

PLANNING NEW YORK'S ENERGY FUTURE
A THREE-YEAR STRATEGIC OUTLOOK 2004-2007

AUGUST 2004

NEW YORK STATE
ENERGY RESEARCH AND
DEVELOPMENT AUTHORITY



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SECTION 1

INTRODUCTION

OVERVIEW

Energy price volatility and supply disruptions have the potential to undermine economic growth, erode public confidence, and negatively affect the quality of life of all Americans. The nation's primary sources of energy are to a large extent imported and pose significant long-term and potentially harmful environmental consequences. These resources are becoming increasingly constrained and will ultimately face depletion. The United States will continue to confront the economic, environmental, and energy security challenges associated with dependence on imported energy until new domestic sustainable sources of energy are developed.

Events in recent years have reminded Americans of just how critical energy is to society. In 2002, electricity customers in California were faced with rolling brownouts, and this past summer blackouts in the Northeast raised serious concerns about the adequacy and reliability of the nation's electricity systems. The terrorist attacks of September 11, 2001 also require that the security of the nation's energy infrastructures be evaluated and strengthened.

This Integrated Program Plan presents the goals and strategies that the New York State Energy Research and Development Authority (NYSERDA) is pursuing to help New York State meet its future energy needs. New York State can play a vital role in securing adequate and reasonably-priced energy supplies. Although there is considerable uncertainty in today's energy markets, the states and the nation can position themselves for the future by:

- Diversifying energy supply sources and fuel types.
- Improving energy efficiency practices and standards for buildings and appliances and improving energy and demand management.

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- Stimulating the production of clean, indigenous resources including renewable energy resources.
- Developing and using technologies that reduce energy intensity in the industrial sector.
- Promoting innovative energy production technologies.
- Improving transportation sector efficiency by increasing the use of public transportation, improving vehicle fuel efficiency, and reducing idling.
- Improving environmental quality by reducing the use of fossil fuels in meeting the energy needs of commercial, industrial, residential, and transportation sectors of the economy.

One clear benefit of increased energy diversity is reduced vulnerability to the risk of energy supply disruptions and price volatility. A diversified portfolio of energy resources can provide economic development opportunities in the State, particularly with respect to the development of indigenous energy resources, including renewable energy. Energy security also promotes a stable environment for business, inducing businesses to remain in New York and attracting new investment from outside of the State for businesses looking to locate in New York.

NYSERDA's portfolio of energy efficiency, research and development, low-income services, and environmental protection programs are designed to help New York meet its energy needs. To date, NYSERDA's programs are helping consumers save more than \$296 million a year and creating more than 4,600 jobs in the State. NYSERDA is committed to helping grow the State's economy and improve its environment by partnering with businesses, industries, and residents to invest in technologies that reduce energy use and promote a cleaner environment.

The three-year strategic outlook presented in this Integrated Program Plan provides an overview of NYSERDA's programs and services that are helping put the State on a path toward greater energy self-sufficiency, improved energy efficiency, smart economic growth, and a cleaner environment. This Plan describes an integrated portfolio of programs designed to support the State's energy policy goals adopted in the most

recent *State Energy Plan*,¹ the public policy goals of the New York State Public Service Commission's (PSC) public benefits program, and Gubernatorial and Legislative initiatives. Broadly, these public policy goals include:

1. Supporting and improving the continued safe, secure, and reliable operation of the State's energy and transportation systems infrastructures.
2. Stimulating sustainable economic growth, technological innovation, and job growth in the State's energy and transportation sectors through competitive markets.
3. Increasing energy independence in all sectors of the State's economy through greater use of energy efficiency technologies and alternative energy resources, including renewable-based energy.
4. Promoting and achieving a cleaner and healthier environment by reducing environmental impacts of energy production and use.
5. Ensuring fairness, equity, and consumer protections in an increasingly competitive energy market, and ensuring access to energy options for under-served customers.

STRATEGIC PLANNING AT NYSERDA

This document presents a comprehensive, integrated plan describing how NYSERDA will achieve its mission and objectives, including the identification of three-year program goals and strategies for their implementation.² The organizational and program strategies identified in this Plan capitalize on NYSERDA's distinctive capabilities and are designed to overcome barriers that might inhibit its ability to meet its mission and goals.

¹ New York State Energy Planning Board. 2002. *State Energy Plan and Final Environmental Impact Statement*. Albany, NY: NYSERDA.

² The development of this Plan is the result of numerous meetings and interviews with NYSERDA management and staff, strategic planning training and professional development workshops, off-site program strategy and planning retreats, and interactions with NYSERDA's Program Planning Committee and Board.

Developed by NYSERDA and approved by its Board, this Plan is used by NYSERDA management and staff to guide program implementation efforts and by NYSERDA's Board to direct and approve corporate initiatives and programs. The Plan is presented in three parts: first – an overview of NYSERDA and its organizational structure; second – a strategic analysis and description of NYSERDA's major programs, the customers served, and a presentation of three-year goals; and third – a discussion of NYSERDA's administrative capabilities and support functions. NYSERDA's Integrated Program Plan supports its mission to:

Use innovation and technology to solve some of New York's most difficult energy and environmental problems in ways that improve the State's economy.

In fulfillment of its mission, NYSERDA's corporate culture reflects its public service orientation:

NYSERDA places a premium on objective analysis, as well as collaboration, reaching out to solicit multiple perspectives and share information. NYSERDA is committed to public service, striving to be a model of what taxpayers want their government to be: effective, flexible, responsive, and efficient.

NYSERDA's mission and culture exemplify its commitment to helping the State achieve its energy policy goals. NYSERDA is a catalyst for change in the development and widespread use of innovation and technology to improve the State's economic and environmental well-being.

SECTION 2

ABOUT NYSERDA

INTRODUCTION

The New York State Energy Research and Development Authority (NYSERDA) is a public benefit corporation created in 1975 under Title 9 of the State Public Authorities Law. Its mission is “to use innovation and technology to solve some of New York’s most difficult energy and environmental problems in ways that improve the State’s economy.” NYSERDA conducts work in collaboration and partnerships with its private and public sector stakeholders, striving to be effective, flexible, and responsive to stakeholder needs.

NYSERDA derives its funding from a statutory assessment¹ on the intrastate sales of electricity and gas by New York’s investor-owned utilities and from voluntary contributions by the New York Power Authority (NYPA) and the Long Island Power Authority (LIPA). In addition, NYSERDA receives public benefits funding from the State’s six electric utility companies to administer the **New York Energy SmartSM** public benefits program on behalf of the New York State Public Service Commission (PSC). This program supports energy efficiency, low-income, R&D, renewable energy, and environmental protection programs in a competitive electricity market.²

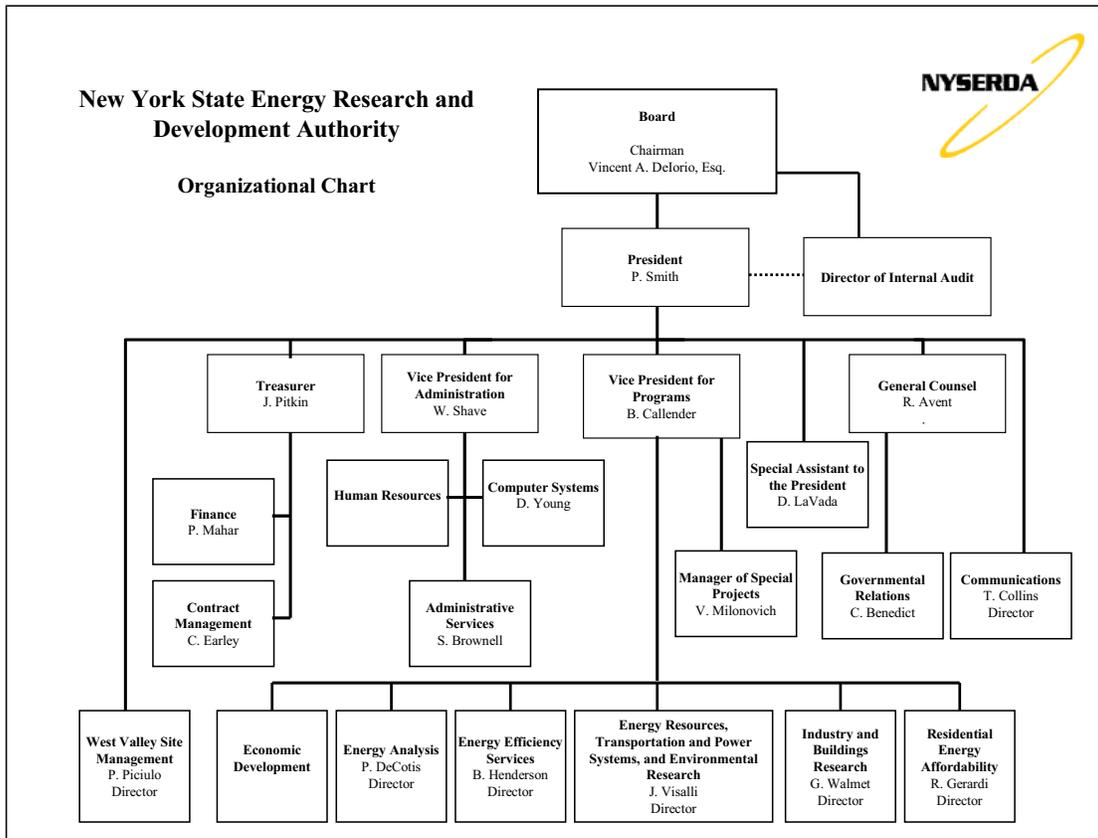
NYSERDA’s programs and services provide a vehicle for the State to work collaboratively with businesses, academia, industry, and households to improve the productivity of energy use, develop a more diversified supply portfolio, and develop market mechanisms and technologies to help New Yorkers plan for and respond to market uncertainties. The implementation of a renewable portfolio standard (RPS) for electricity generation currently being considered by the PSC could have a significant effect on NYSERDA’s renewable energy and green power marketing programs. Similarly, as energy markets continue to develop and retail electricity competition

¹ New York State Public Service Law, §18-a.

² Funding for this program extends through June 30, 2006.

matures, the State's public benefits program could be considered for possible extension. As a result, NYSERDA's programs will be re-examined to ensure that they continue to respond to changing public needs.

NYSERDA is organized functionally around major program areas and services. Its hierarchy is flatter than most organizations of its type, which enables it to remain flexible and responsive to stakeholders needs. An organizational chart depicting NYSERDA's management structure and major programs is presented in the figure below.³



³ NYSERDA is governed by a Board consisting of thirteen Members, including the Commissioner of the Department of Transportation, the Commissioner of the Department of Environmental Conservation, the Chair of the Public Service Commission, and the Chair of the Power Authority of the State of New York, who serve ex-officio. The remaining nine members are appointed by the Governor with the advice and consent of the Senate and include an engineer or research scientist, an economist, an environmentalist, a consumer advocate, an officer of a gas utility, and an officer of an electric utility. The Board Chair is designated by the Governor.

PROGRAM AREAS

NYSERDA's programs are designed to support one another and work in tandem to achieve the State's public policy goals. Where possible, NYSERDA integrates its programs and services to meet customer needs in an efficient and effective manner. Programs are integrated on many levels by sharing customers, addressing common barriers, and seeking to accomplish common program objectives. Moreover, individual markets might be influenced by several NYSERDA programs. For example, the lighting market is influenced by research and development, energy efficiency deployment, technical assistance, financing, residential, and economic development programs.

Each of NYSERDA's major programs is described in Sections 3 and 4 of this Plan in terms of their progress toward meeting goals established in the previous year's Plan, the strategic nature of the program and key implementation strategies, challenges and opportunities, and an identification of three-year goals covering the 2004-2007 period of the current Plan. NYSERDA's major program areas include:

- Economic Development
- Energy Efficiency Services
- Residential Energy Affordability
- Research and Development
- Energy Analysis
- West Valley Management

NYSERDA's administrative capabilities and support services programs that provide management, legal, and administrative services to support NYSERDA's mission include:

- Computer Systems
- Counsel
- Finance
- Human Resources
- Communications
- Contract Management

FUNDING

NYSERDA is funded through an assessment on electricity and natural gas sales, including a system benefits charge, contributions from the New York and Long Island Power Authorities, a variety of public and private funding partnerships, and federal grants, including both competitive and categorical formula grants. The following table presents NYSERDA's program funding for fiscal year 2004-2005 excluding administrative and related budget allocations.

Program Funding Summary - Fiscal Year 2004-2005 (\$000)

Major Funding Category	Program Allocation (\$000)
	2004-2005
System Benefits Charge Funding	
Energy Efficiency	55,925
Research and Development	45,206
Low-Income	31,106
Subtotal SBC	132,237
Research and Development Statutory Funding	
Buildings	2,900
Industry	2,800
Energy Resources	1,200
Transportation and Power Systems	3,200
Environment	2,500
Subtotal Statutory	12,600
Federal Grant Funding and Other Funds*	18,750
Total Program Funding 2004-2005	163,587

* Other funds include such funds as the U.S. Department of Energy, State Energy Program grants, Economic Development funds, United States Environmental Protection Agency (U.S. EPA) grants, Congestion Mitigation Air Quality Improvement funds, and funds for **New York Energy SmartSM** Communities.

SUMMARY OF PROGRAM OUTCOMES AND IMPACTS

The success of NYSERDA's programs continues to support the State's energy policy goals – helping to improve energy efficiency, contribute to improved electric system reliability, further the State's energy diversity, lower energy bills, improve environmental quality, and promote economic development. Some highlights of the NYSERDA's accomplishments include the creation of more than 4,600 jobs in the State and savings in excess of \$296 million from both statutory programs and the **New York Energy SmartSM** public benefits program. Additional highlights include:

- The **New York Energy SmartSM** Program has reduced statewide annual electricity use by 1,000 gigawatt-hours⁴ and made available close to 900 MW of electric demand reduction through a combination of permanent reductions (270 MW) and curtailable reductions (610 MW) over the period from 1998 to year-end 2003. In addition, the Program has:
 - Reduced annual energy bills for New Yorkers by \$196 million annually.
 - Committed more than \$697 million of new capital investment through December 31, 2003⁵.
 - Created over 3,500 jobs in the State through December 31, 2003.
- The **New York Energy SmartSM** Program has contributed to improving energy diversity in the State by reducing electricity use and peak demand, by increasing the share of renewable-energy-based electricity generation, and by reducing the use of fuel oil and natural gas. The Program has stimulated the State's wholesale renewable electricity market, assisting in the development of more than 40 MW of wind generation.

⁴ A gigawatt-hour represents the electricity used by approximately 167 households in a single year.

⁵ This figure is expected to exceed \$930 million through 2006. When combined with private co-funding, the Program will result in investment in the State's economy of more than \$2.8 billion to fund public benefit energy programs.

- The Program is helping conserve the State's natural resources by reducing air polluting emissions and reducing water use. The Program has reduced nitrogen oxide (NO_x) emissions by 960 tons, sulfur-dioxide (SO₂) emissions by 1,706 tons, and carbon dioxide (CO₂) emissions by 750,000 tons.

While the **New York Energy SmartSM** Program is an important driver of outcomes for NYSERDA, statutory programs provide significant environmental and economic benefits to NYSERDA's customers as well. From 1999 through 2003, \$299.2 million in product sales were directly attributable to projects undertaken by NYSERDA's programs. Over the same period, energy and other cost savings amounted to over \$370 million with annual savings in 2003 of \$100 million. Energy savings result from reductions in on-site electricity, natural gas, oil, and other fuels use. Cost savings represent reductions in annual operating costs paid by industrial, commercial, institutional, and residential customers in New York. Jobs created and retained in 2003 as a result of NYSERDA's statutory programs were 1,100.

STRATEGIC CONTEXT

NYSERDA's primary focus is on helping New York achieve its energy, economic, and environmental goals. NYSERDA's mission exemplifies its commitment to the State's goals. NYSERDA is a catalyst for change in the development and widespread adoption and use of innovation and technology to improve the State's economic and environmental well being. NYSERDA uses numerous strategies in pursuing its goals. Originally established as an applied research and development organization, NYSERDA continues to develop and disseminate objective data and technical analyses to help scientific and technological entrepreneurs develop and prepare technologies for commercialization. NYSERDA continues to support research in new and emerging technologies in numerous areas including energy resources, industry, buildings, environmental monitoring, transportation, and power systems.

Once technologies are ready to be marketed, NYSERDA provides financial incentives to various market actors, addressing the unique needs of each market sector and participant. Vendors of equipment and products, service providers, architectural and engineering firms, institutional managers, owners and operators of buildings, all may be recipients of different types of targeted financial incentives. Providing financial incentives is an important strategy at all points in the commercialization process. During

early product and process development stages, funding is provided for developing and testing prototypes. As technologies become ready for market, funding is provided for pilot projects and demonstrations that test viability in practical applications. NYSERDA also provides financial incentives to further the advancement of technologies that improve energy efficiency or environmental quality into the marketplace. Building consumer awareness and demand for energy-efficient products and services are important strategies that begin to reduce the need to provide financial incentives in some end-use market sectors, as less public support is needed to help decision makers understand the value of improving energy efficiency. NYSERDA is developing internal and external mechanisms that enable staff to monitor changing market conditions and the evolving needs of customers by developing plans that are deliberate, flexible, and efficiently administered.

