<b>New Construction</b> \$17.06 million			✓	6-9
<b>Premium Efficiency Motors</b> \$2.5 million			✓	6-11
<b>Small Commercial Lighting</b> \$3.8 million		✓		6-14
<b>Commercial HVAC</b> \$1.7 million		✓		6-16
<b>New York Energy \$mart<sup>SM</sup> Loan Fund</b> \$9.8 million			✓	6-17
<b>Loan Fund Multifamily Building Demonstration</b> \$1.0 million		✓		6-18
<b>Innovative Opportunities: Commercial and Industrial</b> \$2.6 million			✓	6-18
<b>Residential Appliances and Lighting</b> \$8.5 million			✓	6-20
<b>ENERGY STAR<sup>®</sup> Public Awareness</b> \$8.3 million			✓	6-20
<b>Home Improvement Loan Program</b> \$2.0 million	✓			6-26
<b>Residential New Construction</b> \$2.4 million		✓		6-26
<b>Residential Building Performance Market Enhancement</b> \$7.0 million		✓		6-27
<b>Innovative Opportunities: Residential</b> \$820,000			✓	6-27

**TABLE 6-3: Status of Technical Assistance Programs**

<b>Program</b>	<b>Solicitation Phase</b>	<b>Design Phase</b>	<b>Deployment Phase</b>	<b>Section 6 Page No.</b>
<b>Energy Feasibility Studies</b> \$3.2 million			✓	6-29
<b>Energy Operations Management</b> \$1.9 million			✓	6-30
<b>Rate Analysis and Aggregation</b> \$1.0 million			✓	6-31
<b>Energy Audit Pilot</b> \$300,000			✓	6-32
<b>FlexTech</b> \$3.5 million			✓	6-33
<b>Cooling Recommissioning Program</b> \$3 million			✓	6-34
<b>Residential Comprehensive Energy Management Services</b> \$2.5 million		✓		6-35

**TABLE 6-4: Status of Low-Income Energy Affordability Programs**

<b>Program</b>	<b>Solicitation Phase</b>	<b>Design Phase</b>	<b>Deployment Phase</b>	<b>Section 6 Page No.</b>
<b>Low-Income Direct Installation</b> \$9.92 million			✓	6-35
<b>Low-Income Aggregation</b> \$1.7 million		✓		6-38
<b>Technical Assistance for Publicly-Assisted Housing</b> \$790,000		✓		6-38
<b>Affordable Assisted Housing</b> \$3 million		✓		6-39
<b>Low-Income Public Awareness</b> \$775,000	✓			6-39

**TABLE 6-5: Status of Research and Development Programs**

<b>Program</b>	<b>Solicitation Phase</b>	<b>Design Phase</b>	<b>Deployment Phase</b>	<b>Section 6 Page No.</b>
<b>New York State Wind Power Plant Demonstration</b> \$6 million			✓	6-40
<b>Wind Prospecting Program</b> \$300,000	✓			6-41
<b>Residential Photovoltaics</b> \$1.25 million			✓	6-41
<b>Photovoltaics on Buildings</b> \$2.3 million		✓		6-42
<b>High Value PV and Wind</b> \$1.3 million	✓			6-42
<b>Willow Plantation Development</b> \$878,000			✓	6-43
<b>Environmental Monitoring, Evaluation and Protection</b> \$7.1 million			✓	6-43
<b>Energy Efficiency R&amp;D</b> \$5.8 Million			✓	6-47
<b>Strategic R&amp;D</b> \$2.7 million			✓	6-47
<b>Static Inverter Test Procedure Project</b> \$53,064			✓	6-51

One additional program, Environmental Disclosure, is being developed separately and is not listed in Tables 6-1 through 6-5. This program is currently in the design phase and is summarized in this section (on page 6-52).

## **ENERGY SERVICES INDUSTRY PROGRAMS**

### **Standard Performance Contract Program**

The Standard Performance Contract program was initially designed to provide \$45 million in performance-based incentives to leverage \$200 million in private capital for electric energy efficiency measures over the initial three-year public benefits program period. The program is designed to foster growth of the energy services industry with the goal of increasing the number of Energy Service Companies (ESCOs) doing business in the State from seven to 21 in three years. The program's initial goal was to sponsor a total of 300 standard performance contracts (with an average incentive of \$150,000), with 40% of the projects in the institutional sector, 40% in the commercial sector, and 20% in the industrial sector. Standard performance contracts initiated as a result of this program are expected to produce annual electric savings of 115 million kilowatt-hours (kWh).

In June 1998, NYSERDA issued a request for proposals (RFP) for assistance in developing the Standard Performance Contract program. NYSERDA contracted with Schiller Associates in August 1998 for \$228,000 to develop program rules and procedures, application forms, data tracking systems, and measurement and verification protocol. In November 1998, another RFP was issued to retain one or more technical consultants to review incentive applications and provide verification services for incentive awards to ESCOs. Three technical consultants, SAIC Incorporated, Geomet, and ADM Associates, were hired in early 1999. The total contracted amount for the technical consultants was \$1.9 million.

In January 1999, the initial round of program incentives, totaling \$14 million, was offered through program opportunity notice (PON) 455-98. By the June 30, 1999 deadline, a total of 10 applications for nearly \$1.8 million (12.8% of the available incentives) were received. Following a meeting with the ESCO community after the close of round one, NYSERDA made several changes to the program to increase participation. These included:

- Increasing incentive rates;
- Reducing the minimum project size from 200,000 kWh savings per year to 50,000 kWh;
- Including electric to non-electric cooling equipment as eligible for incentives;
- Including incentives for nitrogen oxide (NO<sub>x</sub>) emission reductions; and
- Clarifying and modifying the measurement and verification (M&V) requirements.

In October 1999, the second round of program incentives, totaling \$28 million, was offered through PON

499-99. The balance of the first round of funding was added to the second round. However, as a result of the slower than expected progress in the first round, \$14.3 million was withdrawn from the Standard Performance Contract program and reallocated to other **New York Energy \$mart<sup>SM</sup>** programs where additional public benefit needs or interests were identified. This reallocation leaves approximately \$31.2 million in program incentives for the Standard Performance Contract program.

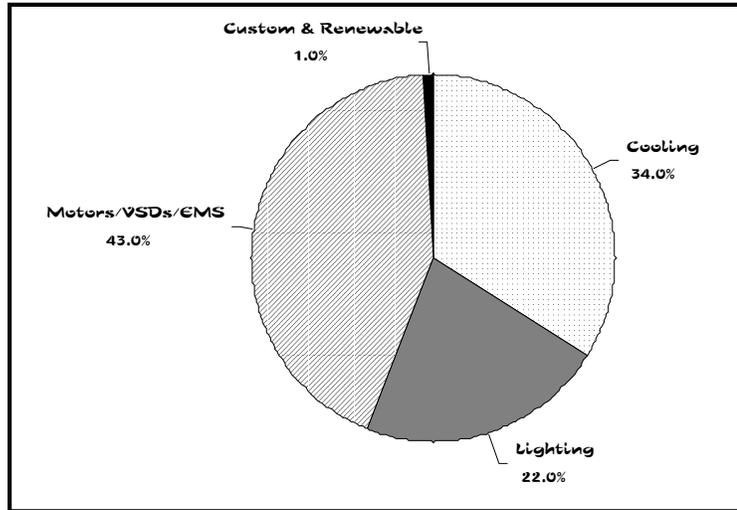
Round two, which ended on June 30, 2000, experienced significantly more interest than the first round. A total of 96 round two applications were received, totaling nearly \$27.5 million in awards. Awards for the 106 projects (round one plus two) total approximately \$29.3 million, representing 94% of the total available three-year funding after the reallocation of Standard Performance Contract program funds.

These projects will leverage approximately \$75 million in private investment in energy efficiency measures, resulting in an estimated savings of about 180 million kWh annually. A total of 39 different ESCOs are now participating in this program.

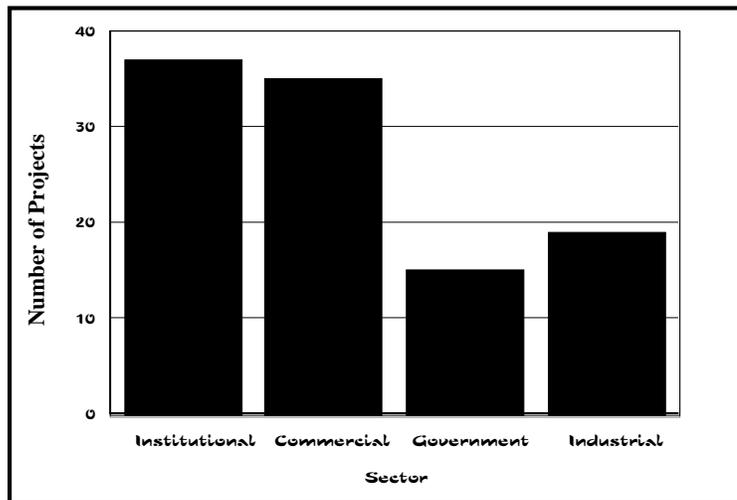
Figure 6-1 shows the dollar value of incentives by measure for the initial 106 projects. The time-differentiated incentive rates that provided higher incentives for measures that reduce summer peak energy use are having the intended result of encouraging comprehensive energy efficiency projects that move beyond lighting. These results are being achieved with incentive levels that average less than 18% of the cumulative present value of energy and capacity savings over the useful life of the equipment installed.

Figure 6-2 shows the number of projects by market sector. These results reflect the higher number of generally smaller institutional projects compared to the larger commercial and industrial projects.

**FIGURE 6-1: Dollars Awarded by Measure (\$29.3 million total awards)**



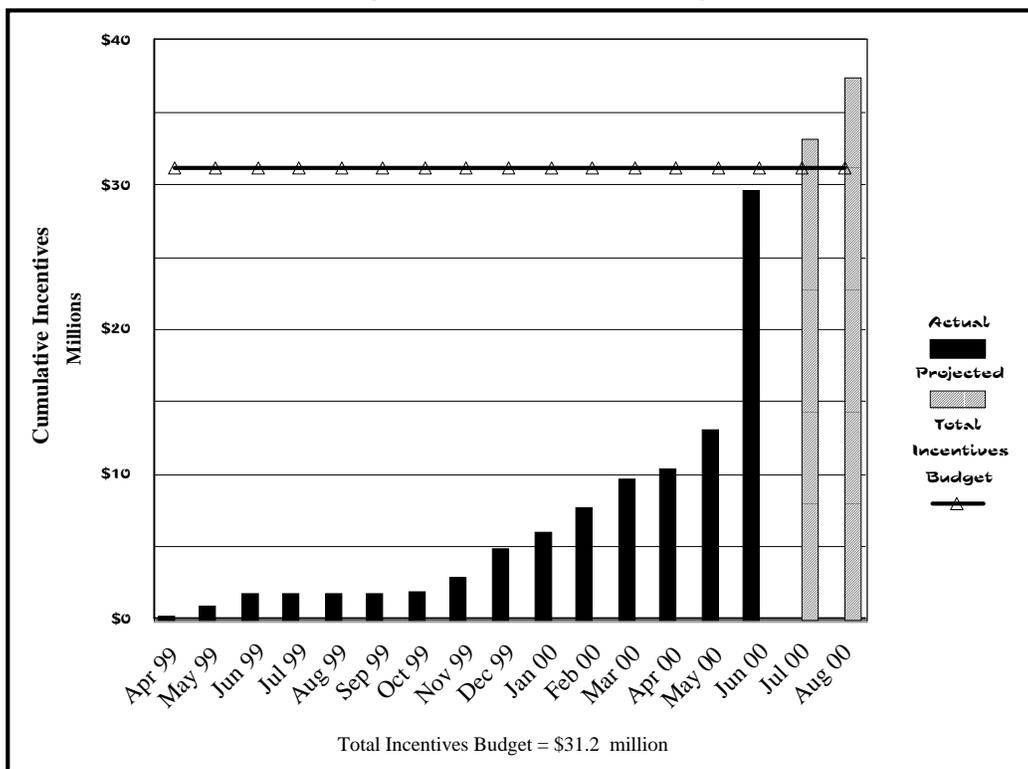
**FIGURE 6-2: Number of Projects by Sector**



Participation goals for each sector have been revised to reflect the funding reallocation and the higher average incentives (\$276,000 per project for the first 106 projects, instead of the original estimate of \$150,000 per project).<sup>2</sup> Based on the adjusted sector goals of 44 institutional, 44 commercial, and 22 industrial projects, the program has achieved 118% of the institutional goal,<sup>3</sup> 80% of the commercial goal, and 86% of the industrial goal.

The dollar value of incentives awarded and projected by month is shown in Figure 6-3. The projection is based on the exponential average percent increase in incentive awards from January through May 2000. This five month period is the most representative since it captures the impact of the increased incentive levels offered during the second year.<sup>4</sup> Based on the projected incentive levels shown in Figure 6-3, the

**FIGURE 6-3: Actual and Projected Incentive Awards by Month**



<sup>2</sup> A total of approximately 110 projects can be supported based on funding reallocation and the higher average incentives.

<sup>3</sup> The 15 government projects are also considered institutional.

<sup>4</sup> The incentives awarded in June 2000 are significantly higher than any preceding months. This is attributable, in part, to June 30<sup>th</sup> being the deadline for program year-two applications, and to NYSERDA's announcement that program funding would be withdrawn and redirected unless greater response was seen. Therefore, June 2000 is considered an outlier and was not included in the exponential average percent increase.

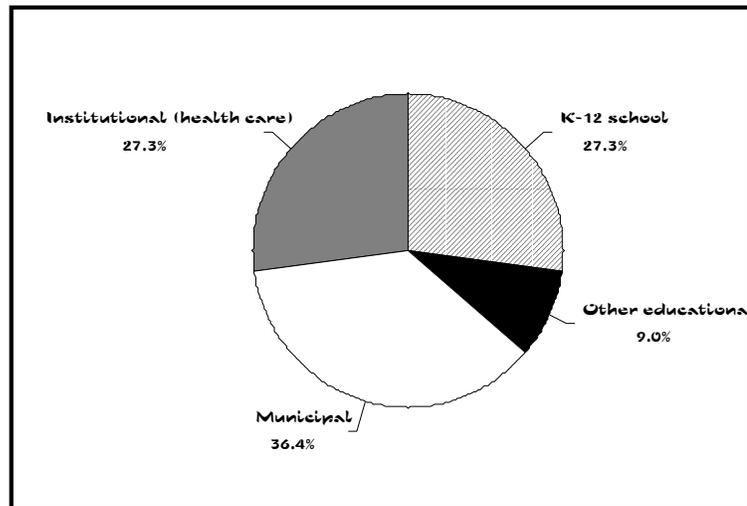
Standard Performance Contract program is expected to award its entire incentive budget by August 2000. Program managers are considering restoring a portion of the funds that were removed from the program earlier in the year. For more detailed information on this program, see the case study in Appendix A of this report.

### **Institutional Energy Performance Contracting Assistance Program**

The Institutional Energy Performance Contracting Assistance program is designed to increase energy performance contracting in the health care, colleges and universities, and municipal building sectors. The program was initially expected to provide 55-70 municipal and institutional customers financial assistance to cover 50% of the cost of a comprehensive energy audit (CEA) and other expenses related to the development of an energy performance contract. CEAs indicate areas where customers can install efficiency measures and achieve reductions in electric energy use and costs by entering into an energy performance contract. The program leads interested customers to the **New York Energy \$mart<sup>SM</sup>** Standard Performance Contract program described earlier.

Total program funding of \$3.25 million is available to customers.<sup>5</sup> The first (initial) round of program funding, from October 28, 1998 through February 7, 1999, provided \$1 million to offset customer CEA costs. Thirty-eight awards for \$995,228 were made. The second round of funding, from November 15, 1999 through April 12, 2000, made \$1.25 million available. The second and third rounds of program funding have since closed, bringing in an additional 50 projects funded at \$911,983. The program has received excellent response with a total of 88 customer applications. Figure 6-4 shows the sectoral break-out of applicants. A total of 81 customer applications have been approved, representing over 100% of the program's goal. To date, 11 customers have completed CEAs, receiving incentive payments of \$254,103. Including customer contributions, the total cost of the 11 audits was \$631,095.

