

Section 1

INTRODUCTION

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New York's System Benefits Charge (SBC) was established in May 1996 by the New York State Public Service Commission (PSC) in Opinion No. 96-12¹ to fund public benefit programs during the State's transition to a competitive retail electricity market. The SBC is designed to fund public policy initiatives not expected to be adequately addressed by competitive markets, in the areas of energy efficiency, low-income energy affordability, research and development (R&D), and environmental protection. SBC funding levels were established within individual electric utility rate cases² and funds are collected through a non-bypassable charge on electric utility transmission and distribution (T&D) systems. As a measure of reasonable funding, the PSC capped SBC funding at one mill per kilowatt-hour (kWh), during the initial phase of transition, based on 1995 utility expenditures on demand-side management programs. This section provides an overview of key events leading to NYSERDA's administration (planning and implementation) of New York's public benefits program.

NYSERDA was designated the administrator of New York's Statewide public benefits program, pursuant to a January 30, 1998 order of the New York State Public Service Commission³ (PSC). The public benefits program, administered as the **New York Energy Smart**SM program, is designed to continue energy efficiency, low-income services, and R&D and environmental protection programs during the State's transition to electric retail competition.⁴

A March 1998 Memorandum of Understanding (MOU)⁵ finalized SBC operating arrangements among the PSC, the New York State Department of Public Service (DPS), and NYSERDA, and directed NYSERDA to solicit public input in developing its draft SBC operating plan for PSC approval. The

¹ Cases 94-E-0952 *et al.*, *In the Matter of Competitive Opportunities Regarding Electric Service*, Opinion No. 96-12, Opinion and Order Regarding Competitive Opportunities for Electric Service (issued and effective 20 May 1996).

² Cases 94-E-0952 *et al.*, *In the Matter of Competitive Opportunities Regarding Electric Service*, Opinion No. 98-3, Opinion and Order Concerning System Benefits Charge Issues (issued and effective 30 January 1998).

³ New York State Public Service Commission. *Opinion and Order Concerning System Benefits Charge Issues*. Issued and effective, January 30, 1998.

⁴ The three-year period from July 1, 1998 through June 30, 2001 was initially envisioned as a transition period for full electric retail competition.

⁵ Memorandum of Understanding (MOU) among the PSC, DPS, and NYSERDA, March 11, 1998.

MOU also directed the formation of an outside advisory group (Advisory Group) to serve as advisor and independent program evaluator. The SBC Advisory Group held its first meeting in April 1998, following a public hearing on the State's public benefits program earlier in the month. The Advisory Group has met quarterly to review NYSERDA's implementation plans and progress, as well as to help guide program evaluation.⁶

The PSC approved NYSERDA's **New York Energy SmartSM** program plan, with slight modifications, in July 1998. Program implementation began later that same year. A generalized schedule of activities that have guided program development and implementation to date is shown in Figure 1-1. Prior to NYSERDA being named administrator of New York's public benefits program, NYSERDA participated in the PSC's proceeding on the SBC,⁷ and proposed a set of principles to be used to guide program development, planning, and administration of public benefits programs. After being named administrator, and at the PSC's request, NYSERDA prepared a proposed public benefits program plan (Plan) for PSC consideration and approval consistent with its recommended guiding principles.⁸

NYSERDA's Plan recommended a strategic process for regularly assessing the changing needs of the marketplace against general market indicators, including market activity, institutional barriers, marketplace inequities, transaction risks, lost opportunities, specific customers needs, and financial constraints. The Plan was stakeholder-driven and inclusive in its development of program goals and objectives, intervention strategies, and exit criteria.⁹ NYSERDA's principles continue to guide implementation of the **New York Energy SmartSM** programs and modifications to the program and its components, to improve service delivery and success toward its goals.