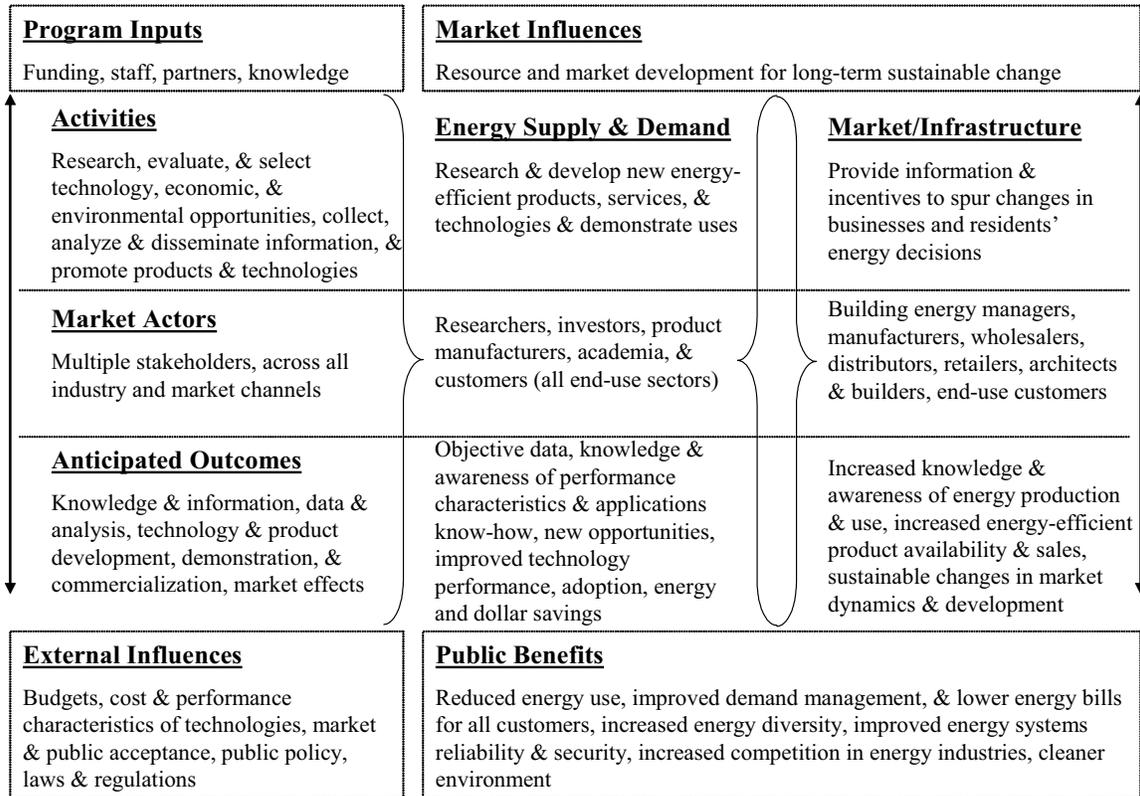
NYSERDA manages numerous programs that require consistent delivery mechanisms while retaining the ability to modify or even discontinue programs in response to market and customer needs. Increasing collaboration and integration among partners, customers, and staff will enable NYSERDA to refine delivery of resources and leverage outside financial investment and expertise. Staff are putting a greater emphasis on identifying and emphasizing synergies among programs because exploiting synergies allows NYSERDA to deliver quality programs and undertake analytic and technical activities in support of its mission. A summary process map illustrating the logic of NYSERDA's programs is provided below, reflecting the various activities engaged in, market actors served, and outcomes expected. Collectively these programs satisfy important public interests and market needs.

With few exceptions, NYSERDA projects are competitively selected. In fiscal year 2003-2004, more than 97 percent of the research, development, and deployment projects were contracted through a competitive solicitation and procurement process. Such solicitations are effective in selecting the most innovative ideas and identifying the best technical approach and service provider. Less than 3 percent of NYSERDA's projects are selected and funded through unsolicited and sole-source processes. Such projects are often the result of specific grant categories established by the federal government, or are creative and innovative proposals that help serve NYSERDA's mission and goals but fall outside the solicitation process.

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In 2003, 81 solicitations were issued, of which approximately 16 percent were for subscription programs, a total of 3,856 contract actions were processed.

NYSERDA STRATEGIC PROCESS MAP



NYSERDA will continue to support the safe, secure, and reliable operation of the State's energy infrastructures. NYSERDA will help the State progress toward its goals and increase opportunities for energy diversity by working with market forces to pursue sustainable economic growth, technological innovation, and the retention and creation of jobs.

SECTION 3

NYSERDA'S PROGRAMS

1. ECONOMIC DEVELOPMENT

The Economic Development Program (Economic Development) works to improve the State's business climate by forming strategic partnerships with State agencies and authorities, local governments, and economic development entities, and delivers services that help to develop and commercialize new energy technologies. The New York State Energy Research and Development Authority (NYSERDA) provides financial and technical assistance to New York businesses to invest in buildings and equipment that meet the highest standards of energy efficiency; assists businesses in developing innovative energy and environmental products and in creating business plans for commercializing such products.

Contribution To NYSERDA's Mission

Economic Development contributes directly to NYSERDA's mission of "using innovation and technology to solve some of New York's most difficult energy and environmental problems in ways that improve the State's economy" by identifying businesses interested in reducing energy use and peak electrical demand and assisting them in doing so, reducing negative impacts on our natural resources, and helping to contribute to a more profitable bottom-line. Economic Development advocates for business investment, commercialization of scientific research developed in New York's universities and colleges, and energy-efficient economic planning by local governments. Economic Development forms public and private partnerships to assist individuals and organizations to apply for financial assistance at any stage in the commercialization of their energy products and services including research, proof of concept, product and service development, demonstration, testing, marketing, and manufacturing. Economic Development staff work to match industries and organizations with the NYSERDA programs that can best meet the customer's individual needs.

Accomplishments

Accomplishments during the past year are summarized in relation to the previous year's strategic planning goals.

Expand the Saratoga Technology + Energy Park (STEP)

STEP is a knowledge-based community for clean energy and technology businesses in the early stages of product commercialization. NYSERDA helps businesses overcome the most difficult step in business development, *i.e.*, the transition from product testing and demonstration to commercialization. STEP provides a unique opportunity for businesses to share advanced technologies and dramatically improves the chances of successfully commercializing innovations of University-based businesses and independent researchers. The setting is designed to enhance opportunities for cooperation and collaboration among start-up businesses. During the past year, Economic Development completed the following:

- Completed the STEP Master Plan and Land and Marketing Plans.
- Prepared Conceptual Design Guidelines for STEP.
- Completed State Environmental Quality Review (SEQR) Act environmental impact study and zoning and permitting requirements for most of the site.
- Continued to refurbish the existing STEP facility.
- Issued a request for proposals for a developer for STEP.
- Established a STEP Advisory Group comprised of local community leaders to provide guidance and expertise.

STEP Partners

- Advanced Energy Conversion, LLC
- Bergmann Associates
- Building Performance Institute
- Global Resource Options
- Harris, Beach, LLP
- North American Board of Certified Energy Practitioners
- Rensselaer Polytechnic Institute
- Saratoga Economic Development Corp.
- Skidmore College
- Starfire Systems, Inc.
- Town of Malta
- University at Albany
- Union College

Develop a comprehensive statewide marketing and outreach infrastructure

Economic Development staff in New York City are coordinating efforts with New York City leaders to incorporate green building principles and renewable energy technologies in all major efforts to rebuild Manhattan in the aftermath of the September 11, 2001 terrorist attack on the World Trade Center. Staff have also established NYSERDA as a credible partner with New York City economic development leaders in the public and private sectors. NYSERDA played a significant role in helping the New York City Energy Policy Task Group develop a comprehensive energy strategy for the City.

NYSERDA met with representatives of the British government to discuss issues relating to climate change and hosted tours by British officials of local green building sites at 4 Times Square and the Metropolitan Transit Authority's hybrid electric bus operations. Economic Development staff have also enabled NYSERDA management to contribute to and participate in an Economic Summit with Canadian officials to explore potential synergies in mutual efforts to develop renewable energy technologies and new grid technologies.

Economic Development participates in industry and trade organizations and serves actively on committees with private sector leaders such as the New York Building Congress and the Real Estate Board of New York. NYSERDA has been recognized as a key resource in charting the City's energy future. Through its Economic Development Program, NYSERDA partnered with key developers, such as Albanese Development, the Durst Organization, and the Battery Park City Authority, to bring green and renewable technologies to commercial reality.

NYSERDA 2003 Entrepreneurial Network

- Empire State Development
- Business Council of New York State
- Real Estate Board of New York
- Building Congress
- Buffalo/Niagara Partnership
- Chambers of Commerce
- Local Development Corporations
- NYC Partnership
- Lower Manhattan Development Corporation
- Regional Technology Development Corporations
- Local municipal government entities including City Councils, City Halls, and Community Boards
- The Center for Economic Growth, Inc.
- University at Albany and other colleges and universities

Economic Development staff in Western New York are involved in the effort to develop supercomputers to aid in biological discovery through Governor Pataki's designation of Buffalo as a Center for Excellence in Bioinformatics. In particular, Economic Development staff worked to ensure that the three most critical entities in bioinformatics are active participants in NYSERDA's New Construction Program: Hauptman Woodward Institute's Structural Biology Research Center, Roswell Park Cancer Institute Center for Genetics and Pharmacology, and the University at Buffalo Center for Excellence in Bioinformatics. Collectively, these entities are projected to infuse more than \$300 million dollars into the economy of western New York.

Economic Development established NYSERDA as a founding member of the Entrepreneurial Services Network, a partnership of economic development organizations, educational and research institutions, industry groups, and professional service providers created to provide coordinated assistance to new businesses in the technology and life sciences fields. Economic development organizations, educational and research institutions, industry groups, and professional service providers across the State are encouraged to participate in the initiative to aggregate, amplify, and extend the technology and life sciences fields in New York.

In the past year, Economic Development launched numerous cooperative initiatives with the New York State Empire State Development Corporation (ESD). With ESD, Economic Development staff are working to retain companies considering relocating out of the state and providing joint incentive packages to companies considering moving into New York. As a result, companies such as International Paper in the North Country Region and C&D Technologies in the Mid-Hudson Region have elected to keep their operations in the State.

Program Strategies

NYSERDA is focusing Economic Development's program strategies regionally to enable staff to become better acquainted with and informed about local development networks, businesses, industries, and trade and other organizations. Economic Development Program staff work out of NYSERDA's main office in Albany as well as from the Buffalo and New York City offices. Economic Development continues to increase business investment in New York by advertising available NYSERDA programs and advocating promising projects.

New York State has a distinguished network of universities and colleges. Economic Development works with these academic organizations to keep talented graduating students in New York State and cultivate innovations from those graduates. For example, the STEP program exemplifies NYSERDA's commitment to the commercialization of academic research and knowledge-based economic development.

Activities of Economic Development are designed to complement and enhance the efforts of program staff to promote their programs statewide. Solicitations and program information are marketed to midstream organizations, such as the Regional Technical Development Centers, Regional Empire State Development Offices, local Industrial Development Agencies, business associations, chambers of commerce, universities, and Centers for Advanced Technology. Economic Development staff share NYSERDA solicitation information with representatives of these organizations and ask them to disseminate this information to businesses in their regions. This intermediary approach is a successful aspect of the Economic Development marketing plan, and, in 2003, the Economic Development Program expanded the network to include end-users of electricity.

Economic Development staff seek organizations that want to identify cost-effective energy-efficient capital improvements, receive guidance about energy-related process improvements, develop energy-efficient operational procedures, conduct strategic energy planning, retro-commission existing systems, and help electric customers analyze electric rates, load shapes, and aggregation opportunities for saving energy and money. Economic Development staff seek projects that would not occur without government assistance or another form of outside support.

Three-Year Goals

The Economic Development program will work with individual organizations with energy-related problems and those businesses with a willingness to provide custom energy services, acting as a conduit for potential clients, directing them to appropriate NYSERDA programs with the ability to provide energy solutions the market might not currently sustain. Economic Development has adopted a business model that focuses on individual customers and will continue to expand its network of contacts during the next three years to further NYSERDA's goals, especially through contracts with New York State businesses. More specifically, Economic Development will:

- Select a developer for STEP and work to attract tenants to “build-out” the park.
- Develop a business amenities plan (*e.g.*, interns, mentors, consultants, speakers) for STEP.
- Continue working to connect New York businesses with technical know-how and financial resources to increase energy productivity. Economic Development’s goal is to share NYSERDA’s program solicitations and opportunities with midstream development organizations, so they might share targeted information with businesses in their regions.
- Continue working with customers to reduce energy demand as the most economical way to meet current and future energy needs and reduce the environmental impacts of energy projects.
- Partner with a two- or four-year New York State college to take the lead on a \$600,000 two-to-three year U.S. National Science Foundation “Partnerships for Innovation” grant. Funds will be used for technology transfer activities, internship programs, consultant service, and equipment to support innovations in the use of energy and technology.

Opportunities and Challenges

Through the support of Economic Development, customers are able to reduce energy use, thereby reducing their vulnerability to energy supply and price volatility. Economic Development offers New Yorkers opportunities to design independent solutions and develop new technological answers to these problems.

Having established a strong network among economic planners, investors, business owners, and university researchers, Economic Development is in a favorable position to identify organizations that might not ordinarily work with NYSERDA. Economic Development staff have in-depth knowledge of NYSERDA’s markets and programs and can channel potential business partners to the most effective and beneficial energy programs.

Energy Efficiency Services (EES) and Economic Development work together to overcome two of the most significant barriers to energy efficiency technology growth – lack of information and inadequate financing. Economic Development acts in an outreach capacity, and EES provides financial incentives for necessary technical

assistance and the purchase and installation of energy efficiency measures to improve the energy efficiency of existing electrical loads from eligible ratepayers. NYSERDA assistance is available to all individual households and establishments, new and existing, who want to reduce their energy bills by implementing energy efficiency measures.

Future Directions

Ultimately, New York's economy will support more competition in energy markets and prosper from the introduction of clean energy technologies. Until then, NYSERDA offers financial assistance for individual projects to ensure continued economic growth and better air quality while working with stakeholders to promote joint investment in emerging energy technologies. Economic Development will focus its efforts on "building out" STEP and meeting individual business needs by marketing NYSERDA's programs and creating partnerships among customers, businesses, academia, and government.

Three-Year Funding

The following table shows preliminary program funding for Economic Development for fiscal years 2004-2007.

Economic Development Funding for Fiscal Years 2004-2007 (\$000)

	2004-2005	2005-2006	2006-2007
Program Funding	\$500	TBD ¹	TBD

¹ To be determined.

Solicitations

Currently, open and planned solicitations are presented in the following table.

Solicitations for Economic Development

Solicitation Number	Title	Proposal Release	Proposal Due Date
Anticipated Solicitations			
PON 718	Initiative for STEP - Attracting Clean Energy Technology Companies	9/20/04	10/15/04
RFP 875	STEP Forest Management Services	7/19/04	8/12/04

Note: Anticipated solicitations are included for planning purposes and have not been approved by NYSERDA's Program Development Management Committee. They are subject to change. All solicitations are current as of June 21, 2004.

2. DEPLOYMENT PROGRAMS

Energy Efficiency Services

New York's business and institutional sectors account for nearly 50 percent¹ of the State's primary energy use and have a significant impact on the State's economy, environment, and demand for electricity. The transportation sector alone accounts for 35 percent of the State's primary energy use.² Energy Efficiency Services plays an important role in improving energy efficiency, increasing the use of sustainable design practices, promoting electric peak-demand reductions, and reducing fossil use in these sectors. Programs target new and existing buildings, industrial and process activities, and vehicle fleets. Specific initiatives include performance-based contracting, technical assistance, financial incentives, demand response, and the development of an infrastructure of energy efficiency product and service suppliers. Energy Efficiency Services programs have a direct and significant effect on energy use, the reliability of the electric system, and the State's economic health and environmental stewardship.

Contribution To NYSERDA's Mission

Energy Efficiency Services programs contribute to NYSERDA's mission in several ways. Program staff collaborate with key stakeholders to expand the market's capabilities to target and implement projects that address the State's short-term and long-term energy priorities. Initiatives are designed to consider the State's immediate and long-term economic needs and to support job retention and business expansion throughout New York. Specific strategies employed by Energy Efficiency Services that contribute to NYSERDA's mission include:

- Developing aggressive electric-system and peak-load reduction initiatives that reduce the risk of energy supply disruptions and price volatility to ensure the continued safe, secure, and reliable operation of the State's energy infrastructures.

¹ New York State Energy Research and Development Authority. 2003. *Patterns and Trends*. Albany, NY: NYSERDA.

² Ibid.

- Reducing the energy bills of New York businesses so they remain competitive and are more likely they remain in New York, expand their operations, and continue to contribute to the State's economic development.
- Fostering long-term market changes with energy efficiency products and services such that the benefits will be sustained and grow over time.
- Promoting efforts that reduce cost, expand availability, and increase the use of clean, alternative fuel and advanced technology vehicles that ultimately result in economic and environmental gains.

Accomplishments

Accomplishments during the past year are summarized in relation to the previous year's strategic planning goals.

Improving the reliability of the State's electric system.

- Through a combination of demand response and permanent load reductions, the Peak-Load Reduction Program enabled commercial and industrial facilities to reduce summer peak demand by 338 megawatts, equivalent to the power needs of approximately 250,000 households. Reductions of 160 megawatts were enabled in Consolidated Edison Company of New York, Inc.'s service area where load reductions are most critical. Summer 2003 was an atypical year, during which New York's demand response capabilities were called on to restore service to the State following the August 2003 blackout. (See sidebar.)

August 14, 2003 Blackout:
Energy Efficiency Services' Role in the Response

- More than 500 direct phone calls and e-mails requesting that private and public entities reduce their load directly resulted in up to 10 MW reduction from the grid.
- All Executive Order No. 111 state agency contacts will be e-mailed and asked to initiate load reduction orders per the Governor's directives to State entities.
- NYSERDA implemented its own load reduction plan – reducing building load by more than 85 percent.

Building a self-sustaining market for energy-efficient products and services.

- Approximately 150 energy services companies (ESCOs) are now active in energy efficiency, performance-based contracting in New York, as a result of the Commercial and Industrial Performance Program. As the number of active ESCOs increase, so do the options, tools, and services available to customers to help find ways to reduce electricity use and control loads.
- Continue to build and expand the network of service providers across the State, which currently number more than 1,200 allies, by providing training, outreach, and technical support. Allies include approximately 350 architecture and engineering firms, 220 motor vendor shops, 380 electrical contractor firms, nearly 80 lighting designers and 80 lighting distributors, almost 90 lenders, and more than 50 HVAC contractor firms.

Energy Efficiency Services 2003 Awards

- “Certificate of Recognition for Exemplary Natural Gas Efficiency Program,” awarded to the FlexTech Program by the American Council for an Energy-Efficient Economy.
- “Certificate of Appreciation” from the International Performance Measurement and Verification Protocol, Inc.
- “Certificate of Appreciation” from the New York Association of Public Transportation.