**FIGURE 6-4: Customer Applications by Sector**



<sup>5</sup> Original program funding of \$2.25 million was supplemented with \$1 million reallocated from the Standard Performance Contract program.

Table 6-6 shows the potential electric savings that could result if all the recommended measures in the 11 completed projects are installed. Experience with technical assistance programs shows that about two-thirds of participants will typically implement two-thirds of the recommended measures. Therefore, the 11 completed CEAs could lead to about \$3.6 million in capital investments and about \$1 million in annual electric savings assuming that these customers act in a similar manner.

**TABLE 6-6: Electric Savings by Measure**

<b>Recommended Measure</b>	<b>Potential kWh Savings</b>
Lighting	9,791,987
HVAC	4,181,979
Motors	1,668,871
Cooling	351,815
<b>TOTAL</b>	<b>15,994,652</b>

## **MARKET TRANSFORMATION PROGRAMS**

### **New Construction Program**

The **New York Energy Smart<sup>SM</sup>** New Construction program was established to change standard design and building practices among architects and engineers, and to inform building owners about the long-term advantages of building to higher energy standards. To encourage the incorporation of energy efficiency in new construction and substantial renovation of commercial buildings, the program provides financial incentives to building owners and technical assistance to building designers. Building owners can apply for pre-qualified equipment, custom measure, or whole-building design incentives. Design teams may also be eligible for technical assistance to evaluate energy efficiency and green building opportunities in their projects. The goal of the program is to directly influence the design and construction of 140 projects involving custom measures and 38 whole building design projects (a total of about 180 projects) by June 2001. In addition, the New Construction program aims to directly influence the standards for upwards of 1,800 subsequent projects completed by the same design teams over the next three years. The program will also provide pre-qualified incentives for 550 lighting projects, 450 unitary HVAC projects, and 475 motors projects for a total not to exceed \$2 million in incentives.

In December 1998, as a result of RFP 440-98, NYSERDA contracted with New England Electric System (NEES) Global for program design and implementation services. NEES Global was awarded \$168,000 and has since provided program design assistance, incentive applications and forms, marketing and outreach strategies, measurement and verification guidelines, and a procedures manual. Through RFP 462-99, NYSERDA hired several contractors to provide outreach project management and technical assistance services. Two contractors, SAIC Inc. and Erdman Anthony and Associates Inc., were selected to provide outreach project management services including marketing of the New Construction program,

and assisting customers in applying for incentives. Five contractors - Einhorn, Yafee, Prescott, Architecture and Engineering Inc.; Joseph R. Loring and Associates; SAIC Inc.; Steven Winter Associates; and Wendell Engineering P.C. - were selected to provide expert technical assistance to customers in areas including equipment selection and computer energy modeling. The outreach and technical assistance contractors began work in December 1999.

NYSERDA recently completed a baseline survey of Architecture and Engineering (A&E) firms in New York State. This survey provides baseline data on A&E firm practices related to energy efficiency in new construction and substantial renovation projects. Over 100 usable responses were received and results are currently being analyzed.

Customer incentives totaling \$14.4 million<sup>6</sup> were made available for the period from September 6, 1999 through June 30, 2001. Funding is provided to eligible building owners to offset between 50 and 70% of the incremental capital costs to purchase and install energy-efficient equipment, and for building designs that reduce electric energy use. Only electric energy efficiency measures are eligible for incentives.

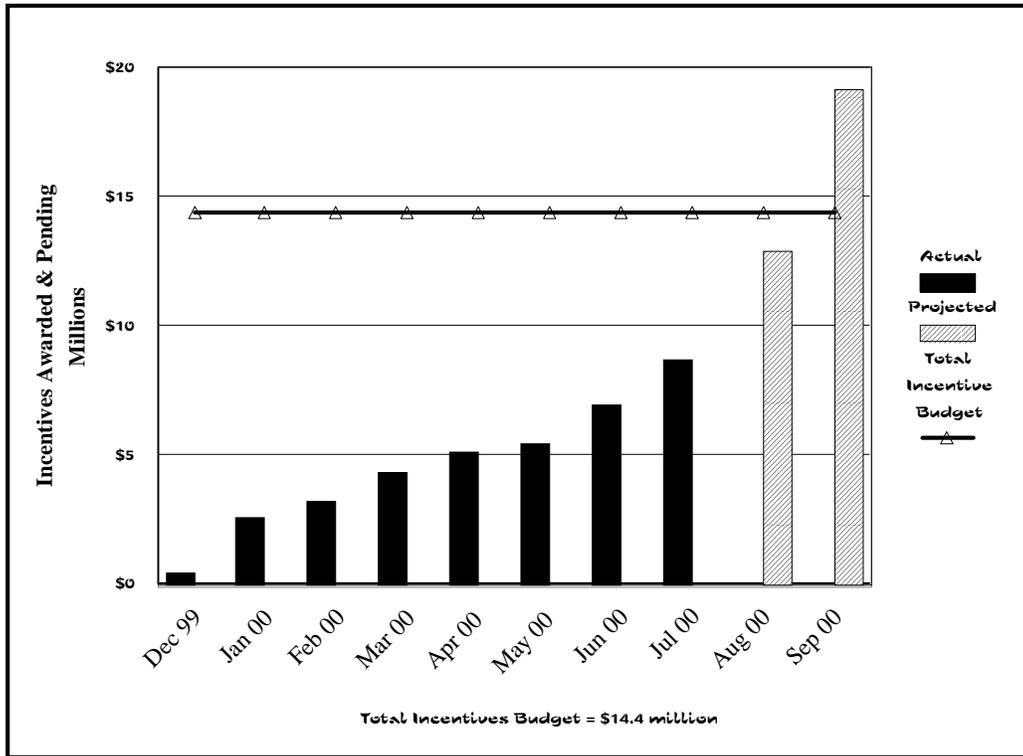
In the first 10 months of the program (through June 2000), a total of 138 eligible project applications were received for \$7.2 million. These applications represent nearly 17.2 million square feet of commercial building space. The 138 applications include 90 custom measure projects and 30 whole building design projects. This represents about 65% of the program's 140 custom measure project goal, and 78% of the 38 whole building design project goal. If program activity continues at its current pace, then the program will likely well-exceed its goal in the area of whole-building design. The 138 eligible applications are currently at various stages in the project approval process. As of June 30, 2000, 46 of the applicants had received technical assistance worth over \$595,913, and incentive awards totaling \$2.8 million had been made to 27 of the 138 applicants. The 27 projects are expected to achieve electric savings of 7.8 million kWh.

Figure 6-5 shows the actual and projected dollar value of incentive applications by month for the New Construction program. The projection is based on the exponential average percentage increase in the dollar value of incentive applications per month through July 2000. Given this projection, the program will likely receive applications for its entire incentive budget by the end of the year. For more detailed information on the New Construction program see the case study in Section 7 of this report.

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<sup>6</sup> A total of \$2.5 million was added to the original incentives during the reallocation of Standard Performance Contract program funds.

**FIGURE 6-5: Actual and Projected Dollar Value of Incentive Applications**



### Premium Efficiency Motors Program

The Premium Efficiency Motors program is designed to induce lasting structural change in the motors market resulting in increased use of Consortium for Energy Efficiency (CEE)-qualified premium efficiency motors in commercial buildings, institutions, industries, and municipal applications. The goal is to increase the market share of CEE-qualified premium efficiency motors by 10%. A total of \$645,000 in vendor incentives are available for the sale of approximately 8,000 qualifying motors over three years.

NYSERDA issued a competitive solicitation (RFP 452-98) in September 1998 to hire a vendor assistance contractor to help interested vendors complete the program applications, to market the program, and to provide training and information to participants. Honeywell DMC Services, Incorporated (Honeywell) was selected as a result of this solicitation and began work in May 1999. NYSERDA also participated in the *Northeast Premium Motor Initiative Market Baseline and Transformation Assessment*<sup>7</sup> to inform program development and implementation.

<sup>7</sup> Easton Consultants, Inc. and Xenergy, Inc. *Northeast Premium Motor Initiative Market Baseline and Transformation Assessment*. August 17, 1999.

Incentives totaling \$350,000, were available to vendors in the first year of the program (September 1998) through PON 451-98. The year-one incentive offering, scheduled to close in June 1999, was extended until November 1999 to give interested vendors adequate time to participate in the program with assistance from Honeywell. In total, 18 vendor applications were received. Seventeen vendor applications (representing 72 individual shops) were approved for participation. The reported annual sales of the 17 participating vendors was nearly one-half of the total motor sales in New York's SBC program area (24,176 of the 50,000-motor market). The total year-one sales performance goal for participating vendors was about 3,200 premium efficiency motors.<sup>8</sup> By the end of year one, 242 qualifying motors were sold.<sup>9</sup> Therefore, only about 7% of the year-one sales performance goal was realized. A total of \$9,680 (2.8%) of the \$350,000 in year-one incentives were paid. About 53% of the 17 participating vendors were "active" (actually requesting incentives for motor sales) in year-one.

Based on slower than expected sales in year-one, NYSERDA made several modifications to the program to stimulate greater vendor and customer response (in this second round of incentives). Changes in year-two include:

- Streamlining the application requirements.
- Offering additional funding to vendors in the form of a voucher worth up to \$600 to cover the full or partial cost of a qualifying motor installed in a customer's facility for every 15 qualified motors sold by the vendor.
- Enhancing marketing to customers.
- Providing greater interaction with contractors who sell motors to state agencies.
- Coordinating the delivery of the Premium Efficiency Motors program with NYSERDA's FlexTech, New Construction, and Loan programs.

The year-two incentives were originally expected to be \$430,000. However, \$206,000 in remaining year-one funds that had not been set aside for participating vendors were added to the year-two offering, bringing the total to approximately \$636,000. The \$636,000 in year-two incentives can support a maximum of 7,950 motors.

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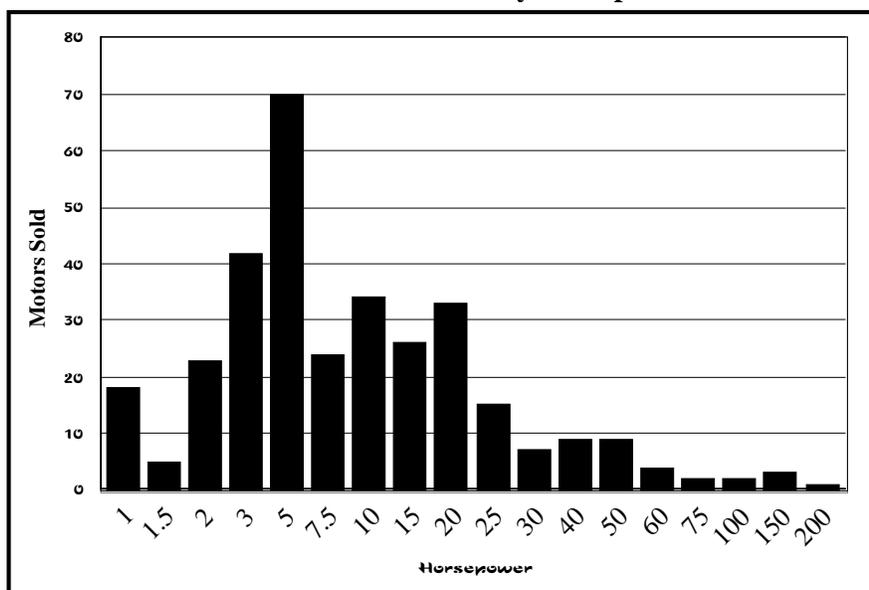
<sup>8</sup> As part of their program application, participating vendors are asked to set a sales performance goal for the number of CEE-qualified premium-efficiency motors they will sell by the stated deadline. The sales performance goal must be at least 10% of the vendor's previous year's sales. In year one, vendor sales performance goals amounted to 13% of the 24,176 motors they sold in the previous year.

<sup>9</sup> Year one motors had to be sold by March 31, 2000.

Vendors who participated in the first year have the opportunity to participate again in year-two.<sup>10</sup> Year-two funding was made available in February 2000. As of June 30, 2000, 14 of the vendors participating in year one have re-applied, and six new vendors have applied and been approved. In total, 20 vendors are signed-on for the second round, with a sales performance goal of 4,100 motors. These 20 vendors represent over 80 individual shops. Thus far, the vendor response to year two shows improvement over year one. Currently, there are 20 participating vendors nearly five months into the year-two offering, whereas it took nearly eight months to sign-on only nine vendors in year one. As of June 30, 2000, 85 motors were sold in year two, and \$3,400 in incentives were paid. To date, three vendors have requested and received voucher coupons for a total value of up to \$2,400 (at up to \$600 each).

To date, the Premium Efficiency Motors program has fostered the sale of 327 CEE-qualified motors. As indicated in Figure 6-6, almost 90% of the motors sold are 25 horsepower or less. The electric savings expected from use of the 327 premium efficiency motors is nearly 205,000 kWh annually.

**FIGURE 6-6: Motor Sales Distribution by Horsepower**

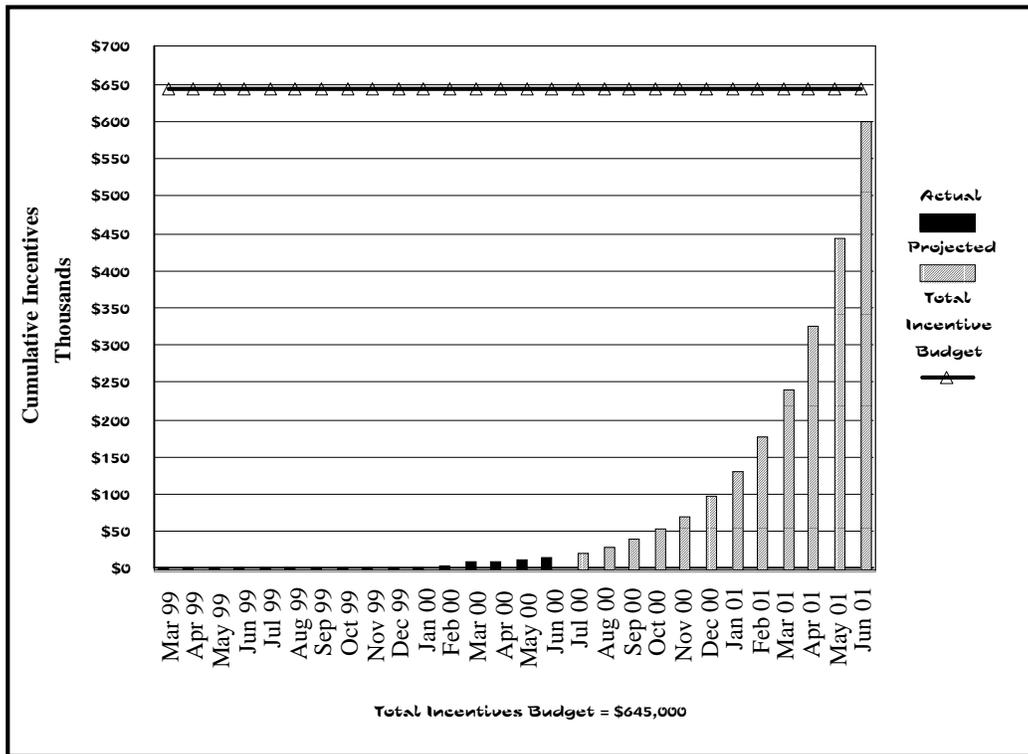


The dollar value of motor incentives paid to date and projected through the end of

the program by month is shown in Figure 6-7. As noted earlier, NYSERDA is gaining experience with the increased incentive levels for the second program year. The data presented in Figure 6-7 accounts for changes in incentive levels for the second year by including the maximum dollar value of vouchers provided during May and June 2000. Based on this projection, the Premium Efficiency Motors program is expected to pay approximately \$600,000, or 93% of its total incentive budget, by June 2001. For more detailed information on the Premium Efficiency Motors program, refer to the case study in Section 7 of this report.

<sup>10</sup> The year-one vendors who choose to re-up agreements are permitted to use the sales information they documented for their year-one applications in the year-two application.

