Energy Efficiency Assessment

New York State Energy Plan 2009

December 2009

1 Overview

The State's need for energy can be met by either increasing supply or by reducing energy demand through energy efficiency. This Assessment provides an overview of the benefits, costs, and market impacts of New York's energy efficiency resources and estimates the potential for additional cost-effective energy savings. The Assessment looks at the impacts of the State's ongoing energy efficiency programs, identifies new initiatives, and provides direction for further action. For purposes of this Assessment, energy efficiency resources are defined as actions or technologies that provide reductions in energy use at the end-use level while maintaining equal or greater quality of services.

Energy efficiency resources provide value by meeting the State's energy needs in a cost-effective manner and by reducing energy bills, thereby making New York businesses more competitive and allowing families to save money. They also help the State to achieve its environmental goals by reducing emissions of greenhouse gases and other harmful pollutants. Energy efficiency resources enhance the quality of life by increasing comfort, safety and productivity. Finally, energy efficiency resources increase energy security by reducing exposure to supply disruptions and price volatility associated with reliance on imported fossil fuels, particularly petroleum.

New York has been among the nation's leaders in implementing market-based programs to ensure that energy efficiency is developed, valued and recognized as a cost-effective alternative to supply-side energy resources. More than a decade ago, the Public Service Commission (PSC) instituted a System Benefits Charge (SBC) to fund energy efficiency programs. The New York State Energy Research and Development Authority (NYSERDA) has administered these funds to achieve more than 3,000 GWh in annual electricity reductions.[1] During this same time period, the New York Power Authority (NYPA) and the Long Island Power Authority (LIPA) contributed an additional 2,000 GWh in annual electricity reductions. These energy reductions have saved consumers billions of dollars in electricity and fuel costs. Other State agencies, including the Division of Housing and Community Renewal (DHCR), also administer successful energy efficiency programs. Moreover, New York's Energy Conservation Construction Code (ECCC or simply hereinafter as the "Energy Code") has been in place since 1979, and both this Code and State appliance standards have been periodically updated.

Beyond reducing the amount of energy used by customers who install energy efficiency measures, New York's energy efficiency program efforts are designed to transform markets by changing the products, services and delivery mechanisms that are available. For example, programs directed at upstream market participants, including distributors, contractors, trade associations, and manufacturers, seek to induce structural changes in the marketplace that will result in accelerated adoption of energy efficient technologies and practices. Programs are designed to promote permanent changes, including changes in consumer behavior that result in the availability and adoption of innovative energy efficiency products and services. New York's research and development efforts, carried out through NYSERDA and other entities, have also been instrumental in creating new markets, adopting new products, changing consumer behavior and transforming markets.

[1] NYSERDA. **New York Energy $mart^{SM}** *Program Evaluation and Status Report*: *Year Ending December 31, 2008*. 2009. http://www.nyserda.org/publications/SBC%20March%202009%20Annual%20Report.pdf

Recent studies indicate that there continue to be extensive and cost-effective opportunities for energy efficiency in New York. A draft electric energy efficiency potential study, the 2008 Optimal Study, concluded that a 14 percent reduction in projected levels of electricity use, over and above what can be realized from compliance with expected updates in energy efficiency codes and appliance standards, could be "achievable" by 2015 with well designed, fully funded statewide energy efficiency programs.[2] Achievable potential for cost-effective natural gas efficiency savings is estimated to be approximately 18 percent of forecasted load for 2016, according to a natural gas energy efficiency potential study, the 2006 Optimal Study.[3] Comparable savings potential is expected for heating oil and propane use, though comprehensive State-specific studies have not been done.

In his 2009 State of the State address, Governor Paterson reaffirmed New York's commitment to achieve high levels of energy efficiency by announcing the '45 by 15' clean energy goal, which challenges the State to meet 45 percent of its electricity needs by 2015 through increased energy efficiency and renewable energy.[4] The '45 by 15' clean energy goal proposes to reduce electricity end-use by 15 percent below 2015 forecasted levels, while simultaneously meeting 30 percent of the State's electricity supply needs through renewable resources. Achievement of this aggressive goal will require the cooperative efforts of many entities, including State agencies and authorities, energy utilities, municipalities, and third party program administrators. Energy efficiency targets to be achieved by NYSERDA and other program administrators, as well as through new codes and standards, were recently established by the PSC as part of its Energy Efficiency Portfolio Standard (EEPS) proceeding. Specific targets for natural gas efficiency have also been established. Expanded and new energy efficiency programs to be administered by NYSERDA, as well as new utility and third-party administered initiatives, are also being established by the PSC. All energy efficiency programs should be rigorously monitored and evaluated to ensure that funds are well spent, and to make sure that energy and gas system planners can rely on forecasts of energy efficiency savings in assessing the need for new supply-side resources.

This Assessment emphasizes the need for New York to continue to pursue ongoing initiatives while identifying and developing the new strategies critical to maximizing the potential benefits of energy efficiency. An important focus is to work toward mitigating various impediments or barriers that prevent achievement of cost-effective energy efficiency. For example, there is a need to expand the portfolio of energy efficiency programs to include non-regulated fuels, such as heating oil and propane, thereby overcoming the limited access to funds for energy efficiency improvements in these areas. Also needed is development of legislation to expand the reach of the State's Energy Code and to enhance its enforcement. There is a need to expand consumer access to information regarding the energy efficiency attributes of housing at the time of purchase or lease by updating the State's Truth in Heating Law.[5] Federal stimulus funding through the American Recovery and Reinvestment Act (ARRA) provides an important new set of energy efficiency strategies that will complement current State programs.[6] New York's ARRA plan, recently approved by U.S. Department of Energy (DOE), will allow NYSERDA to

[2] Optimal Energy, Inc. *Achievable Electric Energy Efficiency Potential in New York State.* 2008.

[3] Optimal Energy, Inc. *Natural Gas Energy Efficiency Resource Development Potential in New York*. 2006. To realize the maximum achievable potential, programs would be required to deliver for a full 10 year period and pay 100 percent of the incremental cost of the measure plus an additional 30 percent in excess of the measure cost to fund program delivery.

[4] Governor David A. Paterson. *Our Time to Lead: State of the State Address*. 2009. http://www.state.ny.us/governor/keydocs/speech_0107091.html

[5] New York Energy Law § 17-103. The Truth in Heating Law was established in 1981 to afford potential real estate purchasers and renters a right to receive the past two years utility, or fuel bills, for any property they are considering purchasing or renting.

[6] Public Law 111-05 was signed into law on February 17, 2009.

provide additional financial support for the installation of energy efficiency measures and renewable energy systems across the State, and for the introduction of alternative fuel vehicles into fleets.

2 New York's Energy Efficiency Potential

Energy efficiency potential studies are conducted to estimate energy efficiency savings opportunities. For the purposes of this Assessment, energy efficiency potential refers to "achievable potential," i.e., "the energy efficiency that is economic from a total resource cost perspective that can realistically be captured with well-designed, aggressive, fully-funded efficiency programs."[7] Achievable potential takes into account market barriers to efficiency adoption, penetration rates of adoption, as well as the costs associated with program administration, including monitoring and evaluation of programs to measure and validate the savings.

2.1 Electricity Efficiency Potential

The 2008 Optimal Report concluded that opportunities for electricity end-use efficiency in New York are extensive and inexpensive compared with available supply options.[8] Results of the study estimate the State's achievable potential through 2015 to be about 26,000 GWh,[9] representing a reduction of approximately 14 percent from the forecast of electricity demand in 2015.[10] In addition, improved building codes and appliance standards, likely to be implemented prior to 2015, could provide a reduction of an additional 11,000 GWh (5.7 percent) from the forecasted electricity use.[11] Programs that would capture this achievable potential would cost $7.2 billion in 2008 dollars over seven years, or an approximate average annual program portfolio budget of $1.0 billion. Net benefits to the New York economy would total $12.8 billion, including $20.8 billion in total statewide benefits and $8.0 billion in societal costs. The benefit-cost ratio of the electric efficiency measures is estimated to be 2.60, which means that the New York economy would capture approximately $2.60 in benefits for every dollar invested in efficiency.[12]

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[7] Optimal Energy, Inc. *Achievable Electric Energy Efficiency Potential in New York State.* 2008.

[8] The 2008 draft report was an update to Optimal Energy Inc.'s *Energy Efficiency and Renewable Energy Resource Development Potential in New York State: Final Report*, published in 2003, which stated that only one out of every seven kWh of cost-effective, achievable electric energy efficiency savings opportunities within New York were being realized. The study predicted that realizing even one-third of this potential would yield over $2.9 billion in net benefits to New Yorkers by 2007 and over $6.2 billion by 2022.

[9] All savings and forecast energy values in the 2008 Optimal Study are at the "point of purchase" as opposed to "at meter." Point of purchase savings correspond to avoided costs at the entrance to the utility service territories and include savings in transmission line losses. Customer meter level savings also reflect a reduction in distribution level losses commensurate with reduced system deliveries.

[10] The 2008 Optimal Study relies on adjusted 2015 zonal load forecasts provided by the New York Independent System Operator (NYISO) which were adjusted to reflect a baseline that does not include impacts from future ratepayer-funded efficiency programs, but does assume naturally occurring efficiency gains in the market and reflects codes and standards that have recently been passed as well as those considered highly likely to pass.

[11] This reflects changes to residential and commercial building codes, as well as federal appliance and equipment standards that have either already passed (but not yet taken effect), or are considered highly likely to take effect during the next ten years.

[12] Optimal Energy, Inc. *Achievable Electric Energy Efficiency Potential in New York State.* 2008.

The 2008 Optimal Study attributes 38 percent (9,824 GWh) of the statewide achievable potential to New York City, 14 percent (3,603 GWh) to Long Island, and the remaining 48 percent (12,573 GWh) to the rest of the State. Approximately 70 percent of the total achievable potential savings in 2015 would be in the commercial sector, 17 percent would be in the residential sector, including low-income programs, and 13 percent would be in the industrial sector.

Within each sector, the report identifies the end-uses that provide the greatest achievable potential. As shown in Table 1, the most significant energy savings potential for the residential sector comes from indoor lighting, water heating, and air conditioning. Similarly, the end-uses with the greatest efficiency potential for the commercial sector are indoor lighting, cooling, ventilation, and refrigeration. Within the commercial sector, the study concludes that the building type with the greatest energy savings potential is office space, which accounts for 33 percent of the efficiency savings opportunities. Finally, for the industrial sector, the greatest efficiency savings opportunities are in industrial process end-uses and indoor lighting.

Table 1. Distribution of Residential, Commercial, and Industrial Achievable Potential by End-Use (2015)

End-Use	Residential (17% of Total)	Commercial (70% of Total)	Industrial (13% of Total)
Indoor Lighting	51%	48%	22%
Miscellaneous	8%	5%	13%
Outdoor Lighting	1%	1%	
Refrigeration	2%	7%	1%
Space Heating	1%	1%	
Water Heating	20%	1%	
Cooling	17%	20%	
Ventilation		17%	
Process			64%
Total	**100%**	**100%**	**100%**

Source: Optimal Energy, Inc. *Achievable Electric Energy Efficiency Potential in New York State.* 2008.

2.2 Natural Gas Efficiency Potential

The 2006 Optimal Natural Gas Potential Study assessed the energy efficiency potential for natural gas in New York.[13] The gas potential study was designed to identify energy efficiency potential, i.e., program potential, funded at $80 million per year for five years, plus five years of post-market effects, as well as the total economic potential for the 10 year period. The study estimated the program potential would be 1.5 percent of total projected residential, commercial and industrial customer load in 2016. The study also estimated the "maximum achievable potential" over a 10-year period of 18 percent of projected natural gas consumption.