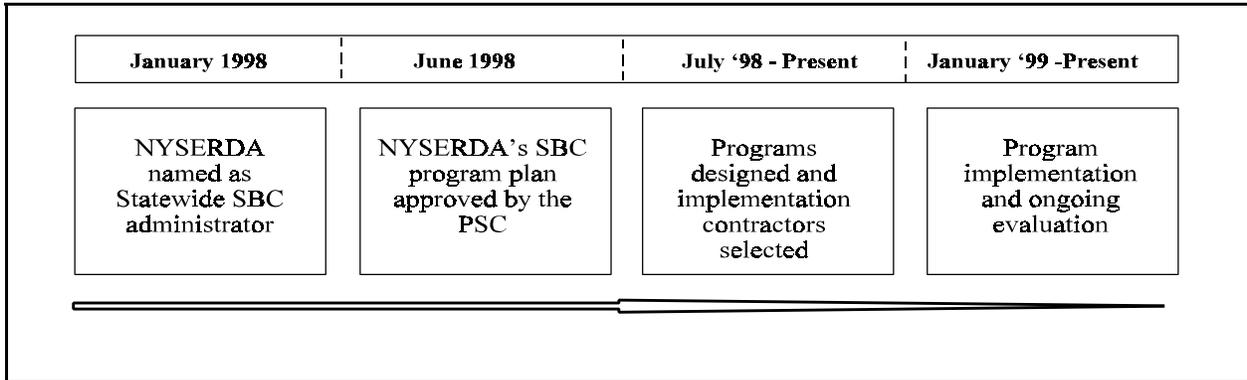
⁶ The SBC Advisory Group meets quarterly and provides guidance and input to NYSERDA's administration of the **New York Energy SmartSM** program. The SBC Advisory Group met in May and August 2000, and held several telephone conference call to discuss the members' review and comments on the *New York Energy SmartSM Program Draft Evaluation Status Report*, May 2000. Since the release of the May report, Oak Ridge National Laboratory (ORNL) conducted additional research to finalize the six **New York Energy SmartSM** case studies (contained in Section 7), responding to SBC Advisory Group suggestions. GDS Associates, Inc., and its subcontractor, Megdal & Associates, has completed an intensive case study of the Standard Performance Contract program, which located in Appendix A of this report. The findings and conclusions of this case study are also reported as appropriate in Sections 4 and 6. Additional evaluation efforts ongoing throughout the latter half of 2000 include: participant and non-participant surveys for the Premium Efficiency Motors, Appliances and Lighting, Direct Installation, Technical Assistance, and New Construction programs; characterization research on the unitary HVAC market; and review of preliminary electric savings methods for several of the **New York Energy SmartSM** programs.

⁷ New York State Public Service Commission. Case 94-E-0952 - *Competitive Opportunities Regarding Electric Service: System Benefits Charge Issues*. 1994.

⁸ New York State Energy Research and Development Authority. *Proposed Plan for Public Benefit Programs Funded by System Benefits Charge*. May 8, 1998.

⁹ New York State Energy Research and Development Authority. *Initial Comments in Case 94-E-0952 - Competitive Opportunities Regarding Electric Service: System Benefits Charge Issues*. March 31, 1997.

FIGURE 1-1: NYSERDA Activities Schedule



Many of the **New York Energy SmartSM** programs are designed to bring lasting structural changes in consumer behavior, professional practices, and the delivery of energy efficiency services. As a result, programs were designed to underscore the PSC's broad policy goals for this program. The program design logic was based on NYSERDA's understanding of energy markets and how energy use decisions are made in New York. Program design was also based on the experiences of some of the more successful program efforts in other states and jurisdictions.¹⁰ A simplified logic model was developed for each program, that identified the program inputs and activities, as well as indicators for early, intermediate, and final outcomes. These indicators and outcomes provide the basis for evaluating the progress that has been made to date in implementing these programs. These indicators and outcomes are also used to help determine the ultimate success of the **New York Energy SmartSM** program. The logical underpinnings for the **New York Energy SmartSM** program are discussed in greater detail in Section 3 of this report.

As of August 2000, the majority of **New York Energy SmartSM** program initiatives are underway, and many programs, including those offering financial incentives, technical assistance, or outreach are in their second or third program cycle. Program components have been modified and revised as necessary, based on feedback from participants in earlier rounds, to improve marketing, increase participation, and enhance overall program performance. The evaluation of these programs is ongoing and integrated into all phases of program planning, design, and implementation. Integrating evaluation in this manner allows continual monitoring and regular feedback on program performance and enables project managers and NYSERDA management to respond quickly to changing market and customers needs.

¹⁰ The **New York Energy SmartSM** energy efficiency programs are limited to improving the efficiency of electric energy use specifically, while the low-income, and R&D and environmental programs are less restrictive, allowing for the consideration of other factors.

Program Evaluation

Evaluation of the **New York Energy SmartSM** program and each of its component programs has been ongoing since NYSERDA was named administrator of the program. NYSERDA's evaluation team has been involved in all aspects of program planning, design, implementation monitoring, and evaluation, as described in Section 2 of this report. DPS staff have also been involved in these various program phases and participated in each RFP and PON solicitation and contractor selection. The **New York Energy SmartSM** program evaluation consists of three broad elements: (1) a process evaluation, (2) an outcome evaluation, and (3) an assessment of causality attribution. Each element has been incorporated into individual program and project measurement and tracking efforts to aid in program assessment and refinement. These elements also provide a foundation for this evaluation by identifying the key early, intermediate, and final outcome indicators of success for the overall goals of the **New York Energy SmartSM** program. This evaluation concentrates on assessing program start-up procedures and early progress indicators as they relate to the **New York Energy SmartSM** program goals. NYSERDA collected and developed baseline information (and initiated baseline studies) for major program areas and developed a tracking system of key indicators for monitoring program progress. These key indicators are derived from prior market research, market characterization and progress studies that are part of program implementation, and related performance measurement studies. The market assessment information is the basis for evaluating and assessing how programs are progressing in meeting early indicators of success.