**FIGURE 6-7: Actual and Projected Incentives by Month Through Program End**



### Small Commercial Lighting Program

The Small Commercial Lighting program is designed to demonstrate how high-quality energy-efficient lighting services can enhance business opportunities and improve practices for lighting suppliers, electrical contractors, and retailers. The \$3.8 million program serves small to medium-sized commercial spaces, less than 10,000 square feet. The program seeks to:

- Increase electrical contractor, lighting supplier, and retailer knowledge on high-quality energy-efficient lighting;
- Increase the availability of customer promotional materials on high-quality energy-efficient commercial lighting;
- Influence lighting decisions for approximately 15 million square feet of commercial building space; and
- Save 42,230 megawatt hours of electricity annually.

The program began in March 2000, with prime contractor ICF Consulting, and subcontractors Opinion Dynamics Corporation (ODC), the Lighting Research Center, Consolidated Edison Company of New

York, Inc., and Honeywell DMC Services. The contracted team is designing and implementing a program that integrates high-quality energy-efficient lighting (at least 10% more efficient than ASHRAE 90.1-99 and addressing quality issues such as reduced glare, ease of use, and affects on worker fatigue and productivity) guidelines into the practices of electrical contractors, lighting suppliers, and retailers.

The program began with an extensive market research baseline effort and pilot projects to test various methods of influencing lighting design. The market baseline study is now complete. ODC conducted focus groups, in-depth interviews, quantitative surveys, and secondary research as part of this effort. Through this research, ODC verified the major premises NYSERDA used to structure the program. In addition ODC found that architects, engineers, and lighting designers provide lighting design services some of the time in small- and medium-commercial projects and should be included among the targeted market participants. ODC also found that while the small commercial customers reacted favorably to the benefits associated with quality lighting, they wanted to see proof that these benefits were real.

Two pilot projects are currently underway. One pilot is taking place at a community care physicians office in Saratoga Springs, NY. The project upgraded the lighting in 2000 square feet of the space that included exam rooms, offices, laboratory and treatment rooms, a waiting room, and a reception room. The existing lighting, although fairly new, was inadequate, poorly distributed, and generally not well designed. To create a project baseline, an evaluation of existing lighting conditions (energy use, user acceptance, etc.) was conducted. The project team met with the contractor and building manager, provided training on effective, energy-efficient lighting, and reviewed design concepts, fixture selections, and control strategies and made recommendations on improvements. The installation is 95% complete. Light levels have increased by 16% while reducing wattage by 16%. The project team will be creating a DELTA Portfolio case study publication of the project. Additionally, the contractor is using the program design guidelines for the lighting in the remainder of the building. The physician's practice is also planning to construct a new building and the project team has made initial contact with the developer of that site to discuss lighting issues.

The second pilot is taking place at P&M Diesel, a commercial diesel repair shop located in the greater Syracuse area. The owner was considering increasing the lighting levels because the existing lighting system was inadequate, averaging 10-20 footcandles where 50 footcandles would be the recommended level. The system consisted of twenty-five 400-watt metal halide low bay fixtures. The project team conducted a site visit to assess existing lighting system, and provided design recommendations and training to the contractor and lighting supplier. Both the contractor and lighting supplier, Doug's Electric and Solvay Supply, were enthusiastic about the project and participated in the assessment, design, and cost proposal. The project specified replacing the existing fixtures with forty-two 320-watt Pulse Start metal halide fixtures and adding twenty-four 4-foot T-8 electronically ballasted fluorescent fixtures for task lighting. Materials were ordered and delivered to Solvay Supply. The installation was scheduled

for completion by August, however, the start of the installation work has been delayed.

### **Commercial HVAC Program**

The Commercial HVAC program is designed to increase the availability, promotion, sale, and long-term performance of energy-efficient commercial or industrial heating, ventilation, and air conditioning (HVAC) products and services. The program is expected to result in an estimated 6,000 mWh in energy savings annually.

In November 1999, NYSERDA issued a \$1.7 million competitive solicitation to fund three to five turnkey projects focusing on energy-efficient commercial or industrial HVAC equipment and services. Projects could focus on aggregated procurement, increasing product availability and promotion, improving installation practices, and commissioning. Eleven proposals totaling \$4.2 million were received and reviewed by a Technical Evaluation Panel in February 2000. Three projects were recommended for funding.

One project with the American Council for an Energy-Efficient Economy (ACEEE) is designed to reduce barriers to commissioning in New York State. ACEEE will implement a program that includes education and technical assistance for both the purchasers and providers of commissioning services. Purchasers will be provided with introductory workshops, a variety of printed materials, and technical assistance to help them learn about the benefits of commissioning. Providers will receive hands-on technical training on commissioning processes. A kick-off meeting was held for this project in June 2000. One of ACEEE's first tasks is to carry out a baseline study on commissioning practices for large (defined for this project as greater than 100,000 square feet of floor area) public and private sector commercial and institutional buildings.

Contract negotiations have begun on the other two projects. Work is expected to begin in July 2000, with these two contractors working together on their first task to conduct a baseline assessment of the unitary HVAC market. These other two projects both target unitary air conditioning equipment. One aims to increase the penetration of commercial high-efficiency unitary (packaged) air conditioners by: (1) informing decision-makers on the benefits and cost-effectiveness of high-efficiency units; (2) promoting the sale of high-efficiency units; and (3) lowering the price by organizing group purchases. This project will reach out to architecture and engineering firms, energy service companies, building owners and managers, and state and local procurement officials. Proposed activities include: producing and disseminating a variety of materials to highlight high efficiency equipment performance and benefits; offering workshops on applying design and analysis principles to high-efficiency equipment; developing a web site to help equipment buyers make more informed purchases; and approaching purchasing decision makers to participate in aggregated purchases.

The other project will develop and offer training and marketing support services that promote high efficiency packaged air conditioning equipment, improved packaged equipment installation practices, and broader use of commissioning procedures. This project primarily targets HVAC distributors and contractors and aims to furnish contractors with tools to market and deliver HVAC efficiency services; convince contractors that investment in developing capabilities to deliver these services is worthwhile; and provide marketing support to those contractors who promote energy efficiency. Additionally, the project will offer training to increase customer knowledge about HVAC efficiency products and services, enhance understanding of the value of these goods and services; and provide customers with the tools and guidelines they need to make informed purchases of energy-efficient products and services.

These projects will tie into other appropriate **New York Energy \$mart<sup>SM</sup>** programs and national activities. Together, these projects allow NYSERDA to offer a comprehensive program promoting high efficiency unitary air conditioning equipment that reaches all decision makers in the market.

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

The goal of the **New York Energy \$mart<sup>SM</sup>** Loan Fund is to increase awareness among loan officers of a client's ability to repay loans from the energy savings resulting from energy efficiency and renewable energy projects. The program is designed to expand the list of criteria used by lending institutions in approving loans to include projected savings from energy efficiency projects. The program targets smaller projects, offering loans up to \$500,000. By providing loan interest reductions on loan amounts up to \$500,000 for up to five years, the program is expected to leverage \$8.8 million in private sector investment in energy efficiency and renewables projects. Many pre-qualified energy efficiency improvements are eligible under this program, including: heat pumps; water heaters; windows; insulation; lighting; motors; and appliances. Custom projects, which have a payback of 10 years or less, are permitted and approved on a project-by-project basis. Process measures and renewable energy projects are also eligible. The three-year cumulative program energy savings are expected to be approximately 325,000 mWh.

Prior to program implementation, NYSERDA completed a baseline study of lending practices. Approximately 577 surveys were mailed to lenders in New York State and 49 responses (8.5%) were obtained. When asked if their lending institution ever considers the energy efficiency of capital improvements being financed by their loans, about 41% of the lenders that responded indicated that they did. On average, the lenders who said they consider the energy efficiency of capital improvements do so on about 6.5% of their total loans. In depth interviews are also planned for a subset of lenders participating in the Loan Fund program.

In September 1999, NYSERDA contracted with Hamilton, Rabinovitz & Alschuler, Inc. for program

development and marketing services. The program operations manual and application forms have been developed. On January 10, 2000 NYSERDA began soliciting applications from interested lenders and borrowers through PON 504-99. Applications will be accepted through June 30, 2001. To date 12 lender agreements have been executed. Before applying to the program, interested borrowers must already have a loan commitment from participating lenders. Thus far, six borrower applications have been received, and four of them have been approved with loan amounts of approximately \$50,000 in total. The two other borrower applications are being reviewed.

NYSERDA issued an additional solicitation (RFP 488-99) for targeted promotional assistance for **New York Energy \$mart<sup>SM</sup>** energy efficiency programs. As a result, six contractors were awarded \$174,000. The first meeting with contractors was held on March 28, 2000. These contractors will be assisting NYSERDA in promoting program services by providing customer outreach, workshops, and referrals to the Loan Fund and other SBC-funded programs.<sup>11</sup> As these contractors increase their targeted outreach efforts, the number of lender and borrower applications to the Loan Fund are expected to increase.

### **Loan Fund Multifamily Building Demonstration**

The Loan Fund Multifamily Building Demonstration is intended to increase lenders' use of projected savings from energy efficiency projects as a consideration in approving loans. This program will develop a template for financing energy efficiency improvements in multifamily buildings by implementing pilot demonstrations in approximately 20 buildings. Guaranteed loans will be offered for energy efficiency improvements in publicly-assisted and other hard-to-finance housing. Total program funding is \$1 million.

NYSERDA issued an RFP in August 1999 to select a contractor to assist in program development and management, and act as a lender. The contractor will develop forms and guidelines, market the program, and originate and underwrite loans for improvements in up to 20 buildings. A contract was signed with the Low-Income Housing Fund on June 19, 2000 and work has commenced.

### **Innovative Opportunities: Commercial and Industrial**

The Commercial and Industrial Innovative Opportunities program is intended to influence the behavior of market participants at all levels to increase the availability, promotion, and sale of energy-efficient products and services not addressed through NYSERDA's other market transformation programs. Five projects, totaling approximately \$1.5 million, are being implemented under the first program round.

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<sup>11</sup> The Targeted Outreach effort supports the **New York Energy \$mart<sup>SM</sup>** Loan Fund, as well as the New Construction and Technical Assistance programs.

Each of these projects is described briefly below.

Project on Energy Efficiency and Property Valuation. This project will develop and implement strategies to promote energy efficiency as a component of property valuation. The target audience is appraisers and commercial property investors. The project was initiated on December 13, 1999, and a market assessment of property valuation practices has been completed. A total of 1,000 written questionnaires were mailed to appraisers in October 1999, with 114 completed surveys received (a response rate of approximately 13%). Approximately 25% of respondents said that energy saving technologies rarely or never affect commercial property valuation, 45% said these technologies sometimes affect value, and 30% said that energy-saving technology affects valuation often or always. Results indicate that insulation levels, heating ventilation and air-conditioning (HVAC) equipment, and windows were the most frequently cited energy-saving technologies or building materials considered in property valuation. The development of recommendations and guidelines for energy reporting in property valuation is in progress.

Transforming Commercial, Industrial, and Institutional Buildings with GeoExchange. This project seeks to increase the use of geothermal heat pumps by providing strategic outreach and design assistance to commercial, industrial, and institutional customers. The project will provide technical workshops to architects, engineers, drillers, appraisers and other market influence groups. The project contractor has modified their national design assistance program and marketing materials to meet New York's needs. The project started in November 1999. To date, the contractor has completed two technical workshops with about 35 attendees in total. A total of 18 design assistance applications have been received, and 17 have been approved for participation in this project. To date, 13 of the approved design assistance studies have been completed. The 13 participants were awarded \$30,500 for these studies. The 13 recommended geothermal heat pumps will cost approximately \$31.4 million to implement, and gas and oil savings are expected to amount to 135,175 mmBtu if all of the heat pumps are installed. Experience with NYSERDA's technical assistance programs indicates that approximately two-thirds of customers will actually implement the recommended measures. Therefore, the savings from the 13 completed studies is expected to be closer to 90,567 mmBtu.

Assisting Energy Service Companies (ESCOs) to Improve Lighting Quality and Efficiency. This project seeks to promote energy-efficient lighting upgrades (in schools, healthcare, and commercial office buildings) as part of ESCO performance contracts. The project was initiated in mid-January 2000. The first project task, to conduct a market and needs assessment, is nearing completion. Following this, the contractor will begin a customer information and outreach campaign and conduct training sessions for ESCO personnel on lighting.

### Increasing New York State Market Awareness and Demand for Energy-Efficient LED Traffic Signals.

This project is designed to develop market demand for single-color LED retrofits and for the new, fully-integrated three-color signal products. The project was initiated in February 2000. Initial tasks include assessing product availability; reliability; current installations; market structure; developing performance and purchasing specifications; and developing outreach materials.

Energy and Environmentally Sensitive Schools. This project will develop and implement strategies to increase energy efficiency in schools. The major tasks include: conducting school surveys for purposes of market assessment and identifying those most in need of assistance; designing program materials for marketing, recruiting, and energy analysis in schools; and conducting intensive outreach to analyze the 100 New York State schools most in need of energy efficiency measures, and recommend alternatives to improve efficiency. The project began in September 1999. The *New York Energy \$mart<sup>SM</sup> Schools Market Assessment*<sup>12</sup> is now complete. This report entailed a detailed survey of 214 public and private schools of various types (pre-school to adult learning center) in the service territories of Central Hudson Gas & Electric Corporation (CHG&E), Consolidated Edison Company of New York, Inc. (ConEd), Niagara Mohawk Power Corporation (NMPC), New York State Electric & Gas Corporation (NYSEG) and Orange and Rockland Utilities, Inc. (O&R). Results indicate that close to one-half of the school buildings are more than 50 years old. Natural gas was the most common heating fuel in these schools. Over one-third of schools indicated that they did not specifically track their energy costs. When asked to rate their barriers to addressing energy and air quality needs, schools rated lack of money for improvements as the largest barrier. In terms of specific types of assistance, schools were most interested in a means of reducing bills, rate analysis, air quality and standardized guidelines for efficiency. Now that the market assessment has been completed, the outreach portion of this project has commenced.

In November 1999, NYSERDA offered a second round of the Innovative Opportunities Commercial and Industrial program. Seven proposals were received under PON 500-99. NYSERDA expects to fund four of these projects for a total of \$1.12 million. Contract negotiations are underway and work on round two projects will commence in July 2000.

### **Residential Appliances and Lighting and ENERGY STAR<sup>®</sup> Public Awareness**

The Residential Appliances and Lighting, and ENERGY STAR<sup>®</sup> Public Awareness programs work in tandem to increase awareness and understanding of the ENERGY STAR<sup>®</sup> logo and increase sales of qualifying products. The Residential Appliances and Lighting program focuses on mid-stream market actors, including retailers, remodelers, multifamily building owners, and manufactured home dealers, in

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<sup>12</sup> RLW Analytics. *New York Energy \$mart<sup>SM</sup> Schools Market Assessment*. June 7, 2000.

an effort to improve stocking, promotion, and sales of ENERGY STAR® products.<sup>13</sup> This program seeks to achieve a three-percent increase in market penetration rates of ENERGY STAR® appliances, lighting, and home electronics products over its two-year duration. The Appliance and Lighting program is funded at \$8.5 million.<sup>14</sup> The ENERGY STAR® Public Awareness program targets end-use consumers through a multi-media campaign intended to increase awareness and understanding of the ENERGY STAR® logo, and sales of these products. This program is funded at \$8.3 million.<sup>15</sup> Through the joint effort of these two programs, NYSERDA seeks to permanently transform the market for ENERGY STAR® products.<sup>16</sup>

The Residential Appliances and Lighting program began in February 1999 when NYSERDA awarded \$3 million, through a competitive solicitation, to Aspen Systems Corporation for program design and implementation. By June 1999, Aspen had completed its Phase I program design activities. Phase II then began with the collection of market baseline data through an August 1999 consumer mail survey to 23,000 New York households assessing awareness and understanding of the ENERGY STAR® logo, and purchasing of these products.<sup>17</sup> Results of the baseline and one follow-up survey are summarized later.

Once program design and baseline research were completed, Aspen began full-scale program implementation. Program implementation activities to date include:

- Recruiting, training and supporting New York ENERGY STAR® partners;
- Providing in-store sales assistance, including labels and point-of-purchase displays, to partners; and
- Developing and implementing a \$3 million incentive program for New York ENERGY STAR® retail partners, multifamily building owners, remodelers, and manufacturers.

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<sup>13</sup> A total of 15 appliances, lighting and home electronics products are targeted under this program. They are ENERGY STAR® refrigerators, dishwashers, clothes washers, room air conditioners, compact fluorescent lights (CFL's), suspended lighting fixtures, portable fixtures, ceiling mounted fixtures, wall mounted fixtures, recessed fixtures, exterior fixtures, cabinet integrated fixtures, televisions (TVs), video cassette recorders (VCRs), and combination TV/VCR units.