A limited update of the 2006 Optimal Natural Gas Potential Study was performed in 2008.[14] The 2008 updated Optimal study projected program potential energy savings of 2.8 percent of 2017 forecasted energy use, which is almost twice the figure the 2006 five-year program indicated would be achievable by 2016, and reported the 2.8 percent savings by the tenth year is approximately 15 percent of the achievable potential.

While the potential for natural gas energy savings from natural gas efficiency programs is significant, efficiency programs in other energy sectors could affect the overall results. For example, many electricity efficiency programs, including NYSERDA's EmPower New York [SM] and Assisted Home Performance with ENERGY STAR® programs, encourage switching electric appliances, such as clothes dryers and water heaters, to gas-fired appliances.[15] A growing market also exists for combined heat and power technologies, which enable customers to use natural gas on their premises to generate electricity and use the waste heat for space and water heating. Further, some utility-sponsored programs promote switching from electricity and oil to natural gas. While these initiatives would tend to increase natural gas use, the increase could be at least partially offset by a reduction in natural gas use for central station electricity generation. Also, overall efficiency could be improved. For example, using natural gas for water heaters, which typically operate at between 60 and 80 percent efficiency, is more efficient than burning natural gas at a power plant with a maximum efficiency of 60 percent and transporting the electricity over power lines with line losses of 8 to 10 percent.[16]

In the short-term, it is anticipated that residential and commercial natural gas demand will increase because many customers are converting to natural gas from heating oil. The overall trend of natural gas use, per residence, is anticipated to continue to decline for three reasons. First, appliances and equipment that use natural gas have become more efficient over time. Second, unlike electricity, there are relatively few new natural gas applications for residential customers. Third, whole building approaches to energy efficiency maximize the effectiveness of energy efficiency expenditures and produce reductions in both electricity and natural gas use.

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[13] Optimal Energy, Inc., *Natural Gas Energy Efficiency Resource Development in New York.* 2006.

[14] Optimal Energy, Inc. *New York State Natural Gas Efficiency Program Assessment Update*. 2008. The update changed the length of the $80 million per year program scenario funding from five to ten years (from $400 million to $800 million) and applied a modified discount rate. All other assumptions used in the 2006 study were preserved including budget allocation based on sector spending, 50 percent of the residential budget allocated to low income consumers, and the proposed programs which attempted to balance short-term resource acquisition efforts and long-term market transformation benefits.

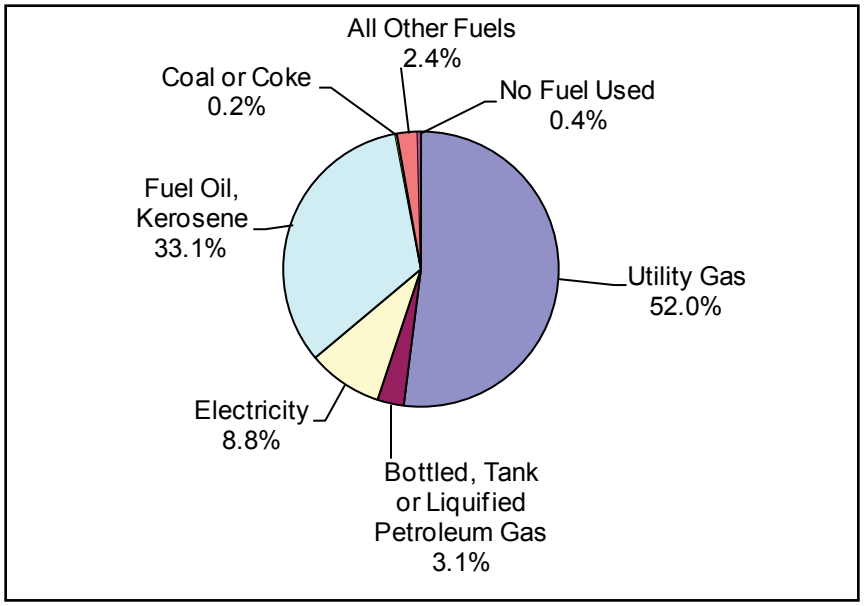
[15] As discussed later in this Assessment, ENERGY STAR is a voluntary labeling and recognition program sponsored by the U.S. Environmental Protection Agency (EPA) and DOE that helps businesses and consumers identify high-efficiency products, homes, and buildings that save energy and money and protect the environment.

[16] In this example, net efficiency equates to 50 percent.

2.3 Oil and Other Fuels

A significant level of efficiency potential likely exists with regard to New York's No. 2 home heating oil, also known as fuel oil. Figure 1 shows that approximately one-third of New York households, or an estimated 2.3 million households, use fuel oil to heat their homes. Based on the U.S. Energy Information Administration's (EIA's) estimates for 2007, New York's residential and commercial sectors use more fuel oil than any other state, accounting for 24 percent and 22 percent of national residential and commercial use, respectively.[17]

Figure 1. Distribution of Primary Home Heating Fuel in New York, 2007



Source: EIA. *State Energy Data System: Distillate Fuel Oil Consumption Estimates by Sector.* 2008.

While New York has not conducted a comprehensive energy efficiency potential study for fuel oil, generalities can be drawn from a study conducted for Vermont in 2007.[18] The Vermont study estimated the achievable cost-effective savings potential for fuel oil across all sectors to be 14 percent of the forecasted fuel oil use in 2016. The estimated savings potential for the commercial sector was estimated to be 24 percent. These results suggest that the potential for energy efficiency associated with use of No. 2 fuel oil in New York may be comparable to the estimate from the Vermont study.[19]

[17] EIA. *State Energy Data System, Table F4a, Distillate Fuel Oil Consumption Estimates by Sector.* 2007. http://www.eia.doe.gov/emeu/states/sep_fuel/html/pdf/fuel_use_df.pdf

[18] Vermont Department of Public Service (prepared by GDS Associates, Inc.). *Vermont Energy Efficiency Potential Study for Oil, Propane, Kerosene and Wood Fuels*. 2007. http://publicservice.vermont.gov/pub/other/allfuelstudyfinalreport.pdf

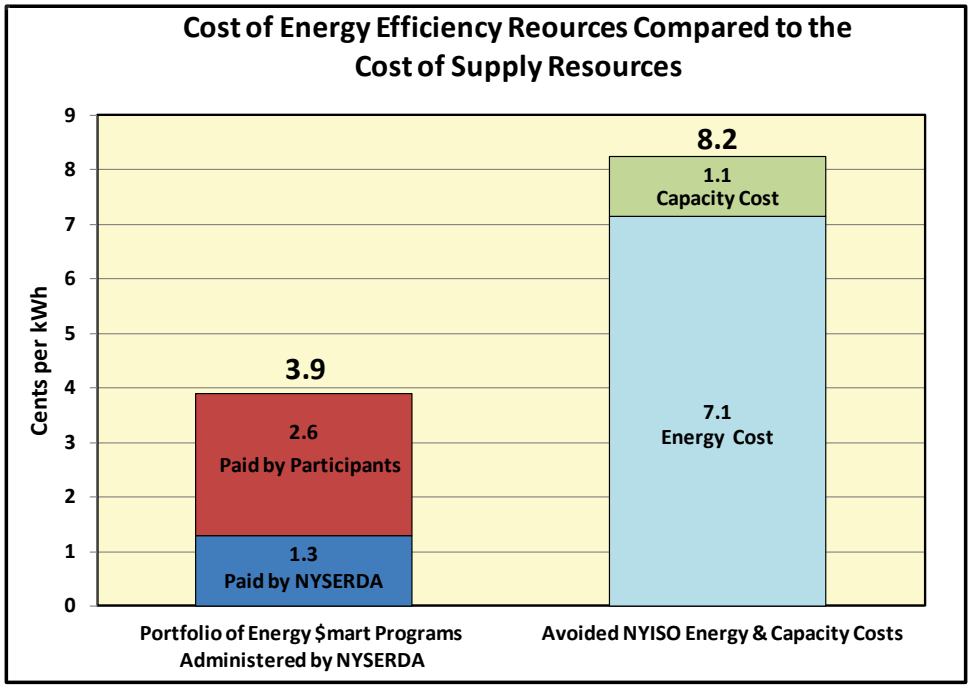
[19] Energy efficiency potential studies also have not been conducted in New York for other home heating fuels, such as propane and wood, though it is estimated that the energy efficiency potential for these fuels (in percentage terms) is similar to that of natural gas and home heating oil.

3 Benefits and Cost-Effectiveness of Energy Efficiency Programs

Analyses of the portfolio of **New York Energy $mart**[SM] programs administered by NYSERDA are presented below as examples to demonstrate the benefits and cost-effectiveness of energy efficiency programs. A rigorous and objective evaluation process, including benefit-cost analysis, is critical to ensuring that program results are real, verifiable, and that goals are achieved.

As indicated in Figure 2, energy efficiency resources can be implemented at a substantially lower cost than supply resources. Through 2007, **New York Energy $mart**[SM] programs have been implemented at an overall portfolio cost of 3.9 cents per kWh, including program costs paid by NYSERDA and on-site costs paid by participating customers, compared to avoided supply costs of 8.2 cents per kWh, which includes energy and capacity costs.

Figure 2. Cost of Energy Efficiency Resources Compared to the Cost of Supply Resources



Source: NYSERDA, NYISO

3.1 Cost-Effectiveness of Energy Efficiency Resources

The cost-effectiveness of energy efficiency resources is analyzed by calculating benefit-cost ratios. The threshold for cost-effectiveness is a benefit-cost ratio greater than one; higher values indicate greater cost effectiveness.

Table 2 shows the results of two types of benefit-cost tests performed on the **New York Energy $mart**[SM] portfolio of programs for the period between 2000 and 2008:

- *The Total Resource Cost (TRC)* test measures the present value of the resources saved (benefits) against the present value of Program Administrator's spending plus customer investments (costs).

- *The Program Administrator Cost (PAC)* test measures the ratio of benefits to costs, using only the expenditure of funds by the Program Administrator.

Three levels of benefits are shown in Table 2 for each type of test. Under the TRC test, the ratio of benefits to costs is 1.8, rising to 6.0 when non-energy impacts and macroeconomic impacts are included. These ratios indicate that each dollar spent on energy efficiency through **New York Energy $mart**[SM] programs resulted in $1.80 of energy resource benefits or $6.00 with the inclusion of non-energy and macroeconomic impacts. Similarly, the PAC ratio is 5.6 and when non-energy and macroeconomic impacts are added to the resource benefits, the ratio is 18.3.