An important element of this report is the individual program case studies that provide information on progress and accomplishments to date. The case studies are used to highlight the effects of certain programs on target audiences. Seven case studies were conducted for this evaluation report. Six of the case studies, including: (1) New Construction, (2) Premium Efficiency Motors, (3) Energy Operations Management, (4) Residential Appliances and Lighting, (5) Low-Income Direct Installation, and (6) Environmental Monitoring, Evaluation, and Protection programs are provided in Section 7 of this report.¹² The seventh case study, of the Standard Performance Contract program, follows a different format and addresses more fundamental issues than those addressed in the other six, and is provided in Appendix A. Results and lessons learned through the seven case studies are reported in Sections 4 and 6 of this report.

Case studies were selected based on a particular program's potential to report some early results, similarity in participant base (*e.g.*, fairly homogeneous population so that results could be easily

¹² Case studies were recommended by the SBC Advisory Group as a way to assess the effect and gauge the value of the programs to customers. The number of the case studies conducted, however, was limited by the amount of the total **New York Energy SmartSM** program evaluation budget. It is anticipated that year 3 evaluation activities will include additional case studies and perhaps some follow-up on the first seven.

replicated), and realization of harder-to-quantify and non-energy benefits that were of value to participants. Lessons learned are also presented in these case studies to identify areas where programs can be improved, and to provide information and insights to NYSERDA project managers and implementation contractors to use as a management tool to help guide project modifications. In a great many instances (e.g., Premium Efficiency Motors, New Construction, and Residential Lighting and Appliances), case study research provided useful lessons to NYSERDA program managers to support program modifications to improve service delivery and program performance.

PROGRAM FUNDING AND OVERVIEW

Total three-year public benefits funding approved by the PSC was \$234.3 million, with NYSERDA administering just over three-quarters of the overall three-year budget.¹³ The remaining 25% was reserved to fund prior commitments of New York's utility-run programs and continue some targeted services for selected customers.¹⁴ Of the total \$234 million, nearly \$162 million was directed toward energy efficiency programs serving the commercial and industrial, and product and equipment markets; nearly \$41 million was directed toward R&D and environmental protection programs; and \$29 million was directed toward low-income energy affordability and efficiency programs. Three million dollars was made available to establish a disclosure program for labeling environmental attributes of electricity generation supplies, otherwise known as “environmental disclosure.”¹⁵

NYSERDA funding for the **New York Energy SmartSM** program by major program area is \$177 million for three years, including administration costs and interest earnings, as shown in Figure 1-2. NYSERDA capped its administrative costs for the public benefits program at 5.5% of the total budget, following its initial 5% allocation. In addition to administering the **New York Energy SmartSM** program, NYSERDA was charged with developing and overseeing the evaluation of these programs on behalf of the SBC Advisory Group.¹⁶ To assist in evaluation planning, implementation, and reporting, NYSERDA contracted with GDS Associates, Inc. (GDS), and Oak Ridge National Laboratory (ORNL). The \$400,000

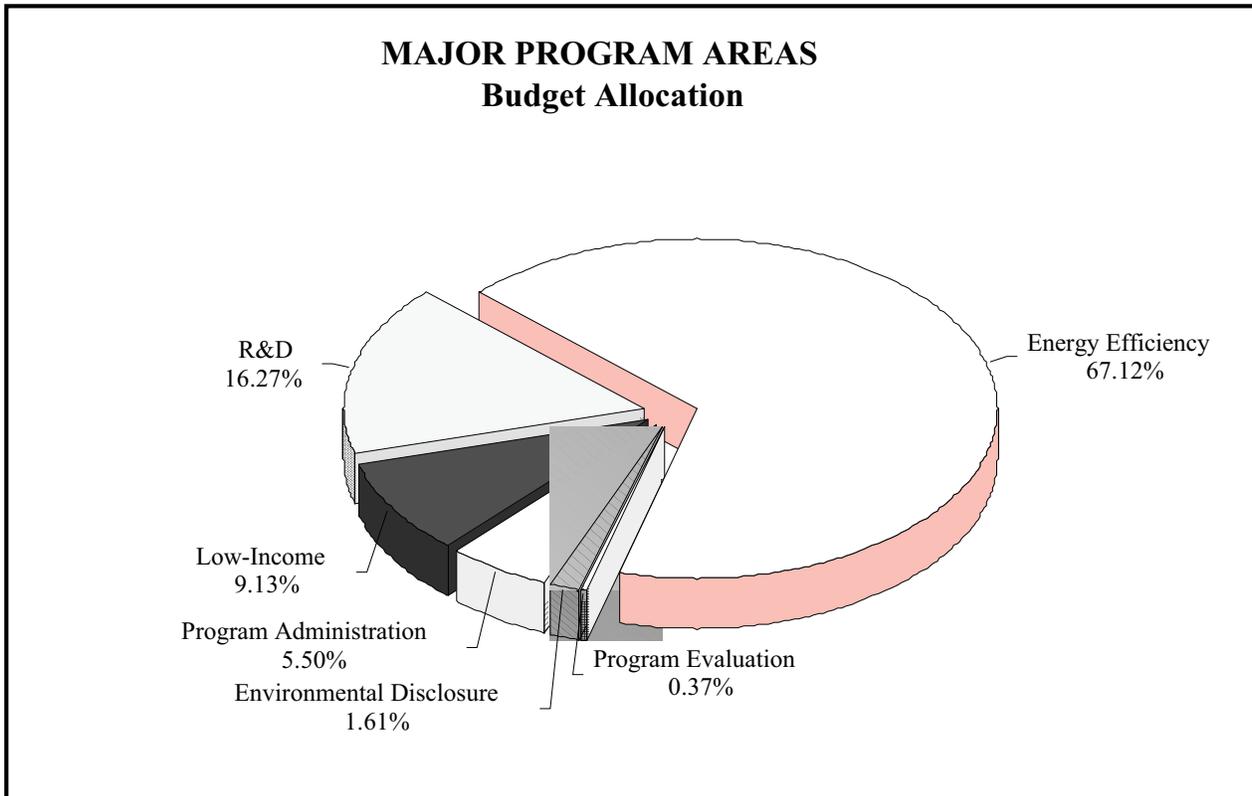
¹³ Cases 94-E-0952 *et al.*, *In the Matter of Competitive Opportunities Regarding Electric Service*, Order Approving System Benefits Charge Plan with Modifications and Denying Petitions for Rehearing, (issued and effective 2 July 1998).