Increasing energy efficiency and productivity in the industrial and manufacturing sectors.

- Through the joint efforts of Energy Efficiency Services and NYSERDA’s Research and Development Program, more than 100 combined heat and power (CHP) projects have been approved for funding and 17 systems have been installed. The installed systems are expected to reduce peak demand by more than 7.5 megawatts, providing a valuable return on investment to program participants and the State’s electricity grid.

Improving the energy affordability of existing buildings and the energy performance of new buildings.

- Green design and high performance buildings are becoming more mainstream as the New Construction Program has taken major steps toward implementing a

more holistic, building-performance approach to delivering services to customers. Recently design team incentives were increased for projects that are Leadership in Energy and Environmental Design (LEED™) certified with the U.S. Green Buildings Council. To date, over 1,000 projects have received services through the Program, representing over 100 million square feet of new construction and substantial renovation projects.

- The Commercial and Industrial Performance Program has leveraged over \$500 million of energy efficiency retro-fit projects in existing buildings and facilities.

Encouraging leadership for energy efficiency in the public sector.

- The Energy Smart Schools Program expanded its membership with the New York State Education Department and many school associations to support K-12 schools in developing comprehensive approaches to constructing and managing healthy, cost-effective buildings and vehicle fleets. To date, more than 100 schools have accessed assistance through the New Construction Program and many are incorporating green design features into their buildings. More than 45 districts have received assistance to implement comprehensive performance-based projects. An online training curricula for high-performance school design has been developed and more than 100 schools have been benchmarked to develop energy efficiency implementation plans. More than 2,000 school buses have been converted to an alternative fuel or are installing emission reduction systems. In total, NYSERDA has committed more than \$22 million to the K-12 schools market supporting these efforts.
- As chair of the Advisory Council on State Energy Efficiency, NYSERDA has partnered with State agencies and authorities to make significant progress toward the goals set forth in Governor Pataki's Executive Order No. 111, "*Green and Clean*" *State Buildings and Vehicles* (E.O. 111). To date more than \$30 million in public-benefit funds have been used to help finance energy efficiency improvements in State buildings. In addition, more than \$86 million in State EnVest projects are under way that will improve energy efficiency in New York State. Executive Order No. 111 efforts to date have led to an 8.9 percent reduction in energy use per square foot, which is approximately one-fourth of the Governor's multi-year goal of reducing energy use by 35 percent by 2010.

Increasing energy diversity in the transportation sector.

- The alternative fuel vehicle programs have completed forty-six projects representing an investment of over \$14 million in the State. As a result, ten hybrid-electric buses, 174 compressed natural gas (CNG) buses, and over 760 light-, medium-, and heavy-duty CNG vehicles are being operated in public and private fleets. More than 1.5 million gallons of biodiesel (B-20) have been consumed through a Western New York supply and distribution network. Over the lifetime of the vehicles, nearly 25 million gallons of petroleum fuel will be displaced, and 1,130 tons of oxides of nitrogen, 53.5 tons of particulate matter, and 70,000 tons of carbon dioxide (greenhouse gas) emissions will be avoided.
- The New York State Clean Air School Bus Program, funded by \$5 million from the Clean Water/Clean Air Bond Act, received an overwhelming response in its first funding cycle. Through this first-in-the-nation initiative, 75 school districts are retrofitting nearly 2,200 schools buses with advanced emission-reducing equipment. The implementation of the technology will help improve air quality in some of the State's worst air quality areas.

Program Strategies

Energy Efficiency Services will continue to incorporate a range of intervention strategies that promote: the design and implementation of cost-effective energy efficiency and sustainable design practices; competitive markets and dynamic, real-time pricing strategies; enhanced market development initiatives; and economic development in the State's buildings and transportation sectors. Energy Efficiency Services' initiatives induce lasting structural and behavioral market-based changes and increase the adoption of technologies and design, purchasing, and management practices to achieve NYSERDA's mission. Energy Efficiency Services will continue to partner with vendors, energy services companies, contractors, distributors, architects, engineers and others involved in the specification, design, construction, procurement, and facility management professions. These partnerships, combined with well-placed financial incentives and other professional development tactics (*e.g.*, on-line training and conferences, primers, etc.), will allow Energy Efficiency Services to help its partners differentiate (including highlighting important non-energy benefits) the value of their services from those of their competitors. Increased recognition of partner accomplishments and deployment of new training programs will be critical to making Energy Efficiency Services' initiatives a continuing success.

As markets for energy-efficient products and services mature, Energy Efficiency Services is transitioning program emphasis from providing direct end-user financial incentives for capital improvements toward fostering integrated building and system management; performance bench-marking; and advanced maintenance and operations practices. The key to successful transition is the development of long-term relationships with property owners and occupants and the associations and businesses that support them.

Energy Efficiency Services understands that different market sectors have different business models and as a result has initiated specific program changes to better serve these unique market sectors. In an effort to expand the reach and visibility of these initiatives, Energy Efficiency Services' programs and messages will continue to be tailored to match the varying business models and will continue to build relationships with organizations representing each sector. Such program changes will include a greater focus on demonstrating the business case to justify energy efficiency improvements appropriate for each market sector. Energy Efficiency Services' staff, in concert with NYSERDA's regional offices, Economic Development staff, and consulting resources, are continuing to improve their ability to identify customers with the greatest need and potential. Certain sectors and geographic regions of the State, *e.g.*, commercial property owners in the New York City metropolitan area and the manufacturing sectors, still present significant opportunities.

Energy Efficiency Services will help ESCOs incorporate the emerging competitive energy market and real-time pricing opportunities in New York into their business model and continue to foster an active ESCO industry. With NYSERDA's targeted support for reaching underserved customers, ESCOs will be able to provide more services to an expanded range of customers.

Energy Efficiency Services will also develop additional links with key State, regional, and national partners. (See text box.) Linking activities include leveraging opportunities with: the national ENERGY STAR[®] campaign developed by the U.S. Environmental Protection Agency (U.S. EPA) and U.S. Department of Energy (U.S. DOE); the national Federal Energy Management Program developed by the U.S. DOE; the national LEED[™] programs developed by the U.S. Green Buildings Council; and the

Selected Energy Efficiency Services Partners

- Alliance to Save Energy
- American Council for Energy-Efficient Economy
- Building Commissioning Association
- Business Council of New York
- City of Buffalo Advisory Group
- Clean Fuel Vehicles Council
- Congestion Mitigation Air Quality Advisory Board
- Consortium for Energy Efficiency
- Design Lights Consortium, Working Group on Coordinating Lighting Initiatives
- Electric Drive Transportation Association
- Executive Order No. 111 Advisory Council
- Greater Long Island Clean Cities Coalition
- Green Buildings Task Force on High Performance Schools
- Light Right Consortium, Board of Motor Resource
- Manufacturers' Association of Central New York
- National Clean Cities, Inc.
- National Council for Qualifications of the Lighting Professions
- New York Association of Public Transportation
- Northeast Energy Efficiency Partnership
- United States Department of Energy
- United States Environmental Protection Agency
- United States Green Building Council

New York State Green Building Tax Credit developed by the New York State Department of Environmental Conservation. Use and incorporation of these national and statewide messages and tools into Energy Efficiency Services' programs will help attract the attention of more corporations and encourage them to do business in New York.

Energy Efficiency Services will direct available resources to the acquisition of alternative-fuel vehicles, alternative-fuel development, and advanced technology equipment in areas of the State where air quality is a major concern. At the same time, new strategies and approaches will be developed with the R&D program that focus on emissions reductions from on-road and off-road diesel vehicles.

Energy Efficiency Services is continually examining programs and markets to achieve the greatest impact with available resources. Anticipated changes to services and target audiences include:

- Expanding the Peak-Load Reduction Program to address emerging issues such as dynamic retail pricing, risk mitigation, and bidding strategies. NYSERDA will assist customers to enter into fair and reasonable commodity and load management contracts and implement technology solutions, such as smart meters, that integrate facility operations with new electric rate structures.
- Expanding peak-load reduction initiatives to reduce winter peak and year-round load management, where appropriate. Expanded services could include facility audits and technical assistance focused on demand response.
- Expanding services to sectors most in need of assistance including colleges and universities, the hospitality sector, and industrial manufacturing facilities.
- Expanding green buildings and sustainable design initiatives to include existing buildings and moving toward developing guidelines for the construction of new buildings.
- Working closely with original equipment manufacturers (OEMs) to improve the energy efficiency of equipment at the factory, instead of retrofitting used equipment. For example, heating, ventilating and air conditioning (HVAC) systems could include premium-efficient motors and direct load controls in products.
- Placing greater emphasis on reducing plug load, which can account for approximately 20 percent of a building's electricity requirements. Simple, low-cost, no-cost actions and the use of power management software can lead to significant electricity savings.
- Modifying programs to influence decisions without offering incentives and exploring alternative financing approaches such as expanding tax-exempt leasing to schools and local governments. Staff will work to identify other leverage points in the market and will inform customers of the economic benefits of energy efficiency improvements.
- Supporting CHP, distributed generation (DG), and emergency generation technologies and projects. Power reliability is important to mission-critical facilities like hospitals, wastewater treatment plants, and data processing centers, and Energy Efficiency Services will consider offering incentives for CHP, DG, and emergency generation projects.

- Creating demand for biofuels and efficient, clean vehicles produced in New York and used by New Yorkers.

Program Opportunities and Areas of Program Development

Energy Efficiency Services has identified several significant program opportunities that may require additional program resources and will contribute substantially to accomplishing NYSERDA's mission.

- Active load management can help save the private and public sectors money and can benefit all electricity users in the State by mitigating potential peak demand constraints statewide and in load pockets. However, load management does not necessarily lead to a reduction in electric energy use and emissions. Emphasis on load management has increased in recent years and Energy Efficiency Services will balance these two needs by finding new and innovative ways to help customers reduce electricity use and demand.
- Federal funding through the State Energy Program (SEP) allows Energy Efficiency Services to address important issues and serve customers that are not eligible to receive system benefits charge (SBC) funded assistance. However, annual federal appropriations are uncertain, and reductions in funding could affect NYSERDA's ability to continue this work. In addition, the U.S. DOE is modifying its deployment programs and the effects of changes in approach and funding are unknown.
- Improvements in equipment and design protocols for State buildings will provide enduring energy and cost savings. NYSERDA's ability to assist agencies to comply with Executive Order No. 111 is limited by the absence of dedicated funding and resources. Nonetheless, the State EnVest program fulfills a critical role in providing state agencies and authorities with opportunities to fund energy improvements using future years' guaranteed savings.
- Improving the efficiency of natural gas used in the commercial and industrial sectors. As renewable (*e.g.*, photovoltaic systems and small wind) and clean (*e.g.*, fuel cells and CHP) energy technologies mature and become more readily available, increasing opportunities will emerge to use them in deployment applications. These technologies are currently maturing into valuable components of energy efficiency projects.

- NYSERDA's approach to transportation has historically focused on increasing energy diversity and reducing the use of petroleum, primarily through promoting the use of different fuels. However, to achieve the carbon dioxide (CO₂) reduction goals outlined in the *State Energy Plan*, the transportation deployment program will need to expand beyond fuel switching to projects that also result in significant reductions in (CO₂). The policy attention toward emission reductions (particularly diesel emissions) is relevant and important. However, Energy Efficiency Services is cautious not to overemphasize emission reduction initiatives at the expense of other initiatives to promote improvements in efficiency and fuel diversity.

Three-Year Goals

Energy Efficiency Services Program goals are driven largely by long-term commitments through the **New York Energy SmartSM** Program, Executive Order No. 111, federal grants, and other ongoing projects and initiatives. While these program commitments dictate that the goals remain relatively stable, a transition in objectives and in the manner in which the programs are implemented reflects a maturation in programs, a response to evaluations, technological and regulatory advances, and evolution in the marketplace. The goals for Energy Efficiency Services are to:

Foster Competitive Choices.

Energy Efficiency Services will help foster a more vibrant competitive energy commodity and services market. Working closely with the New York Department of Public Service (DPS) and the New York Independent System Operator (NYISO), Energy Efficiency Services will provide private and public customers with the information and tools they need to better understand the range of opportunities presented by competitive choices and dynamic and alternative rate options. Energy Efficiency Services will strive to increase participation in competitive commodity markets.

- Provide customers with tools to understand, use, and purchase energy in the most cost-effective manner. Planned activities include investigations of load management opportunities and development of model documents for streamlined purchasing in the competitive market.

- Combine strategies for load management, dynamic retail pricing, bidding, and price hedging with commodity purchasing initiatives to assist customers in managing their response to electric price volatility.
- Create enhanced opportunities for consumer choice by expanding the number of energy service companies and the abilities and services of existing energy service companies.
- Collaborate with DPS to develop dynamic retail pricing rate options and programs that increase customer awareness of the cost savings available through price-responsive strategies.
- Develop a pilot effort to increase customer understanding of transmission owner and NYISO Day-ahead pricing options. The pilot project may include demand response audits, training seminars, economic analyses, and no-risk test runs.

Improve the Reliability of the State's Electric System.

Energy Efficiency Services will help private and public customers manage electricity use and reduce peak load demand. Energy Efficiency Service will strive to increase the percent of statewide load participating in demand response markets up to 15 percent above the current level of 327 MW.

- Coordinate with the NYISO and DPS to develop and provide creative approaches to reduce summer and winter peak load statewide, focusing on load pockets in New York City and on seasonally constrained areas upstate.
- Provide customers with tools to make improved business decisions about energy use, rate structures, and how to directly control loads.
- Incorporate demand response and real time pricing capabilities (*i.e.*, advanced interval metering with robust communications) into new construction projects.
- Expand technical assistance services to help customers take advantage of opportunities for distributed and combined heat and power generation. With continued market development, Energy Efficiency Services could include these as options in existing deployment programs.

- Work with the New York State Department of Environmental Conservation and the DPS to support the enactment of the Distributed Generation Rule-Making.

Improve the Energy Affordability and Sustainability of Existing Buildings and the Energy Performance of New Buildings.

Energy Efficiency Services will help alleviate high energy costs in buildings by increasing awareness and providing energy audits, technical guidance, financial incentives, and low-cost financing. Energy Efficiency Services will strive to increase the energy efficiency for each project by an average of 20 percent over the New York Energy Code baseline.

- Aggregate energy projects to encourage ESCOs to expand in New York State and facilitate private investment in the energy services industry.
- Partner with the commercial real estate markets to include energy-efficient building improvements and systems enhancements that will raise property values and improve return on investments.
- Continue with plans to streamline incentives, processes, and services to deliver benefits to existing buildings more efficiently.
- Work with the K-12 schools, colleges, and universities to incorporate energy-efficient and green-building designs into curricula for future building designers.
- Continue to support sustainable design in new buildings, major rehabilitations, and other construction projects. Continue to encourage each market sector to make use of new performance-based incentives. Promote the recognition of programs such as the Green Building Tax Credit, LEED™, ENERGY STAR®, and other high-performance building standards.
- Foster long-term relationships among building owners and energy professionals who can produce strategic energy plans that present time horizons for implementing various renewable energy, energy efficiency, and other cost-reduction strategies.

Increase Process Energy Efficiency and Productivity in the Industrial, Manufacturing and Water Sectors.

Energy Efficiency Services will promote system and process improvements that decrease operational expenses, increase productivity, reduce environmental impacts, and assist industries to compete globally from a New York base.

- Enable industries to evaluate and implement productivity measures, waste management, distributed generation, combined heat and power, and demand response strategies.
- Increase emphasis on the food, wood products, glass, ceramics, chemical, printing, and metal-products industries.
- Increase the use of performance contracts and advanced web-enabled metering in the municipal water and wastewater markets.

Lead by Example in the Public Sector.

Energy Efficiency Services will continue to foster the objectives of Governor Pataki's Executive Order No. 111, "*Green and Clean*" *State Buildings and Vehicles*. This includes green design, energy efficiency, peak demand, purchasing standards, alternate fuel vehicle purchasing, and renewable energy purchasing. Energy Efficiency Services will strive to support all the goals established in Executive Order No. 111.

- Provide information and resources to State agencies to: purchase and install energy-efficient products; make operational and maintenance improvements through commissioning and advanced metering; and develop and implement demand response capabilities.
- Increase understanding and use of alternative fuels and technologies for transportation.
- Reduce the need for taxpayer support of Executive Order No. 111 implementation by encouraging participation in tax-exempt leasing programs, such as the State EnVest Program. Continue to identify and establish new financing opportunities to support agency investment in energy efficiency and renewable energy.

- Encourage schools and municipalities to adopt the principles of Executive Order No. 111.
- Accelerate sustainable design practices in K-12 schools by encouraging adoption of the High Performance School Design Standards. Continue to encourage the use of U.S. EPA's Portfolio Manager for benchmarking energy reduction potential, offering a building operator certification training program, and use a variety of online training modules to inform the architecture and engineering community of best practices for the K-12 school market.
- Collaborate with the Clean Fuel Vehicles Council to co-fund vehicle and infrastructure projects that help state fleets achieve their vehicle procurement and petroleum-reduction goals.

Build a Self-Sustaining Market for Energy-Efficient Products and Services

Energy Efficiency Services will expand the capability and capacity of suppliers and specifiers who provide energy products and services to the private and public sectors. Energy Efficiency Services will strive to increase the use of energy efficient products targeted in its programs by up to 25 percent above current usage levels.

- Examine interactions with the markets, raising participation requirements as increasing numbers of high efficiency products are purchased and reducing and removing program support when products and services have reached acceptable penetration rates. New initiatives will target underused technologies.
- Provide new and innovative tools, resources, and information to enable partners and market allies to incorporate energy-efficient operational and procurement practices into their business plans and to more effectively promote energy efficiency options to their customers.
- Help market allies and business partners to better differentiate their high efficiency products and services from the standard-efficiency options of their competitors and increase their profits.

Increase Energy Diversity in the Transportation Sector

Energy Efficiency Services offers technical information and financial incentives to overcome barriers to the purchase and use of alternative-fuel and low-emission vehicles, reducing dependence on fossil fuels and ensuring a cleaner, healthier environment.