Table 2. Benefit-Cost Ratios for New York Energy $mart[SM] Program Portfolio through 2008

	Total Resource Cost Test	**Program Administrator Cost Test**
Avoided Resource Benefits	1.8	5.6
Avoided Resource Benefits + Participant non-energy impacts	2.6	7.9
Avoided Resource Benefits + Participant non-energy impacts + Macroeconomic benefits	6.0	18.3

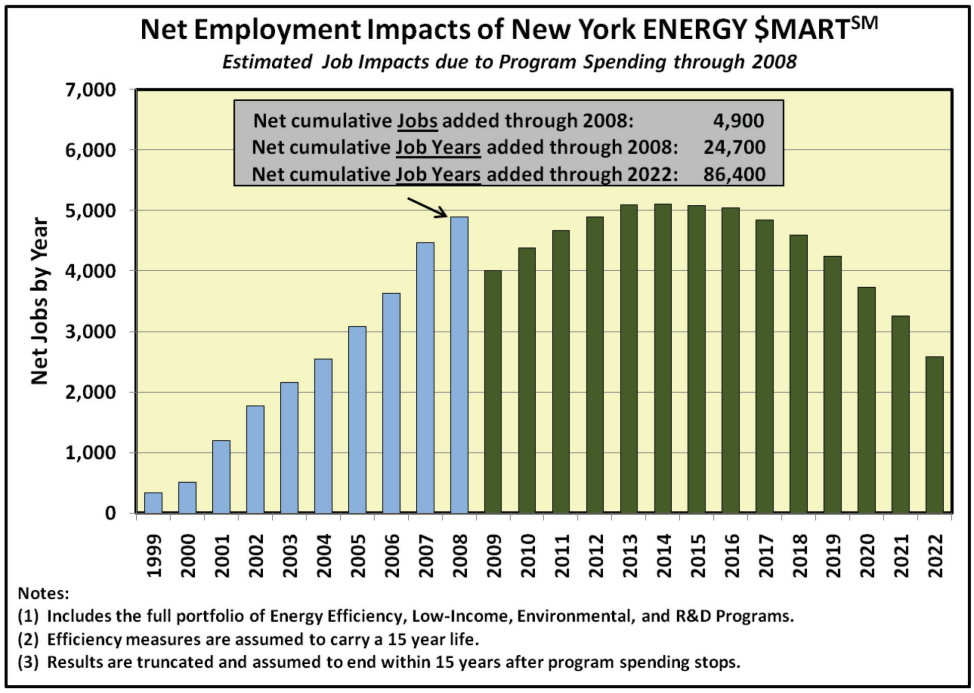
Note: Avoided resource benefits include avoided costs associated with lower requirements for electricity generation, natural gas, and water. Participant non-energy impacts are monetized values for factors such as comfort, safety, and productivity. The monetized value of environmental benefits, such as reductions in emissions of sulfur dioxide, nitrogen oxides, and carbon dioxide, are included as benefits in the benefit/cost analysis to the extent that the value to society of removing emissions from the air is reflected in emissions trading costs that are included in the price of electricity. Macroeconomic benefits are the result of greater in-State economic activity due to energy bill savings.

Source: NYSERDA. **New York Energy $mart**[SM] *Program Evaluation and Status Report*: *Year Ending December 31, 2008*.

3.2 Macroeconomic Impact of Energy Efficiency

Macroeconomic analyses of the **New York Energy $mart**[SM] programs have shown that expenditures and annual savings produced by energy efficiency programs set off a ripple effect that influences many sectors of the New York economy. As shown in Figure 3, through 2008, 4,900 net jobs have been created by the **New York Energy $mart**[SM] programs. The analysis evaluates macroeconomic impacts over 10 years of program implementation (1999-2008) and 14 years following the installation of measures (2009-2022).[20] The analysis includes the net effects of injecting money into New York's economy by investing in energy efficiency equipment, program administrative expenditures, reduced consumer spending power due to the collection of funds to pay for the programs, and the stream of annual energy savings created by the energy efficiency measures. In addition to creating jobs, in 2008, the programs are estimated to increase personal income by $293 million and Gross State Product by $644 million. The net benefits continue long after energy efficiency measures are installed due to recurring annual energy bill savings and increased productivity.

Figure 3. Net Employment Impacts of New York Energy $mart[SM]



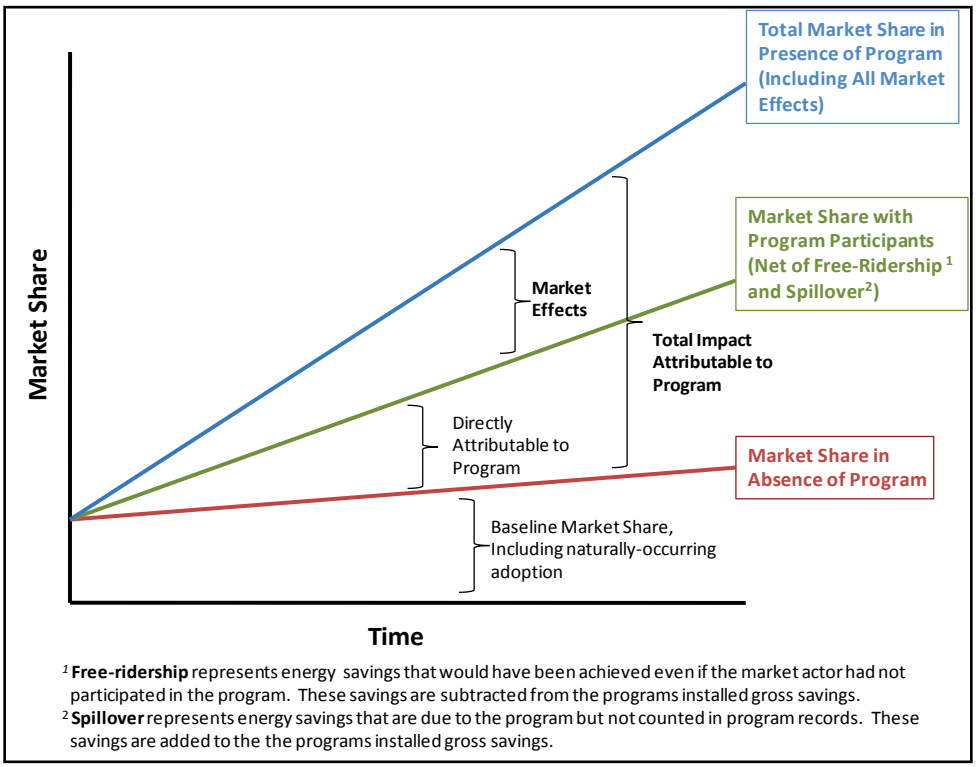
Source: NYSERDA

[20] A 15-year period was selected to represent the average life of efficiency measures installed under the **New York Energy $mart**[SM] Program.

3.3 Market Effects of Energy Efficiency Programs

The State's energy efficiency program offerings include both resource acquisition and market transformation strategies that lead to substantial impacts beyond measured energy savings and peak demand reductions. Some of these impacts are skills, attitudes, behaviors, product offerings, and policies, collectively termed "market effects" because they are expected to persist beyond the particular energy efficiency program and continue to affect market dynamics and program participant and non-participant decision making. As shown in Figure 4, market effects can be measured through the analysis of the difference between total energy efficiency market share realized in the presence of a program and the market share that can be directly attributed to the resource acquisition efforts of that program.

Figure 4. Market Share Attributable to Program



Source: NYSERDA.

Market characterization and assessment evaluations are routinely performed on **New York Energy $mart**[SM] programs to: (1) develop a comprehensive understanding of current and emerging markets, e.g., market structure and market actors; (2) provide baseline and background information needed to define and deliver programs to target markets; and (3) track changes in markets over time with a specific focus on market indicators that are likely to be affected by programs offerings. The market characterization and assessment results can be used to assess progress towards the PSC public policy goals and the general movement of markets toward energy efficiency. In addition, NYSERDA uses the information to adjust and improve program offerings to generate maximum market interest and program participation.

NYSERDA's New Construction Program, which creates long-term changes in design practices through the mainstreaming of energy efficiency and green building concepts, provides an example of how market transformation impacts can be quantified by a carefully-designed evaluation process. A market assessment of the commercial new construction market[21] found that non-participant awareness of the New Construction Program has increased from between 0.4 and 2 percent in 2003 to 32 percent in 2007; similarly, the percentage of participating architecture firms by dollar value has increased from 50 to 90 percent between 2003 and 2007.

The Market Support Program provides an additional example of New York's efforts to quantify the market transformation results of energy efficiency programs. The program increases the availability of ENERGY STAR qualified products in stores, as measured by the percent of models on display that bear the ENERGY STAR label. Table 3 indicates that, from 1999 to 2008, the percent of ENERGY STAR clothes washers, dishwashers, and room air conditioners increased from 16, 18 and 26 percent, respectively, to 51, 79 and 63 percent, respectively.[22]

Table 3. Percent of ENERGY STAR Models on Display at Partner Retailers

Products	**1999**	**2008**
Refrigerators	14%	29%
Clothes Washers	16%	51%
Dishwashers	18%	79%
Room Air Conditioners	26%	63%
CFL Bulbs	16%	24%
All Lighting Fixtures	0-4%	0-46%
Source: NYSERDA. **New York Energy $mart**[SM] *Program Evaluation and Status Report*: *Year Ending December 31, 2008*. 2009.		

[21] Summit Blue Consulting (prepared for NYSERDA). *New Construction Program Market Characterization and Assessment.* 2008.

[22] NYSERDA. **New York Energy $mart**[SM] *Program Evaluation and Status Report*: *Year Ending December 31, 2008*. 2009.

4 Ongoing Energy Efficiency Programs

New York has supported energy efficiency programs for nearly three decades, beginning with utility demand-side management (DSM) programs in the 1980s and expanded through the efforts of the NYSERDA-administered SBC program in the late 1990s as well as the efforts of NYPA, LIPA and DHCR. Annual funding committed to efficiency programs by New York's utilities and energy authorities alone, has grown from a modest $25 million in 1984 to over $700 million for 2009. In 2008, the PSC approved the EEPS in support of New York's goal of reducing electricity use by 15 percent below 2015 forecast levels. Additional information about efforts of the State's energy authorities and the EEPS proceeding are presented below. The programs collectively and individually serve all energy consumers including those using low-income residences, large commercial and industrial facilities, and large public facilities. The programs serve all geographical areas of New York. While the primary objective of these programs is to encourage the adoption and use of energy-saving products and services to yield verifiable energy savings, the programs also provide significant economic and environmental benefits to the citizens of New York.

Announced in Governor Paterson's 2009 State of the State Address, the recently-launched online New York State Energy Efficiency Clearinghouse serves as a single point of access for energy efficiency programs targeted to municipalities, State government, schools, colleges and universities, healthcare, and water and wastewater facilities that are available through NYSERDA, NYPA, LIPA, Dormitory Authority of the State of New York (DASNY), and Environmental Facilities Corporation (EFC).[23]

4.1 New York State Energy Research and Development Authority (NYSERDA)

NYSERDA provides a comprehensive portfolio of energy efficiency programs serving residential customers, including low-income customers, and non-residential energy consumers, including business and industry, agriculture, institutions, municipalities, and State government. Market and workforce development, which includes training and certification, incentives, and business support are important components of NYSERDA's programs. A strong effort is made to reach beyond individual projects to improve the energy efficiency and vitality of communities by developing collaborative relationships among local organizations and agencies. In addition, NYSERDA provides critical support for the "innovate" phase of the innovate-market-regulate cycle of energy efficiency through its extensive research, development, and demonstration programs.

NYSERDA's energy efficiency efforts are made possible primarily because it is the designated administrator of the **New York Energy $mart**[SM] Program. The **New York Energy $mart**[SM] Program, initiated in 1998 by order of the PSC, is funded by the SBC, a centralized program established by the PSC to fund energy efficiency on behalf of the electricity ratepayers of New York. Through year-end 2008, the **New York Energy $mart**[SM] portfolio is estimated to have achieved 3,220 GWh of cumulative annual

[23] NYSERDA, NYPA, DASNY, LIPA, and EFC. *New York State Energy Efficiency Clearinghouse: Energy Efficiency Programs for Institutional Customers*. 2009. http://www.nyserda.org/clearinghouse

electricity savings and more than 5.4 million MMBtu of natural gas, fuel oil, and other annual fuel savings. The peak electric load reduction attributed to the program is estimated at 1,284 MW. The reductions in energy use translate to:

- $590 million in annual energy bill savings (electricity, oil, and natural gas) in 2008 for New York consumers
- 2,800 tons of annual nitrogen oxides (NO_x) emission reductions
- 5,120 tons of annual sulfur dioxide (SO_2) emission reductions
- 2.2 million tons of annual carbon dioxide (CO_2) emission reductions, which is equivalent to removing 435,000 automobiles from New York's roadways

In addition, it is estimated that the **New York Energy $mart^{SM}** portfolio created or retained 4,900 net New York jobs through 2008.[24]

The SBC-funded **New York Energy $mart^{SM}** Program is currently in its third funding cycle. The first funding cycle ran from June 1998 through June 2001 at an annual funding level of $58 million per year. The second funding cycle provided $147 million dollars per year and ran from July 2001 through June 2006. In December 2005, New York's SBC program funding was extended for an additional five years, from July 1, 2006 through June 30, 2011, and funding was increased to approximately $175 million annually or $896 million over the five-year period.[25] Based on currently approved funding through June 2011, **New York Energy $mart^{SM}** Program savings are expected to peak in 2013 at 4,750 GWh of electricity savings and 1,246 MW of peak load savings.