<sup>14</sup> Original program funding of \$6 million was supplemented with \$2.5 million during the reallocation of Standard Performance Contract program funding. The additional funding will support the electric equipment bounty on old air conditioners which has been added to the program.

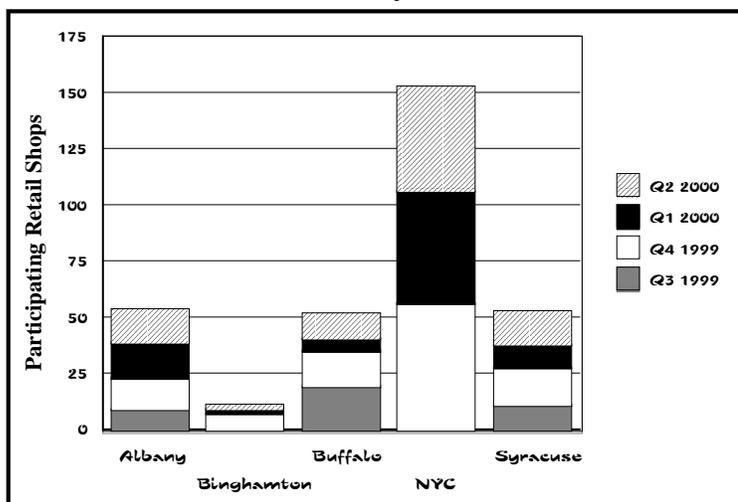
<sup>15</sup> Original program funding of \$5.8 million was supplemented with \$2.5 million during the reallocation of Standard Performance Contract program funding.

<sup>16</sup> Other **New York Energy \$mart**<sup>SM</sup> programs, such as the Residential New Construction program and the Home Improvement Loan program, also support the effort to promote ENERGY STAR® products to the residential sector.

<sup>17</sup> A response rate of 11% was achieved.

As of June 30, 2000, 325 retail shops<sup>18</sup>, 48 contractors, and five manufacturers had become New York ENERGY STAR® partners. Partners are typically recruited when “circuit riders” hired by Aspen conduct in-person visits to explain the benefits of the program. From December 1999 through February 2000, an average of 38.7 retail recruits were made per month. Figure 6-8 shows the geographic distribution of retail shops recruited by quarter over the past year. New York City has the highest number of retail outlets. However, the Designated Market Areas (DMAs) of Albany, Buffalo, and Syracuse are also well-represented with nearly 50 outlets each. By June 30, 2000, nearly 13,815 point-of-purchase displays including posters, brochures, ENERGY STAR® labels,

**FIGURE 6-8: Retail Recruits by Location**



banners and videos were placed in these retail establishments. A total of \$81,141 in retailer incentives have been paid to date for cooperative advertising. It is estimated that the cooperative advertising incentives have leveraged about \$240,000 in additional investments in ENERGY STAR® advertising by retailers.<sup>19</sup> Efforts to recruit contractors, multifamily building owners and manufacturers are also well underway.

To assess the extent of market transformation, in-store measurements are being taken for several indicators including: the average percentage of displayed models that are ENERGY STAR® compliant, the average percentage of showroom display area devoted to ENERGY STAR® models, and the average percentage of ENERGY STAR® models that are actually labeled as such. Baseline measurements were taken by Aspen for these indicators in October 1999 and follow-up measurements were completed in April 2000. Baseline and follow-up measurements for these three key indicators are shown in Table 6-7. Given that it is still early in this market transformation program, results for the first two indicators (percent of displayed models that are ENERGY STAR®, and percent of showroom area given to ENERGY STAR®) are mixed. It is too early to ascertain program impacts on these two indicators since the difference between baseline and follow-up measurements is slight for most products. However, the program’s early assistance to retailers is making a difference in terms of ensuring that ENERGY STAR®

<sup>18</sup> Retail shops are not to be confused with retailers. Some retailers have multiple shops participating in the program.

<sup>19</sup> The cooperative advertising incentives average about 25% of total ENERGY STAR® ad costs.

qualifying products are labeled as such. The percentage of ENERGY STAR® models on display that are actually labeled increased significantly for 11 out of 15 products. The next round of in-store measurements will be taken in January 2001.

**TABLE 6-7: Baseline and Follow-up Measurements for Key Indicators**

Product	Average % of Displayed Models that are ENERGY STAR® Compliant		Average % Showroom Display Area Given to ENERGY STAR® Models		Average % of Displayed ENERGY STAR® Models that are Labeled as Such	
	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up
Refrigerators	13.5	11.4	15.4	14.1	1.4	70.8
Clothes Washers	16.4	16.1	14.7	19.3	1.7	59.9
Dishwashers	17.8	23.3	17.9	24.1	1.7	62.1
Room Air Conditioners	26.3	N/A <sup>(1)</sup>	25.0	N/A <sup>(1)</sup>	2.0	N/A <sup>(1)</sup>
CFLs	31.8	21.6	10.5	16.7	0.6	50.0
Suspended Light Fixture	0.0	0.0	0.4	0.0	0.0	0.0
Ceiling Light Fixture	4.4	0.9	2.7	0.4	1.2	91.6
Wall-Mounted Light Fixture	0.8	0.5	1.2	0.2	0.0	100.0
Recessed Light Fixture	0.6	0.0	1.8	0.0	0.0	0.0
Portable Light Fixture	0.6	5.0	1.2	4.8	0.0	100.0
Exterior Light Fixture	1.0	0.7	1.9	0.7	0.0	100.0
Cabinet-Integrated Fixture	0.0	0.0	0.0	0.0	0.0	0.0
TV	16.5	23.1	17.2	30.8	10.0	85.2
VCR	33.7	42.5	30.8	38.5	26.0	91.7
Combination TV/VCR	14.9	17.2	14.2	15.9	7.5	77.8

(1) This indicator is affected by seasonality. Since the baseline was conducted in late summer and the follow-up in early spring, a second same-season measurement is not yet available for air conditioners.

The ENERGY STAR® Public Awareness campaign began in May 1999 when NYSERDA contracted with DDB Needham, the Environmental Protection Agency’s contractor for the national ENERGY STAR® program. DDB Needham was hired to implement a multi-media consumer awareness campaign that leads to increased recognition and understanding of the ENERGY STAR® label and increased purchases of ENERGY STAR® products. DDB will receive up to \$1.5 million to provide these services. By working with this national contractor, NYSERDA was able to leverage over \$360,000 in advertisement production costs for the *Socket Boy* and *Lawnmower* public service announcements (PSAs). The multi-media awareness campaign was launched in August 1999 in the Buffalo DMA and has since been rolled-

out to all five DMAs.<sup>20</sup> The multi-media campaign includes community and promotional events; paid TV, radio and print ads; PSAs; and media relations which are discussed below.

By the end of June 2000, NYSERDA had promoted ENERGY STAR® at 83 community events, drawing over 1.7 million attendees in total. These events occurred in the Albany, Binghamton, Buffalo and Syracuse areas and consisted of sports promotions, fairs and festivals, and torchiere trade-ins. Three torchiere trade-ins held in the Buffalo area, resulted in 714 halogen lamps being removed from use.

Over this same time period, \$1.8 million in paid advertising resulted in nearly 15,700 ads being placed in various media, reaching approximately 6.8 million people.<sup>21</sup> Table 6-8 shows the cost of the paid ads by media type. To date, the majority of the funds allocated for paid advertising (64%) have been used to purchase television ads. To date, 26,617 ENERGY STAR® television and print PSAs have run. These PSAs are valued at more than \$514,161, and have obtained more than 43.6 million impressions.

**TABLE 6-8: Summary of Paid Advertising**

Type of Media	Number of Ads Purchased	Total Cost (\$)
Television	11,243	\$1,153,555
Radio	4,160	\$370,644
Print	30	\$195,706
Transit	193	\$41,243
Mall Kiosk	52	\$42,208
Yellow Pages	9	n/a
<b>TOTAL</b>	<b>15,687</b>	<b>\$1,803,356</b>

DDB Needham also works to maintain relations with the local media in each DMA.

Additional leveraging occurs when the local media runs a television, radio, or print story on the ENERGY STAR® campaign. Media relations have resulted in 21 television stories, 17 radio stories, and 38 print stories. Table 6-9 shows the distribution and dollar value of these stories by DMA.

**TABLE 6-9: Summary of Media Relations**

DMA	Television Stories	Radio Stories	Print Stories	Dollar Value Leveraged
Albany	1	0	6	\$51,163
Binghamton	7	0	0	\$4,474
Buffalo	12	16	6	\$87,704
New York City	0	0	8	\$2,542
Syracuse	1	1	3	\$15,049
Non-DMA	0	0	15	\$22,408
<b>TOTAL</b>	<b>21</b>	<b>17</b>	<b>38</b>	<b>\$183,340</b>

<sup>20</sup> Paid advertising is not planned in the New York City DMA. However, promotional events and Public Service Announcements are run in New York City.

<sup>21</sup> Each person will likely be reached multiple times.

One key indicator of progress and market transformation on the consumer side is change in awareness and knowledge. A baseline consumer mail survey conducted by Aspen indicated that about 34% of consumers were aware of ENERGY STAR®, and 57% of those consumers aware of the ENERGY STAR® logo understood its meaning prior to the launch of the program. A second random mail survey was recently completed. These results indicated that 35.4% of consumers are now aware of ENERGY STAR® and 73.5% of those who are aware now understand its meaning. The next consumer mail survey will be conducted in January 2001.

Increased calls to the ENERGY STAR® hotline and website hits are another indication that consumers are becoming aware and seeking information on ENERGY STAR® products. These indicators are being tracked quarterly to assess changes in awareness and information sought. During the first quarter of tracking (the 4<sup>th</sup> quarter of 1999), there were 411 calls to the ENERGY STAR® hotline and over 200 hits to the website. As of June 30, 2000, there have been over 1,100 calls and nearly 1,100 website hits. While the number of calls per quarter have remained steady at around 400, the number of website hits have increased from the initial 200 hits per quarter to over 650 hits.

Through its consumer mail survey, Aspen also measures consumer reported purchases (market share) of ENERGY STAR® products. The baseline measurement showed market shares of less than 10% for all covered products, except TVs and VCRs which had market shares of 17.6 and 11.2% respectively. The first follow-up measurement showed a significant increase in market shares, with shares increasing on all but one covered product, and approximately doubling for eight out of 15 products. The consumer reported increase in market share was used along with consumer reported appliance purchases in the covered geographic area to provide a preliminary estimate of appliance sales and electric savings resulting from these programs. The electric savings estimate of 13.9 million kWh per year includes refrigerators (44%), clothes washers (31.7%), dishwashers (1.4%), room air conditioners (7.3%), televisions (13.7%) and video cassette recorders (1.9%).<sup>22</sup>

A recent expansion of the Residential Appliances and Lighting program and ENERGY STAR® Public Awareness campaign is the Keep Cool program. The goal of this effort is to reduce peak demand by promoting and enabling the purchase of energy-efficient air conditioners. This program element will leverage the existing program activities and contractors. ENERGY STAR® qualifying room air conditioners are targeted. Residents and building owners have the opportunity to turn-in their old room air conditioners and receive a \$75 coupon good toward the purchase of an ENERGY STAR® room air conditioner. Old air conditioners will then be recycled and demanufactured.

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<sup>22</sup> Estimates of electric savings from other covered products are being compiled and will be included in future reporting. The estimate presented here will be revised as necessary once the next wave of consumer data are available.

For more detailed information on the Residential Appliances and Lighting program, including perspectives from participating retailers and contractors, refer to the case study in Section 7 of this report.

### **Home Improvement Loan Program**

The Home Improvement Loan program will provide unsecured loans to residential home owners for projects that incorporate ENERGY STAR® products and renewable energy technologies. By becoming a sponsor of the federal Fannie Mae Residential Energy Efficiency Financing Program, NYSERDA seeks to affect changes that increase customer eligibility by lowering interest rates and the credit threshold for which applicants will be approved, and by extending payment terms.

The Fannie Mae Residential Energy Efficiency Financing Program provides unsecured loans up to \$20,000 to single family homeowners for home improvements including energy efficiency measures. Under the Home Improvement Loan program, the Fannie Mae loan product will be offered to customers through qualified contractors. A total of \$2 million is available for this program, the majority of which will be used to buy-down or decrease the interest rate on Fannie Mae loans. Other options to customize the loan product in New York are being considered. In a soon to be released solicitation, NYSERDA will secure a Fannie Mae approved lender to help develop and implement the Home Improvement Loan program.

### **Residential New Construction**

The Residential New Construction program, also known as the New York ENERGY STAR® Homes program, will provide technical assistance and financial incentives to one- to four-family home builders to encourage the adoption of energy-efficient design features and the selection and installation of more energy-efficient equipment in new construction, and substantial renovation projects. The program is intended to implement and promote an enhanced ENERGY STAR® Homes program within the **New York Energy \$mart<sup>SM</sup>** program service area. Participating builders will be encouraged to build ENERGY STAR® Homes that use 30% less energy than that required by the Model Energy Code. This program will also incorporate ENERGY STAR® appliances and ventilation standards beyond the current national standard for an ENERGY STAR® home. The program will offer technical assistance to builders to help them assess the potential range of improvements available for specific projects. Total program funding is \$2.4 million.

An RFP was issued in April 2000, in the amount of \$250,000, to competitively select one contractor to provide program design and implementation services. These services will include: training, qualifying, and enrolling builders; marketing the program; and managing a \$2.15 million incentive program for

builders. NYSERDA received four proposals in response to the RFP. A Technical Evaluation Panel met in May 2000 to review proposals, and contract negotiations have commenced with one contractor. Work on this program has begun.

### **Residential Building Performance Market Enhancement Program**

The Residential Building Performance Market Enhancement program is designed to enhance the existing capacity for delivering energy efficiency services to existing one- to four-family residences. The program will foster consumer protection by training and qualifying mid-stream market participants, including building performance contractors, home energy raters, and contractors who provide energy efficiency services. Total program funding is \$7 million.

NYSERDA issued a competitive solicitation in December 1999 to hire one contractor to provide program design and implementation services including: establishing a baseline of the existing infrastructure for delivering energy efficiency services; designing a \$6.5 million incentive pool (aimed at contractors); establishing a qualifying process for contractors, raters, remodelers, and other midstream market actors; and implementing the program and collecting data. Three proposals were reviewed by a Technical Evaluation Panel in March 2000. A contract was signed with Conservation Services Group (CSG) in June 2000 and work has commenced.

### **Innovative Opportunities: Residential**

The Residential Innovative Opportunities program seeks to increase the availability, promotion, and sale of energy-efficient products and services not currently addressed through NYSERDA's other market transformation programs. This program is designed to influence the behavior of up-stream and mid-stream market participants and residential customers. Several of the individual projects are working to identify market barriers to energy efficiency and affordability, and recommend strategies to overcome them. Six projects, totaling \$816,000, are currently funded under this program, and described below.

Market Assessment of Coin-Operated Washing Machines in New York City. This market assessment will identify the market structure and energy efficiency of coin-operated washers in New York City, and recommend strategies for increasing the energy efficiency levels. This six-month market assessment project is nearing completion. A draft final report was received by NYSERDA in April 2000. The final report is expected to be issued shortly.

Residential Software Demonstration. This project will identify and demonstrate the market transforming effects of Personal Computer (PC) ownership and Internet access in the area of home energy efficiency. PC ownership and the Internet enable residential customers to conduct home energy analyses; obtain

information on energy use, electricity industry restructuring and efficiency; and directly purchase retrofit items through e-commerce. This project will develop and distribute on-line and CD-based software tools for home energy analysis. The CD-based software has been completed and distribution of 20,000 CDs is underway. The on-line web audit tool and the website are also operational as of June 2000.

Development of Dispute Resolution Procedures for Submetered Cooperatives. This project will research and develop alternative procedures for dispute resolution for sub-metered consumers with delinquent accounts. By developing appropriate procedures for reducing delinquent accounts, there will be less reluctance by cooperative members to install submetering in their buildings. This project will recommend and test procedures that appear most promising. The project advisory committee has been formed. A draft Dispute Resolution Manual has been provided to NYSERDA, with a final report expected in August 2000.