- Expand the use of biodiesel by public and private fleets and support development of a New York-based biodiesel production and delivery infrastructure. Through development of regional markets, encourage use of 10 million gallons of B20 biodiesel by 2007.
- Secure funding to expand the pilot diesel retrofit program for school buses and other heavy-duty diesel vehicles; begin to include off-road equipment, which presents significant emission-reduction opportunities. Accelerate introduction of ultra-low-sulphur diesel to enable the use of the best available emission reduction equipment which requires cleaner fuel to be effective.
- Focus alternative-fuel and hybrid-electric strategies on medium- and heavy-duty fleets in areas with high concentrations of asthma and where fleets participate in the Clean Cities Program. Meet fleet needs by developing in-state vehicle production capacity to fill the gap left by the original equipment manufacturers' phase-out of product lines.
- Collaborate with purchasing consortia to bring down the costs and streamline procurement for transit operators interested in expanding their hybrid-electric bus fleets.
- Integrate idle-reduction strategies and technologies into fleets, particularly for school districts and businesses involved with the delivery of products in urban environments.
- Provide an avenue for deployment of technologies developed through NYSERDA's transportation research and development program.

Three-Year Funding

The following table shows preliminary program funding for EES for fiscal years 2004-2007.

Energy Efficiency Services Funding For Fiscal Years 2004-2007 (\$000)³

Source of Funding		2004-2005	2005-2006	2006-2007
System Benefits Charge Funding	Peak Load & Emergency Generation	\$4,660	\$4,660	TBD ⁴
	Energy/Information Management Systems	\$1,415	\$1,415	TBD
	Energy Efficiency Products	\$2,937	\$2,937	TBD
	Technical Assistance	\$6,482	\$6,487	TBD
	Performance Contracting	\$10,202	\$10,202	TBD
	Financing	\$1,580	\$1,580	TBD
	Energy Management	\$2,396	\$2,396	TBD
	New Construction	\$10,800	\$10,800	TBD
	Municipal Water/Wastewater	\$853	\$853	TBD
	Subtotal SBC	\$41,325	\$41,325	TBD
Federal, Grants, and Other Funding	Clean Water/Clean Air Bond Act Clean Fuel Bus Program	\$9,250	\$4,000	\$0
	Congestion Mitigation Air Quality Improvement Funds	\$7,000	\$2,000	\$2,000
	State Energy Program Base Grant	\$900	\$900	\$900
	Other Grants	\$650	\$650	\$650
	Subtotal Federal, Grants, and Other Funding	\$17,800	\$7,550	\$3,550
Total		\$59,125	\$48,875	TBD

³ Reflects unencumbered program funds available as of March 31, 2004, subject to reallocation with approval by the Department of Public Service staff or Public Service Commission.

⁴ To be determined.

Solicitations

Currently, open and planned solicitations are presented in the following table.

Solicitations For Energy Efficiency Services

Solicitation Number	Title	Proposal Release	Proposal Due Date
Current Solicitations			
PON 660	Premium-Efficiency Motors Financial Incentives	12/24/01	12/31/05
RFQL 702	Energy Performance Contracting in State Owned Facilities	6/10/02	6/01/07
PON 809	Small Commercial Lighting Program Incentives	8/25/03	12/31/04
PON 811	Technical Assistance	6/14/04	12/1/04
PON 814	New York Energy SmartSM Loan Fund	6/30/03	6/30/05
PON 831	CHP and Renewable Generation Technical Assistance	6/7/04	9/1/04
PON 831A	CHP and Renewable Generation Technical Assistance	6/7/04	12/1/04
PON 835	Peak-Load Reduction Program	12/22/03	11/1/04
PON 852	Retrocommissioning Initiative for Commercial Buildings	3/8/04	4/1/05
PON 853	Smart Equipment Choices Program	3/29/04	12/31/04
PON 855	Commercial & Industrial Performance Program	3/29/04	12/31/04
PON 869	New Construction Financial Incentives	5/31/04	12/30/04
PON 872	New York City Private Fleet Program	6/21/04	9/15/04
Anticipated Solicitations			
PON 707	New York City Clean Fuel Taxi Program, Round II	7/15/04	7/15/05
PON 858	CHP and Renewable Generation Technical Assistance	2/7/05	3/1/05
PON 858A	CHP & Renewable Generation Technical Assistance	2/7/05	6/1/05
PON 865	Technical Assistance	11/8/04	6/1/05
PON 866	Technical Assistance	5/9/05	12/1/05

Note: Anticipated solicitations are included for planning purposes and have not been approved by NYSERDA's Program Development Management Committee. They are subject to change. All solicitations are current as of June 21, 2004.

TBD - to be determined.

Residential Energy Affordability Program

Reducing the energy burden on residential and low-income customers is one of the most significant challenges facing NYSERDA's Residential Energy Affordability Program (REAP). REAP offers customers comprehensive energy services including technical information and assistance and access to energy-efficient products and services. Residential programs are integrated into the markets and serve to balance consumer demand with the delivery of energy-efficient goods and services.

Contribution To NYSERDA's Mission

REAP supports NYSERDA's mission and objectives by designing and delivering programs that make energy more affordable for New Yorkers. REAP works closely with the entire product supply chain to increase the availability of energy-efficient appliances, lighting, and other products; provides information to customers to increase their awareness of energy management and efficiency; provides financial incentives to partners and customers to support the purchase of energy-efficient products and services; and provides technical training to contractors and builders. Collectively, these activities improve energy efficiency and support economic development, increase energy diversity, and facilitate access to competitive market services for residential and low-income customers.

REAP coordinates its residential energy efficiency strategies with external stakeholders and program partners that include other State agencies, national and regional organizations, community-based organizations, home builders and contractors, and the product supply chain. These partners provide balanced and consistent information to customers and leverage and maximize resources to improve the effectiveness of energy efficiency programs for residential customers. REAP envisions a time when residential builders offer a "self-supporting home," completely powered by renewable energy technologies such as photovoltaic systems.

In supporting NYSERDA's mission and objectives, REAP is guided by the following principles:

- Program strategies and services are market based to ensure that programs are cost effective and meet the needs of residential customers.

- Programs foster a network of market actors who value energy efficiency.
- Programs facilitate dialogue between customers and partners regarding customers' awareness of, and demand for, energy-efficient products and services.
- Programs target underserved and hard-to-reach energy consumers such as low-income households, to help provide the benefits of competition and energy efficiency to customers who find it difficult to obtain benefits directly in the marketplace.

Accomplishments

REAP program initiatives have been recognized as national models for collaboration and innovative design for energy efficiency programs and have received several awards.

Accomplishments during the past year are summarized in relation to the previous

2003 REAP Awards

- U.S. Department of Energy and U.S. Environmental Protection Agency, "2003 ENERGY STAR® Award for Excellence in Home Improvement" for the Home Performance with ENERGY STAR® Program.
- American Council for an Energy-Efficient Economy, "Exemplary Energy Efficiency Program" for the Keep Cool and Home Performance with ENERGY STAR® programs.
- Association of Energy Services Professionals International (AESP), "2003 Award for Honorable Mention in Achievement in Energy Services" for the Home Performance with ENERGY STAR® Program.
- Public Relations Society of America (PRSA) "Soundie Award" for the "Smart People" public service announcement.
- Mercury Award Finalist: "Smart People" public service announcement.
- Communication Arts: First prize for the "New Pet" TV Ad.
- Seattle Show Silver Award for the "New Pet" TV ad.
- Adcritic.com's Spot of the Day: "New Pet" TV Ad placed first.

Accomplishments during the past year are summarized in relation to the previous year's strategic planning goals.

Increasing supply and demand for energy efficiency products and services in the residential market.

- Increased awareness of the ENERGY STAR[®] logo. According to a consumer mail survey conducted in 2003, awareness of the ENERGY STAR[®] logo in **New York Energy SmartSM** territory has increased from 43 percent in 2001 to 62 percent in 2003.¹
- Increased market share of ENERGY STAR[®] products. Since 2001, consumer purchases of ENERGY STAR[®] products has increased. For example, market share for ENERGY STAR[®] refrigerators has increased from 16 percent in 2001 to 22 percent in 2003, while market share for ENERGY STAR[®] room air conditioners has increased from 18 percent in 2001 to 33 percent in 2003.²
- More than 230,000 old room air conditioners (RACs) have been replaced with ENERGY STAR[®] models through the Keep Cool Program, a joint effort of NYSERDA's **New York Energy SmartSM** Program, the Long Island Power Authority, and the New York Power Authority.
- REAP Programs have enabled old, inefficient appliances to be recycled, increasing activity in the State's recycling industry. In excess of 5,000 tons of materials have been diverted from private and public landfills, representing in excess of 4,300 tons of steel, 618 tons of aluminum and copper, 66 tons of copper, 44 tons of polychlorinated biphenyls (PCBs), 30 tons of hydrochlorofluorocarbons (HCFCs); 12 tons of power cords; and 1,500 pounds of chlorofluorocarbons (CFCs).³ These materials were contained in approximately 5,000 recycled refrigerators and 230,000 recycled room air conditioners.

¹ New York State Energy Research and Development Authority. 2004. *New York Energy SmartSM Program Evaluation and Status Report*. Albany, NY: NYSERDA.

² Ibid.

³ As of May 2003.

Develop the infrastructure for energy efficiency products and services

- Through December 31, 2003, 576 retailers and 19 manufacturers were partners in the ENERGY STAR® Products program.
- The Home Performance with ENERGY STAR® Program has trained and certified 104 contractors. More than 7,000 homes have conducted audits, and 3,844 homes have implemented energy efficiency recommendations through year-end 2003. These improvements have resulted in approximately three GWh of electricity savings and 0.8 MW of demand reduction.
- In the New York ENERGY STAR® Labeled Homes Program, 186 builders and 13 Home Energy Rating System (HERS) raters are participating, and 2,395 homes have been built to the New York ENERGY STAR® standard through December 31, 2003. Electricity savings to these homeowners are approximately one GWh and 0.3 MW of demand reduction.

Decrease the energy burden for low-income households

- As the Assisted Multifamily Program (AMP) continues to expand, staff anticipate that it will significantly reduce the energy burdens of low-income customers. Local case managers have been trained and will assist owners in completing projects. As more projects are completed and post-construction monitoring is completed, actual energy savings will be determined. Average projected savings are estimated at \$418 per unit per year.

Program Strategies

REAP's management structure supports the development and transformation of the residential market for energy-efficient products and services. Program initiatives are designed and managed collaboratively so that synergies that might exist between REAP initiatives and other programs can be maximized. REAP focuses its efforts on improving the manner in which residential customers use energy and make decisions that effect energy use. REAP has identified a number of strategies and approaches to support NYSERDA's mission and the State's energy policy objectives. These include:

- Reducing consumer incentives as programs succeed, thereby beginning the transition to self-sustaining residential markets for energy-efficient equipment, products, and services.
- Monitoring the market for energy-efficient products and services to carefully balance supply and demand.
- Developing, maintaining, and using data and data management processes to support program planning, incentive level analyses, program integration, quality control, and program benefits analyses.
- Coordinating program offerings and services with national, regional, and statewide entities. Promoting the installation of ENERGY STAR[®] and other high-efficiency products.
- Obtaining feedback from mid-stream partners through focus groups to better understand program impacts and enable program adjustments in light of changing market conditions.
- Marketing programs and disseminating educational materials locally, closest to the decision-makers, to make the best use of limited resources.
- Assisting residential and low-income customers to secure lower energy prices and improved service through bulk purchases of energy supplies (*i.e.*, fuel oil, propane, and electricity) and the aggregation of customers to increase buying power.
- Providing technical assistance and financial packaging to improve the energy efficiency, fiscal health, and overall performance of eligible residential apartment buildings.
- Contracting with a single lender, Neighborhood Housing Services (NHS), for the Assisted Home Performance with ENERGY STAR[®] Program. This partnership will increase the number of loan approvals, increase the amount of work conducted in low-income homes, and allow NYSERDA to reduce its financial incentives.

Major REAP Initiatives

- ENERGY STAR[®] Products
- New York ENERGY STAR[®] Labeled Homes
- Home Performance with ENERGY STAR[®]
- Assisted Home Performance with ENERGY STAR[®]

- Providing incentives for the installation of energy management and advanced metering systems which help residential customers make more informed energy choices.
- Increasing residential consumers' awareness of federal tax credits available to homeowners through the Home Performance with ENERGY STAR® and New York ENERGY STAR® Labeled Homes programs.
- Increasing the momentum NYSERDA has built in recycling energy products; initiating a dialogue and seeking collaborative efforts with economic development organizations, product manufacturers, retailers, recycling businesses, government agencies, and local communities.
- Evaluating marketing strategies through surveys, the residential program website, www.GetEnergySmart.org, and call center activity to determine the most effective means to reach targeted audiences in all regions of the State.
- Developing extensive marketing expertise and experience by producing multi-media marketing campaigns; facilitating a "brand development" workshop with NYSERDA staff to identify ways to coordinate promotion of the **New York Energy SmartSM** Program; providing funds to develop a **New York Energy SmartSM** website; and developing its own dedicated residential website that can be expanded to other program areas. These efforts have given REAP a foundation of widely applicable marketing expertise.

REAP actively seeks to partner with other energy services organizations. Such collaboration increases the leverage value of NYSERDA funding and greatly enhances market impacts. (See the following text box.)

REAP Partnerships

- Alliance to Save Energy
- Building Performance Contractors
- Building Performance Institute
- Community-based organizations
- Educational Institutions
- Home Builders
- Local Departments of Social Services
- Local governments
- Local water districts
- Manufacturers
- Professional and trade organizations
- Retailers
- State- and locally-based environmental interest organizations
- Utilities
- Wholesalers
- Long Island Power Authority
- New York Power Authority
- New York City Department of Housing Preservation and Development
- New York State Builders Association
- New York State Consumer Protection Board
- New York State Division of Housing and Community Renewal
- New York State Office for Temporary and Disability Assistance
- New York State Department of Public Service
- U.S. Department of Energy
- U.S. Environmental Protection Agency
- U.S. Home Energy Assistance Program
- U.S. Department of Housing and Urban Development
- Weatherization Assistance Program

Three-Year Goals

During the next three years, REAP plans to focus its efforts on achieving the following goals:

Increase the awareness of, and demand for, selected energy-efficient products and services in New York.

- REAP will continue to build consumer demand for its programs and for the energy efficiency products and services it promotes, such as ENERGY STAR[®] appliances and lighting products, ENERGY STAR[®] labeled homes, and energy-efficient improvements for existing homes.

Develop the infrastructure for energy efficiency products and services.

- REAP will expand activities that focus on upstream and mid-stream market actors such as manufacturers, wholesalers, distributors, retailers, technical service providers, installers, ENERGY STAR® home builders, home performance contractors for existing homes, and Home Energy Ratings System (HERS) raters. REAP will also expand the infrastructure for training and certifying partners.

Decrease the energy burden on low-income households.

- Through expansion of the Assisted Multifamily Program, REAP expects to reduce energy costs and improve the affordability of energy for low-income households in multifamily buildings.

Promote the whole-building approach and its benefits.

- REAP will provide information to partners on how a whole-building approach improves health, comfort, safety, and energy efficiency within a home, reasons to take the whole building into consideration when recommending home improvements, and steps to take to implement the approach.

Opportunities and Challenges

Opportunities to enhance program contributions to NYSERDA's mission and to meet the State's energy policy objectives include:

- To assume overall coordination of **New York Energy SmartSM** Program promotion, REAP will collaborate with NYSERDA programs that conduct marketing activities in order to consolidate marketing functions into a more comprehensive marketing strategy. By coordinating the promotion of the **New York Energy SmartSM** Program, NYSERDA could specifically focus on increasing consumers' awareness of the program, thus increasing interest and participation in all of NYSERDA's programs.
- Coordinating activities with the Long Island Power Authority, the New York Power Authority, and other state, regional, and federal entities involved in economic development and providing energy-related and energy efficiency assistance programs to residential customers.

- Consolidating program areas and activities to prevent overlapping services in the market and to increase program administrative efficiency.
- Leveraging New York City Department of Housing Preservation and Development (HPD) and U.S. Housing and Urban Development (HUD) funds for energy efficiency work, resulting in long-term investments in place of the short-term energy bill payments currently provided HUD participants.
- REAP will explore expanding cost-effective energy efficiency financing opportunities for low-income borrowers through nontraditional lenders including housing advocacy groups that offer financing to households with low credit scores.
- Growth in the Assisted Home Performance with ENERGY STAR[®] program offers owners of one-to-four family low-income households ineligible for the federal Weatherization Assistance Program opportunities to implement cost-shared efficiency improvements. REAP will continue to explore avenues to expand services to this group.
- The recent transfer of responsibility from Niagara Mohawk and New York State Electric & Gas (NYSEG) to NYSERDA of the energy-efficiency-services and energy use education components of the utilities' low-income programs offers an opportunity for a partnership that will build on the strengths of the organizations and provide expanded, efficient services to low-income customers.

Certain conditions could challenge REAP's ability to meet its goals including: (1) difficult economic conditions that deter customers' investments in energy efficiency; (2) market and regulatory barriers that inhibit installations of new energy-efficient technologies, such as advanced meters, (3) the inability to fully integrate natural gas and oil efficiency improvements into **New York Energy SmartSM** programs, (4) the lack of residential time-of-use rates that enable implementation of advanced meters, and (5) inability to increase energy efficiency levels of ENERGY STAR[®] products.

Future Directions

As the residential market for energy efficiency products and services is developed and transformed, REAP plans to work with NYSERDA's research and development programs to evaluate, commercialize, and support the next generation of technologies that will continue to transform how residential and low-income customers use energy. REAP will also work to inform consumers about, and build demand for, new energy technologies. REAP is shifting from consumer-based incentive programs to mid- and up-stream initiatives using a combination of training and incentives to change partner practices over the long term. For example, the Keep Cool Program, which previously offered a bounty to consumers for replacing old room air conditioners (RACs) with ENERGY STAR® units, is now a retailer-based program. Retailers will receive an incentive for sustaining ENERGY STAR® RAC market share at 67 percent and above. The consumer incentive has been removed from this program; however, a marketing effort (called Stay Cool) targeting consumers will continue to encourage the replacement and recycling of old air conditioners. Building consumer demand through effective targeted marketing will continue to be a primary strategy. REAP will leverage the momentum established by past marketing campaigns and transition to a more locally-based marketing strategy, including events, local newspaper articles and advertising, and community-based support.