Table 4 below summarizes achievements and spending for NYSERDA-administered energy efficiency activities from 1998 through 2008, as well as three energy efficiency programs that NYSERDA administers on behalf of three investor-owned utilities: Consolidated Edison, National Fuel Gas, and National Grid.

[24] NYSERDA. **New York Energy $mart^{SM}** *Program Evaluation and Status Report*: *Year Ending December 31, 2008*. 2009.

[25] This consists of $866 million in SBC funding plus $30 million in anticipated interest earnings.

Table 4. NYSERDA Efficiency Programs: Energy Savings and Program Costs: 1998-2009

Year	Cumulative Annual Reductions		Cumulative Annual Peak Non-Curtailable Electric Demand Reductions	Cumulative Peak Curtailable Demand Reductions	Annual Spending
	Electric (GWh)	Other (MMBtu)	(MW)	(MW)	($ Millions)
System Benefits Charge					
1998-2001	399	1,470,403	106	Not available	$ 27.4*
2002	690	3,000,000	218	434	$ 113.7
2003	1,000	2,800,000	270	610	$ 129.3
2004	1,400	2,600,000	325	535	$ 135.5
2005	1,950	4,000,000	445	595	$ 137.5
2006	2,350	4,049,000	495	618	$ 146.1
2007	3,060	4,660,000	650	550	$ 154.0
2008	3,220	5,400,000	700	575	$ 163.8
2009**	3,454	5,250,000	755	590	$ 147.0
Con Edison Gas Funded					
2005	-	-	-	-	$ 0.4
2006	-	-	-	-	$ 1.4
2007	-	134,689	-	-	$ 2.5
2008	-	232,135	-	-	$ 7.3
2009	-	277,740	-	-	$ 10.2
National Fuel Gas Funded					
2008	-	24,778	-	-	$ 1.7
2009	-	59,133	-	-	$ 6.1
National Grid Funded					
2008	-	1,811	-	-	$ 0.18
2009	-	28,229	-	-	$ 2.7
System-Wide Program					
2006	10	-	3	9	$ 3.6
2007	38	-	13	31	$ 17.1
2008	82	-	24	61	$ 5.7
2009 **	83	-	24	67	$ 2.0
Total	3,537	5,615,102	779	657	$ 1,223.18

* The annual spending for 1998-2001 represents the average annual value across the four-year span.

** 2009 SBC figures are through September 2009, and system-wide figures are through program end (March 31, 2009).

Source: NYSERDA.

4.2 New York Power Authority (NYPA)

NYPA is the nation's largest State-owned electric utility organization. As part of its mission, NYPA provides energy efficiency services primarily to its governmental customers in southeastern New York as well as to public entities throughout New York State. As shown in Table 5, NYPA's efficiency programs have resulted in annual savings of 749 to 1,007 GWh of electricity since 1990, through investments in energy services projects reaching a level of $121 million in 2007, and cumulative investments surpassing $1 billion since the program's inception.

NYPA has financed and directed energy efficiency projects across New York State at 3,150 public facilities, saving tax dollars, and reducing energy use and annual greenhouse gas emissions by more than 815,000 tons, and dependence on foreign oil by more than two million barrels a year. Those efforts have contributed savings of more than $115 million a year for numerous State, regional, and local agencies and have reduced demand by more than 200 MW, equivalent to the output of a medium-sized power plant.

NYPA plans to expand its investment in energy efficiency measures for program participants by an additional $1.4 billion, including annual investments of more than $200 million for the period 2012 through 2015. The projected energy reductions are estimated to be 1,411 GWh and 248 MW.

Table 5. NYPA Efficiency Programs: Energy Savings and Program Costs: 1990-2009

Year	Cumulative Annual Electric Savings *(GWh)*	Coincident Cumulative Annual Non-electric Fuel Savings *(MMBtu)*	Cumulative Annual Peak Demand Reduction *(MW)*	Annual Funding *($ Millions)*
1990-2001	749	885	168	48*
2002	781	984	174	98
2003	831	1,100	183	64
2004	852	1,258	188	54
2005	879	1,427	194	51
2006	917	1,525	198	61
2007	958	1,838	206	121
2008	1,007	2,071	214	82
Estimated 2009**	1,030	2,175	219	68

Notes:
1. Annual investments reflect completed projects only and include total project costs financed by NYPA. Costs also include rebates and incentives paid by NYSERDA and utilities.
2. Annual investments include other, non-electric end use, distributed generation, and peak load management projects.
3. Impacts reflect projects completed statewide and may be included in data for utilities and NYSERDA.

* $48 million represents the average annual funding over the 12-year period of 1990-2001; the total funding for this 12-year period was $576 million.
** 2009 figures are estimated through September 2009.

Source: NYPA.

4.3 Long Island Power Authority (LIPA)

In May 1999, LIPA initiated its Clean Energy Initiative (CEI), intended at that time to be a five-year, $160 million effort targeted at achieving energy and capacity savings, delivering electric bill savings to customers and providing environmental benefits to society. The original CEI portfolio included energy efficiency rebates and incentives to: encourage customers to purchase ENERGY STAR qualified appliances and install energy-efficient central air conditioners and geothermal heat pumps; encourage builders to construct ENERGY STAR homes; facilitate the growth of the building performance industry and provide home energy assessments for customers; and promote efficiency during the design and/or renovation of commercial buildings. Table 6 summarizes the LIPA-administered electric energy efficiency achievements and spending since 1999.

Table 6. LIPA Efficiency Programs: Energy Savings and Program Costs: 1999-2009

Year	Cumulative Annual Electric Savings *(GWh)*	Cumulative Annual Peak Demand Reduction (*MW)*	Annual Funding *($ Millions)*
1999-2001	171	48	21.1 *
2002	187	60	39.3
2003	262	80	27.6
2004	328	94	24.3
2005	380	110	26.1
2006	458	128	26.5
2007	587	148	24.4
2008	688	165	21.3
Estimated 2009	791	183	32.8

* $21.1 million represents the average annual funding over the three-year period of 1999-2001; the total funding for this three-year period was $63.1 million.

Source: LIPA.

In an effort to reduce energy costs while keeping up with Long Island's growing energy demands, LIPA has announced a new energy efficiency program, Efficiency Long Island. The 10-year, $924 million Efficiency Long Island program kicked off on January 1, 2009 and will succeed and expand on the efficiency component of CEI. Efficiency Long Island is designed to reduce peak electric demand by 520 MW by 2018. Such a reduction will result in the deferral or elimination of the equivalent of one large power plant from LIPA's capacity expansion plan and avoid high-cost, on-peak energy production equivalent to saving 2.2 million barrels of oil annually. Efficiency Long Island will offer residential and business customers programs that support increased levels of energy efficiency in new and retro-fit construction, as well as supporting sale of energy-efficient products.

4.4 Division of Housing and Community Renewal (DHCR) Weatherization Program

DHCR implements the New York State Weatherization Assistance Program (WAP), which provides services to some of New York's neediest residents. Funding for 2009 has increased to $104.7 million, which is estimated to provide assistance to more than 20,450 households across New York, primarily assisting income-eligible families and individuals by reducing their heating and cooling costs and improving the safety of their homes through installation of energy efficiency measures.[26] Households in both single- and multi-family buildings are eligible. In addition to energy savings, weatherization projects improve housing stock, promote health and safety, help customers pay their energy bills thus reducing arrearage levels, and mitigate release of harmful emissions. Weatherization programs also create jobs that support the local community.

New York's 2009 WAP budget was increased significantly by the 2009 ARRA. Under the ARRA, New York received an additional $394 million for WAP over the next two years. DOE has approved New York State's Weatherization Recovery Act Funding Plan[27] to utilize the additional funding. New assistance guidelines will increase the eligibility levels for participants and increase the amount that can be spent per household to $6,500, from the previous level of $4,500. In addition, weatherization will be allowed in homes that had been previously weatherized before 1994. These changes allow the State to move forward on its strategy to make at least 45,000 low-income households more energy efficient over the next two years.

4.5 Executive Order 111

In 2008, Governor Paterson reaffirmed the State's commitment to Executive Order 111 for "Green and Clean State Buildings and Vehicles" (EO 111). Among other requirements, Executive Order 111 directed that all State agencies and departments strive for a collective reduction in energy use in all buildings they own, lease or operate, of 35 percent by 2010, relative to 1990 levels.[28]

In 2006, State entities reported that they were, on average, 12.32 percent more efficient than the reported base year. While State entities have made significant improvements in the efficiency of energy use in their building space since the issuance of EO 111, they also report that with the expansion of air conditioned spaces, increased plug load, e.g., computers, office equipment and other energy using equipment, and increased numbers of customers and clients, their energy use is increasing.

[26] Energy efficiency measures include: air sealing, i.e., weather stripping and caulking; wall and ceiling insulation; heating system improvements or replacements; providing efficiency improvements in lighting; hot water tank and pipe insulation; and replacing refrigerators with ENERGY STAR qualified units.

[27] DHCR. *Weatherization Recovery Act Funding Plan*. 2009. http://nysdhcr.gov/Programs/WeatherizationAssistance

[28] The measure of success for the 35 percent reduction target was based on an Energy Use Index (EUI) metric of total annual Btu used by State entities divided by the total square footage of floor space (Btu/sf). The EUI is calculated annually based on a compilation of all reporting State entities' annual energy reports, and is compared to the EUI measured in the base year 1989-1990. NYSERDA. *Executive Order 111 "Green and Clean" State Buildings and Vehicles, Guidelines Second Edition.* 2004.

The State has undertaken a number of projects and activities to improve energy efficiency and reduce energy use in State-owned and/or managed buildings.[29] Although significant efficiency improvements have been achieved to date, much of that success has been associated with addressing easy-to-implement improvements. Future improvements may be more difficult in light of expected building load growth and other issues. Future issues to address include the methodologies for measuring progress toward the goal; accountability for improvements; and inconsistencies and conflicts between programs, requirements, and jurisdictions.

[29] While this Assessment focuses on energy efficiency, it is noteworthy that the Office of General Services (OGS) has also installed a number of renewable energy resources such as photovoltaic systems, as well as combined heat and power projects, in order to offset the need to draw power from the electric grid.