Policy Research on Submetering. Focusing on the needs of low- and moderate-income tenants, this project will examine the evolution of the New York State Public Service Commission regulations regarding the submetering of rental properties to discern the opportunities presented by the submetering of direct metered rental properties and the potential impact on public policy. This project will direct attention to the prospect of renters in multi-family buildings paying lower electric costs through submetering, and energy management and aggregation in the emerging competitive energy marketplace. The project began in December 1999. Since that time, project advisory committee meetings have been held and the survey research has been completed. A final project report is expected in August 2000.

Developing the Market for Whole-House Energy Services. This project will provide outreach and training that encourages contractors to offer whole-house energy services as a value-added service in the form of performance problem solving, problem avoidance, liability reduction, and energy efficiency for New York residences. The project will offer qualification, field training, and technical support to contractors. A contract was signed in January 2000, and work has commenced.

Increasing the Availability of Residential Building Science Training. This project will develop and disseminate residential building science curriculum and training to adults and high school students. This curriculum will consist of three to four adult classes and integration of building science into various existing high school vocational classes. Work commenced on the project in October 1999. The curriculum for the first class has been developed and dissemination began in March 2000. Curriculum development for the remaining classes is underway. The project is guided by a stakeholders advisory board which convened their second meeting in March 2000.

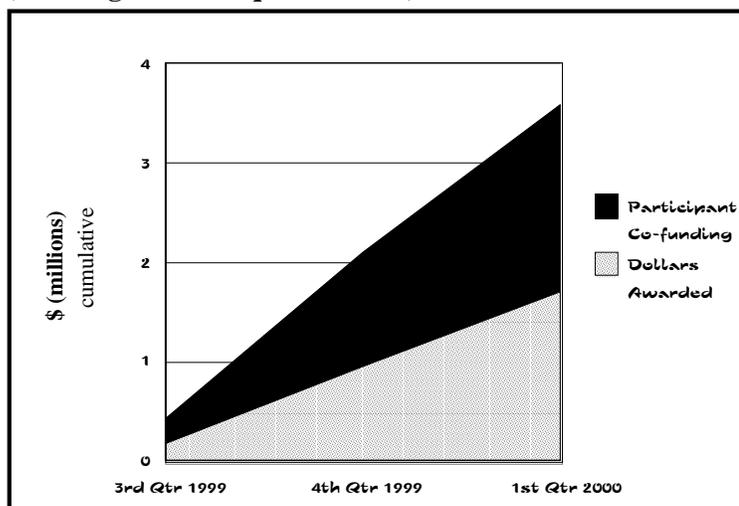
## TECHNICAL ASSISTANCE PROGRAMS

### Energy Feasibility Studies

The Energy Feasibility Studies program is designed to improve electrical efficiency by identifying and encouraging implementation of cost-effective, energy-efficient capital improvements. The program will help individual customers overcome barriers preventing them from implementing energy efficiency projects by providing technical information and expertise on a cost-shared basis. Up to \$3.2 million is available over three years for feasibility and technical assistance studies including guidance with industrial process improvements, waste minimization, and environmental performance. The program aims to sponsor 225 studies, identifying \$45 million in capital improvements and \$13 million in annual energy savings.<sup>23</sup>

The first round of program funding opened in August 1998. By November 1999, three rounds of program funding had been offered resulting in 90 applications received, with 78 approved. The 78 customers were awarded \$1,697,000. Total participant co-funding was \$1,892,374. Figure 6-9 shows the increase in total dollars awarded and participant co-funding by quarter through the first three rounds of the program.

**FIGURE 6-9: Dollars Awarded and Co-funding (unchanged for 2<sup>nd</sup> quarter 2000)**



Approximately 70% of program participants are from the business and institutional sectors, but participation from the government and multifamily sectors is also strong. Figure 6-10 shows how the 78 projects are distributed by sector. The fourth round of program funding is now open to applicants.

To date, four studies have been completed and \$71,888 in study costs have been paid. Approximately \$1 million in capital improvements and \$287,500 in potential energy savings have been identified. It is estimated that the 78 approved studies, once completed, will result in \$24 million in capital improvements and \$7 million in annual energy savings. The capital improvements and energy savings

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<sup>23</sup> Initial program targets (sponsor 225 studies with \$60 million in capital improvements and \$17 million in annual energy savings) were based on a FlexTech evaluation report entitled *FlexTech Final Evaluation*. Results from a subsequent FlexTech Evaluation Update indicate that the ratios of dollars in capital improvements and dollar value of energy savings identified to NYSERDA funds expended are 14:1 and 4:1 respectively.

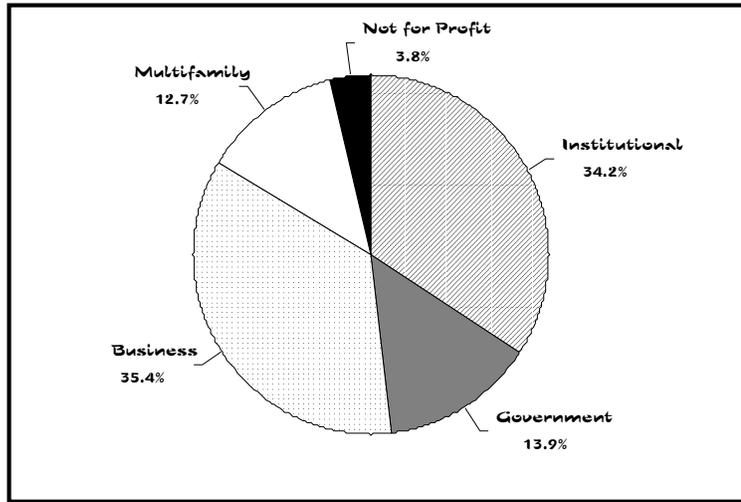
anticipated from the 78 projects are each just over 50% of the program's goal. A participant survey is planned for the program to assess the implementation rate of recommended improvements.

### Energy Operations Management

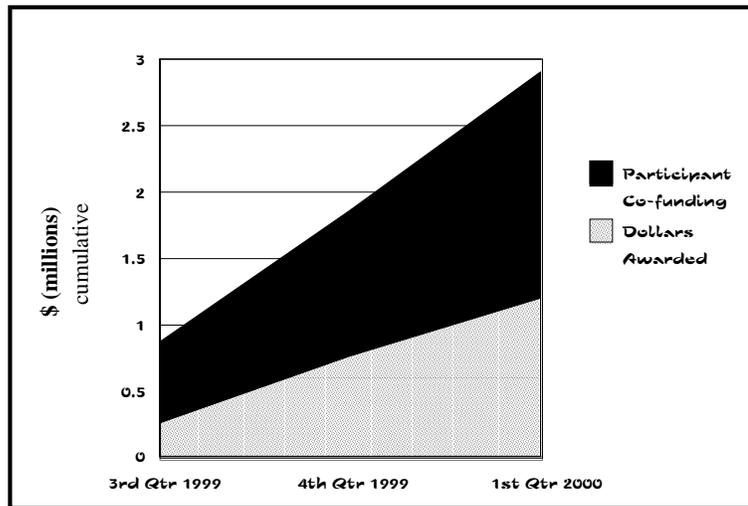
The Energy Operations Management program was designed to identify and encourage operational efficiency improvements through engineering analysis and on-site energy management services. Types of assistance eligible for funding include; development of baseline information on energy use, energy planning, facility staff outreach and training, and commissioning of existing systems. The program aims to sponsor 30 studies that identify \$4.4 million in annual energy savings.<sup>24</sup> The program is also working to increase the number of firms in the State providing energy operations management services. Nine firms were identified as providing these services at the beginning of the program.

The first round of program funding opened in August 1998. By November 1999, three rounds of program funding had been completed, resulting in 50 applications received, with 46 being approved. The 46 customers were awarded \$1,209,386. Total participant co-funding was \$1,703,498. Figure 6-11 shows the increase in total dollars awarded and participant co-funding through the first three rounds. Thus far, participation is strong in the institutional, commercial and industrial sectors. Figure 6-12 shows how the 46 projects are distributed by sector.

**FIGURE 6-10: Distribution of Projects by Sector**



**FIGURE 6-11: Dollars Awarded and Co-funding (unchanged for 2<sup>nd</sup> quarter 2000)**

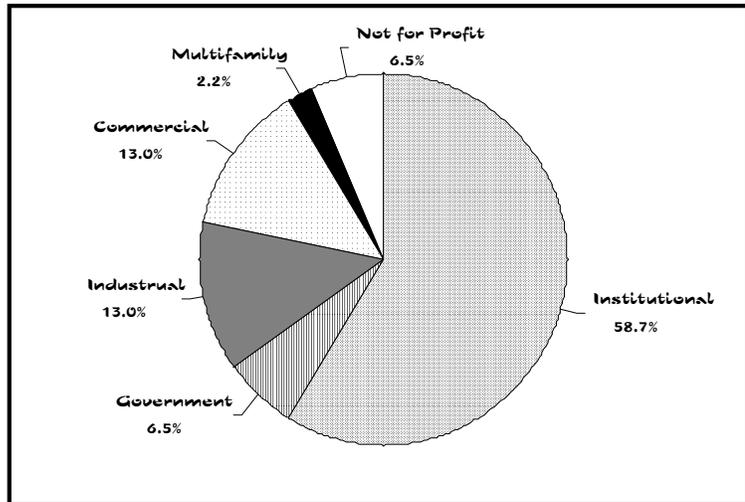


<sup>24</sup> Initial program targets (sponsor 30 studies with \$5.7 million in annual energy savings) were based on a FlexTech evaluation report entitled *FlexTech Final Evaluation*. Results from a subsequent FlexTech Evaluation Update indicate that the ratio of dollar value of energy savings identified to NYSERDA funds expended is 4:1.

Overall, the program has exceeded expectations in terms of the number of customers served. In just over one year, the initial goal of supporting 30 studies has been surpassed by about 50%. Given the success of the program and the need for these services, additional funding has been allocated, and a fourth round has just been completed.<sup>25</sup>

As of June 30, 2000, one study has been completed. It is estimated that once all 46 approved studies are complete, \$4.8 million in annual energy savings will have been identified. Therefore, in just the first year and a half of operation, the program has made award commitments which will lead to nearly 110% of the annual energy savings goal of \$4.4 million. A participant survey is planned for this program to assess the implementation rate of recommended improvements. For more detailed information on the Energy Operations Management program, refer to the case study in Section 7 of this report.

**FIGURE 6-12: Distribution of Projects by Sector**



### Rate Analysis and Aggregation

The Rate Analysis and Aggregation program provides analysis of electricity rates and consumption trends for customers. The analysis helps prepare customers to work with power marketers and energy service companies. The goal is to help customers purchase and use energy in a more cost-effective and efficient manner through a better understanding of their electricity use and purchase options. The program's goal is to sponsor 42 projects identifying \$2.4 million in electricity cost savings.<sup>26</sup> The program is also working to increase the number of identified rate analysis and aggregation service providers.

The first round of program funding opened in August 1998. By November 1999, three rounds of program funding had been offered, with 42 applications received and 38 approved. The 38 customers were awarded \$719,000. Total participant co-funding was \$787,000. Figure 6-13 shows the increase in

<sup>25</sup> Initial program funding of \$1.1 million was exceeded in round three. An additional \$800,000 was added during the reallocation of Standard Performance Contract program funds. Total program funding is now \$1.9 million, and expected annual energy savings to be identified from this amount are \$7.6 million.

<sup>26</sup> Initial program targets (sponsor 42 projects with \$3 million in annual energy savings) were based on a FlexTech evaluation report entitled *FlexTech Final Evaluation*. Results from a subsequent FlexTech Evaluation Update indicate that the ratio of dollar value of energy savings identified to NYSERDA funds expended is 4:1.

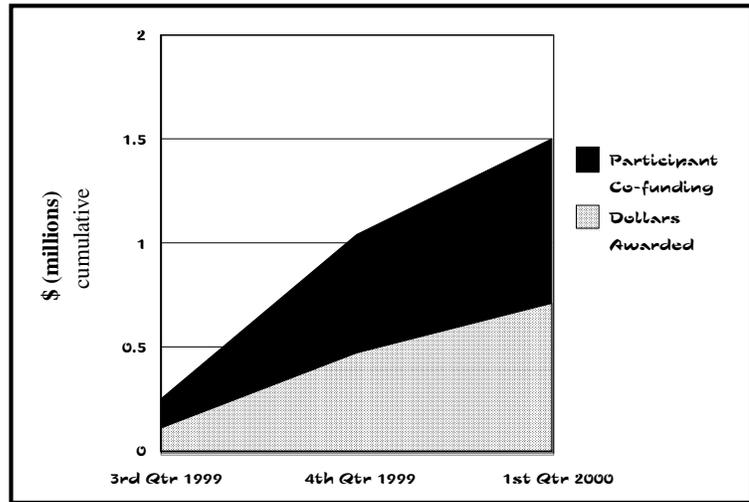
total dollars awarded and participant co-funding levels through the first three rounds of the program. For the first three rounds, institutional and business participation was strongest. Figure 6-14 shows how the 38 projects are distributed by sector.

To date, one study has been completed and \$22,215 in study costs have been paid. It is estimated that the 38 approved studies, once completed, will identify \$2.8 million in electricity savings in total. The program is well-positioned to exceed the goal of identifying \$2.4 million in electric savings in its three rounds of operation. Given the positive response to this program, additional funding has been added and a fourth round has just been completed.<sup>27</sup> A participant survey is planned for this program to assess the implementation rate of recommendations.

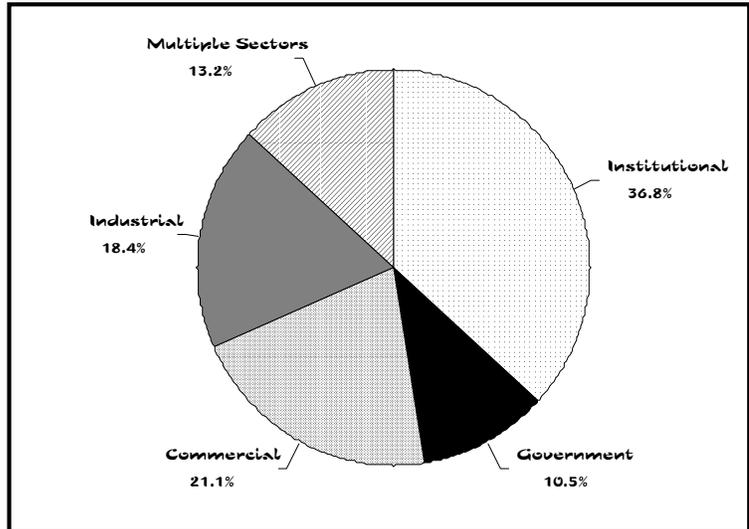
### Energy Audit Pilot

The Energy Audit Pilot is designed to assist small facilities (with less than \$100,000 in annual electric bills) by providing information for energy decisions, implementing energy efficiency strategies, and achieving energy performance goals. The program will fund approximately 300 energy audits and assist interested customers in becoming an ENERGY STAR® partner, and participating in other NYSERDA, New York State, and utility sponsored programs.

**FIGURE 6-13: Dollars Awarded and Co-funding (unchanged for 2<sup>nd</sup> quarter 2000)**



**FIGURE 6-14: Distribution of Projects by Sector**



<sup>27</sup> Initial program funding of \$600,000 was exceeded in round three. To meet round three needs and allow for a round four offering, \$400,000 was added to the program during the reallocation of Standard Performance Contract program funding. Total program funding is now \$1 million, and \$4 million in annual energy savings are expected to be identified at this funding level.