REAP plans on assessing its existing pilots and identifying successful pilots to become models for new programs. For example, should the retailer ENERGY STAR® RAC sales initiative described above be deemed successful and easy to implement, REAP plans to expand the concept to additional ENERGY STAR® products.

REAP will continue to coordinate with other NYSERDA programs, state and federal agencies, and regional organizations. REAP increasingly leverages resources from external entities allowing the Program to serve more customers given the magnitude of its markets.

REAP will continue to devote resources to the **www.GetEnergySmart.org** website and other appropriate online marketing tools. REAP will expand the website to offer downloadable training videos for contractors and builders; increase ease of access to program materials; facilitate information sharing among partners; advance the website's capability to enable partners to register for such events as conferences, home shows, and trade shows; and provide educational material for teachers and students. REAP will also consider investing resources into an advertising campaign to promote the **www.GetEnergySmart.org** website.

REAP's long-term intent is to reduce the energy burden carried by residential customers by installing advanced metering equipment as part of every building project that includes energy efficiency improvements and ensure that every new home built in New York meets the ENERGY STAR® standard. As the energy standards in building codes are raised and as the adoption of energy-efficient home construction practices and sales of energy-efficient homes increase, REAP plans to raise the standard above ENERGY STAR®. High efficiency HVAC systems, increased kWh savings from the installation of ENERGY STAR® appliances and compact fluorescent bulbs, and better construction practices will be used to attain the higher standards. At the same time, the existing building stock will receive increased scrutiny to ensure that occupant health, comfort, and safety as well as building reliability, durability, and efficiency are increased.

REAP will continue to seek opportunities to support energy-efficient emerging technologies through implementation of pilot programs including training and education of mid-stream participants. REAP will work closely with NYSERDA R&D to identify candidate technologies.

Three-Year Funding

The following table shows preliminary program funding for REAP for fiscal years 2004-2007.

REAP Funding for Fiscal Years 2004 - 2007 (\$000)

Source of Funding		2004 - 2005	2005 - 2006	2006-2007	
System Benefits Charge Funding ⁴	Low-Income				
	Energy Affordability	\$4,520	\$4,520	TBD ⁵	
	Buying Strategies	\$311	\$311	TBD	
	Community-based	\$97	\$97	TBD	
	Energy Program	\$647	\$647	TBD	
	Small Homes	\$7,480	\$7,480	TBD	
	Multifamily	\$18,051	\$18,051	TBD	
	Subtotal Low-Income	\$31,106	\$31,106	TBD	
	Energy Efficiency-Residential				
	Community Coordination	\$1,385	\$1,385	TBD	
	Small Homes	\$3,532	\$3,532	TBD	
	Keep Cool	\$411	\$411	TBD	
	Multifamily	\$3,752	\$3,752	TBD	
	Product Support	\$785	\$785	TBD	
	Web Site/Marketing	\$1,669	\$1,669	TBD	
	General Awareness	\$3,066	\$3,066	TBD	
	Subtotal Energy Efficiency-Residential	\$14,600	\$14,600	TBD	
	Subtotal SBC Funding	\$45,706	\$45,706		
	Federal Grants, and Other Funding	New York Energy SmartSM Communities	\$125	\$125	\$125
		State Energy Plan Base	\$450	\$450	\$450
Subtotal Other Funding		\$575	\$575	\$575	
Total		\$46,281	\$46,281	TBD	

⁴ Reflects unencumbered program funds available as of March 31, 2004, subject to reallocation with approval by the Department of Public Service staff or Public Service Commission.

⁵ To be determined.

Solicitations

Currently, open and planned solicitations are presented in the following table.

Solicitations For Residential Energy Affordability Program

Solicitation Number	Title	Proposal Release	Proposal Due Date
Future Solicitations			
RFP 870	Southern Tier Energy SmartSM Communities	7/5/04	8/2/04
RFQL 873	HERS Raters	7/12/04	6/30/06

Note: Anticipated solicitations are included for planning purposes and have not been approved by NYSERDA's Program Development Management Committee. They are subject to change. All solicitations are current as of June 21, 2004.

3. RESEARCH AND DEVELOPMENT PROGRAMS

Conducting a multifaceted energy and environmental research and development program has been a central responsibility at NYSERDA since its inception in 1975. NYSERDA's Research and Development (R&D) Program supports the development and commercialization of innovative energy and environmental products, technologies, and processes that improve the quality of life for New York's citizens and help New York businesses to compete and grow in the global economy. NYSERDA's R&D Program has been instrumental in attracting new businesses to New York, enabling companies to expand, retain and create new jobs, and increase profitability for many businesses across the State.

NYSERDA R&D activities are organized in five primary program areas:

- Energy Resources
- Transportation & Power Systems
- Environmental
- Industry
- Buildings

The R&D projects in each of these program areas address energy supply and end-use sector needs. As a result, crosscutting areas such as environmental protection, waste management, energy product development, and renewable energy technologies are addressed in several R&D program areas. This section discusses the R&D Program's contributions to NYSERDA's mission and State energy policy objectives, the primary strategies for implementing R&D efforts, and future opportunities and challenges facing NYSERDA's R&D Program today. For each of the primary R&D program areas, a program-specific section identifies the area's recent accomplishments, three-year goals, strategies, and future directions.

How R&D programs differ from deployment programs

NYSERDA sponsors both R&D and energy efficiency deployment programs. These programs differ in several important respects.

- Deployment projects typically promote state-of-the-art commercial technologies and practices. R&D projects involve promising but not yet fully commercial products or processes. Therefore, R&D decisions to select and support technologies and practices inevitably incorporate a greater risk of failure and the possibility that initial strategies and approaches might have to be modified.
- R&D project managers are constantly scanning the environment for promising new ideas and for signals that existing ideas have been developed to the point where they are ready to begin a commercialization effort. In both cases, R&D project managers are able to respond quickly to marketplace needs.
- R&D programs include numerous different projects representing widely divergent scientific and technical disciplines at various stages of development. R&D projects are usually individual trials or pilot projects with limited scope. Deployment programs focus on duplicating delivery of a more limited number of technologies and services. Deployment programs frequently can take advantage of economies of scale that are not available to R&D programs.
- The time scale for R&D projects is often significantly longer than the time scale for deployment projects, and involves a number of business, financial, and technical issues that must be resolved to result in a new commercial product or process.
- Deployment programs work directly and in an integrated manner with markets and customers in an effort to affect markets in creative ways so that desired energy efficiency products and strategies will make a lasting impact in the marketplace.

Contribution To NYSERDA's Mission

NYSERDA's mission, to use innovation and technology to solve some of New York's most difficult energy and environmental problems and to improve the State's economy, is underscored by R&D's focus on helping New York manufacturers develop, demonstrate, and bring to market energy-efficient and environmentally desirable products

that are sold worldwide. Since 1990, the R&D Program has developed more than 170 innovative, energy-efficient, environmentally beneficial products, processes, and services. Demonstrating new technology in a variety of applications, and providing reliable objective information and data to decision-makers, investors, and end users of technology are also valuable R&D contributions. Such information helps stakeholders better understand and mitigate environmental impacts of energy production and use, and improves decision making with respect to the acquisition and use of energy services and energy-efficient technologies.

The contributions of NYSERDA's R&D program have been recognized by other organizations, as illustrated in the list of recent awards (see text box below).

Recent R&D Awards

- R&D received Honorable Mention by the American Council for an Energy-Efficient Economy's (ACEEE) America's Best: Profiles of America's Leading Energy Efficiency Program
- "Field Test DELTA: Integrated Skylight Luiminaire" distinguished awards from Society for Technical Communication's (STC) International Technical Publication Competition."
- "Lighting Answers: LED" received an Excellence Award and "Lighting Education Online" received a Merit Award from STC Mohawk Chapter
- Intelligent Dynamic Facade System received 1st Runner up in New Generation Design Prize in Metropolis Magazine
- At the opening ceremony for the first Truck Stop Electrification Facility in America, NYSERDA and two other sponsoring organizations, New York State Thruway Authority and, Niagara Mohawk Power Corp., received Pioneer Awards from IdleAire Technologies, Inc. of Knoxville, TN
- R&D staff member received ACEEE's "2003 Champion of Energy Efficiency Award
- R&D staff member recognized as "CHP Champion" by US Combined Heat and Power Association
- Regional Invention of the Year Award for R&D environmental monitoring technology patent
- 2002 "Demand Response Achievement Award" from the Peak Load Management Alliance for a collaborative effort among the NYISO, New York State Department of Public Service, Long Island Power Authority, New York Power Authority, and NYSERDA

R&D Strategies

NYSERDA's primary strategy for implementing its R&D program is to identify and select worthy research projects through a competitive solicitation process, and then provide funding and technical assistance to help make such projects successful. Most projects involve cost sharing by project proposers. NYSERDA helps reduce the risks of commercializing and using new technologies, while also requiring proposer cofunding to encourage serious efforts and ownership and use of project results. Staff closely oversee project implementation to ensure that NYSERDA's fiduciary responsibility for the public investment in sponsored R&D projects is met.

NYSERDA seeks to augment the resources of small and mid-size firms. More specifically, R&D seeks to provide technical and financial assistance to small New York based manufacturers of innovative, energy-efficient products, equipment, and systems who are otherwise limited in their ability to conduct research and development. In this way, NYSERDA helps reduce their financial risk as they develop energy-efficient and environmentally beneficial products for domestic and international markets.

An important staff responsibility is maintaining awareness of emerging developments in the energy industry, particularly regarding industry needs and changes in focus. This is accomplished by regularly interacting with stakeholders and experts in various energy and environmental related fields. Each of NYSERDA's major program areas, including R&D, holds regular meetings with program review groups to obtain independent input on program direction and emphasis. Staff also periodically hold scoping sessions with interested parties to forge a common understanding of interests and needs. Such interaction helps R&D focus program efforts in those areas that hold the most promise for results and best serve the needs of New York. The R&D program actively seeks to partner with other research organizations. Such collaboration increases the leverage value of NYSERDA funding and greatly enhances technology transfer. The sidebar on the following page provides a list of some of the organizations that NYSERDA teams with on a regular basis.

R&D provides a wide variety of assistance to contractors, customers and partners to increase the probability of success, including business assistance, new partnership introductions, regulations and law development, overcoming environmental and institutional hurdles, and facilitating technology transfer.

Opportunities and Challenges

Economic and Financial Issues

Rapidly changing economic conditions presents the R&D Program with significant challenges and opportunities. In difficult economic times, little capital is invested in new and emerging technologies. On the other hand, rising fuel prices allow NYSERDA to revise and promote technologies previously deferred due to prospects of a poor financial return on investment. The technical potential for energy efficiency improvements in the building industry is significant. However, since construction of new buildings requires major capital investment, the interest of builders and developers is toward reducing first costs and using traditional approaches at the expense of energy efficiency technologies and practices. Demonstrating the meaningful economic benefits of new technologies is an ongoing challenge.

Finding the capital investment to move a product from the demonstration stage to the full-blown commercialization stage, especially for small businesses, is a continuing challenge. Even assuming the required capital can be secured, bringing new technologies to commercialization is frequently challenged by the risk averse nature of many market actors and underscores the need to embrace a life-cycle cost strategies. For example, expensive development costs, the need for special delivery and storage infrastructures, and unfamiliarity by potential end-users, present significant barriers to the widespread development and use of biofuels for transportation and electricity generation.

R&D Partnerships and Network

- American Wind Energy Association
- American Society of Heating, Refrigerating and Air-Conditioning Engineers
- American Council for Renewable Energy
- Association of State Energy Research and Technology Transfer Institutions
- Brookhaven National Laboratory
- Business Council of New York
- California Energy Commission
- Clean Energy States Alliance
- Coalition of Northeast Governors
- Connecticut Innovations
- Empire State Petroleum Association
- Empire State Development's Environmental Management Investment Group
- Federal Transit Administration
- Independent Oil & Gas Association of New York
- Institute for Sustainable Power
- Interstate Renewable Energy Council
- Lighting Research Center at Rensselaer Polytechnic Institute
- Manufacturers' Association of Central New York
- Massachusetts Technology Collaborative
- National Renewable Energy Laboratory
- National Oil Heat Research Alliance
- National Council on Qualifications for the Lighting Professions
- National Lighting Product Information Program
- New York's Centers for Advanced Technologies
- New York Indoor Environmental Quality Center
- New York Solar Energy Industries Association
- New York State Department of Environmental Conservation
- New York State Department of Health
- New York State Department of Public Service
- New York State Thruway Authority
- New York City Department of Transportation
- New York STAR Center for Environmental Quality Systems Commission
- New York State Museum
- New York State Thruway Authority
- New York Metropolitan Transportation Authority
- New York City Department of Environmental Protection
- New York City Taxi and Limousine Commission
- North American Board of Certified Energy Practitioners
- Northeast Sustainable Energy Association
- Oak Ridge National Laboratory
- Regional Technology Development Organizations
- U.S. Geological Survey
- U.S. Environmental Protection Agency
- U.S. Department of Energy

Policies, Standards and Regulations

Federal energy policies, such as the Production Tax Credit, are important tools to encourage the development of renewable energy resources such as wind. Unfortunately, this tax credit expired on December 31, 2003, and, without its renewal, wind energy developers and their financial backers are less inclined to move ahead with new construction.

A major challenge to the development of new distributed generation and combined heat and power (CHP) installations is reconciling local and State siting and permitting regulations, including New York State Department of Environmental Conservation (DEC) emission requirements, and municipal fire and building codes. Onerous utility interconnection rules and standby service tariffs can further inhibit CHP deployment.

From a broad environmental perspective, New York will face a variety of new environmental challenges over the planning horizon including new regulations to control fine particles, regulations to control mercury emissions from power plants, requirements for new fuels and new engine emission standards, new emission standards for distributed generation, local requirements to retrofit diesel engines with pollution control devices, and new requirements for disinfecting water and managing nutrients. Each of these new regulations will affect the production and use of energy in different ways and will require different innovative solutions for compliance.

The New York State Public Service Commission initiated a proceeding to establish a Renewable Portfolio Standard (RPS) for retail electricity service in New York State. The RPS will determine the future direction of a major portion of the Energy Resources program. The RPS is expected to identify eligible renewable energy resources that can be included in the renewable energy portfolio. This should lead to the construction of new, eligible, and renewable energy facilities in the State. In addition to supporting the renewable power market, one of the RPS strategies under discussion includes funding the development of photovoltaic, small wind, and fuel cell technologies following the model currently in place at NYSERDA.

The establishment and implementation of an RPS will likely impact NYSERDA programs, including R&D, in a variety of ways yet to be determined. NYSERDA's challenge is to be flexible and prepared to modify its programs as needed to maximize their contribution to meeting the State's energy policy objectives. The strategies discussed in this section assume that an RPS will move forward with a starting date in the 2005-2006 time period.

Other

Vehicle miles traveled (VMT) grew by 20 percent between 1990 and 2000 in New York State. Current projections are for similar or higher growth in each of the next ten years. The product development cycle in the transportation sector is typically four to six years to complete the introduction of new products. It requires ten years or more to achieve major technology shifts and infrastructure projects. To meet the State's demand for mobility, more than continued incremental improvement in technologies will be required to minimize the negative impact on the State's environment and the economic drain of imported fuel purchases.

The potential for meeting New York's energy needs includes the anaerobic digestion of manure on farms to produce biogas for combined heat and power generation. The on-site electricity generation capacity of this renewable resource exceeds 50 megawatts statewide. Additionally, many industries, especially those involving the production of food and beverages, produce wastewater that can be treated anaerobically, producing energy for combined heat and power applications and reducing the costs and the energy required to treat wastewater.

Energy From Tug Hill

The Tug Hill Plateau region produced natural gas from the late 1800s until the Second World War. NYSERDA's Energy Resources program supported research to reexamine the Plateau's geology, topography and infrastructure for energy resource development in this rural region. Now, the Tug Hill is seeing initial development of both its natural gas and wind resources with the potential to expand the local economy.

Program Area: Energy Resources

Energy Resources focuses on increasing the supply of indigenous energy resources in the State and increasing the concurrent economic development opportunities inherent in the manufacturing, extraction, and deployment of these resources. Target resources include natural gas, petroleum, wind, solar electric, and biomass. Implementation strategies in the Energy Resources program area range from sharing the risk of developing and demonstrating new technologies to offering an extensive practitioner training, education, and outreach program to arm stakeholders with information and knowledge that adds value to their businesses.

Accomplishments

Accomplishments during the past year are summarized in relation to the previous year's strategic planning goals.

Develop new renewable resource-based electricity generation.

- Five small wind (10kW) demonstration sites were built on farms and college campuses in New York.
- Fifty-five customers have installed approximately 320kW (dc) of photovoltaic systems over the last fiscal year. Another 120 customers have a total of 1460 kW(dc) under contract and are waiting for installations.
- Contracts were signed with three developers that represent over 400 MW of new wind capacity for New York. Construction has been delayed pending re-authorization of the federal Production Tax Credit.

Planning New York's Energy Future
A Three-year Strategic Outlook 2004-2007

Establish at least three marketing enterprises to sell renewable-based electricity power.

- There are five green power marketing programs receiving NYSERDA support. Total sales under contract by the end of 2003 were approximately 128,000 MWh.

Develop partnerships with natural gas exploration companies to develop local gas resources.

- A joint venture including Ardent Resources and U.S. Energy Development Corporation drilled a discovery well in an Erie County formation using NYSERDA supported geologic data. This well has a flow of 11.6 million cubic feet per day. The new field may contain 8 billion cubic feet of natural gas.
- NYSERDA funded a series of studies looking at the northern tier of New York that terminates on the Tug Hill plateau to determine if the application of new science and technology could create new opportunities in the shallow fractured Trenton limestone producing region. NYSERDA's study led directly to the leasing and subsequent drilling of 3 wells in Oswego County. Four more wells have been drilled in Wayne and Cayuga counties. Three of these wells resulted in natural gas discoveries.
- Using NYSERDA-funded research such as the Empire State Oil and Gas Information System developed by the New York State Museum, Talisman Energy decided to invest more than \$400 million in 2003 to purchase mineral rights and a number of producing wells in the Southern Tier. Talisman's New York subsidiary, Fortuna Energy, now estimates that its acreage has production potential of at least 500 billion cubic feet. Fortuna is a partner in three ongoing NYSERDA projects.