5 New Efficiency Initiatives

New York has recently re-examined its energy efficiency policies and programs to position the State to realize more of its achievable energy efficiency potential, resulting in several major changes. As part of the State's '45 by 15' clean energy goal, Governor Paterson reaffirmed the State's electricity efficiency goal to reduce electricity use by 15 percent below the 2015 forecasted level ('15 by 15'). Further, the State has established goals for natural gas energy efficiency. To continue New York's leadership in capturing cost-efficient energy efficiency resources and transforming markets, several new initiatives are underway that build upon the substantial achievements of on-going programs. Overall, average annual spending through 2015 on efficiency programs administered by the utilities and the State's energy authorities is expected to approach $1 billion, consisting of funding for NYSERDA through the System Benefits Charge of approximately $175 million, NYPA planned spending of $135 million, LIPA expected spending of an average of more than $90 million, and expected PSC authorization of utility and NYSERDA spending of $330 million on electricity programs annually (in addition to the SBC) and $130 million on gas efficiency programs. In addition, New York State is the recipient of two formula grant programs to fund clean energy activities, including energy efficiency, from the ARRA: the State Energy Program which will provide New Yorkers with approximately $129 million and the Energy Efficiency and Conservation Block Grant Program which will provide over $29 million for energy efficiency activities in small cities and municipalities. These programs will be implemented by NYSERDA. The State will also receive funding for clean energy activities through the Large Cities Program, to be implemented directly by large municipalities. Thorough coordination of these multiple programs is required to help ensure efficient use of ratepayer and taxpayer funding, minimize confusion by customers and contractors interested in participating, and facilitate achievement of the State's goals. Lastly, as mentioned above, DHCR is administering more than $500 million for the Weatherization Assistance Program over the next two years.

Rigorous evaluation, monitoring and verification of all energy efficiency programs are required. Reliable and transparent program evaluation protocols and measures are necessary to ensure that the substantial funds outlined above are spent effectively, programs requiring modification are identified and corrective action taken as soon as possible and funding is redirected to its most effective use. Rigorous and reliable program evaluation and projections of energy efficiency are also required so that the New York State Independent System Operator (NYISO) may rely on forecasts of energy efficiency in assessing resource adequacy, and to allow distribution utilities to rely on such forecasts to reduce the need for costly demand-driven infrastructure improvements, thus reducing the need for supply-side resources.

The State is dedicated to continuing to establish and implement progressive energy policy and regulatory initiatives that overcome remaining impediments to achieving the State's cost-effective energy potential, including financial and informational barriers. Although many energy efficiency measures pay for themselves in a few years or less, for some customers with limited access to capital, the need for upfront investment remains a significant barrier to adoption of cost-effective energy efficiency measures. This concern is addressed, in part, by energy efficiency programs that provide substantial discounts on the cost of efficiency measures, as well as financing offered by NYSERDA. Nevertheless, new initiatives to overcome financial barriers to investment in energy efficiency should be evaluated, such as on-bill financing programs, under which utilities or third-parties provide upfront financing for efficiency measures that are repaid by the customer through the savings in their monthly energy bills. Similarly,

other private and governmental sources of funding may overcome financial barriers to investment in energy efficiency.

The delivery of energy efficiency information should also be enhanced. Achievement of the State's energy efficiency goals requires that consumers understand the benefits of energy efficiency, particularly at the time of a purchase decision regarding homes and energy-intensive appliances, and that consumers take action to invest in energy efficiency equipment and infrastructure. Enhancing the energy efficiency information that is provided to consumers will facilitate informed decisions by consumers that may have a prolonged effect on their energy consumption and bills, and provide a powerful incentive for producers and sellers to ensure that their products satisfy consumer expectations regarding energy efficiency. Legislative changes to the Truth in Heating law to expand the information that must be disclosed to prospective home purchasers or tenants, should be considered.[30] Similarly, consideration should be given to implementing new energy-use benchmarking programs, under which a building's energy use indexed against comparable buildings is publicly disclosed. Efficiency-related outreach, education and marketing programs should also reflect best practices in terms of design and delivery. Special attention should be given to communities generally considered to be "hard to reach" by virtue of their economic and demographic characteristics or geographic location, as well as to consumers for whom English is not the primary language. Additionally, outreach should be targeted to commercial and industrial customers and community clusters such as housing developments.[31]

5.1 Electricity

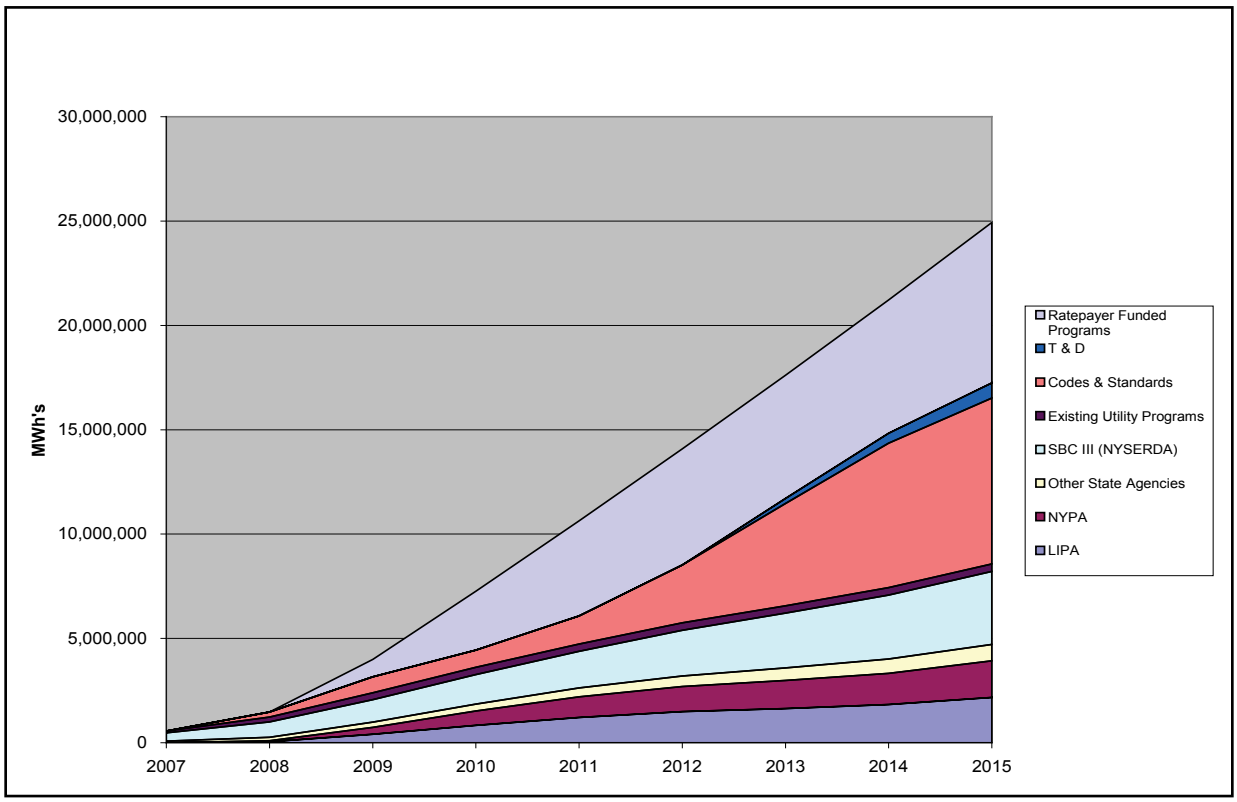
5.1.1 Achieving the '15 by 15' Electricity Efficiency Goal

Achieving the State's '15 by 15' goal requires the cooperative efforts of many different entities, including all State agencies and authorities. Figure 5 shows the results of a "wedge" analysis performed to estimate energy use reductions that are needed to meet the '15 by 15' goal, assuming continuation of existing and planned efficiency programs. The wedge designated as "Ratepayer-Funded Programs" shows the portion of the '15 by 15' goal that is expected to be met by new PSC-authorized programs to be administered primarily by utilities and NYSERDA. These expected new programs will be incremental to the ongoing NYSERDA programs and expanded NYPA, LIPA, and utility programs. The "Codes and Standards" wedge underscores the importance of enhancing efficiency standards for electrical equipment and appliances and of assuring compliance with the State's Energy Code, which is discussed more fully in the Regional Collaboration Issue Brief.

[30] New York Energy Law, Article 17 §103.

[31] In his 2009 State of the State address, Governor Paterson called for the creation of an energy efficiency clearinghouse to streamline access to the State's energy efficiency programs for schools, hospitals, and local governments. The clearinghouse website can serve as a model for other targeted outreach efforts. NYSERDA, NYPA, DASNY, LIPA, and EFC. *New York State Energy Efficiency Clearinghouse: Energy Efficiency Programs for Institutional Customers*. 2009. http://www.nyserda.org/clearinghouse

Figure 5. Achieving New York State's '15 by 15' Goal



Source: NYSERDA.

5.1.2 Net Electricity Price Impact of Achieving the '15 by 15' Policy Goal

Achieving the '15 by 15' policy goal by full implementation of the EEPS is expected to *reduce the net retail price of electricity paid by all ratepayers* by 2015. Figure 6 and Figure 7 show the results of an analysis of the net impacts of the '15 by 15' policy on statewide average retail electricity prices in selected years. As shown in Figure 6, in 2015, the statewide average retail price of electricity is projected to be 0.4 to 0.9 cents per kWh lower, on a net basis, than if the '15 by 15' policy were not implemented. Figure 7 indicates that this estimated reduction in net price per kWh is equivalent to aggregate annual bill savings to ratepayers of $600 million to $1.4 billion in 2015.

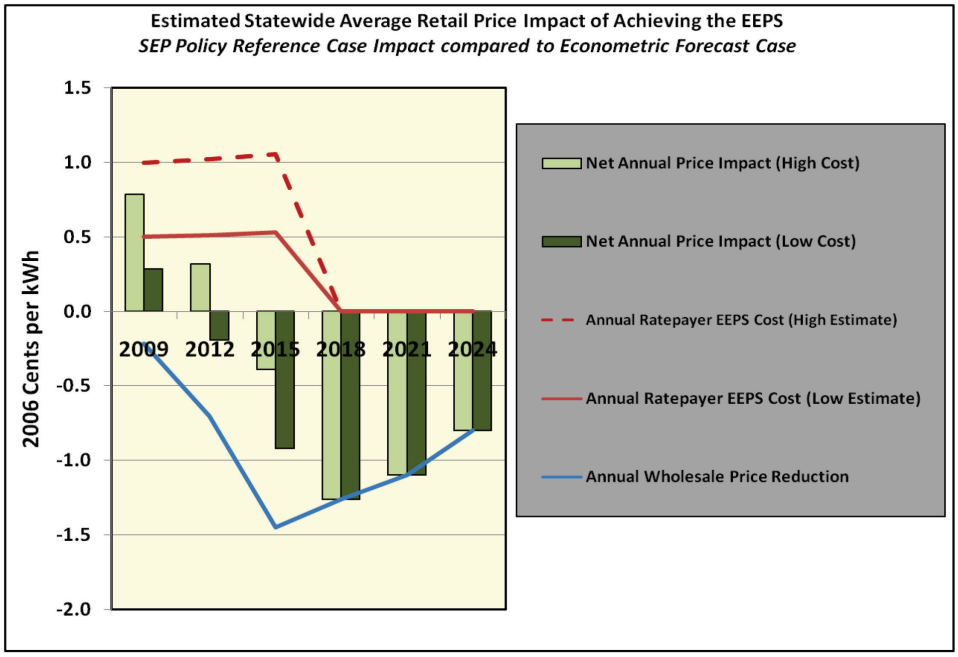
Pursuing the '15 by 15' policy goal impacts average retail electricity prices in two opposing ways. First, the average retail price is expected to *increase* because the annual cost of implementing and administering energy efficiency programs is added to customer bills. Second, the commodity portion of the electricity price is expected to *decrease* as a result of the price reduction effect of lower overall demand for electricity. Both types of price impacts affect all ratepayers, assuming that energy efficiency program costs are averaged across all customer classes and locations. This analysis does not include the additional bill savings that accrue to program participants who install energy-saving equipment and thereby benefit as a result of reduced volume of electricity purchased over time.