¹⁴ New York State Electric & Gas Corporation and Niagara Mohawk Power Corporation continue to administer their respective low-income programs.

¹⁵ NYSERDA is administering this program on behalf of the Department of Public Service (DPS) and overseeing a contract with the New York State Independent System Operator to design and implement an environmental disclosure program in New York.

¹⁶ New York's SBC Advisory Group, established pursuant to the Memorandum of Understanding between the Public Service Commission and Department of Public Service, and NYSERDA, is the Independent Program Evaluator for the **New York Energy SmartSM** program. The SBC Advisory Group is comprised of 18 representatives of interested parties and that provides advice and guidance on program implementation and evaluation.

FIGURE 1-2: Budget Allocation (Total = \$177 Million)



available for evaluation from SBC funding is allocated between these two contractors.¹⁷

Reprogramming of SBC Funds

NYSERDA, with the consent of the Public Service Commission (PSC), has reallocated funding within the **New York Energy SmartSM** program, to reflect individual program progress in the first two years of implementation. Some programs have achieved early success faster than others, and as a result, funding has been reallocated. The funding adjustments that have taken place during the first and second quarters of 2000 are reported in Table 1-1. All of the budgeting information contained throughout this report accounts for these changes.

Several new programs have been created and added to the **New York Energy SmartSM** portfolio as a result of this reallocation. These programs are the Keep Cool (Air Conditioner Bounty) program and the Affordable Assisted Housing program, shown in Table 1-1. A new Cooling Re-Commissioning program was also added to the Technical Assistance area. Each of these new programs are described in greater

¹⁷ GDS Associates, Inc., was awarded \$250,000 and ORNL was awarded \$150,000. An additional \$250,000 has recently been made available to support evaluation activities and to complete evaluation of the **New York Energy SmartSM** program through year three of the program.

detail in Section 6 of this report.

In summary, SBC funding reallocation resulted in \$4.6 million being moved from Energy Efficiency Services to other program areas. A total of \$14.3 million was added to other programs from the Standard Performance Contract program budget, leaving \$33.5 million for this program. Since this reprogramming, applications to the Standard Performance Contract program have picked up considerably, and the \$33.5 million budget is nearly fully committed. As a result, NYSERDA is considering allocating funds back into the Standard Performance Contract program to keep it operational through year three.

TABLE 1-1: PSC Approved Reallocation of SBC Funds (May 2000)

Program Area	New York Energy SmartSM Program	Reallocation Adjustment (\$)
Energy Efficiency Services	Standard Performance Contract	(14,300,000)
	Institutional Performance Contracting Assistance	1,000,000
	New Construction	2,500,000
	Technical Assistance	1,200,000
	ENERGY STAR [®] Awareness	2,500,000
	Keep Cool (Air Conditioner Bounty)	2,500,000
Low-Income	Affordable Assisted Housing	3,000,000
Research & Development	Renewables R&D	1,000,000
	Energy Efficiency and Strategic R&D	600,000

PROGRAM OVERVIEW

NYSERDA's **New York Energy SmartSM** program offers three broad types of programs: Energy Efficiency Services, Low-Income Energy Affordability, and R&D and Environmental Protection. These three program categories are also used to aggregate sub-program areas and outcomes for evaluation purposes:

1. *Energy Efficiency Services* include (1) Energy Services Industry programs, (2) Market Transformation programs, and (3) Technical Assistance and Outreach programs.
2. *Low-Income Energy Affordability* includes (1) Direct Installation program, (2) Affordable Assisted Housing, (3) Public Housing Coordination program, (4) Market-Based Strategies, and (5) Public Awareness.
3. *R&D and Environmental Monitoring* includes (1) Renewable Energy program, (2) Energy Efficiency program, (3) Strategic R&D program, (4) Environmental Monitoring program, and (5) administration