Training and education

- Over the last year, 3 training workshops with a combined 85 attendees were held for photovoltaic system installers; 2 training workshops with a combined 24 attendees were held for small wind installers, 1 workshop with 25 in attendance was held for academic institutions interested in accreditation through the Institute of Sustainable Power; and 9 specialty workshops and conferences were held targeting the consumer and support industries with over 360 people attending.

- Under the School Power Naturally Program, twenty-nine lesson plans were completed and posted on the NYSERDA website, ten teacher training workshops were held across the State, and real-time photovoltaic system performance data, in fifteen minute averages, was made available on NYSERDA's website for individual schools.
- Eleven installers doing business in New York passed the first photovoltaic installer certification exam offered by the North American Board of Certified Energy Practitioners.

Construct and put into commercial operation at least one biodiesel manufacturing facility in New York

- Launched feasibility studies for 3 facilities in New York State and completed a study of biodiesel policy options to support development of a biodiesel industry in the State.

Three-Year Goals and Strategies

The Energy Resources program is focused on four key initiatives: (1) customer-sited renewable energy technology, (2) renewable energy in the wholesale power market, (3) natural gas exploration, and (4) renewable energy technology business development.

Product development efforts are being redesigned to make NYSERDA a bridge from the initiation of an idea to the funding of a commercial venture. As opposed to promoting specific technologies (photovoltaic, wind, biomass), the program will support individuals and companies that have the highest potential to succeed. The goal is to encourage creative thinking and innovation on the part of New York companies as opposed to preselecting the specific area of innovation. Presented below are three-year goals and associated strategies for each of these initiatives.

For customer-sited renewable energy technology, at least three academic programs will be accredited by the Institute for Sustainable Power for photovoltaic system installation training programs. More than fifty photovoltaic system installers will be certified through the North American Board of Certified Energy Practitioners. Over 5 MW of a combination of photovoltaic and small-wind systems will be operating.

Planning New York's Energy Future
A Three-year Strategic Outlook 2004-2007

- Strategy: Activities currently focus on increasing the number and quality of firms that design, install and maintain photovoltaic and small-wind systems. This approach will continue over the next three years with an increasing focus on public awareness and education.

For renewable energy technology in the wholesale power market, three additional wind farms with a capacity of 300 MW will be operating. Five additional wholesale power projects, representing a variety of resources, will be under active development. Competitive green power marketers will have annual sales approaching 500,000 MWh.

- Strategy: The likelihood of a statewide electric energy Renewable Portfolio Standard reduces the need to support the construction of new renewable energy facilities. Future efforts will focus on working with communities to support the siting of new facilities, developing tools to increase the value of on-shore and off-shore intermittent renewables in the wholesale power market, investigating the possibility of renewable energy as a financial risk management tool for fluctuating wholesale power costs, and evaluating the broad positive and negative environmental impacts of renewable energy deployment relative to conventional power production facilities.

In renewable energy technology business enterprise development, ten start-up companies will be established through NYSERDA-supported entrepreneurial networks. Five new products will be ready for commercial development. Three companies will receive sufficient outside investment to commercialize a new product.

- Strategy: Four initiatives have been implemented to support the development and commercialization of new products:
 - Entrepreneurial Networks for Renewable Energy Technology – encourages the development of incubator and business networks around renewable energy technologies.
 - Renewable Energy Technology Options Program – shares the risk of technology development, prototype construction, testing, demonstration and manufacturing improvement of new products and applications that will lead to commercial validation.

- Business Partnerships – a focused commercialization approach to link NYSERDA-developed technology to private sector capital.
- Manufacturing Incentive – provides a nominal incentive for the manufacture of renewable energy products in New York State facilities through a competitive selection process.

These initiatives began in 2003 and will continue through a series of competitive solicitations over the next two years.

Private investment in gas exploration will increase across New York State by 50 percent.

- Strategy: The combination of long-term support for exploration and the recent escalation in natural gas prices has resulted in significant private investment in natural gas development. Future activities will continue to share the risk of exploration in new gas fields with an increasing focus on using local natural gas resources as a mechanism for economic development.

Future Directions

Throughout the planning horizon, the Energy Resources program will continue to partner with the private and public sectors to increase the supply of indigenous energy resources. Programs will continue to emphasize quality training, education, and initiatives to increase the number of businesses able to serve the demand for renewable energy technology and power. As the training and education programs become self-sustaining, an increasing focus will be placed on expanding the in-State development and manufacturing of solar, electric, bioenergy, and wind energy technologies.

Program Area: Transportation and Power Systems

New York is the national leader in the manufacture and use of transit buses, subways, ferries, and advanced power generation equipment. The Transportation and Power Systems program supports technologies that will help keep New York's businesses in the lead and provide energy users with additional options that reduce costs and improve energy security. These technologies include fuel cells, advanced power

electronics, energy storage systems, and advanced motors and generators. The program focuses on New York's needs and problems that are not being adequately addressed by other organizations.

Accomplishments

Accomplishments during the past year are presented in relation to the program's 2003 goals.

Develop new renewable resource-based electricity generation.

- Successful testing and demonstration of a run-of-river, low-impact hydroelectric generation was completed in the East River and is expected to produce 10,000 kW of electricity. This "underwater windmill" technology has no visible impact and does not require dams. Based on these tests, it is hoped that continued development and findings of negligible environmental impact will result in the commercialization of a renewable technology that could provide New York City and the State with hundreds of megawatts of renewable power.

Establish a New York company to provide hardware and a business package for truck stop electrification projects.

- A new business was established in Rome, NY to provide truck stop owners and long haul truckers with technology that reduces the idling time of diesel engines. The company will provide products that enable long haul trucks to maintain heat, air conditioning, electrical appliances, cable TV and internet without vehicle fuel consumption and emissions associated with idling.

Demonstrate advanced air pollution control technologies.

- Hybrid-electric transit buses built in Oriskany, NY, using a hybrid drive system manufactured in Johnson City, NY entered full production. This technology, developed with NYSERDA support, completed qualification by the Metropolitan Transportation Authority (MTA) and is now being supplied in large quantities to New York City and other markets.

Three-Year Goals and Strategies

New York's dense urban downstate area poses many challenges in terms of congestion, mobility, available electric transmission capacity, and local air quality. Through collaboration with the markets having these needs, the program will strive to bring New York's technical resources to bear in the development of solutions.

Develop and commercialize three new vehicle technologies that provide New Yorkers improved urban mobility, environmental performance and vehicle energy efficiency.

- **Strategy:** Work with New York City government, taxi owners, the City's Taxi & Limousine Commission, disabled community and vehicle developers to introduce and expand the use of an energy-efficient, environmentally preferred, handicap accessible taxi for New York City. Work with public and private heavy-duty vehicle fleets to develop and introduce made-in-New York regenerative braking technology, light-weight wheel rotors and other products that can provide urban driving-cycle efficiency benefits. Collaborate with urban and regional transportation planners, mass transit operators, and the State's transportation manufacturers to better use off-peak power and improve the efficiency of our electro-transportation (e.g., electrified rail, subway, and trolley) options.

Alstom Efficient Subway Cars

New York City has ordered 660 MTA subway cars (with an additional 1,000 pending) that use the Alstom (Hornell, NY) subway propulsion system. This propulsion system, developed with NYSERDA support, will allow the MTA to improve subway car energy efficiency.

Develop and commercialize three new energy technologies that offer New Yorkers improved energy reliability and environmentally preferred power generation options.

- **Strategy:** Work with State policy makers and regulators to establish procedures that allow for permitting and siting of liquified natural gas facilities in New York and demonstrate the energy and economic benefits of a first facility. Demonstrate and document the reliability, environmental, peak load reduction, and improved power quality benefits of emerging electrical energy storage technology and power system monitoring technology to the State's electric grid and its customers. Support product development activities in innovative, yet-to-be-commercialized, clean power generation technologies (e.g., kinetic hydro, quantum-well

thermoelectric conversion, power generation from bottoming cycles using waste heat, and fuel cells). Establish a public database of the energy, environmental, and economic performance of distributed generation technologies to help potential users, policymakers, and developers to identify best practices and quantify benefits of adapting these new power generation options.

Develop and establish the most cost-effective approaches to reduce emissions from the State's inventory of diesel engines that have been or will be manufactured before 2007, and facilitate the use of these approaches on such engines.

- **Strategies:** Support technology developers and collaborate with regulatory agencies to improve, evaluate, and verify the performance of the best available retrofit reduction technologies for off-road, stationary and on-road equipment. Collaborate with State and federal organizations to develop incentives and other programs that encourage the deployment of truck stop electrification and other anti-idling and diesel emission reduction technologies.

Future Directions

NYSERDA will continue to invest in the development and accelerated introduction of innovative new technologies and solutions that have demonstrated benefits to the State's transportation and power system sectors, such as: freight pipe lines, light rail, intelligent transportation systems, next generation ferries, fuel cells, energy storage, power reliability, and non-fossil fuel-fired generating technologies. Additional resources will be applied to move these technologies to commercialization as these new technologies are proven to provide competitive and public benefits.

Turning Waste into Profit

In the 1990s NYSERDA invested in a small start-up company with an innovative waste processing system that could convert organic wastes into biogas. The system was demonstrated successfully at a winery in Ontario County, NY. The technology yielded large energy savings for the winery and allowed the winery to substantially increase its production capacity. The small start-up company subsequently demonstrated its technology in other food processing facilities in New York and in the nation. Several full-scale facilities are on-line and others are under construction. The Rochester-based start-up company, Ecovations Inc., has secured substantial capital investment and now employs 25 people with promising prospects for growth and an innovative way to turn organic waste into biogas energy and profit.

Program Area: Environmental

NYSERDA's Environmental program develops and demonstrates energy-efficient technologies associated with waste management and pollution control. The program also supports research to better understand and mitigate the environmental impacts of energy production and use a key objective identified in NYSERDA's enabling legislation. The Environmental program is a cross-cutting program, which interacts with several other units within NYSERDA to ensure maximum environmental benefit to New Yorkers.

Accomplishments

Accomplishments during the past year are presented in relation to the program's 2003 goals.

Develop new renewable resource-based electricity generation.

- Brought three industrial/agricultural facilities on-line in New York State to convert waste into biogas energy.

Demonstrate advanced air pollution control technologies.

- Secured \$7 million in federal grants to demonstrate advanced air pollution control technology in ferries in the New York City area - an effort that has the potential to reduce of nitrogen oxides (NO_x) by more than 225 tons.

Provide scientific foundation to attain air quality standard for fine particulate matter.

- Completed the third year of a major environmental field study to establish the scientific foundation for an effective air quality management strategy to attain the new ambient air quality standard for fine particles (PM_{2.5}).

Three-Year Goals and Strategies

The Environmental program has four distinct initiatives that target very different customer groups and needs: (1) municipal water and wastewater facilities, (2) environmental product developers, (3) industrial and agricultural sectors, and (4)

environmental policy-makers. Most of the environmental initiatives will continue to employ site-specific risk reduction through cost-shared demonstrations of new technology. In addition, the following program-specific strategies will be employed to accomplish goals:

For Municipal Water/Wastewater: Increase efficiency in at least one dozen major facilities in New York.

- Strategy: Increase efforts to encourage energy service providers to address the needs of the sector; partner with the State's Environmental Facilities Corporation to ensure that energy efficiency is considered early in facility planning and financing; work at the national level to increase incentives for efficiency.

For Environmental Product Development: Launch one new commercial product each year, with the total product sales of the program portfolio approaching \$10 million by 2006.

- Strategy: Help New York environmental businesses gain market acceptance by providing objective independent product validation; help companies refine business strategies and gain access to financing and strategic partners necessary for growth; focus on potential growth markets for air pollution control.

For Industry and Agricultural Waste Management: Increase viability of 25 farms and 5 industrial operations through energy-efficient waste management.

- Strategy: Explore opportunities for biogas production from waste; focus on process optimization to improve overall economics; support extensive technology transfer in the agriculture sector to increase program impact through partnerships with the Cornell Cooperative Extension, the Farm Bureau, and the U.S. Department of Agriculture; explore more viable business models for waste management with cooperatives or third-party operation and maintenance of systems.

For Environmental Policy Makers: Through the Environmental Monitoring, Evaluation, and Protection Program (EMEP), provide the scientific foundation for an effective fine particle State Implementation Plan by 2006-07; provide the environmental and baseline data evaluating effectiveness of utility acid rain and mercury controls; and demonstrate a variety of advanced air pollution control strategies to help meet State air quality goals for ozone, fine particles, and sulfur dioxide.

- Strategy: Continue active stakeholder involvement and peer review to ensure relevance and credibility in the EMEP program; implement an EMEP science-policy communications program to help ensure that research results reach target user groups; support scientific research that will increase the understanding of transboundary pollution and source-receptor relationships; and pursue federal funding to support critical scientific studies and air pollution control technology field demonstrations that will benefit New York.

Future Directions

Throughout the planning period, the Environmental Program will pursue the strategies and goals identified above. In addition, based on the current state-of-science and emerging policy issues, the following topics will be explored further and may warrant new initiatives or increased efforts: control and monitoring of ultrafine particles; production of emission reduction credits; climate change effects and mitigation; indoor environmental quality; emission reduction strategies including use of cleaner fuels for home heating, marine, and other uses; water conservation and reuse; environmental impacts associated with wind power production and alternative energy; and energy-related environmental education.

Program Area: Buildings

New York's building sector accounts for 50 percent of the energy use and 63 percent of energy expenditures in the State, and is second to the transportation sector in carbon dioxide (CO₂) emissions. In recent years, the difficulty of siting new electricity generating capacity has increased the importance of electricity demand management in buildings. The development of cost-effective metering and demand control technologies has become increasingly important for demand management and for maintaining the

reliability of the State's electricity system. Building energy systems are needed that reduce energy use and minimize disruptions to building occupants. The increased use of combined heat and power in a variety of building types and applications can also help alleviate demand on the electricity system providing economic options for meeting on-site energy needs.

Accomplishments

Accomplishments during the past year are summarized in relation to the previous year's strategic planning goals.

Accomplishments in the Buildings program area during the past year included introduction by contractors of many new products. The products meet the program's 2003 goal, to *"Develop, manufacture, and commercialize energy-efficient and environmentally friendly products and processes."*

Heat Wise

Heat Wise, Inc, of Long Island is poised to introduce two new oil burner technologies designed to improve performance of fuel oil for heating applications (relative to natural gas) through reducing emissions and improving energy efficiency. The first product, a European style, blue flame burner uses an extended flame tube to reduce NO_x and particulate emissions by approximately 50 percent. The product has achieved Underwriters Laboratories, Inc. (UL) certification. The second product, featuring a DC brushless blower motor and electromagnetic fuel pump, will reduce electric power requirements by 75 percent below conventional burners, saving up to 400 kwh per year. This product is undergoing UL certification. Both products are scheduled to begin production and enter the market in late 2004. Heat Wise, is a small manufacturer specializing in innovative oil burner technology and has recorded sales of about \$2 million in 2003. NYSERDA has supported both of these products from inception.

Heating and Cooling

- Reported interim findings on field trials involving 1,100 homes using low-sulfur/B20 biodiesel fuels (a blend of 80 percent low-sulfur and 20 percent biodiesel). Along with efficiency improvements offset the added cost of the fuel, making such fuels an economic and environmental competitor to natural gas.
- Heatwise completed product development and Underwriters Laboratories (UL) testing for its low power burner product.

Lighting

- New lighting products introduced include - Minima Par20 Metal Halide track fixture and ArcliteT6 Atrium Fixture by Edison Price, photovoltaic powered exterior fluorescent lighting system by Selux, and high efficiency ultraviolet lighting system by Atlantic Ultraviolet.
- Evaluation of lighting technologies provided, via website, for compact fluorescent lamps (CFLs), full-spectrum light sources, adaptable ballasts, light-emitting diode (LED) lighting systems, light pollution, and mid-wattage metal halide lamps by the National Lighting Product Information Program (NLPIP).

Building Materials and Systems

- Inauguration of Building Green Suite website for evaluation and sourcing of green building materials for architects and engineers.
- Performance evaluation of efficacy of commercially available air purification products at the Syracuse Center for Indoor Environmental Quality.
- Titan manufactured home capable of achieving Energy Star rating.
- Trio cellular shades system by Comfortex.

Three-Year Goals and Strategies

Buildings' three-year goals center on product development and are grouped according to product category.

For Heating and Cooling: Increase the use of lower sulfur and B20 biodiesel and other blended fuels; increase commercial introduction of fuel compatible, low-power heating and cooling technologies.

- Strategy: Conduct 500 field trials for lower sulfur and /biodiesel and other biofuels to identify benefits; identify and address barriers to expanded use of low-sulfur/B20 biodiesel fuels for home heating; and support product development for fuel compatible, low-power technologies.

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For Lighting: Increase use of lighting as a demand response resource; and increase new product development, commercialization and demand for fixtures and integrated controls for new and existing efficient light sources.

- Strategy: Facilitate the use of innovative light sources through lighting fixture and control product development; and support dissemination of information on light sources, fixtures and controls under the Lighting Research Center National Lighting Products Information Publication and Delta programs.

For Building Materials and Systems: Introduce new building materials and components that increase energy and environmental efficiency in manufacturing and installation; and strengthen New York's reputation as a center for advanced research on indoor environmental quality.

- Strategy: Work with New York companies to advance new building materials with green and high recycling content attributes; and continue to support the Syracuse Center for Indoor Environmental Quality through development of collaborative projects to develop new products and dissemination of objective product information.

Future Directions

The Program will continue to focus on innovative products including the initiation of B100 (100 percent biodiesel or other biofuel) field trials; support product development for integrated appliances which use waste heat; support product development of intelligent lighting systems including daylight harvesting, smart roadway lighting to reduce pollution and increase safety, and new lighting applications to enhance human health and well-being; and advance zero energy buildings and supporting systems.