The price reduction (or "market price effect") impact of achieving the '15 by 15' policy goal is extracted directly from modeling results by comparing the statewide average electricity prices in the State Energy

Plan Policy Reference Case, which assumes full achievement of the '15 by 15' policy goal, to the Higher Demand Case, based on the NYISO's econometric forecast, which includes no downward adjustments for implementation of the '15 by 15' policy goal. The lower average electricity prices in the SEP Policy Reference Case are directly attributable to achievement of the '15 by 15' policy goal, due to the reduction in the need for electricity generated by the most inefficient and expensive fossil fuel-fired units, as well as by reducing imports of electricity from outside New York. As shown in Figure 8, the avoided electricity due to implementation of the '15 by 15' policy in 2015 is projected to be comprised of 59 percent oil and gas, 39 percent imports, and two percent various other sources.

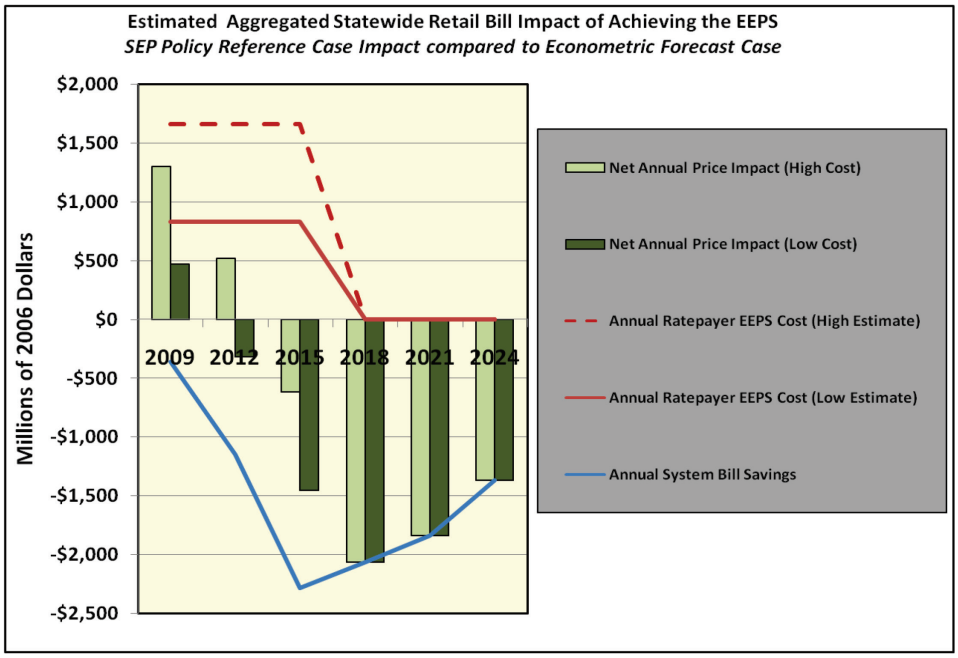
Since the annual costs to ratepayers of all the programs needed to achieve the '15 by 15' policy goal are not yet known with a high degree of certainty, "low" and "high" estimates are used to bound the analysis. The low estimate is based on a three-year historical average (2006 through 2008) of NYSERDA's energy efficiency programs funded through the SBC. The high estimate assumes that the future cost of energy efficiency programs on a cents per kWh basis is double the cost of programs implemented to-date. The expected system load reduction due to improved Codes and Standards is assumed to be achievable with no incremental cost to ratepayers.

Figure 6. Estimated Statewide Average Retail Price Impact of Achieving the EEPS



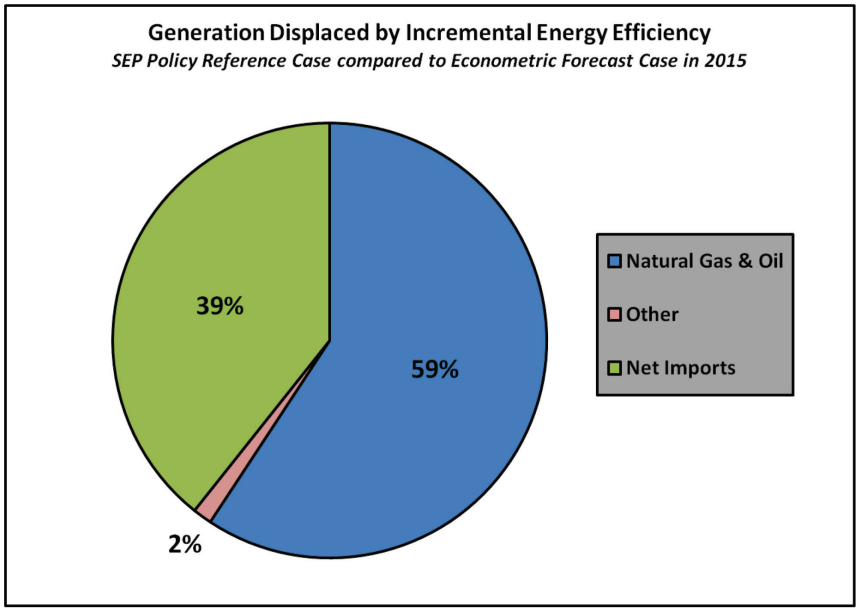
Source: NYSERDA.

Figure 7. Estimated Aggregated Statewide Retail Bill Impact of Achieving the EEPS



Source: NYSERDA.

Figure 8. Generation Displaced by Incremental Energy Efficiency

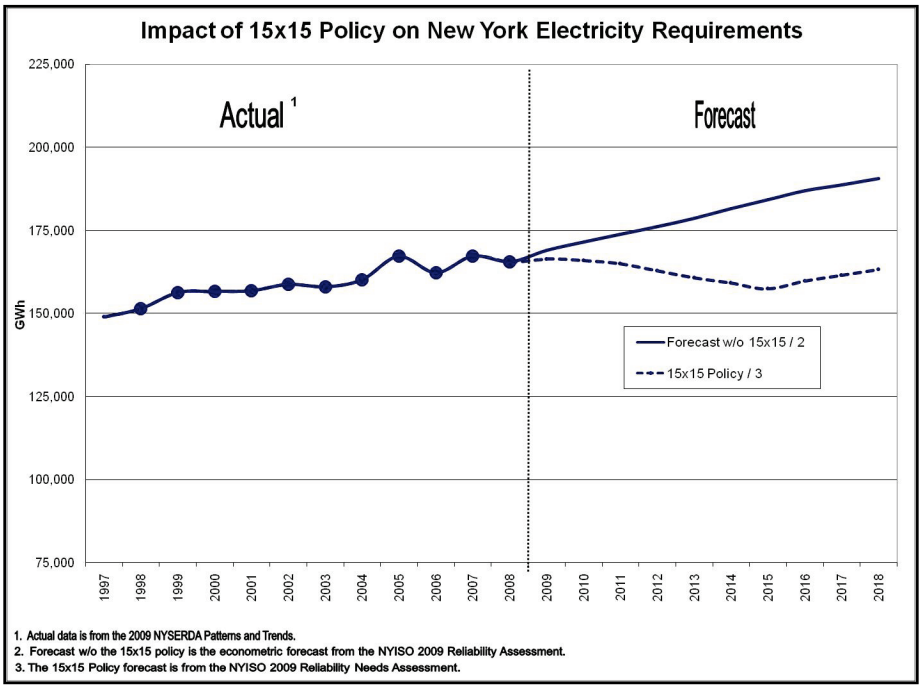


Source: NYSERDA.

5.1.3 Energy Efficiency Portfolio Standard Proceeding

The EEPS proceeding was initiated by the PSC in May 2007 as part of the overall effort to reduce New York State's electricity use by 15 percent from forecasted 2015 levels.[32] The EEPS is designed to forestall an otherwise expected rise in electricity use by establishing efficiency targets for the State's investor-owned electric utilities and NYSERDA.[33] Figure 9 shows the expected impact of the '15 by 15' policy on New York's total electricity needs, compared to forecasted total electricity needs without the policy.

Figure 9. Impact of '15 by 15' Policy on New York Electricity Requirements



Source: NYSERDA. 2009.

In June 2008, the first programs were approved.[34] Approximately $74 million per year through 2011 was approved for NYSERDA to expand and enhance a number of existing programs, including a lighting program, low-income program, and programs to encourage high-performance energy-efficient buildings, improve industrial processes and expand the number of service providers available to facilitate more informed decision-making with respect to energy efficiency, energy procurement, and project financing.

[32] PSC. *Case 07-M-0548: Proceeding on Motion of the Commission Regarding an Energy Efficiency Portfolio Standard, Order Instituting Proceeding*. Issued May 16, 2007.

[33] Implementation of EEPS programs will be the responsibility of NYSERDA, the utilities, and third party program administrators.

[34] PSC. *Case 07-M-0548: Proceeding on Motion of the Commission Regarding an Energy Efficiency Portfolio Standard, Order Establishing Energy Efficiency Portfolio Standard and Approving Programs*. Issued June 23, 2008. This approved funding is incremental to funding of $175 million annually for the pre-existing SBC Program, which is used in part to support energy efficiency programs.

An additional $74 million per year through 2011 was authorized for investor-owned utility programs that could be implemented quickly and build internal energy efficiency program administration capabilities within the companies. The electricity programs include a residential heating, ventilation and air conditioning (HVAC) program, and a small business direct install program for retrofits of various types of existing equipment with high-efficiency equipment. The approved natural gas program is a residential efficient gas equipment program focusing on such measures as furnaces, boilers and water heaters.[35]

New York has taken several steps to ensure that energy efficiency funds are well spent and that forecasts of energy savings are reliable and can be used with confidence by energy system planners, including at the NYISO and utilities. The PSC has reinforced New York's commitment to rigorous, accurate, timely and transparent program evaluation by expanding evaluation budgets from 2 to 5 percent of overall program budgets; requiring detailed evaluation and reporting guidelines; and mandating that program proposals be accompanied by detailed evaluation plans. It has also established a statewide Evaluation Advisory Group to advise the Commission on critical evaluation issues, comprised of administrators of energy efficiency programs in New York including those not under the PSC's jurisdiction, as well as nationally recognized evaluation experts. Evaluation protocols for estimating energy savings with a goal that reported values will be within 10 percent of actual results are being established. Similarly, formal standards for collecting program data are being established to ensure quality, uniformity and reliability. These efforts are essential to ensuring the reliability and transparency of the evaluation, monitoring and verification of all energy efficiency programs and program results, and should continue throughout the planning period.

Throughout the remainder of 2009, it is anticipated that the PSC will consider additional programs to be operated through 2011 as proposed by EEPS Program Administrators. The PSC will institute a comprehensive review of the programs included in its EEPS initiative in advance of the December 31, 2011 expiration of the initiative's initial phase to inform its decisions regarding funding beyond 2011.

Achieving the EEPS objectives would result in multiple benefits to customers. The June 2008 EEPS Order estimated that the total savings generated from EEPS-funded efficiency programs would yield approximately 7,639 GWh of energy efficiency savings in 2015. Program benefits for measures implemented from 2008 through 2015 are estimated to be about $12 billion and include:

- $6.5 billion – savings in avoided energy payments
- $2 billion – reductions in average market prices of energy resulting from reduced energy use, and concomitant savings on remaining energy purchases
- $3 billion – savings in avoided capacity charges as a direct result of peak load reductions
- Reduced emissions as a result of less fossil fuel burned. Staff estimates emission reductions of 6,544 tons of NO_x, 9,040 tons of SO_2, and 9,123,570 tons of CO_2 in 2015
- Increased economic development associated with the creation of approximately 37,000 sustained jobs by 2015 associated with program implementation

[35] The PSC approved "Fast Track" utility-administered electric energy efficiency programs with modifications on January 15, 2009. Utility-administered natural gas programs are being considered by PSC. NYSERDA began implementing additional electric energy efficiency programs on March 13, 2009.