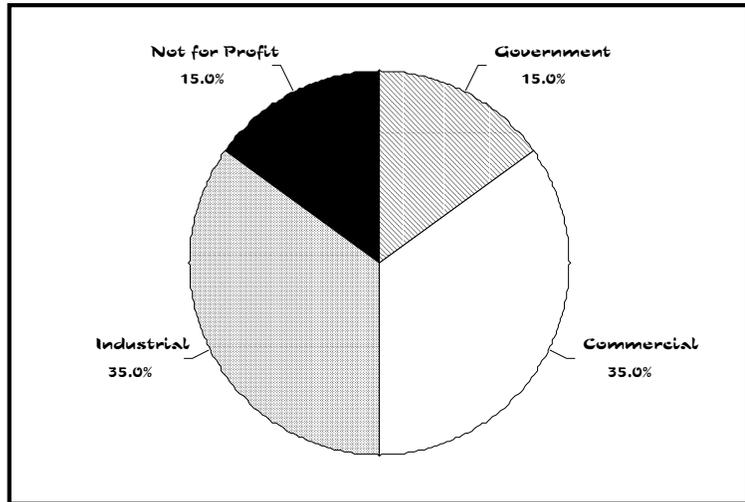
In March 1999, NYSERDA issued a competitive solicitation to hire a contractor to assist with program development, delivery, marketing, and evaluation. In December 1999, NYSERDA contracted with the Daylight Savings Company in the amount of \$297,620. In January 2000, the contractor started identifying customers and conducting audits.

To date, 64 applications have been received and 40 have been approved. The 40 projects represent 13% of the 300-audit goal, and will receive \$19,100 to contribute toward audit costs.

Thirty projects are located in the ConEd service territory, and the other ten projects are located in the CHG&E service territory.

Figure 6-15 shows how the 40 approved projects are distributed by sector. To date, the commercial and industrial customers are the most active participants in the program. Thirteen of the 40 audits have been completed.

**FIGURE 6-15: Distribution of Projects by Sector**



### **FlexTech**

The FlexTech program provides project managers at customer facilities with the information necessary to obtain management support and project financing for energy-efficient improvement measures. The program's goal is to sponsor 175 projects, identifying \$49 million in capital investments and \$14 million in energy savings.<sup>28</sup>

The FlexTech program is funded by \$3.5 million in SBC monies. FlexTech existed prior to the SBC program and is funded by other sources in addition to the **New York Energy Smart<sup>SM</sup>** program. Contractors are selected through a competitive process every three years. The most recent RFP in 1998 to select contractors anticipated the addition of **New York Energy Smart<sup>SM</sup>** to NYSERDA's programming and increased the number of service providers from 18 to 24.

To date, FlexTech has received a total of 164 applications associated with the **New York Energy**

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<sup>28</sup> Initial program targets (sponsor 175 projects with \$66 million in capital improvements and \$19 million in annual energy savings) were based on a FlexTech evaluation report entitled *FlexTech Final Evaluation*. Results from a subsequent FlexTech Evaluation Update indicate that the ratios of dollars in capital improvements and dollar value of energy savings identified to NYSERDA funds expended are 14:1 and 4:1 respectively.

**\$mart<sup>SM</sup>** program, representing 94% of the program’s 175-project goal. A total of \$1,848,800 in study costs have been awarded. Figure 6-16 shows the increase in total dollars awarded and participant co-funding.

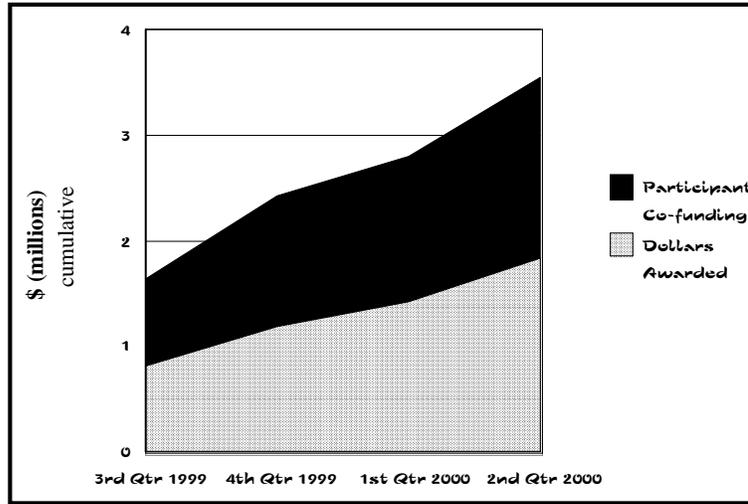
Thus far, all major customer sectors are participating in the program, with awards to the industrial, institutional, government and commercial sectors fairly well balanced. The distribution of the 164 projects by sector is provided in Figure 6-17. Thus far, 82 FlexTech projects have been completed, and \$928,000 in study costs paid.

**Cooling Recommissioning Program**

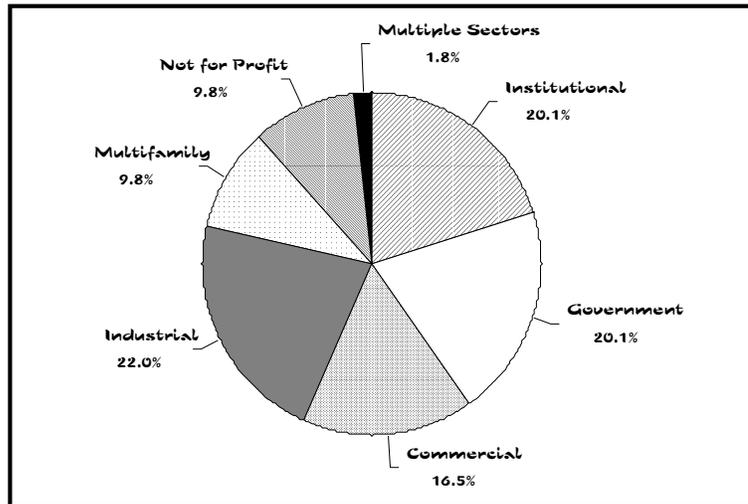
The \$3 million Cooling Recommissioning program was created in Spring 2000 to help commercial customers more effectively manage and shed load and address the high energy demand charges expected during the summer. Commercial cooling systems represent a major contributing factor to the summer peak load of the State’s utilities. During periods of high demand, customers with real time pricing will likely experience increases in utility bills affecting operating costs, cash flow, and profitability.

The Cooling Recommissioning program offers a three-phase approach to help customers reduce energy consumption and utility costs. In phase one, NYSERDA provides technical assistance on a cost-shared basis to identify load shedding/shifting opportunities and other strategies. All energy-consuming equipment is reviewed, with an emphasis on space cooling. NYSERDA will fund up to 80% of the technical assistance costs (up to a maximum of \$0.06 per square foot or \$100,000, whichever is less). Phase two, which must begin by mid-August 2000, involves customer implementation of the improvements identified in phase one. NYSERDA incentives cover up to 80% of the implementation

**FIGURE 6-16: Dollars Awarded and Co-funding**



**FIGURE 6-17: Distribution of Projects by Sector**



costs (at a maximum of \$0.10 per square foot or \$200,000, whichever is less). During phase three, project evaluation, an energy consultant returns to the facility to ensure that customers are receiving the summer peak load and energy consumption reductions expected. The Cooling Recommissioning program began in July 2000.

### **Residential Comprehensive Energy Management Services**

The Residential Comprehensive Energy Management Services program is designed to spur the acquisition and installation of sophisticated energy management and advanced metering systems and prepare the residential sector for aggregation. The program will provide incentives to owners of 3,000 single-family homes and 300 multi-family buildings to reduce the expense of advanced metering.

Advanced metering systems will provide data on actual energy use in numerous buildings that have installed energy efficiency measures under SBC-funded programs. The data will facilitate comparisons of actual energy use to projected use, allowing conclusions to be drawn regarding the reliability of projected savings and the availability of an income stream for debt service as a result of the energy efficiency installations. Use of monitoring systems is also expected to permit energy management interventions to remedy problems if actual use is not meeting projected use.

Total program funding of \$2.5 million will be split to provide \$500,000 for design and implementation services, and \$2 million for capital subsidies on qualifying equipment. NYSERDA released an RFP in March 2000 to hire a contractor with specific expertise in energy management hardware and advanced metering systems to provide design assistance and implementation services for the program. Five proposals were received and reviewed by a Technical Evaluation Panel on June 9, 2000. NYSERDA has entered into negotiations with one contractor and work is expected to begin shortly.

## **LOW-INCOME ENERGY AFFORDABILITY**

### **Low-Income Direct Installation**

The Low-Income Direct Installation program is intended to reduce the energy burden of low-income households and provide information and related services to the low-income community regarding energy use and efficiency. The program builds upon the existing infrastructure of the federal Weatherization Assistance Program (WAP) to offer electric reduction measures, including energy-efficient lighting, appliances, and electric-to-gas fuel conversions, to low-income customers. The program aims to serve approximately 4,700 units per year, or a total of about 9,400 units over the two-year program period, in the utility service territories of Central Hudson Gas & Electric Corporation, Consolidated Edison Company of New York, Inc., and Orange and Rockland Utilities, Inc.

Through the competitive solicitation process, NYSERDA awarded the Association for Energy Affordability (AEA) \$1.2 million in April 1999 for program design and implementation services. The program also includes approximately \$8.72 million for electric reduction measures. By October 1999, AEA had completed program design and began field implementation.

By June 30, 2000, program applications had been received for nearly 5,500 units in 494 buildings. The geographic distribution of program applications by type of dwelling is featured in Table 6-10. By this same date, (approximately eight months into field implementation), electric reduction measures were installed in more than 1,200 units. Of the units served, about 16% were in small homes, and 84% were in multifamily buildings.

**TABLE 6-10: Geographic Distribution of Program Applications (Units)**

	<b>Small Homes (1-4 unit)</b>	<b>Multifamily Buildings (&gt;4 units)</b>
Central Hudson	147	0
Con Ed	338	4,883
Orange & Rockland	63	40
<b>TOTAL</b>	<b>548</b>	<b>4,923</b>

The electric reduction measures installed consist of lighting and refrigerators. Table 6-11 indicates the number of measures installed in small homes and multifamily buildings. The number of units (or households) receiving the various measures, and the measure penetration rate are also shown in Table 6-11. In total, over 5,600 compact fluorescent lights (CFLs), 2,100 hard-wired lighting fixtures, and 1,000 refrigerators have been installed to date.

**TABLE 6-11: Measures Installed by June 30, 2000**

<b>Measure</b>	<b>Small Homes (1-4 unit)</b>			<b>Multifamily Buildings (&gt;4 units)</b>		
	<b>Number of Measures Installed</b>	<b>Units Served by Measures</b>	<b>Measure Penetration Rate</b>	<b>Number of Measures Installed</b>	<b>Units Served by Measures</b>	<b>Measure Penetration Rate</b>
Compact Fluorescent Lighting (CFLs)	1,724	200	8.6/unit	3,953	1,005	3.9/unit
Hard Wired Lighting (In Unit)	0	0	n/a	1,101	276	4/unit
Hard Wired Lighting (Common Area/Outdoor)	0	0	n/a	1,058	536	2/unit
Refrigerators	74	110	67%	1,012	2,037	50%

The total cost of the installed electric reduction measures is approximately \$1.13 million. This total cost is shared by the Direct Installation program, the Weatherization program, and building owners of low-income rental properties. The portion of measure costs from these various sources is illustrated in Figure 6-18. The Direct Installation program has funded the largest portion of measure costs to date, awarding approximately \$720,000 for these completed measures. The Direct Installation program support appears to be critical to fostering electric measure upgrades in buildings. In a recent survey of participating building owners, 50% of respondents said they would not have installed the common area electric measures in the next five years, and 70% of respondents said they would not have installed electric reduction measures in individual apartment units in the next five years.

**FIGURE 6-18: Funding of Installed Measures by Source**

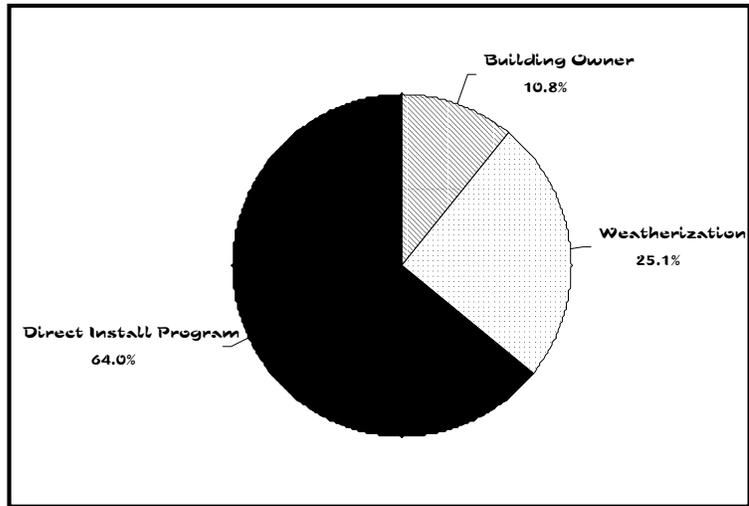
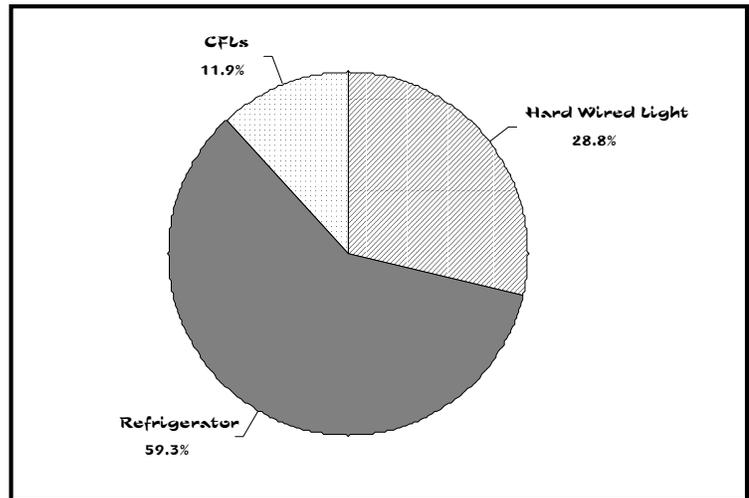


Figure 6-19 shows the distribution of Direct Installation program funding by installed measure. To date, the majority (nearly 60%) of program funds have provided for refrigerator installations. Also accounting for a large portion (29%) of Direct Installation program funding is hard-wired lighting which includes in-unit lighting, as well as common area and outdoor fixtures.

**FIGURE 6-19: Distribution of Direct Installation Program Funding of Completed Measures (Total = \$720,358)**



Total electric savings from completed measures are nearly 1.1 million kWh per year,<sup>29</sup> which equates to

<sup>29</sup> Electric savings are 515,892 kWh per year for refrigerators, 444,370 kWh per year for CFLs, and 119,744 kWh per year for hard-wired lighting fixtures. In some cases, the Direct Installation program not only replaces existing hard-wired fixtures with more efficient models, but also installs additional high-efficiency fixtures to improve building safety and security. The electric savings for hard-wired lighting fixtures are net savings.

annual cost savings of over \$170,000<sup>30</sup> for the buildings and households served. The savings per household are largely dependant upon the measures installed. In some households receiving new refrigerators, a 25 to 30% reduction in electric bills has been documented.<sup>31</sup> The non-energy benefits obtained as a result of new, more efficient lighting will also be measured for this program. Participant surveys (with low-income customers) will commence soon to assess the level of improvement to health, safety, and comfort resulting from lighting upgrades. For more detailed information on the Low-Income Direct Installation program, refer to the case study in Section 7 of this report.

### **Low-Income Aggregation**

The Low-Income Aggregation program seeks to improve energy affordability for low-income consumers by aggregating energy buyers to secure lower prices through bulk purchase of electricity, natural gas, fuel oil, and propane. The program will supply energy efficiency services to low-income customers in an effort to reduce demand. One or more contractors will be selected to launch pilot aggregation projects to explore ways to improve the market position and self-sufficiency of low-income consumers.

A total of \$1.7 million is available for this program. Actual aggregation of customers is expected to occur during the course of this program. The aggregated customer pool will include a minimum number of low-income consumers, representing at least 51% of the total aggregated pool, along with customers from other sectors including municipalities, institutions, and commercial buildings, to balance load and add to the attractiveness of the customer pool to marketers.

A competitive solicitation was released in April 2000 to select contractors to pilot a variety of aggregation models for low-income customers. Four proposals were received and reviewed by a Technical Evaluation Panel on June 28, 2000. NYSERDA is currently discussing work scopes with the recommended contractors.

### **Technical Assistance for Publicly-Assisted Housing**

The Technical Assistance for Publicly-Assisted Housing program is designed to increase the affordability of public housing for low-income residents by improving energy efficiency and energy management in the State's publicly-assisted housing. The program will initiate a series of pilot projects to incorporate design, selection, and installation of energy-efficient equipment into the State's portfolio of publicly-

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<sup>30</sup> At \$0.155 per kWh, which is the rate in ConEd service territory, where most of the installations have taken place.