Program Area: Industry

According to *Site Selection* magazine, New York has ranked among the top ten states in the nation in new business creation and expansion for eight years in a row. The Industry R&D program works with manufacturing, agriculture, and high-technology industry sectors of the State to nurture such growth and success. Specifically, the program demonstrates and promotes adoption of process and productivity enhancements, pollution prevention and waste mitigation strategies, use of combined heat and power, and various emerging energy technologies.

Advanced Power Management Chip

In a collaborative project, Philips Semiconductor of East Fishkill was funded to develop an advanced power management chip for increased battery life to address the power needs of next generation consumer and military mobile electronics. The project helped this New York State company and the US to continue its leadership role in the world semiconductor marketplace and in developing innovative technologies ahead of foreign competitors. It is believed that this project played a critical role in keeping this manufacturing facility open as Philips closed two other US manufacturing facilities, saving nearly 300 high-technology jobs in the Hudson Valley, New York.

The State's manufacturing sector directly employs approximately 11 percent of the State's civilian labor force; brings in wealth from outside the State and overseas; and creates jobs at supplier companies, and in services, retail, and other industries. Last year, the manufacturing sector exported goods worth \$40 billion.

Accomplishments

Accomplishments during the past year are summarized in relation to the previous year's strategic planning goals.

Develop, manufacture, and commercialize energy-efficient and environmentally friendly products and processes.

- Successfully demonstrated energy-efficient and environmentally friendly process improvements at ten manufacturer sites, including a robotic milking system at Francisco Farms in Belmont and a high-luminosity burner at an Owens Corning plant in Delmar, NY.

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- Aided in the development and commercialization of six new energy-efficient and environmentally friendly products, including thermoelectric cooling systems by Solid State Cooling, Bohemia, and a compact radio frequency generator by ENI Products, of Rochester, NY.

Increase market acceptance and penetration of clean, efficient distributed generation and combined heat and power systems.

- Increased the number of CHP demonstrations to 75 from 60 of which twelve are operational with an combined output of 10 MW.
- In partnership with New York State Department of Public Service, developed a broad CHP exemption in the utility standby rates for new projects that meet certain criteria and also established an eight-year phase-in exemption for existing NYSERDA-funded projects.
- Developed and issued a web-enabled guide book for siting and permitting distributed generation resources.

Promoting early adoption of emerging energy technologies.

- Conducted a stakeholder scoping process and developed a strategy for the State's hydrogen program; and conducted outreach on high-temperature superconductivity (HTS) to electricity system operators and technology developers.

Three-Year Goals and Strategies

Industry R&D will continue to focus on industrial product development and process improvements, distributed generation-combined heat and power opportunities and emerging energy technologies.

For Industrial Products and Processes: In the Industrial R&D program area, the near-term focus will continue to be on process improvement, waste mitigation, and product development. Specifically, to develop and support 10 process improvements, five pollution and waste mitigation, and five product development projects.

- Strategy: Issue and market process improvement and product development solicitations that target innovative energy applications in areas such as food processing, glass making, and advanced materials. Conduct three or more demonstrations that promote electro-technologies (i.e., applications that use electricity) that reduce on-peak electricity demand, and thermally-activated technologies that reduce overall energy use.

For Distributed Generation and Combined Heat and Power Systems (DG-CHP): Focus on the replication of successful CHP demonstrations, demonstration of CHP projects powered by renewable fuels such as landfill gas and anaerobic digester gas, and establishment of a web portal for operational and run-time data from current NYSERDA CHP projects.

- Strategy: Increase public awareness of DG-CHP by holding a conference to inform stakeholders about DG/CHP work and studies that have taken place; develop and support 10 or more renewable fuel powered DG-CHP projects; and increase market acceptance and penetration of clean, efficient DG-CHP systems by encouraging DG advocates and end-users to develop faster, better, and more economical projects with less NYSERDA cost-share.

For Emerging Energy Technology: Demonstrate high-voltage High-Temperature Superconductivity (HTS) cable in Albany and develop other utility-scale HTS products such as power lines, power transformers, fault current limiters, and motors. Develop a blueprint for the Hydrogen Program with both near-term and long-term objectives that delineate the scope and role of hydrogen as a viable energy source in meeting the State's future energy needs; consistent with NYSERDA's previously developed Hydrogen program.

- Strategy: Support six or more hydrogen research, development, and demonstration projects that address major technical challenges facing a transition to a hydrogen economy and bring various hydrogen stakeholders. Also support two or three projects that identify and develop hydrogen education and outreach activities as well as those that review applicable codes and standards for hydrogen storage, transportation, and handling.

Future Directions

Industrial R&D will continue to seek ways to better serve the State's industrial sector and developers and manufacturers of combined heat and power equipment and systems.

- Draw on resources offered by federal agencies and national collaboratives, such as Association of State Energy Research and Technology Transfer Institutions (ASERTTI) to leverage cost-sharing and ensure broader input and project support.
- Develop a methodology to account for and produce appropriate emission reduction credits (ERCs) and NO_x allowance reductions for the DG-CHP projects and other industrial process improvement projects.
- Collaborate with the Department of Public Service and other DG stakeholders to enhance the DG standard interconnection requirement (SIR) guidelines by increasing the limit to 1 MW and by establishing a SIR suitable for network design electric distribution systems.
- Continue to play an active role in the development and promulgation of DG emission standards for criteria pollutants.
- Ensure that the hydrogen roadmap sets a long-term course for the NYSERDA's Hydrogen Program that is in concert with federal program priorities.

R&D Three-Year Funding

The following table shows preliminary program funding for R&D for fiscal years 2004-2007.

R&D Funding - Fiscal Years 2004-2007 (\$000)

Source of Funding		2004-2005	2005-2006	2006-2007
System Benefits Charge Funding ¹	End-Use Renewables	\$4,646	\$4,646	TBD ²
	Wholesale Renewables	\$14,598	\$14,598	TBD
	Secure Power/Energy Storage	\$1,832	\$1,832	TBD
	Distributed Power and Combined Heat and Power	\$14,358	\$14,358	TBD
	Environmental Monitoring	\$2,662	\$2,662	TBD
	Institutional Barriers to Competition	\$1,712	\$1,712	TBD
	Next Generation and Strategic Technologies	\$5,398	\$5,398	TBD
	Subtotal SBC	\$45,206	\$45,206	TBD
Statutory Funding	Energy Resources	\$1,200	\$1,200	\$1,200
	Transportation and Power Systems	\$3,200	\$3,200	\$3,200
	Environment	\$2,500	\$2,500	\$2,500
	Buildings	\$2,900	\$2,900	\$2,900
	Industry	\$2,800	\$2,800	\$2,800
	Subtotal Statutory	\$12,600	\$12,600	\$12,600
Total R&D Funding		\$57,806	\$57,806	TBD

¹ Reflects unencumbered program funds available as of March 31, 2004, subject to reallocation with approval by the Department of Public Service staff or Public Service Commission.

² To be determined.

R&D Solicitations

Currently, open and planned solicitations are presented in the following table.

Solicitations for Research and Development

Solicitation Number	Title	Proposal Release	Proposal Due Date
Current Solicitations			
Energy Resources, Transportation, and Environmental R&D			
PON 716	Photovoltaic Incentives for Eligible Installers	10/28/02	12/30/05
PON 787	Renewable Power Technology and Resource Prospecting Program	6/7/04	7/19/04
PON 787A	Renewable Power Technology and Resource Prospecting Program	6/7/04	1/17/05
PON 792	Wind Incentives for Eligible Installers	6/2/03	12/30/05
PON 827	Renewable Energy Technology Manufacturing Incentive Program	5/24/04	7/20/04
PON 827A	Renewable Energy Technology Manufacturing Incentive Program	5/24/04	12/15/04
PON 827	Renewable Energy Technology Manufacturing Incentive Program	5/24/04	5/12/05
PON 856	Innovations in Agriculture	6/14/04	8/19/04
PON 857	Energy-Efficient Treatment Process Improvements at Municipal Water & Wastewater Treatment Plants	5/31/04	7/29/04
PON 871	Advanced Transportation Technologies	6/28/04	9/2/04
Industry and Buildings R&D			
PON 798A	Manufacturing Assistance for Peak Shaving (MAPS)	1/19/04	9/23/04
PON 805	Heating and Cooling	5/24/04	9/29/04
PON 864	Building Products and Systems	5/31/04	9/15/04

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Solicitation Number	Title	Proposal Release	Proposal Due Date
Future Solicitations			
Energy Resources, Transportation, and Environmental R&D			
PON 761	Private Ferry Emissions Reduction Program	9/13/04	10/14/04
PON 849	NYSERDA Solar Electric Awning	7/19/04	8/23/04
Anticipated Solicitations			
Energy Resources, Transportation, and Environmental R&D			
PON 867	Municipal Water and Wastewater Technologies	5/31/05	7/29/05
PON 882	Clean Diesel Technology Development and Evaluation	10/25/04	1/3/05
TBD	Advanced Transportation Technologies	Spring 2005	TBD
TBD	Advanced Transportation Technologies	Fall 2005	TBD
TBD	Agricultural Innovations	TBD	TBD
TBD	Assistance to Community Planning Authorities to Facilitate Wind Power Plant Projects	6/04	8/04
TBD	Comparative Environmental Risk Assessment of Wind Power	7/04	9/04
TBD	Development of Avian and Bat Database for Use in Assessment of Risks From wind Power in New York State	9/04	11/04
TBD	Diesel Engine Emission Reduction Technology	Fall 2004	TBD
TBD	Energy Storage and Reliability	Summer 2005	TBD
TBD	Entrepreneurial Networks for Renewable Energy Technology Businesses	1/05	3/05
TBD	Environmental Impacts of Wind Energy	1/05	3/05
TBD	Environmental Product Development	3/05	5/05
TBD	Green Marketing Incentives Program	10/04	12/04
TBD	Natural Gas and Petroleum Exploration and Production for Economic Development	8/04	10/04

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Solicitation Number	Title	Proposal Release	Proposal Due Date
TBD	Natural Gas Industry Outreach and Technology Transfer	8/04	10/04
TBD	Natural Gas Storage	12/04	2/05
TBD	Photovoltaic Practitioner Training: Accreditation and Certification	9/04	11/04
TBD	Power Systems Product Development	Spring 2005	TBD
TBD	Public Awareness and Education for the Competitive Green Power Market	12/04	2/05
TBD	Renewable Energy Technology Options Program	1/05	3/05
TBD	Wind Power as a Financial Risk Management Tool	8/04	10/04
TBD	Wind Power Education and Curriculum Development	1/05	3/05
Industry and Buildings R&D			
TBD	Advanced Heating and Cooling	7/04	10/04
TBD	Advanced Lighting Products and Demonstrations	8/04	11/04
TBD	Demand Response and Time Sensitive Prices	9/04	12/04
TBD	Energy-Efficient Products and Processes for Industrial Applications	10/04	1/05
TBD	Low Sulfur and Biodiesel Field Demonstrations	8/04	11/04
TBD	Next Generations Technologies	9/04	12/04
TBD	Sensors and Controls for Energy Management, Power Quality, and System Reliability	10/04	1/05
TBD	Ultra Low Energy Building Demonstrations	8/04	11/04

Note: Anticipated solicitations are included for planning purposes and have not been approved by NYSERDA's Program Development Management Committee. They are subject to change. All solicitations are current as of June 21, 2004.

TBD - to be determined.

4. ENERGY ANALYSIS

NYSERDA's Energy Analysis Program helps to serve the needs of the State's energy policy makers and energy industry stakeholders.¹ Energy Analysis provides the analytical underpinnings and data used to assist in the design, deployment, and evaluation of NYSERDA's programs. Collaborating with stakeholders and leveraging resources, where appropriate, are critical to meeting Energy Analysis' responsibilities. Energy Analysis contributes to NYSERDA's mission by supporting its strategic energy policy, planning, and evaluation functions.

Energy Analysis works collaboratively with other State agencies and entities to develop, implement, and evaluate comprehensive statewide energy policies. Energy Analysis also supports the State's energy emergency planning and response capabilities, radioactive waste policy and nuclear program coordination, and power plant siting. The strategic and administrative responsibilities and support provided by the Energy Analysis Program are included in the text box that follows.

Energy Analysis Responsibilities

Strategic	Administrative
<ul style="list-style-type: none"> • Statewide energy planning and analysis • Emergency planning and response • Nuclear program coordination • Radioactive waste policy • Power plant siting 	<ul style="list-style-type: none"> • Program evaluation • Policy and analytical studies • Program and strategic planning • Data collection and analysis • Energy Planning Board membership • NYISO governance membership

¹ Stakeholders of the Energy Analysis Program include, but are not limited to: NYSERDA's Board, senior management, and staff; Governor's staff, Executive and Legislative staffs, and individual legislators; State Energy Planning Board and Article X Power Plant Siting Board; major energy suppliers; the New York Independent System Operator (NYISO); utilities; State agencies and authorities; federal government agencies; New York's Congressional delegation; local governments; professional and trade associations; interest groups; and citizens.

The Energy Analysis Program has served internal and external stakeholders in the following ways during the past 12-months:

- Prepared a comprehensive evaluation of the **New York Energy SmartSM** public benefits program.
- Prepared an annual update to the *2002 State Energy Plan* through collaboration with former New York State Energy Planning Board agencies staffs.
- Supported a New York State Public Service Commission (PSC) regulatory proceeding by initiating a study of the oil and gas infrastructures of the State.
- Actively supported the Governor's Greenhouse Gas Task Force and efforts of the Governor's Regional Greenhouse Gas Initiative.
- Prepared a series of annual reports, some required by statute, addressing a wide spectrum of topics. The reports are detailed in the table below.

Energy Analysis regularly contributes to NYSERDA's internal and external program collaboration. Internally, Energy Analysis supports all other programs and activities of NYSERDA that require energy-related data and analysis to support administrative and programmatic decision making. Energy Analysis collaborates with NYSERDA's customer service and R&D programs, helping to define performance metrics for each respective program, evaluating program progress, and assisting in program design and implementation through timely feedback of evaluation findings.

Energy Analysis Internal and External Deliverables

- State Heating Oil and Propane Program (SHOPP) Report
- NYSERDA Strategic Plan (Integrated Program Plan)
- Annual Low-Level Radioactive Waste Status Report
- **New York Energy SmartSM** Program Annual Evaluation & Status Report
- **New York Energy SmartSM** Program Evaluation & Status Report - Quarterly
- Patterns & Trends, New York State Energy Profiles: 1998-2002

Energy Analysis staff also track, monitor, and report on New York's fuel prices and inventories, make this information publicly available and accessible, and conduct specialized studies at the request of NYSERDA management and stakeholders that serve to inform decision making on policy relevant issues pertaining to energy and the environment, fuel diversity, and greenhouse gas policy, among many other subject areas. Strategies employed by Energy Analysis to meet its stakeholders needs include:

- Regularly assessing program strengths and needs on an ongoing basis, looking for opportunities to enhance in-house capabilities and expertise to improve program efficiency and effectiveness.
- Obtaining critical review of program plans and activities from stakeholders and other interested parties (*e.g.*, SBC Advisory Committee, Technical Review Group, Energy Coordinating Working Group) and seeking ways to better meet stakeholders needs.
- Developing and maintaining close working relationships with energy suppliers and other industry associations (*e.g.*, Empire State Petroleum Association, New York State Petroleum Council, Independent Power Producers of New York, Energy Association of New York State, Business Council of New York State, Northeast Gas Association, New York Propane Gas Association, among others) for maintaining market intelligence and strengthening relationships with energy industry representatives.
- Supplementing in-house resources and expertise with technical and analytical support contractors when and where needed (*e.g.*, public benefits program evaluation contractors).
- Monitoring State and federal regulatory actions affecting energy markets and energy use in New York, with particular emphasis on the New York State Public Service Commission, the New York State Department of Environmental Conservation, and the Federal Energy Regulatory Commission.
- Participating in the Management Committee and other oversight and advisory committees of the New York Independent System Operator (NYISO) to maintain awareness of developments in the operation of the State's electricity markets and high-voltage grid system.

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- Sharing market intelligence with NYSERDA's management and staff and with public and private sector energy decision makers to assist them in continuously improving their programs and with other agencies in order to develop more cohesive and effective public policy.
- Serving as a clearinghouse for energy related information that is responsive to the needs of government agencies, the public, industry, business, trade organizations, and other stakeholders.

5. WEST VALLEY SITE MANAGEMENT PROGRAM

On behalf of New York State, NYSERDA holds title to the Western New York Nuclear Service Center (the Center), a 3,300 acre parcel located near the hamlet of West Valley in Cattaraugus County. The West Valley Site Management Program (West Valley program) supports NYSERDA's mission by managing New York State's responsibilities at the Center as efficiently and effectively as possible, protecting public health and safety and the environment, conforming to all applicable regulations, and providing effective liaison with the surrounding community. The West Valley program addresses the Center's environmental management challenges by implementing sound environmental, health and safety, and technical policies, while at the same time making sure the federal government honors its obligations for the cleanup and long-term care of the site.

The Center was established in the early 1960s in response to a federal initiative to commercialize the reprocessing of spent nuclear fuel from power reactors. This federal initiative "Atoms for Peace," encouraged widespread participation in the development and use of atomic energy for peaceful purposes. The federal government offered incentives to states and industry to design, construct, and operate spent nuclear fuel reprocessing facilities. With State's approval, a private enterprise, Nuclear Fuel Services (NFS), took advantage of the federal incentives to develop the nation's first commercial atomic park in western New York. NFS operated the spent nuclear fuel reprocessing facility at the Center for six years before it was shut down for economic and regulatory reasons, leaving 600,000 gallons of high-level radioactive waste in two underground tanks.

Though located in New York, the NFS reprocessing operation used technology supplied by the federal government to reprocess spent fuel, most of which was provided by the federal government under a license issued by the federal government, with the recovered plutonium being returned to the federal government. The federal government even recommended the fee structure at the NFS plant, which ultimately proved too low for profitability.