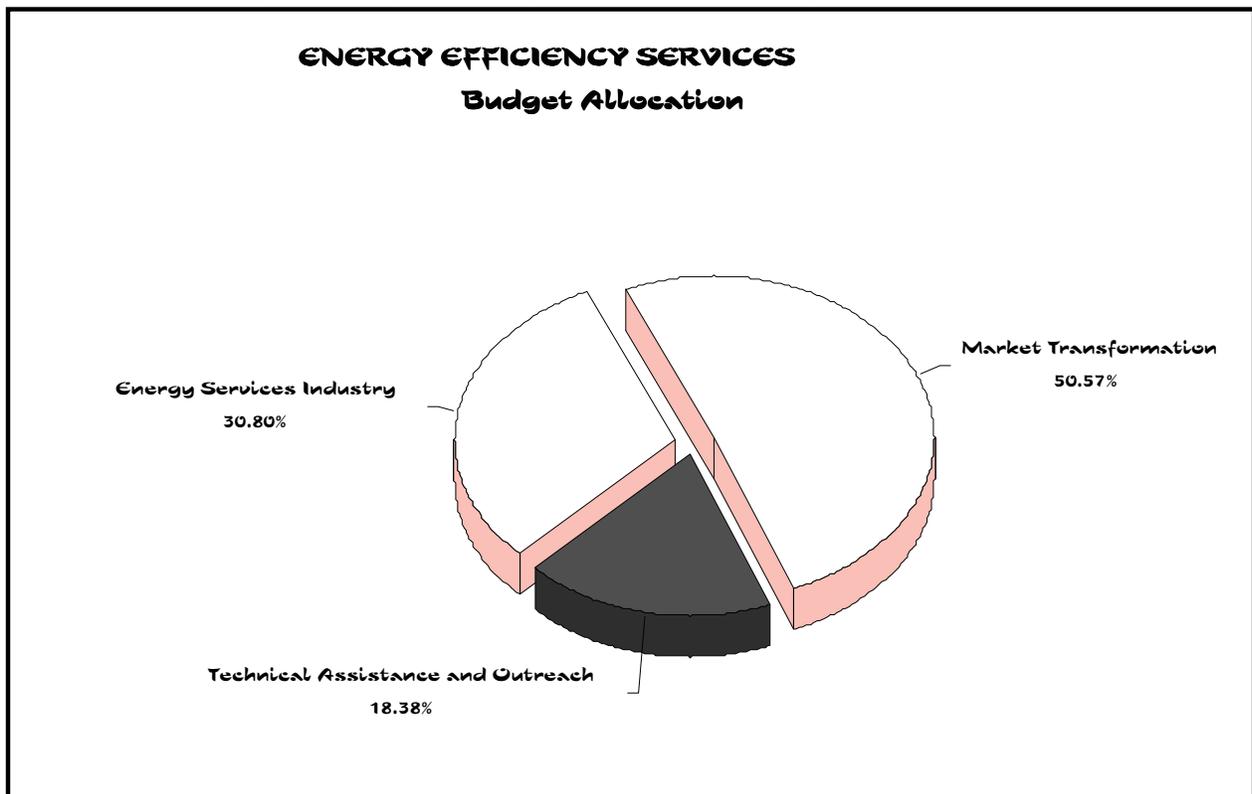
of former Empire State Electric Energy Research Corporation (ESEERCO) R&D projects.

Program budgets for each of the major program initiatives are shown in Figures 1-3 through 1-5, and are described in the remainder of this section.

Energy Efficiency Services Programs

Consistent with the SBC-funded public benefits program plan approved by the PSC, NYSERDA expects to commit \$119.2 million¹⁸ to the Energy Efficiency Services programs, allocated among Energy Efficiency Services (\$36.71 million), Market Transformation (\$60.25 million), and Technical Assistance and Outreach (\$21.9 million) programs, as depicted in Figure 1-3. These programs are designed to help develop a viable energy services industry in New York and assist in transforming markets for energy efficiency. Market transformation activities include programs designed to: increase sales of energy-efficient equipment and products; provide information to customers to improve energy decision-making; encourage customers to regard energy efficiency as a value-added service; and, improve the efficiency of electricity use economically.

FIGURE 1-3: Energy Efficiency Services (Total = \$119.2 Million)



¹⁸ The \$119.2 million includes \$118.9 million for program budgets and \$0.3 million for metrics and evaluation.

The **New York Energy SmartSM** Energy Efficiency Services programs are specifically intended to identify and effectuate changes in decision making to improve the efficiency of electricity use. Opportunities for improving the efficiency of petroleum, natural gas, and other fuels are identified as part of the **New York Energy SmartSM** Technical Assistance programs, however, incentive programs are only available for improving electric energy efficiency.