<sup>31</sup> Refer to the Low-Income Direct Installation Case Study found in Section 7 of this report for specific customer data.

assisted housing. Program funding of \$790,000 will support and promote:

- The use of new replacement technologies for electric resistance heat;
- Training and certification of boiler mechanics responsible for large heating plants;
- The bulk purchase of energy-efficient appliances; and
- Innovative financing mechanisms to fund energy efficiency.

A competitive solicitation was issued in February 2000 to hire a technical assistance program implementor to support a series of pilot projects. The contractor will assist NYSERDA with program design, training, coordination, and monitoring. In April 2000, a Technical Evaluation Panel was convened to review proposals and recommend a contractor. Contract negotiations have commenced and the program is expected to begin shortly.

### **Affordable Assisted Housing**

The Affordable Assisted Housing program was created in Spring 2000 as a result of the **New York Energy \$mart**<sup>SM</sup> funding re-allocations. This \$3 million program will add-on to the Technical Assistance for Publicly-Assisted Housing program (discussed above) by establishing an incentive pool to write down the incremental cost of energy efficiency measures and electric heat conversions in the Division of Housing and Community Renewal (DHCR) and Housing and Urban Development (HUD) publicly-assisted housing portfolios. The work recommendations and conversion strategies will be in accordance with those developed under the Publicly-Assisted Housing program, which currently has funding only for development of the energy work protocols for several pilots. The \$3 million is expected to drive over five times its value in leveraged funds. The incentive pool will be managed by the contractor selected under the Publicly-Assisted Housing program.

### **Low-Income Public Awareness**

The Low-Income Public Awareness program is intended to inform low-income persons and State and community-based service providers of the services and options available to them under the Low-Income Energy Affordability program offered by NYSERDA and other changes taking place in the newly restructured energy marketplace. This program, funded at \$775,000, will provide consumer/energy education and referrals to existing credit/budget counseling services available locally. The program also aims to support the ongoing Low-Income Forum on Energy (LIFE) process, especially the public awareness activities of the LIFE Communications and Outreach Committee.

NYSERDA will soon issue a competitive solicitation to select one contractor to develop strategies and

printed materials, hold outreach events, and improve the linkages among NYSERDA, the Department of Public Service, the Consumer Protection Board, and other parties who help address the special energy needs of low-income New Yorkers.

## **RESEARCH & DEVELOPMENT**

### **New York State Wind Power Plant Demonstration**

The Wind Power Plant Demonstration is designed to support the installation, demonstration, and operation of one or two utility-scale wind power plants to foster future wind development in the state. The program goal is to install at least four megawatts (MW) of large-scale, grid-tied wind energy systems in New York State.

In November 1998, NYSERDA issued a competitive solicitation for the installation, demonstration, and operation of one or two utility-scale wind power plants in New York. NYSERDA contracted with Madison Windpower, LLC in June 1999 for the construction of an 11.5 MW wind project in Madison, New York. The total cost of this project is \$10.7 million, with a SBC contribution of \$2 million. The environmental review of the Madison Wind project was completed in December 1999. Groundbreaking on the 11.5 MW facility began in April 2000, and the installation of turbines is nearing completion.

Due to a lack of progress, contract negotiations for the second large wind project selected through the solicitation were halted in January 2000. The NYSERDA Source Evaluation Board (similar to a Technical Evaluation Panel) for this solicitation recommended that NYSERDA consider working with other technically-qualified proposers should negotiations fail with any of those originally selected. Based on this suggestion, NYSERDA began negotiations with two firms. As a result, a second 7.5 MW project for \$2 million has been contracted for, with a Summer 2001 installation planned, and a third 10 MW project for \$2 million is under negotiation with installation planned for Summer 2001.

Although the Madison, NY project installation is not yet complete, the 11.5 MW installation is nearly three-times the four MW goal set early in the program. If the additional two projects, totaling 17.5 MW are contracted, the program will have fostered a total of 29 MW of utility-scale wind generation in the State, more than seven-times the initial four MW capacity goal. Each thousand kWh of pollution-free wind energy will avoid 1.3 lb of nitrogen oxides, 3.02 lb of sulfur dioxide, and 882 lb of carbon dioxide based on system average emission rates. Consistent with the goal of investing in public benefit energy R&D, not otherwise provided by private markets, the Wind Power Plant Demonstration program has created significant momentum for developing and installing wind power plants in New York, where previously there had been none.

## **Wind Prospecting Program**

The goal of the Wind Prospecting program is to sustain and increase the momentum of the Wind Power Plant Demonstration program by providing assistance to help companies to find, measure, and develop specific locations for building wind energy farms. Results of the Wind Power Plant Demonstration solicitation indicated that there is interest in developing wind power plants in the State, but that the risks of doing so are perceived to be high. Therefore, there is a need for NYSERDA to seed future wind development and keep the industry's attention focused on New York State. Through this program, NYSERDA will support a portion of the siting risk, so that the wind developer may be willing to absorb some of the risks associated with the New York green power market.

NYSERDA will soon issue a competitive solicitation in the amount of \$300,000 seeking proposals (up to \$100,000 each) to cost share site identification and characterization activities. Proposals will be due in October 2000 and the program will begin soon after.

## **Residential Photovoltaics**

The Residential Photovoltaics program is designed to encourage the installation of grid-connected photovoltaic (PV) energy systems by supporting companies with an interest in marketing and installing residential grid-connected PV in the State. By gaining experience and documenting the cost of installing and operating residential grid-connected PV systems, the program will demonstrate that these systems can be connected to the utility power grid and provide safe, reliable energy.

NYSERDA issued a competitive solicitation for \$1 million in March 1999 with the intention of providing up to three awards to support programs that expand the use of residential grid-connected PV. Due to the high quality proposals received, an additional \$250,000 was made available to the program, bringing the total funding amount up to \$1.25 million. The following three firms were awarded contracts:

- Astropower was awarded \$499,880 to identify PV system dealers and installers and develop an outreach program with Pace Energy Project. The Company expects to install 150 systems.
- Four Seasons Solar was awarded \$250,000, and is currently working to obtain Underwriters Laboratory approval for its PV-glass module system. The Company expects to install approximately 35 systems.
- Sun Wize Technologies was awarded \$499,952 and is currently identifying dealers and installers of PV systems. Sun Wize is also preparing informational materials for consumers. The company expects to install approximately 100 PV systems.

Contracts were signed during the fourth quarter of 1999 and work is progressing. Based on contractor's

goals, the program will likely install approximately 285 grid-connected residential PV systems. Therefore, the Residential Photovoltaics program is expected to exceed its initial goal of installing 150 to 200 residential PV systems by at least 40%.

### **Photovoltaics on Buildings**

The Photovoltaics on Buildings program is designed to foster New York's market for installing PV on buildings by supporting projects that demonstrate innovative PV technologies and applications on commercial, industrial, institutional, and certain multifamily buildings. The program aims to encourage private companies to install PV while increasing the installation and operating experience with this emerging technology and reduce barriers to the future use of building-integrated PV. The goal is to install a total of 150 kilowatts (kW) of PV on non-residential and multifamily buildings.

A competitive solicitation in the amount of \$1.7 million was issued in October 1999. Eleven proposals were received, and five projects, totaling \$2,714,693, were recommended for funding. The SBC funding reallocation that took place earlier this year provided an opportunity to add \$400,000 to the budget for this solicitation and partially fund all five proposals. Contract negotiations are currently underway for these projects. Another \$600,000 in additional funding was added to the program so that two municipal building PV projects could be pursued in New York City. NYSERDA will work with New York City to issue competitive solicitations for each of the buildings for integrated PV design, construction and monitoring services. NYSERDA will also be working with the New York State Department of Environmental Conservation on an additional unsolicited project. In total, these building integrated PV projects aim to install approximately 781 kW of capacity, more than five-times the initial goal.

### **High Value Photovoltaics and Wind**

The High Value Photovoltaics and Wind program is intended to foster markets for customer- and cooperative-owned wind systems and remote photovoltaic (PV) systems in New York. The current New York market for these technologies is small and underdeveloped. This program seeks to identify market barriers, strengthen the market, and provide valuable information on the future potential of these technologies, and the need for any further assistance to stimulate the market. A total of \$1.3 million is available to support these efforts. NYSERDA issued a competitive solicitation in March 2000 to obtain proposals to install customer- and cooperative-owned wind systems and remote PV systems in New York State. Eleven proposals were received by the June 28 deadline, and are currently being evaluated by the Technical Evaluation Panel.

## **Willow Plantation Development**

The Willow Plantation Development program is designed to commercialize the dedicated energy crop concept. It is necessary to ramp-up production now so that plantations can supply a significant portion of New York's biomass needs in the future. The program will evaluate potential problems with scale-up when planting many acres of willow; determine costs associated with planting, maintaining, and harvesting willow for biomass supply; and determine the costs and benefits of co-firing willow or waste wood blends in a pulverized coal boiler. The program seeks to establish a private cooperative to manage the plantations and provide wood to power plants.

The Salix Consortium is a partnership of over 25 groups and organizations representing research institutions, farming, environmental groups, government and industry. Specific organizations include the U.S. Department of Energy, Niagara Mohawk Power Corporation (NMPC), Burlington Electric, the State University of New York (SUNY) College of Environmental Science and Forestry (ESF), and NYSERDA. The Consortium's goal is to help willow crops become a locally-produced source of renewable energy by simultaneously optimizing production systems, developing producer interest in participation, and expanding markets. The seven-year study is in its second year. However, NMPC is unable to meet all of their original funding commitments, and without **New York Energy Smart<sup>SM</sup>** support, the project would have been canceled. The project costs total over \$16.6 million, including \$878,000 in SBC funding. To date, 17 landowners, with 716 acres of land, are participating in the program, with about 460 acres currently planted.

## **Environmental Monitoring, Evaluation and Protection**

The Environmental Monitoring, Evaluation and Protection program is designed to support research that will increase the scientific understanding of behavior, cycling, and interaction of primary and secondary pollutants related to electricity generation (e.g., SO<sub>x</sub>, NO<sub>x</sub>, ozone, particulates, mercury, etc.) in the environment, so that policy makers can identify effective strategies for mitigating the impacts of energy production and use. The program also supports research that will increase the understanding of the role of local versus regional sources of air pollution in New York State, so that more equitable control strategies can be developed. In an effort to provide better environmental data for decision-making, the program helps companies in New York develop and commercialize improved instrumentation to measure pollutants associated with electricity generation. In addition, the program also provides a forum for policy makers and scientists to share information on critical environmental research initiatives in New York to maximize the value of limited research dollars and increase the policy-relevancy of environmental research supported in New York. A total of \$7.1 million has been allocated for the Environmental Monitoring, Evaluation and Protection program, including six expedited review

projects.<sup>32</sup>

These programs are guided by an eleven-member Program Advisory Group (PAG) composed of representatives from the New York State Departments of Environmental Conservation (DEC), Health (DOH), and Public Service (DPS); the U.S. Environmental Protection Agency (EPA); the New York Academy of Sciences; a utility association; and two environmental/public interest groups. A science advisory committee also provides periodic review in critical disciplines. To date, 12 contracts have been awarded for the Environmental Monitoring, Evaluation and Protection program.

The program has implemented the following environmental quality research projects:

- Assessing the Effects of Transboundary Pollution on New York's Air Quality. The State University of New York (SUNY) at Albany has completed its compilation of data from Ontario and eastern U.S. sites. Initial runs have been made using the 3 models: MODELS#, UAM-V, and CHRONOS.
- Source Apportionment of Fine Particles in New York City. During 1999, the New York University Medical Center ordered monitoring equipment for two monitoring sites (New York City and Tuxedo, NY). Clarkson and New York University agreed to use common source apportionment techniques as a result of the annual science advisory meeting in December 1999. Plans call for making final arrangements with host site in NYC to locate fine particle samplers, and to test and install monitoring equipment so that sampling can begin Spring/Summer 2000.
- Impact of In-and-Out-of-State Power Plants on Semivolatile Pollutants in New York State. During 1999, Clarkson University established a ground level monitoring site at Potsdam airport and ordered fine particle and mercury vapor air samplers for Potsdam and Stockton, NY. Monitoring equipment is expected to be tested and installed in the Spring 2000. Plans call for developing standard operating procedures and quality assurance plans. Sampling is expected to begin Spring 2000.
- Effects of Atmospheric Deposition of Sulfur, Nitrogen, and Mercury, on Adirondack Ecosystems. Monthly water samples from 52 Adirondack lakes are being sampled for nitrate, ammonium, dissolved organic nitrogen and dissolved organic carbon. Geographic Information System (GIS) maps have been produced for the Moose River basin wetlands to assist in assessing the abundance of speckled alder, a nitrogen-fixing riparian shrub. Speckled alder have been collected from a number of watersheds and processed for nitrogen analyses. Time series analyses of wet deposition chemistry data from Huntington Forest through 1999 have been made, and new data is being compiled. Fish surveys of the Moose River watershed are being conducted for comparison to the time-series analyses of lake water chemistry. Sediment cores have been collected and sectioned for eight Adirondack lakes and will be analyzed for mercury content to determine changes in past rates of mercury deposition to lake sediments.

The following two instrumentation projects are being supported under the program:

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<sup>32</sup> These projects were identified in the New York State Public Service Commission's SBC order as being critical to environmental policy development in the State.

- Development and Demonstration of Continuous Ambient Particulate Monitor. Rupprecht & Patashnick Co. will develop a “continuous” particulate monitor that provides particle readings comparable to those using the PM<sub>2.5</sub> Federal Reference Method (FRM) which is the method required by U.S. EPA’s air quality standards. The FRM is a filter-based sampler that has to be brought to a laboratory for weighing under standard conditions. The continuous monitor provides on-site readings and would reduce the cost of data collection and improve data quality. The contractor has developed a prototype referred to as the Sample Equilibration System (SES). Independent laboratory testing of SES has been initiated and plans are set to begin independent side-by-side testing of the SES with the 24-hour FRM over four seasons.
- Innovative Instrument for an Ambient Air Particulate Matter Mass Measured Standard. Rupprecht & Patashnick Co. will develop and demonstrate a “real-time,” mass-based instrument to provide a standard for the measurement of fine particle mass in ambient air. The current filter-based method calls for a 24-hour data collection period in which the changing conditions of pressure, temperature, and humidity produce unpredictable changes in the mass. A project kick-off meeting was held in March 2000 and work is progressing.

The following six expedited review projects were identified by the New York State Public Service Commission as being crucial to the development of State policy. These projects were reviewed by the PAG and recommended for funding under the **New York Energy \$mart<sup>SM</sup>** program. All six contracts have been signed, and the projects are described below.

- Clinical Studies of Exposure to Ultrafine Particles. Rochester University completed the first series of clinical trials with twelve healthy individuals, while at rest, breathing air with and without ultrafines. An array of physiological measurements were gathered and analyzed. Laboratory analyses of blood clotting and immunological factors are ongoing. Modifications are being made to the experimental set-up to improve comfort of participants in the clinical trials. Once modifications are complete, clinical trials will begin with subjects, while exercising at moderate rates, breathing air with and without ultrafines.
- Analysis of Ozone and Fine Particles in the Northeast. The State University of New York (SUNY) at Albany has completed a compilation of data from NESCAUM, National Park Service, and former Empire State Electric Energy Research Corporation sites. Work on time-series and trajectory analyses has begun.
- Long-Term Monitoring Program for Evaluating Changes in Water Quality in Adirondack Lakes. The Adirondack Lakes Survey Corporation is continuing their collection and analyses of monthly samples from 52 lakes and 6 streams. Routine pond and lake sample analyses include pH, acid neutralizing capacity, sulfate, nitrate, chloride, ammonium, silica, fluoride, potassium, calcium, sodium, and magnesium. The ongoing sample split program with Syracuse University continues as part of the routine quality assurance/quality control effort. Sampling to determine changes in fish composition over the past several years has been conducted. The Adirondack Lake Survey Corporation website is scheduled to be operational by mid-summer 2000.
- Mercury in Adirondack Wetlands, Lakes and Terrestrial Systems. Syracuse University developed a GIS database of surface and subsurface hydrogeologic features including soil type, soil depth, water

sources, and wetlands in the watershed; set up a climate monitoring station, pore water sampling sites, and gaging and sampling sites at nine locations in the watershed; sampled lake and stream water; and made efforts to integrate, test and validate two models (one simulating the physical and biogeochemical processes in lakes, and another that simulates processes affecting mercury cycling in wetlands and watersheds). Sampling of lake, stream, pore water, soils, and fish will be conducted as described in the sampling plan. These samples will be analyzed for mercury along with about 18 additional water quality characteristics.