The level of benefits actually achieved will depend on, among other things, the degree of program success, load growth, changes in fuel prices, changes in market rules, changes in environmental regulations, and changes in the economy.

The PSC recognized that financial incentives would be beneficial in ensuring cooperation by the regulated utilities. Consequently, in an Order issued August 22, 2008, the PSC adopted a model for incentives that: (a) establishes statewide incentive levels relative to a pre-determined estimate of overall program costs; (b) applies symmetrical positive or negative monetary adjustments based on achieved megawatt-hour reductions; c) applies to all electric utility-administered efficiency programs; and (d) preserves some flexibility in application to ensure that all objectives of a portfolio of efficiency programs are achieved.

5.1.4 Additional Electric Efficiency Efforts

In addition to the EEPS proceeding, the PSC has several other efforts underway that will further improve and reduce electricity and natural gas use by the State's energy consumers, further ensuring that the State's energy goals will be met or exceeded. Some of these efforts are discussed below.

Electric Transmission and Distribution Efficiency Proceeding

As part of the EEPS proceeding, a separate proceeding was initiated to examine ways to reduce electric transmission and distribution system losses.[36] Each electric utility identified major sources of losses on their respective systems and the specific measures and programs available to mitigate those losses. Currently under consideration are the utility-identified technically-feasible options for reducing delivery losses and the maximum potential improvement and a benefit-cost analysis for each option. The New York State Department of Public Service (DPS) will also work with the NYISO and the transmission owners to examine the potential loss reduction that could result from employing "optimal power flow" technology in dispatching the bulk electric system in New York.

Revenue Decoupling Mechanisms

In 2007, the PSC determined that properly designed utility revenue decoupling mechanisms (RDM)[37] could address potential disincentives to utilities in promoting and implementing more efficient energy use by their customers.[38] If designed correctly, RDMs remove such disincentives the utilities might have to promote energy conservation, efficiency, and behind-the-meter renewable technologies and other forms of distributed generation. As utilities file new rate proposals, proposals for implementing RDMs are required so that the utilities, DPS, and interested parties might consider utility-specific circumstances and customer bill impacts before implementation. Since April 2007, the PSC has approved RDMs for three electric utilities and five gas utilities. Two additional gas utility RDMs and two electric utility RDMs are currently under review.

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[36] PSC. *Case 08-E-0751 Proceeding on Motion of the Commission to Identify the Sources of Electric System Losses and Means of Reducing Them, Order Clarifying Scope of Proceeding*. Issued July 17, 2008.

[37] An RDM is a ratemaking approach designed to eliminate or substantially reduce the link between sales and utility revenues and profits. Existing utility rate designs have historically collected some fixed utility costs through variable charges (the amount of customer use). Consequently, absent an RDM, any reduction in electricity use by customers results in a reduction of revenues and profits for utilities. This creates disincentives for utilities to pursue programs that would assist customers in reducing the use of energy delivered to them by the utilities.

[38] In May 2003, the PSC initiated a proceeding to investigate potential electric delivery rate disincentives that discourage implementation of energy efficiency and greater use of renewable technologies and distributed generation. In 2006, the Commission established a separate proceeding expanding its inquiry to include the gas utilities.

Submetering

Many New Yorkers residing in multi-family housing, including occupants of more than 450,000 residential units, do not currently have meters for electricity service. Rather, service to these structures is provided through a single master meter. Without individual meters, residents do not directly pay for the electricity actually used, and therefore have no financial incentive to conserve energy or to adopt energy efficiency measures.

The State has undertaken several initiatives to facilitate submetering of electricity over the last decade, ranging from an incentive program for Con Edison multi-family buildings to implement submetering; simplifying procedures for cooperatives and condominiums to obtain submetering approval; to the implementation of programs to assist multi-family buildings to implement submetering, through feasibility studies, informational materials, and financial incentives. The PSC is currently reviewing the regulations governing the conversion of master-metered buildings to submetered service, to streamline regulations where appropriate, ensure that policies governing submetering reflect the impact of submetering on tenants and on incentives for landlords to invest in energy efficiency, and make sure that tenants receiving submetered electricity service are provided essential consumer protections.

Advanced Metering Infrastructure (AMI)

There is a need to identify and evaluate tools that allow customers to take advantage of additional opportunities to make intelligent energy use decisions, while helping to reduce the cost of utility service to all customers.[39] Many customers, including all of New York's largest customers (500 kW of peak demand or larger), participate in demand response programs or are subject to hourly pricing.[40] Implementation of mandatory hourly pricing for commercial and industrial customers with lower demand thresholds would lead to substantially increased energy savings. By enabling customers to receive information regarding system costs in real time and to take actions to respond to higher electricity peak prices, AMI has the potential to reduce peak demands, with an accompanying reduced need for new generators and reduced emissions of CO_2 and other pollutants. AMI is also a potential resource for improving outage detection and reporting capabilities which could prove valuable to utility restoration efforts following system disruptions. In addition, the ability to monitor customer usage would improve a utility's ability to measure the actual effects of energy efficiency measures.

In February 2009, PSC established minimum functional requirements for AMI systems in New York and began a proceeding to examine the key aspects of AMI benefit-cost analysis, with the goal of developing a generic approach to be used in New York.[41] While this work is ongoing, approaches to alternative and more economical AMI technologies for controlling utility operating costs and customers' energy costs are being investigated. These include enhanced Automated Meter Reading (AMR), which can provide some of the benefits of AMI, including that it can be used in conjunction with time-sensitive rates, can be used to develop load profiles, and enable demand forecasting and outage detection. Similarly, the PSC has directed Con Edison to continue and expand its residential and small business air conditioning direct load control program, under which participants allow the utility to take control of air conditioning loads during periods of peak demand.

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[39] For a more detailed description of the State's demand response programs, see the Electricity Assessment: Resources and Markets.

[40] PSC continues to investigate lowering the threshold for mandatory hourly pricing on a utility by utility basis.

[41] PSC. *Case 09-M-0074: In the Matter of Advanced Metering Infrastructure*. Issued February 13, 2009.

5.2 Natural Gas Efficiency

In May 2009, the PSC established targets and standards for natural gas efficiency programs as part of the EEPS proceeding in order to establish a comprehensive approach to gas efficiency, including a transition from the interim and "fast track" programs.[42] Combined with reductions anticipated from other sources, the natural gas reduction targets will result in a nearly 15 percent reduction in estimated gas use by 2020, independent of any fluctuations in use caused by fuel switching or other economic factors. This represents an average annual reduction of gas usage of 3.8 billion cubic feet by 2020, enough gas to heat about 39,000 average-sized homes. This goal is expected to be achieved as a result of changes to codes and standards, a continuation and expansion of programs administered by State authorities and DHCR, as well as through programs authorized by PSC-approved funding totaling $130 million annually.

Natural gas efficiency programs previously approved on an individual basis outside of the scope of the EEPS proceeding vary in design and duration and are expected to result in natural gas savings of approximately 2,400,000 MMBtu in 2009 with annual funding of approximately $62.7 million.[43]

Earlier in the EEPS proceeding, natural gas utilities established energy efficiency programs that provide rebates to consumers for purchasing high-efficiency equipment such as furnaces, water heaters, clothes washers, solar hot water technology, and hot water conservation measures. The programs also provide marketing training for contractors and sponsor discounted sales of low-flow showerheads, faucet aerators, and tank wraps.[44] Also, in April 2009, EEPS programs for residential gas efficiency equipment programs, designed to promote the installation of efficient, cost effective, furnaces, boilers and other equipment were approved. These programs are funded at approximately $10.6 million per year through 2011, and are designed to reduce annual natural gas consumption by approximately 587,000 MMBtu per year.[45]

5.3 Oil Heat Efficiency

NYSERDA is designing a set of new programs under RGGI to increase the energy efficiency of homes and businesses that use fuel oil for space and water heating. The new activities will build on NYSERDA's existing programs funded by the System Benefits Charge. The RGGI programs are designed to ensure that the portfolio of State-based efficiency programs are available for all economic sectors and to capture additional efficiencies and energy bill savings opportunities that are not available with current funding sources.

The Commercial and Industrial Efficiency program will provide technical support and implementation assistance to existing facilities and new construction, including commercial, industrial, transportation, agricultural, and municipal and institutional facilities such as schools and hospitals. The Residential Space and Water Heating Efficiency program will target fossil-fuel-based measures not eligible for System Benefits Charge initiatives. Nearly half of the residential program funds will be used to support

[42] PSC. *Case 07-M-0548 Proceeding on Motion of the Commission Regarding an Energy Efficiency Portfolio Standard, Order Establishing Targets and Standards for Natural Gas Efficiency Programs*. Issued May 19, 2009.

[43] PSC. *Case 07-M-0548 Proceeding on Motion of the Commission Regarding an Energy Efficiency Portfolio Standard, Report on Natural Gas Efficiency Goals, Working Group IV*. Issued October 17, 2008.

[44] PSC. *Case 08-E-1003 Petition of Orange and Rockland Utilities, Inc. for Approval of an Energy Efficiency Portfolio Standard (EEPS) "Fast Track" Utility-Administered Electric Energy Efficiency Programs with Modifications, et al*. Issued January 16, 2009.

[45] PSC. *Case 08-G-1016 Petition of KeySpan Energy of New York for Approval of an Energy Efficiency Portfolio Standard (EEPS) "Fast Track" Utility-Administered Gas Energy Efficiency Program with Modifications, et al.* Issued April 9, 2009.

energy efficiency improvements in low-income homes and multi-family housing, and will address environmental justice concerns.

6 Energy Conservation Construction Code and Appliance Standards

When new construction or renovations are undertaken, or when major equipment and appliances are installed, the decisions regarding construction practices and the types of equipment and appliances to install can have a large impact on New York's ability to achieve its energy efficiency goals. Strengthening building codes and appliance and equipment efficiency standards can result in substantial long-term reductions in energy use. When more energy-efficient choices are not made, the "lost opportunities" result in higher-than-necessary energy use for years, or even decades.

Building codes and equipment and appliance standards set minimum efficiency and performance levels, effectively setting a floor or baseline. Over time, with education, enforcement, and technology advances, the stringency of these codes and standards can be increased. Full compliance with energy codes and standards would produce significant annual and cumulative energy savings for New Yorkers beyond what would otherwise occur. Construction activity in New York remains significant. During the past eight years, nearly 58,000 non-residential new construction and rehabilitation projects, representing 576 million square feet of building area and $112.5 billion in construction value, have been completed. Over the same period, more than 150,000 single family homes have been built in New York and each year thousands of heating, cooling, and lighting equipment units have been installed.[46] As provided in Table 7, a recent study by Optimal Energy, Inc. estimated the potential for substantial energy savings that could be achieved through an enhancement of New York's building codes and appliance standards.[47]

Additional benefits include improved building stock, lower demands on New York's electricity infrastructure, which reduces the need for new generation and transmission facilities, and reduces emissions of greenhouse gases and other harmful pollutants. Improvements in codes and standards have the potential to produce major savings for all fuel types used in New York, including natural gas, propane and home heating oil. Implementation of enhanced building codes and standards can be achieved at relatively low cost with large resulting benefits in terms of energy and cost savings to consumers.