In addition to the spent nuclear fuel reprocessing operation, NFS constructed and operated two radioactive waste disposal facilities at the Center. One of the disposal areas, the Nuclear Regulatory Commission-licensed Disposal Area (NDA), was constructed and operated as an adjunct to the nuclear fuel reprocessing operation; only

wastes from the fuel reprocessing operations were disposed of in the NDA. As its name indicates, the NDA was licensed by the Nuclear Regulatory Commission (NRC). A second disposal area, the State-licensed Disposal Area (SDA) – licensed by the State of New York – was operated by NFS as a second commercial endeavor at the Center. The SDA received wastes from low-level waste generators across the country.

Key goals of the West Valley Site Management program are to:

- Ensure that plans for the West Valley Demonstration Project's (WVDP) completion and closure of the Center emphasize remedial actions that protect public health and safety and the environment, maximize waste removal, minimize the need for active controls in the long-term management of the Center, and maximize Federal responsibility for the remediation.
- Manage the SDA with utmost attention to NYSERDA staff and worker safety; protect public health and safety and the environment; comply in a timely manner with applicable laws and regulations; and ensure cost-effective implementation of management activities.
- Protect NYSERDA and New York State interests with regard to day-to-day management and cleanup activities of the WVDP. Promote the protection of public health and safety and the environment, maximize clean-up, and minimize liabilities for New York State.

West Valley Demonstration Project

In 1980, Congress passed the West Valley Demonstration Project Act directing the U.S. Department of Energy (U.S. DOE) to carry out a demonstration project to solidify the high-level radioactive waste in the underground tanks, transport the solidified waste to a federal repository for permanent disposal, and decontaminate and decommission the facilities used in the solidification process. The federal Act requires New York State to pay 10 percent and the federal government to pay 90 percent of the Project costs. The WVDP is the only high-level radioactive waste cleanup site in the country where the State is contributing to the cost of the clean-up, more than \$200 million state dollars thus far.

During the past 24 years, substantial progress has been made toward cleanup of the Center. The solidification of the liquid high-level radioactive waste into 275 glass logs was a crowning achievement in environmental innovation. However, much decontamination and decommissioning cleanup work remains to be done at the WVDP and recent U.S. DOE plans to cut funding and accelerate its schedule raise serious issues concerning the federal government's long-term stewardship responsibilities at the site.

State-Licensed Disposal Area

The SDA occupies approximately 15 acres of the Center, immediately adjacent to the 200 acres U.S. DOE is using for the WVDP cleanup. NFS operated the SDA from 1963 to 1975, when disposal operations were terminated as a result of problems with water that infiltrated the disposal trenches. Approximately 2.4 million cubic feet of low-level radioactive waste were disposed of in the SDA.

In 1983, NYSERDA assumed management responsibility for the SDA from NFS. Through a series of interim remedial measures, NYSERDA has successfully minimized water infiltration into the SDA disposal trenches. Routine monitoring of environmental media (*e.g.*, soil and water) is performed to demonstrate continuing protection of public health and safety and the environment. Maintenance activities are routinely conducted to preserve the physical conditions at the SDA. Management of the SDA is performed under permits and a license with the New York State Departments of Environmental Conservation and Labor.

Decommissioning and Long-Term Site Management

Long-term management of all the facilities at the Center is being addressed as part of a joint environmental impact statement (EIS) that U.S. DOE and NYSERDA are carrying out for decommissioning and long-term stewardship at the WVDP and Center. The joint EIS is evaluating a range of alternatives to cleanup and close facilities at the Center, as well as requirements for long-term stewardship. U.S. DOE recently unveiled a plan for many of the contaminated facilities at the Center to be closed in place. However, U.S. DOE has expressed its unwillingness to accept any long-term stewardship responsibility for the waste it will leave at the Center. As a result, NYSERDA is engaged in a three-part strategy, focusing on regulatory, legislative, and litigation options to ensure U.S. DOE fully completes its cleanup and long-term care responsibilities at West Valley.

SECTION 4

SUPPORT FUNCTIONS

NYSERDA's operation depends heavily on management, legal, and administrative support services provided by the following organizational units:

- Computer Systems
- Counsel
- Finance
- Bond Financing
- Human Resources
- Communications
- Contract Management

This section briefly describes the scope of operations and responsibilities of each of these units.

COMPUTER SYSTEMS

The Computer Systems unit and associated staff provide consultation and advisory and problem resolution services for the application of computer technology. Support services include investigating system configuration options and recommending suitable purchases; consulting for application design; and troubleshooting. Computer Systems also reviews requests for the purchase of computer equipment and software.

As a function of its work in the development of computer systems for NYSERDA, Computer Systems is responsible for the procurement and maintenance of software and computer hardware. Staff maintain inventory of hardware and software, and monitor applicable billing and expenses. The unit is also responsible for upgrading hardware and software, repairing hardware, and performing preventative maintenance procedures.

Computer Systems staff assist in training other NYSERDA staff in the use of software applications and computer technologies. As a broader service, the unit obtains information about specific computer topics and recommends training courses to staff.

COUNSEL

The Counsel's Office, under the direction of the General Counsel, provides all legal advice for NYSERDA and represents NYSERDA in legal actions or proceedings. Specifically, Counsel's Office assists in negotiating and drafting contracts, prepares legal opinions, renders advice concerning NYSERDA programs and policies, and reviews and advises staff on legislation and regulations. This Office also prepares comments on proposed legislation, prepares NYSERDA rules and regulations, reviews NYSERDA's applications for permits, assists staff in the preparation of environmental documents, and provides advice concerning personnel matters. In addition, Counsel's Office performs the secretarial function for all the standing committees of NYSERDA's Board.

FINANCE

The Finance unit is responsible for development of the NYSERDA Annual Budget, preparation of quarterly and annual financial statements, and oversees the Internal Control System for financial reporting. The unit is responsible for accurately recording all NYSERDA transactions, including receipts, disbursements, income, and expenses. The unit produces periodic budget reports for management to ensure that proper budgetary controls are maintained and advises on timely resource allocation decisions. The Finance unit handles reporting requirements of the Division of Budget and the Office of the State Comptroller.

BOND FINANCING

NYSERDA is authorized to issue tax-exempt bonds for certain gas and electric utility facilities and special energy projects, resulting in millions of dollars in interest saved over the life of the bonds and lower utility costs for ratepayers. NYSERDA has approximately \$3.7 billion in bonds outstanding and interest savings of about \$3.7 billion are expected to accrue to utility ratepayers over the lives of these bonds.

HUMAN RESOURCES

Human Resources staff are responsible for planning, developing, and directing NYSERDA's personnel program. They are responsible for representing NYSERDA in personnel matters when dealing with the Division of the Budget, the Office of Employee

Relations, and other State agencies, and advising management on personnel, professional development, and employee relations issues. Human Resources staff develop and implement programs for staffing, classification, compensation, performance evaluation, and professional development. They direct and coordinate NYSERDA's recruitment program and implement NYSERDA's affirmative action program. The Human Resources staff administer a number of employee benefit programs.

COMMUNICATIONS

NYSERDA's Communications Department's (Communications) responsibilities include management of program publications and informational materials, including editing, updating, managing printing and mailing processes, and preparing mailing lists. Communications also arranges for photographic services and supports NYSERDA's consumer information hotline.

Communications staff continually track all media queries, monitor press releases that are relevant to NYSERDA activities, and identify and attend numerous events that require NYSERDA's presence. Each year NYSERDA staff disseminate information about NYSERDA's programs at approximately twenty trade shows and similar events. Communications staff handle all inquiries from the Governor's correspondence office relating to such topics as energy efficiency, renewable technologies, and power generation. Communications is also the first stop for information requests from the Legislature and other agencies.

Communications staff strive to balance media exposure among television, radio, daily and weekly newspapers, and other publications such as trade journals without overexposing NYSERDA's message. The types of activities pursued depend on the type of media and include televised press conferences, television talk show appearances, radio press events, newspaper articles resulting from press releases, press releases issued to business newspapers and magazines, and press releases to weekly newspapers.

Communications supports NYSERDA's mission by informing policy makers and the public about NYSERDA's successes in fulfilling its mission and meeting its public policy goals. Communications explains how NYSERDA uses innovation and technology

to solve difficult problems; it assists programs with reaching out to solicit multiple perspectives; and it ensures that NYSERDA is presented to New Yorkers as a model of effective, flexible, responsive, and efficient action.

CONTRACT MANAGEMENT

Contract Management ensures compliance with NYSERDA's internal control policies and audit requirements. Contract Management oversees and monitors the contracting process and works to ensure the efficient and effective transfer of contracting documents internally and externally to NYSERDA's customers. Contract Management continually seeks to improve its processes with particular focus on streamlining and making them user-friendly for staff and customers. A primary goal of the unit is to provide timely services with the maximum degrees of accuracy and efficiency. Cross training of unit staff is an important tool in achieving this goal.

Contract Management provides an orientation to the solicitation and contracting process for new employees. In addition, the unit periodically offers refresher training to project managers and support staff on important topics such as complying with the requirements of the State Environmental Quality Review Act. In an effort to improve communications with the rest of NYSERDA, Contract Management plans to hold frequent workshops with staff to explain contracting procedures and the rationale for the procedures, thereby reducing the number of errors and expediting the solicitation and contracting processes.

With few exceptions, NYSERDA projects are competitively selected. In fiscal year 2003-2004, more than 97 percent of the research and development, and deployment projects were contracted through a competitive solicitation and procurement process. Such solicitations are effective in selecting the most innovative ideas and identifying the best technical approach and service provider. Less than 3 percent of NYSERDA's projects are selected and funded through unsolicited and sole-source processes. Such projects are often the result of specific grant categories established by the federal government, or are creative and innovative proposals that help serve NYSERDA's mission and goals but fall outside the solicitation process. In 2003, 81 solicitations were issued (of which approximately 16 percent were for subscription programs), and a total of 3,856 contract actions were processed.

SECTION 5

INTEGRATED PROGRAM PLAN IMPLEMENTATION AND EVALUATION

IMPLEMENTATION

The programs and strategies described in this Strategic Plan are being implemented conscientiously and consistently across all program areas. As a result of the integration of evaluation activities and metrics reporting into management practices at NYSERDA, program elements as well as individual strategies are revisited regularly and revised as the need arises. NYSERDA has the staff expertise and skill capabilities to implement this Integrated Program Plan. It also has the financial resources necessary to fulfill implementation of this Plan, with approval by NYSERDA's Board.

NYSERDA's delivery approach for energy efficiency, renewable energy development, and research and development is predicated on establishing public and private partnerships. The commitment of the energy services industry, renewable energy developers, building construction professionals, appliance manufacturers, distributors and dealers, and research institutions is an invaluable component in all of our program initiatives. In addition, we have in place evaluation plans to document and measure the progress of each of the programs in our portfolio within this context. For instance, evaluation efforts have shown a three-to-one ratio of private sector capital investment to public sector dollars – investment that is critical to the programs' successes.

EVALUATION

To ensure that programs meet their expectations for participation and their established energy and cost-savings goals, NYSERDA's evaluation efforts are fully integrated with program design and delivery. Evaluation of the **New York Energy SmartSM** public benefits program, in particular, is conducted by competitively selected, independent third-party contractors and NYSERDA evaluation staff. Evaluation efforts stress the importance of measuring and verifying program outcomes and impacts as an integral part of determining the progress and ultimate success of programs.

SECTION 6

SOLICITATIONS

Currently, open and planned solicitations are presented in the following table.

NYSERDA Solicitations

Solicitation Number	Title	Proposal Release	Proposal Due Date
Current Solicitations			
Energy Efficiency Services			
PON 660	Premium-Efficiency Motors Financial Incentives	12/24/01	12/31/05
RFQL 702	Energy Performance Contracting in State Owned Facilities	6/10/02	6/01/07
PON 809	Small Commercial Lighting Program Incentives	8/25/03	12/31/04
PON 811	Technical Assistance	6/14/04	12/1/04
PON 814	New York Energy SmartSM Loan Fund	6/30/03	6/30/05
PON 831	Combined Heat and Power (CHP) and Renewable Generation Technical Assistance	6/7/04	9/1/04
PON 831A	CHP and Renewable Generation Technical Assistance	6/7/04	12/1/04
PON 835	Peak-Load Reduction Program	12/22/03	11/1/04
PON 852	Retrocommissioning Initiative for Commercial Buildings	3/8/04	4/1/05
PON 853	Smart Equipment Choices Program	3/29/04	12/31/04
PON 855	Commercial & Industrial Performance Program	3/29/04	12/31/04
PON 869	New Construction Financial Incentives	5/31/04	12/30/04
PON 872	New York City Private Fleet Program	6/21/04	9/15/04
Energy Resources, Transportation, and Environmental R&D			
PON 716	Photovoltaic Incentives for Eligible Installers	10/28/02	12/30/05
PON 787	Renewable Power Technology and Resource Prospecting Program	6/7/04	7/19/04

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Solicitation Number	Title	Proposal Release	Proposal Due Date
PON 787A	Renewable Power Technology and Resource Prospecting Program	6/7/04	1/17/05
PON 792	Wind Incentives for Eligible Installers	6/2/03	12/30/05
PON 827	Renewable Energy Technology Manufacturing Incentive Program	5/24/04	7/20/04
PON 827A	Renewable Energy Technology Manufacturing Incentive Program	5/24/04	12/15/04
PON 827	Renewable Energy Technology Manufacturing Incentive Program	5/24/04	5/12/05
PON 856	Innovations in Agriculture	6/14/04	8/19/04
PON 857	Energy-Efficient Treatment Process Improvements at Municipal Water & Wastewater Treatment Plants	5/31/04	7/29/04
PON 871	Advanced Transportation Technologies	6/28/04	9/2/04
Industry and Buildings R&D			
PON 798A	Manufacturing Assistance for Peak Shaving (MAPS)	1/19/04	9/23/04
PON 805	Heating and Cooling	5/24/04	9/29/04
PON 864	Building Products and Systems	5/31/04	9/15/04
Future Solicitations			
Energy Resources, Transportation, and Environmental R&D			
PON 761	Private Ferry Emissions Reduction Program	9/13/04	10/14/04
PON 849	NYSERDA Solar Electric Awning	7/19/04	8/23/04
Residential Energy Affordability Program			
RFP 870	Southern Tier Energy Smart SM Communities	7/5/04	8/2/04
RFQL 873	Home Energy Rating System (HERS) Raters	7/12/04	6/30/06

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Solicitation Number	Title	Proposal Release	Proposal Due Date
Anticipated Solicitations			
Economic Development			
PON 718	Initiative for the Saratoga Technology + Energy Park (STEP) - Attracting Clean Energy Technology Companies	9/20/04	10/15/04
RFP 875	STEP Forest Management Services	7/19/04	8/12/04
Energy Efficiency Services			
PON 707	New York City Clean Fuel Taxi Program, Round II	7/15/04	7/15/05
PON 858	CHP and Renewable Generation Technical Assistance	2/7/05	3/1/05
PON 858A	CHP & Renewable Generation Technical Assistance	2/7/05	6/1/05
PON 865	Technical Assistance	11/8/04	6/1/05
PON 866	Technical Assistance	5/9/05	12/1/05
Energy Resources, Transportation, and Environmental R&D			
PON 867	Municipal Water and Wastewater Technologies	5/31/05	7/29/05
PON 882	Clean Diesel Technology Development and Evaluation	10/25/04	1/3/05
TBD	Advanced Transportation Technologies	Spring 2005	TBD
TBD	Advanced Transportation Technologies	Fall 2005	TBD
TBD	Agricultural Innovations	TBD	TBD
TBD	Assistance to Community Planning Authorities to Facilitate Wind Power Plant Projects	6/04	8/04
TBD	Comparative Environmental Risk Assessment of Wind Power	7/04	9/04
TBD	Development of Avian and Bat Database for Use in Assessment of Risks From wind Power in New York State	9/04	11/04
TBD	Diesel Engine Emission Reduction Technology	Fall 2004	TBD

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Solicitation Number	Title	Proposal Release	Proposal Due Date
TBD	Energy Storage and Reliability	Summer 2005	TBD
TBD	Entrepreneurial Networks for Renewable Energy Technology Businesses	1/05	3/05
TBD	Environmental Impacts of Wind Energy	1/05	3/05
TBD	Environmental Product Development	3/05	5/05
TBD	Green Marketing Incentives Program	10/04	12/04
TBD	Natural Gas and Petroleum Exploration and Production for Economic Development	8/04	10/04
TBD	Natural Gas Industry Outreach and Technology Transfer	8/04	10/04
TBD	Natural Gas Storage	12/04	2/05
TBD	Photovoltaic Practitioner Training: Accreditation and Certification	9/04	11/04
TBD	Power Systems Product Development	Spring 2005	TBD
TBD	Public Awareness and Education for the Competitive Green Power Market	12/04	2/05
TBD	Renewable Energy Technology Options Program	1/05	3/05
TBD	Wind Power as a Financial Risk Management Tool	8/04	10/04
TBD	Wind Power Education and Curriculum Development	1/05	3/05
Industry and Buildings R&D			
TBD	Advanced Heating and Cooling	7/04	10/04
TBD	Advanced Lighting Products and Demonstrations	8/04	11/04
TBD	Demand Response and Time Sensitive Prices	9/04	12/04
TBD	Energy-Efficient Products and Processes for Industrial Applications	10/04	1/05
TBD	Low Sulfur and Biodiesel Field Demonstrations	8/04	11/04
TBD	Next Generations Technologies	9/04	12/04

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Solicitation Number	Title	Proposal Release	Proposal Due Date
TBD	Senors and Controls for Energy Management, Power Quality, and System Reliability	10/04	1/05
TBD	Ultra Low Energy Building Demonstrations	8/04	11/04

Note: Anticipated solicitations are included for planning purposes and have not been approved by NYSERDA's Program Development Management Committee. They are subject to change. All solicitations are current as of June 21, 2004.

TBD - to be determined.

For information on other
NYSERDA reports, contact:

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**PLANNING NEW YORK'S ENERGY FUTURE
A THREE-YEAR STRATEGIC OUTLOOK 2004-2007**

**STATE OF NEW YORK
GEORGE E. PATAKI, GOVERNOR**

**NEW YORK STATE ENERGY RESEARCH AND DEVELOPMENT AUTHORITY
VINCENT A. DEIORIO, ESQ., CHAIRMAN
PETER R. SMITH, PRESIDENT**