Energy Services Industry. The Energy Services Industry programs, with three-year funding of \$36.71 million, are an integral element of the SBC-funded public benefits program. The key objectives of this program area are to expand the number of energy services companies (ESCOs) operating in New York, and to increase private sector investments in improving buildings energy efficiency. The Energy Services Industry programs, including Standard Performance Contracting and Institutional Performance Contracting Assistance, are designed to increase market-availability of energy-efficient equipment and products by providing financial incentives to overcome market barriers inhibiting demand for energy-efficient equipment and products. Incentive payments to project sponsors are performance-based and vary depending on the measures installed and the amount of measured and verified savings achieved.

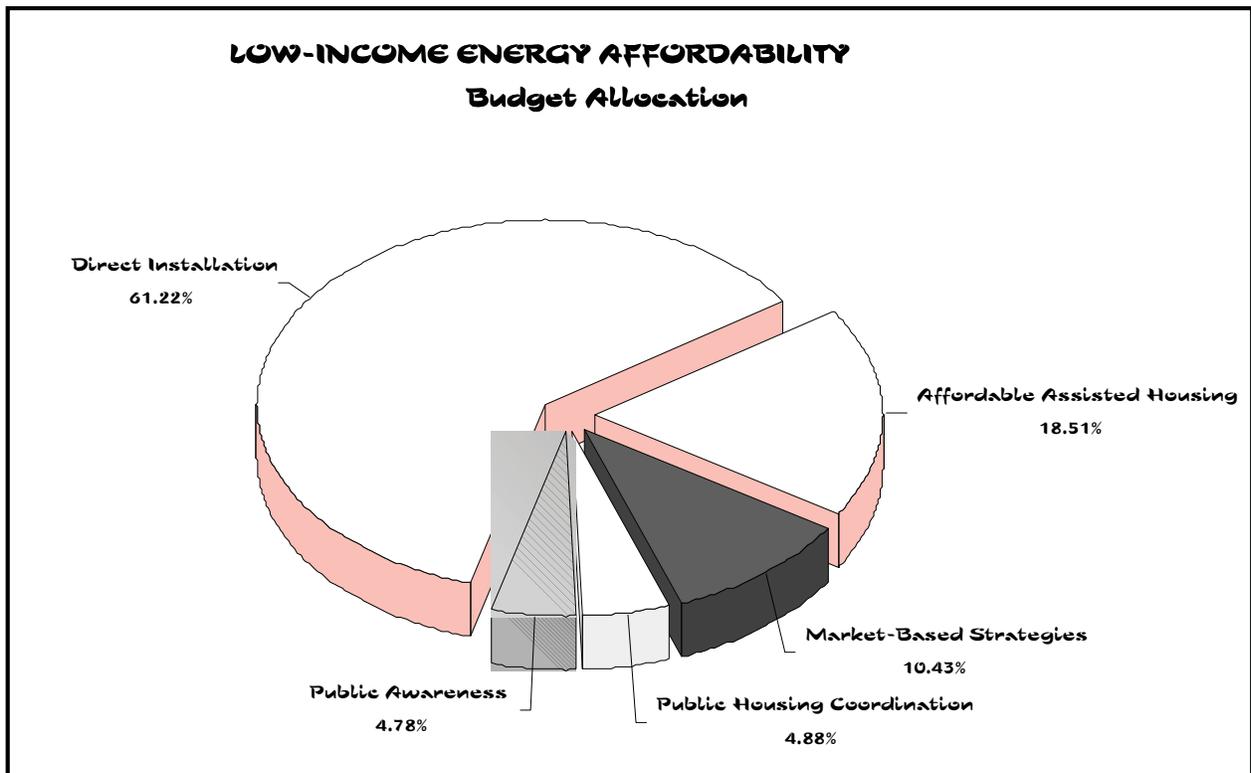
Market Transformation. The Market Transformation programs, funded at \$60.25 million over the three-year period, are designed to increase the adoption and penetration of energy-efficient technologies and practices, and induce lasting structural and behavioral changes in the marketplace. Transforming markets for energy efficiency will be accomplished by reducing barriers that inhibit wide-spread adoption of energy efficiency measures by customers and building a market capability for stocking and promoting energy efficiency products to the point where future publicly-funded incentives and assistance may no longer be necessary. The Market Transformation programs will increase the availability, promotion, stocking, and sales of energy-efficient products and services in targeted end-use markets and sectors. Market participants include retailers, vendors, dealers, distributors, contractors, installers, trade associations, manufacturers, and ultimately, customers. In addition to overcoming barriers in this market chain, the program seeks to encourage building professionals to design, construct, and renovate buildings incorporating high-efficiency equipment. Moreover, lending institutions and appraisers will be encouraged to consider the value-added benefits of energy efficiency when making loans and valuing properties.

Technical Assistance and Outreach. The primary goal of the Technical Assistance and Outreach programs, funded at \$21.9 million over the three-year period, is to overcome market barriers to improving the energy efficiency of facilities. The lack of objective information often results in less than optimal decisions regarding the construction, operation, and maintenance of facilities. These programs provide engineering assistance, low-cost energy audits, aggregation and rate analysis, and energy operations management services to improve the energy efficiency and operation of facilities.