- Evaluation of the Recovery from Acidification of Surface Waters in the Adirondacks. The Arbutus lake watershed continues to be sampled for biochemical analyses. Bulk precipitation and throughfall are being collected monthly for analyses at Huntington Forest. The PnET-BGC model is being applied to the Arbutus watershed data to evaluate the effects of atmospheric deposition on soil, vegetation and water chemistry, and to assess the response of forest and aquatic ecosystems to possible future changes in atmospheric deposition. A digital elevation model has been developed for the Arbutus catchment to evaluate the impact of topography as a factor affecting surface water acidification. Other ongoing components of the project include the analyses of old-growth forest litter and forest soil solutions, a study of the effect of calcium availability on nitrification rates, and a re-inventory of the forest canopy and understory.
- Enhanced Measurements of Oxidants, PM<sub>2.5</sub> and their Precursors. SUNY Albany resumed sampling and analytical activities of trace gases (ozone precursors), ozone and climatological data at Whiteface Mountain (WFM) and Pinnacle State Park (PSP). An aerosol generation and calibration laboratory was assembled and underwent testing. Continuous fine particulate (PM<sub>2.5</sub>) monitors were installed at WFM and PSP. Plans call for installing continuous PM<sub>2.5</sub> organic-carbon and nitrate mass monitors at WFM and PSP in the Spring/Summer of 2000. The project team also submitted a proposal to the EPA and was awarded a \$3.5 million grant to build on the project network and establish a PM super-site in New York City.

In December 1999, NYSERDA cosponsored a conference in Albany, New York along with DPS, DEC, DOH, and the EPA entitled “*Environmental Monitoring, Evaluation, and Protection: Linking Science and Policy.*” In addition to highlighting the **New York Energy \$mart<sup>SM</sup>** environmental programs and initial project results, the conference provided a forum for policy-makers and scientists to share critical information on regional environmental research initiatives on energy-related issues such as ozone, fine particles, acid deposition, and mercury. Over 180 individuals attended the conference, representing approximately 65 different organizations. Feedback from the conference was very positive.

These programs have also been successful in leveraging additional funding assistance and expertise for the development and dissemination of environmental information of critical importance to policy makers. In fact, over \$4 million in out-of-state monies have been leveraged as a result of the EMEP program. For more detailed information on the Environmental Monitoring, Evaluation and Protection program, refer to the case study in Section 7 of this report.

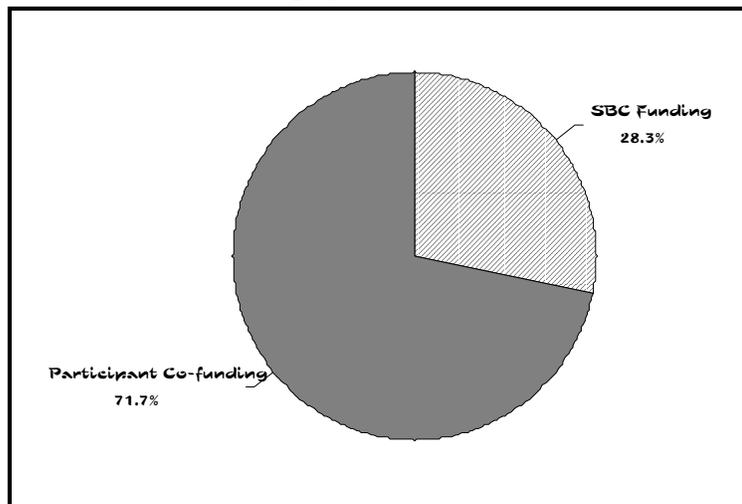
## Energy Efficiency and Strategic R&D

The Energy Efficiency Research and Development program includes R&D and associated information dissemination activities designed to: increase the efficiency of end-use electric energy consumption, (*i.e.*, reduce energy-input requirements per unit of output or service of end-use device) or reduce the demand for electricity in New York State. These projects focus on innovative end-use energy-efficient and energy-saving technologies and systems applicable to New York markets. Projects address developing energy-efficient technologies that could be manufactured in New York, if the public benefit is compelling and near-term private return is inadequate to spur R&D investment, and projects in the major electric end-use energy sectors, (*e.g.*, residential, commercial, industrial, municipal). The total budget for this program is \$5.8 million.<sup>33</sup>

The Strategic Research and Development program will implement, demonstrate, and evaluate innovative electrical end-use technologies with demonstrated potential to play a critical role in improving New York State's air quality, electrical power demand factors, and end-user reliability. Projects are intended to lead to self-sustaining markets for the demonstrated technologies after funding support is removed. Strategic R&D deals with technologies and activities that accelerate development of a sustainable market for emerging energy and environmental products of strategic importance to the State's energy and environmental future. Examples are ultra-clean and high-efficiency distributed power-generating technologies (under 1 MW) and electric transportation technologies. The total budget for this program is \$2.7 million.<sup>34</sup>

**FIGURE 6-20: Funding by Source**

Two rounds of competitive solicitations have been conducted during the past two years. For Energy Efficiency R&D, 66 proposals were submitted and 24 were approved. Under Strategic R&D, 28 proposals were received, with 14 approved. Together, the 38 projects are funded at \$8.3 million and are linked to \$21 million in co-funding. Figure 6-20 shows the share of total project costs from SBC funding and



<sup>33</sup> Original program funding was supplemented with \$155,000 during reallocation of Standard Performance Contract program funds.

<sup>34</sup> Original program funding was supplemented with \$445,000 during reallocation of Standard Performance Contract program funds.

participant co-funding.

Three pre-approved Empire State Electric Energy Research Corporation (ESEERCO) projects are also included in this program.<sup>35</sup> Two of these projects contribute certain tasks to Energy Efficiency and Strategic R&D projects. The third project is a micro-turbine demonstration. These projects are funded at \$425,000 with over \$718,000 in co-funding.

As noted in Figure 6-21, the projects selected under the Energy Efficiency and Strategic R&D programs cover a broad spectrum of technologies and end-use sectors.

**Figure 6-21: Breakdown of Strategic and Energy Efficiency R&D Projects**

Technology	End-Use Sector							Totals
	Multiple*	Residential	Industry	Agricultural	Institutional**	Commercial	Transportation	
Clean Distributed Generation	6	1		2				9
Lighting	6			1	1			8
Heating/Cooling	2	5	1					8
Controls/Meters/Management Systems		4				2		6
Vehicle Electrification and Batteries	1						2	3
Indoor Air Quality					1			1
Power Quality			1					1
Compressed Air			1					1
Cleaning Technologies			1					1
<b>Totals</b>	<b>15</b>	<b>10</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>38</b>

\* Project impacts at least two sectors

\*\* Includes municipal, schools and hospitals

The selected Energy Efficiency projects are predominantly focused in three areas: heating and cooling, lighting, and meters and controls. The projects selected under the Strategic R&D program are primarily focused on clean distributed generation and vehicle electrification. Several Energy Efficiency R&D projects are related to heating and cooling. For example, Brookhaven National Laboratory is developing and commercializing residential heating systems which reduce power consumption for burners, pumps and circulating blowers by an average of 75% below conventional systems. These systems would also

<sup>35</sup> Originally, four pre-approved ESEERCO projects were funded by the SBC. However, one project, Advanced Low-NOx Gas Turbine Combustor Development, was canceled due to lack of interest. This project was funded at \$100,000 from SBC.

increase heating reliability since they will be capable of operating during power outages with only an automotive-type 12-volt battery supply. Various system components have been evaluated, and specific components will be submitted for UL listing. A limited production run of approximately 10 units will be conducted for the purpose of extended field trials and for distribution to potential wholesale customers.

Several lighting projects were also funded under Energy Efficiency R&D. The projects cover an array of technologies and span from product development, to demonstration, and to information dissemination. Examples include:

- Concord Lighting and Paraflex Industries are developing an energy-efficient high intensity discharge (HID) wallpack and floodlight for commercial and multifamily buildings. This project is focused on developing a high quality, low cost fixture that will make the HID technology economically attractive for residential and commercial customers.
- The Lighting Research Center will partner with the Energy Center of Wisconsin to demonstrate that proven CoolDaylighting™ techniques can reduce energy costs by as much as one-half within New York State classrooms. This project aims to overcome technical, economic and institutional barriers to the use of daylighting in schools.
- Several funded projects focus on disseminating lighting information. One project utilizes a two-pronged approach toward overcoming barriers that inhibit the adoption of energy-efficient lighting in residential, commercial, and industrial markets. The project provides financial support for the National Lighting Product Information Program (NLPIP). In addition, funding has been provided to the Lighting Research Center to help companies evaluate product designs and catch potential deficiencies early in product development. One of the ESEERCO pre-approved projects supports the NLPIP effort.

A variety of projects using advanced metering technologies have also been selected under the Energy Efficiency R&D program. For instance, the development of non-intrusive load monitoring system (NILMS) for identifying and disaggregating loads at commercial facilities has made significant progress under NYSERDA's statutory R&D program. One **New York Energy Smart<sup>SM</sup>** project will build upon initial successes by field testing the C-NILMS device and creating a billing system that provides commercial customers with detailed and affordable operating cost information, thereby allowing them to make more intelligent energy purchases and operational decisions.

Another metering project under the Energy Efficiency R&D program focuses on reducing energy consumption and costs through submetering within housing cooperatives. This **New York Energy Smart<sup>SM</sup>** project will: develop a small scale accounting package to bill apartments and maintain payment records; identify appropriate advanced meters and develop sophisticated consumer-choice billing approaches; investigate conjunctional billing options; and develop an apartment display system for electric usage and cost.

A number of projects with less traditional technologies and methodologies have also been selected under Energy Efficiency R&D. For example, a project to demonstrate and evaluate the use of ultraviolet light for air disinfection to control the transmission of infectious disease was selected for funding. The project with Saint Vincents Hospital and the Harvard Medical School will be part of a six-city, multi-year field trial to study the efficacy of ultraviolet germicidal irradiation (UVGI) in controlling tuberculosis (TB) spread in homeless shelters. Results from existing studies show that significant energy savings and environmental benefits are associated with UVGI air treatment as compared to the traditional multiple air change method. One of the ESEERCO pre-approved projects mentioned above supports this effort.

Also, a project focused on improving industrial power quality (through mitigating voltage sags in industrial facilities) was selected under Energy Efficiency R&D. Voltage sags are momentary reductions in supply voltage, lasting from between one-half an electrical cycle to several seconds, that can occur 10 to 20 times as frequently as momentary power outages. These incidents are highly disruptive to manufacturing processes as they can cause equipment to shut down or malfunction, resulting in significant and costly process downtime. Devices are currently commercially available for very large and very small customer loads, however, there is no widely applicable economic solution for loads greater than about 20kVA. Utility Systems Technologies, Inc. recently developed a cost-effective voltage sag mitigation device. Under this project, this technology has successfully replaced the existing ferroresonant transformers at a Mohawk Paper mill in Cohoes, NY. This replacement will result in an annual savings of approximately 130,000 kWh or about \$10,000 in energy savings alone.

In the area of Strategic R&D, nine of the 14 selected projects deal with clean distributed generation. These projects are focused on the development, demonstration and field monitoring of innovative high-efficiency power generation technologies. The selected projects range from the demonstration of fuel cells within individual residences, to the development of advanced high-capacity power cells/batteries for use in computers, cellular phones and small transportation vehicles.

Under one Strategic R&D project, the Eaton Commercial Mixed-use Center and New York State Electric & Gas Corporation (NYSEG) investigated the potential for using combined heat and power (CHP) for this site. The Eaton Center is located in Norwich, NY contains 11 buildings occupied by small businesses. The study indicated that the CHP system would be technically and economically viable for reducing utility grid consumption and supplying hot water and heating for the Eaton Center and a new SUNY Morrisville building. In a second phase of the project, the micro-turbine CHP system will be installed and evaluated for several months. Once complete, this demonstration will show private developers that such systems are feasible and that they have an attractive payback. The system also has the potential to serve as the foundation for a district heating and cooling system for downtown Norwich.

Three Strategic R&D projects target vehicle electrification. One project involves the design and

installation of a facility where long-haul truckers can plug into a power outlet while parked at a rest stop, which would eliminate the eight to ten hours of engine idling and emissions that currently occur when truckers take their mandatory safety breaks. The power stations would allow truckers to run appliances in their cabins while reducing their fossil fuel consumption. The initial phase of the project is focused on conducting a “feasibility study” prior to identifying and creating a demonstration site in New York State. In this study, Niagra Mohawk Power Corporation will determine how many long haul trucks are currently equipped or are being retrofitted with the required power inverter. Potential pollution savings will also be estimated. Future efforts to design and demonstrate the technology at a major truck stop are dependent upon the results of the feasibility study.

Overall, the Energy Efficiency and Strategic R&D projects are on schedule.

### **Static Inverter Test Procedure Demonstration**

The Static Inverter Test Procedure project seeks to demonstrate that static inverter verification and type-testing procedures (published in the New York State Standard Interconnection Requirements (SIR) document for distributed generators less than 300 kVA connected to radial distribution lines) are feasible at a reasonable cost. Once inverters are tested and found to be in compliance with the SIR document, it is expected that they will be accepted by the State’s utilities for interconnection with the electric grid. This will avoid each utility having its own interconnection requirement, which would lead to different inverter specifications that would have to be met by inverter manufacturers depending upon which utility service territory they would be installed in.

The project aims to test two static inverters: (1) a single-phase, less than 10 kW, inverter for amplifier waveform testing, and (2) a three-phase, greater than 10 kW and less than 300 kW, inverter to be tested by a three-phased generator. This project will adhere to the test specifications in the SIR document by the New York State Public Service Commission (PSC) and New York State utilities.

NYSERDA issued a competitive solicitation in July 1999 to select an interested, independent and recognized testing laboratory to participate in demonstrating the test procedures. Two proposals were received and Plug Power, in collaboration with Underwriters Laboratories (UL), was selected as the contractor. Specified testing procedures will be demonstrated by UL, and results will be presented as acceptable or unacceptable. A contract was signed with Plug Power in September 1999. This demonstration program was awarded \$53,064 in SBC funds,<sup>36</sup> and Plug Power is co-funding an additional \$36,457.

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<sup>36</sup> Funding for this program comes from the Strategic R&D budget.

Inverter testing is completed and a draft final report was prepared by UL and reviewed by the Project Steering Committee. Some additional testing was requested by the Committee at additional cost to clarify test procedure difficulties experienced by UL while conducting some test procedures with the three-phase inverter.

### **New York State Environmental Disclosure**

Recognizing the importance of informed choice and the need to give customers useful environmental information, the PSC approved electric restructuring plans that included commitments to develop an environmental disclosure program. The intended benefit of the environmental disclosure program is to facilitate informed customer choice, which could, in turn, lead to improved environmental quality and resource diversity. In 1998, the PSC adopted environmental disclosure requirements and established a tracking mechanism. It is designed to encourage demand for environmentally clean electricity.

The tracking mechanism requires all jurisdictional Load-Serving Entities (LSE's) in the State to disclose to their customers, on a label, the environmental characteristics of the electricity they are supplying. The New York State Department of Public Service (DPS), acting as administrator of this project, is responsible for combining data from two sources to produce the labels. The label, in turn, is derived from generation and consumption information provided by the New York Independent System Operator (NYISO) and by environmental emission data provided by the Environmental Protection Agency (US EPA), the New York State Department of Environmental Conservation (DEC) and other sources. The disclosure labels will reflect each retail supplier's actual purchases without any regional "default" except that imports will be assigned a regional fuel mix and average emissions rates unless the state of origin has a compatible tracking and environmental disclosure system.

Funding for the program is up to \$3 million in SBC funds, reserved through July 2001, and supplemented by voluntary participants. A contract is now in place and work has begun. Initial testing and deployment of the data system will begin in Fall 2000, and initial labels are slated to be provided to consumers in Spring 2001.