Low-Income Energy Affordability

Consistent with the SBC-funded public benefits program plan approved by the PSC, \$16.2 million¹⁹ is allocated for Low-Income Energy Affordability programs in the Consolidated Edison Company of New York, Inc., Central Hudson Gas & Electric Corporation, and Orange and Rockland Utilities service areas. The Rochester Gas and Electric Corporation, Niagara Mohawk Power Corporation, and New York State Electric & Gas Corporation were allocated separate funding for low-income programs in their service areas. The Low-Income programs seek to reduce the energy burden²⁰ of low-income consumers by improving energy efficiency and providing energy management and aggregated energy procurement strategies that will improve the market position and self-sufficiency of low-income consumers. These programs will build on the success of other publicly-sponsored programs by coordinating the delivery of programs and services that reduce energy use and costs of low-income households in the State. Low-Income program budget allocations by major program area are listed in Figure 1-4.

FIGURE 1-4: Low-Income Affordability (Total = \$16.2 Million)



Direct Installation. The Direct Installation program is funded at \$9.9 million over three years and is designed to introduce a broad-range of electric end-use measures into the existing Weatherization

¹⁹ Of the \$16.2 million total, \$30,000 is allocated for metrics and evaluation.

²⁰ A household's energy burden is defined as the percentage of income devoted to energy expenditures.

Assistance Program (WAP) operated by the State's Division of Housing and Community Renewal (DHCR). Electric measures to be considered for eligible households include: energy-efficient fluorescent lighting; appliances (including energy-efficient refrigerators and washing machines); and replacement equipment including electric motors, and strategies to reduce electric resistance space and water heating use. Coordinating electric energy efficiency services with WAP heating-related energy efficiency measures will reduce the energy burden for low-income consumers, and provide non-energy benefits, such as improved comfort and safety, to improve the quality of life in low-income buildings.

Affordable Assisted Housing. The Affordable Assisted Housing program is funded at \$3 million. This newly created program will establish an incentive pool to write down the incremental cost of energy efficiency measures and electric heat conversions in the DHCR and HUD publicly-assisted housing portfolios. The program is expected to leverage funds over five times its value and work in coordination with other **New York Energy SmartSM** programs such as the Guaranteed Multifamily Loan Fund.

Market-Based Strategies. The Market-Based Strategies program, funded at \$1.7 million over three years, is designed to help low-income households pool their purchasing power in a competitive energy market to obtain better terms and conditions of service. In addition, the program will supplement the Residential Energy Assistance Challenge (REACH) grant program, funded by the U.S. Department of Health and Human Services and administered by DHCR, that is designed to lower the price paid by low-income New Yorkers for natural gas, fuel oil, propane, and electricity and provide energy efficiency services through a not-for-profit public interest energy service company.

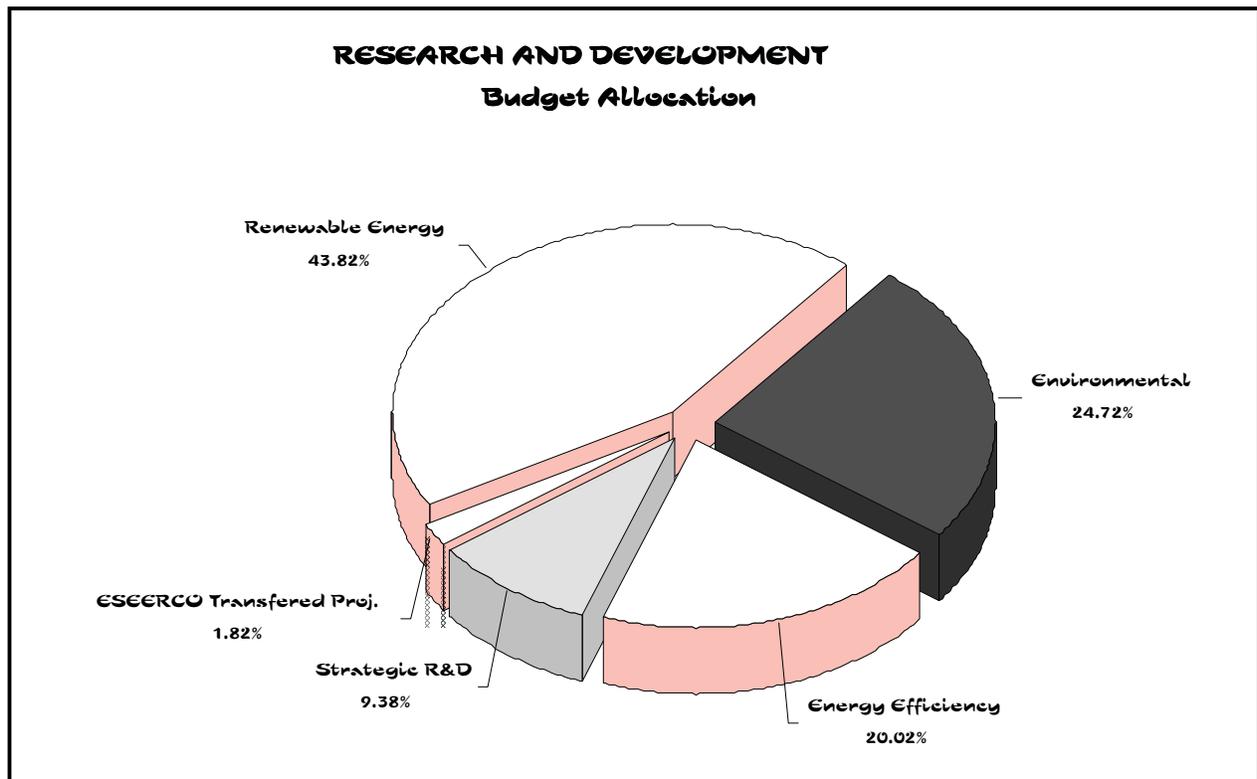
Public Housing Coordination. The Public Housing Coordination program, funded at \$0.79 million over three years, is designed to reduce energy use and costs in public housing by incorporating energy-efficient equipment and design specifications into State- and federally-assisted housing. The program will facilitate the replacement of electric heating systems, promote the bulk purchases of energy efficient appliances, and bring innovative energy efficiency financing to the State's publicly-assisted housing sector.

Public Awareness. The Public Awareness program, funded at \$0.77 million over three years, is designed to promote and support other **New York Energy SmartSM** low-income program initiatives. The program will identify opportunities for enhancing public awareness to bring a better understanding of the benefits of energy efficiency to the low-income community.

Research & Development and Environmental Protection

Consistent with the SBC-funded public benefits program plan approved by the PSC, \$28.9 million²¹ is available for Energy Research and Development (R&D) programs. These programs are in four broad categories: (1) Renewable Energy, (2) Environmental Protection, (3) Energy Efficiency, and (4) Strategic R&D. The goal of these programs is to develop and facilitate deployment of state-of-the-art technologies for market applications, and to provide information to end-users of technology and environmental regulators for decision-making purposes. The focus of these programs is on field testing new technologies, evaluating performance, disseminating information on their application, and developing strategies to promote widespread private sector involvement in energy and environmental R&D. The SBC-funded public benefits R&D programs invest in public benefit energy research that might otherwise not be provided by the private sector during the transition to competition in the electric industry. R&D program budget allocations by major program area are listed in Figure 1-5.

FIGURE 1-5: R&D Programs (Total = \$28.9 Million)



Renewable Energy R&D. The Renewable Energy R&D programs, funded at \$12.7 million over three years, are designed to assist in developing a sustainable market for state-of-the-art wind, photovoltaic, and biomass technologies by promoting the near-term installation and operation of these renewable

²¹ Of the \$28.9 million total, \$70,000 is allocated for metrics and evaluation.

technologies. The Renewable Programs are also designed to encourage the growth of a statewide network of private companies to install and service these technologies with the goals of increasing availability and reducing costs. The program will deliver and help quantify the value-added benefits of renewable energy resource development in the State, including the benefits of providing electricity to rural and off-grid residences, reducing electricity demand in constrained (load pocket) areas of the local utility distribution system, and improving environmental quality by diversifying the State's energy use by using more efficient or cleaner energy technologies.

Environmental R&D. The Environmental R&D programs, funded at \$7.1 million over three years, are designed to provide objective and policy-relevant research to: improve the scientific understanding of electricity-related pollutants in the environment; assess the environmental impact of electricity generation relative to other sources of pollution; and develop approaches to mitigate impacts of electricity generation and improve environmental quality. The program also helps New York companies develop and demonstrate better instruments for monitoring ambient air and water quality that is affected by power generation.

Energy Efficiency R&D. The Energy Efficiency R&D program is funded at \$5.8 million over three years to develop, demonstrate, and evaluate new electric energy efficiency technologies in the residential, commercial, municipal, and industrial sectors. Technologies to be promoted include: advanced lighting; electric metering; energy management and controls; heating, ventilating, and air conditioning systems; and manufacturing process system components.

Strategic R&D. The Strategic R&D program, funded at \$2.7 million over three years, is designed to promote a sustainable market for emerging energy and environmental products of strategic importance to the State by developing, demonstrating and evaluating advanced energy technologies and strategies. The program will emphasize energy storage technologies, ultra-clean and high efficiency distributed generation, and electric transportation technologies.

Figure 1-5 also includes funding for continuation of several R&D projects (\$0.525 million) initiated by the former Empire State Electric Energy Research Corporation (ESEERCO). These projects contribute certain tasks or activities to the Energy Efficiency and Strategic R&D programs, and include a microturbine demonstration project.

More detailed information on program budgets and commitments to date is included in Section 4 of this report. The following section discusses **New York Energy SmartSM** program evaluation methodology.