[46] NYSERDA. *A Strategy for Enhanced Energy Codes and Appliance Standards in New York.* 2008. http://www.dps.state.ny.us/NYSERDA_Codes_and_Standards_Strategy_15_October_2008_FINAL.pdf

[47] Optimal Energy, Inc. *Achievable Electric Energy Efficiency Potential in New York State.* 2008.

Table 7. Estimated Codes and Standards Savings in 2015

Type of Energy Savings	Codes Savings in 2015	Standards Savings in 2015	Total Savings in 2015
Electricity Savings (GWh)	2,158	7,202	9,360
Peak Demand Savings (MW)	469	1,572	2,041
Other Heating Fuels (Billion Btu)	4,960	1,792	6,752

Source: Optimal Energy, Inc. *Achievable Electric Energy Efficiency Potential in New York State.* 2008.

6.1 Building Energy Codes

The State Energy Conservation Construction Code, or the "Energy Code," establishes energy efficiency standards for buildings in New York State. The Energy Code is a statewide regulation adopted by the State Fire Prevention and Building Code Council (the Code Council) pursuant to Article 11 of the New York Energy Law.[48] The Energy Code addresses the design of energy efficient building envelopes and the installation of energy efficient mechanical, lighting, and power systems. Under current law, the Energy Code is applicable to all newly constructed buildings and to existing buildings that undergo "substantial renovations."[49]

Article 11 of the New York State Energy Law authorizes the Code Council to amend the Energy Code from time to time. In recent years, the Code Council has completely updated the Energy Code once every three years. The current version of New York's Energy Code was adopted in 2007 and became effective on January 1, 2008. The provisions of the current Energy Code applicable to residential buildings are based on the 2004 edition of the International Energy Conservation Code (IECC), and the provisions of the current Energy Code applicable to commercial buildings are based on the 2003 edition of the IECC.

Under the provisions of the recently enacted ARRA, New York will qualify for a significant additional federal energy grant, provided that the State is able to certify to the DOE that the Governor has received necessary assurances that certain energy-related initiatives will occur.[50] With respect to the Energy Code, the State must certify to DOE that the Governor has received necessary assurances that the State will implement: (1) a building energy code for residential buildings that equals or exceeds the 2009 edition of the IECC or achieves equivalent or greater energy savings, (2) a building energy code for commercial buildings throughout the State that equals or exceeds the 2007 edition of American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 90.1 or achieves equivalent or greater energy savings, and (3) a plan for achieving compliance with those codes in not less than 90 percent of

[48] The Code Council is a council within the Department of State established under Article 18 of the Executive Law. In addition to its powers and duties with respect to the Energy Code, the Code Council is responsible for the adoption of the State Uniform Fire Prevention and Building Code (the Uniform Code).

[49] Article 11 of the New York Energy Law currently defines "substantial renovation" as "the alteration of any existing building in which more than fifty percent of any building subsystem is replaced." The term "subsystem" is currently defined as "a building assembly made up of various components which serve a specific function, including but not limited to exterior walls, roof and ceiling, floors, lighting, piping, ductwork, and equipment . . ." See Executive Law § 11-102, subdivisions (8) and (9).

[50] The application filed by NYSERDA with DOE requests a grant in the amount of $123,110,000.

new and renovated building space by the end of 2016. The plan must include active training and enforcement programs and provisions for measurement of the rate of compliance each year.

The DOS Codes Division has concluded its work on the Codes of New York State, including the Required Regulatory Impact Statements. DOS expects that the earliest the revised codes can enacted, considering all necessary notification and comment requirements, is in the early Fall of 2010.

6.1.1 Energy Code Compliance

In general, the Energy Code is enforced locally. Enforcement authority is given to the municipal level by Executive Law of New York State, Article 18, The Uniform Fire Prevention and Building Code Act, which gives specifics for localities for enforcement of the Codes of New York State. The Building Code Act outlines procedures for: frequency of inspections, number and qualifications of staff, required minimum fees for administration and enforcement, adequacy of inspections, establishment of a procedure whereby any provision or requirement of the uniform code may be varied or modified, and procedures for inspection of certain classes of buildings based upon design, construction, and/or ownership.

Statewide data on the extent of Energy Code compliance are not currently available, thereby precluding identification of impediments to Energy Code compliance. Further, ARRA requires states wishing to receive additional Federal energy grants to establish plans for achieving compliance in at least 90 percent on new and renovated building space.

In order to better gauge the scope of necessary improvements, a municipal baseline compliance level should be completed annually commencing in 2010. Also, to help measure code compliance, DOS recently adopted an amendment to its regulations requiring local entities that administer and enforce the Building and Energy Codes to file annual reports detailing code enforcement activities. The amendment also provides guidance for use during inspections to ensure that energy requirements are met.

To address remaining concerns, the State should conduct periodic assessments of compliance with the Energy Code and attempt to identify barriers to full compliance. This effort should be coordinated with existing and proposed energy efficiency evaluation plans to maximize the effective use of resources. This effort should also reflect any requirements imposed or to be imposed by ARRA, or by any Federal regulations promulgated pursuant to ARRA, with regard to the methods to be used to measure Energy Code compliance.

6.1.2 Energy Code Training

Although the Energy Code is adopted at the State level, it is enforced at the local level. In most situations, the local government (city, town or village) responsible for enforcing the State Uniform Fire Prevention and Building Code (the Uniform Code) is also responsible for enforcing the Energy Code.[51]

Code enforcement personnel responsible for enforcing the Uniform Code are required to take a 114 hour basic training course prior to, or within one year following, commencement of employment, and to take 24 hours of annual in-service training each year thereafter. However, only a small portion of the currently required training courses relate to the Energy Code. A plan to achieve compliance with the Energy Code in at least 90 percent of new and renovated building space within eight years, as required by ARRA,

[51] There are approximately 1,607 cities, towns and villages in New York State.

should include a significant increase in the amount of Energy Code-related instruction that code enforcement personnel will be required to receive.

The ability of the State to achieve the 90 percent compliance rate contemplated by ARRA will be greatly enhanced if all players in the building and building-related industries receive training in the new Energy Code. Ideally, State-provided instruction would be made available not only to code enforcement personnel, but also to design professionals, builders, and others in the building and building-related industries.

The Department of State, in partnership with NYSERDA, plans to offer Energy Code instruction by presenting live, in-person courses across the State and by making on-line courses available through the Department's website. The courses will provide detailed technical training on five topic areas related to the Energy Code: Building Science, Commercial Building Envelope, Commercial Electrical and Lighting Systems, Commercial Mechanical and HVAC Systems, and Residential Energy Code requirements and techniques. In addition, the Department of State plans to continue to offer a computer lab course designed to provide hands-on training in the use of an Energy Code compliance software tool that allows building designers to confirm that buildings that they design comply with the Energy Code.

The increased training efforts that will be required to achieve the 90 percent compliance goal established by ARRA will require significant funding. It is anticipated that a portion of the State Energy Plan (SEP) funds available to the State through ARRA and/or a portion of the Energy Efficiency and Conservation Block Grant (EECBG) funds available to the State will be used to fund the increased Energy Code training programs, to provide code books for local governments, and otherwise to support enforcement of the Energy Code.

6.1.3 The Fifty Percent Rule

New York's Energy Code applies to a building renovation only if the renovation is "substantial," i.e., it involves replacement of more than 50 percent of any building subsystem. This "fifty percent rule" currently provides owners of existing buildings opportunities to avoid application of the Energy Code by breaking building renovations into separate projects with no single project involving the replacement of more than 50 percent of any building subsystem. In turn, this reduces the State's opportunity to use the Energy Code to achieve improved energy efficiency in existing buildings. While the Energy Code applies to all new construction, the number of new buildings constructed annually is typically dwarfed by the number of existing buildings being renovated, particularly in urban areas, such as New York City. Therefore, the "fifty percent rule" significantly limits the State's ability to use the Energy Code to achieve an overall improvement the energy efficiency of buildings.

6.1.4 Ten Year Payback

The current Energy Code prohibits amendments unless material and installation costs required to meet proposed new standards are equal to or less than the present value of the expected energy savings over a 10-year period. The current regulatory process requires searching for studies that demonstrate that the proposed amendment satisfies the 10-year payback requirement or, if no such study exists, undertaking such a study and paying the associated costs. The consequence is that the 10-year payback requirement hinders the adoption of new energy conservation measures in a timely manner. Legislative changes to revise these provisions of the Energy Code, to apply to a greater proportion of renovations and to eliminate the 10-year payback study provision, are likely to lead to substantially increased energy savings.

6.2 Appliance and Equipment Standards

Appliance and equipment standards, whether applicable to the point-of-sale at the State level or the point-of-manufacture at the national level, can result in large, highly cost-effective energy and demand savings for New York. For example, the American Council for Energy Efficient Economy (ACEEE) estimates that standards enacted prior to 2007 will save about five quadrillion Btu of energy by 2020 nationally, or about four percent of projected energy use in 2020. Annual electricity demand savings will reach 144,000 MW by 2020 nationally, or the equivalent of 480 300-MW power plants.[52]

Joining with other states, New York can have an impact on federal requirements and how they are implemented by participating actively in federal rulemakings and activities to urge adoption of standards which are in the best interests of the State. Historically, State standards have been effective for framing national policy discussion, leading to strong national standards. When a national standard is established, states are preempted from enforcing state-level standards for the same product unless the federal government grants a waiver. Currently, New York does not have any waivers from national standards.

Congress first established national appliance and equipment efficiency standards in 1987 and has enacted further changes over time. In 2006, the U.S. Department of Energy (DOE) released a five-year plan and schedule for its setting of new appliance efficiency standards. Now in the third year of the five-year plan, DOE is moving forward to address its appliance standards rulemaking backlog and meet all of the statutory requirements established in the Energy Policy and Conservation Act (EPCA) and the Energy Policy Act of 2005 (EPACT05). The Energy Independence and Security Act of 2007 (EISA) further updates EPACT05 and sets new federal appliance efficiency standards and prescribes or revises energy efficiency standards for a wide variety of products. Standards will be developed for 13 covered equipment products over the next six years. The EISA requires approximately 25 percent greater efficiency for light bulbs, phased in from 2012 through 2014 (which effectively ban the sale of many current incandescent light bulbs) and approximately 200 percent greater efficiency for light bulbs by 2020.

In 2005, New York amended its Energy Law[53] to authorize the development of appliance and equipment energy efficiency standards for 14 products not regulated by federal law. Subsequently, Congress established federal standards for 13 of the 14 products, preempting State standards in these areas. New York is in the process of establishing standards through the regulatory process for the one remaining product area specified in the 2005 law, consumer audio and video products. DOS is working with NYSERDA to establish standards for these products. Several products not addressed in the 2005 New York amendments and not covered by the federal standards,[54] have energy savings potential in New York.

[52] Appliance Standards Awareness Project. *Appliance Efficiency Standards in the 2007 Energy Bill: Key Facts*. 2007. http://www.standardsasap.org/documents/2007EnergyBill_Standardsfactsheet.pdf

[53] Energy Law, Amendment 16. *Appliance and Energy Efficiency Standards*.

[54] These include bottle-type water dispensers, commercial hot food holding cabinets, circulating portable electric spas and hot tubs, residential furnaces, and main-air circulating fans. Fans account for 92 percent of the overall savings for these products.

7 Complementary Local and Federal Efficiency Initiatives

New York's energy efficiency initiatives are complemented by activities at the local and federal levels that range from enhanced energy efficiency activities, appliance and equipment labeling programs and tax credits. Certain of these activities are described below.

7.1 Local Governments

7.1.1 PlaNYC

In April 2007, New York City Mayor Bloomberg issued PlaNYC, which among other things focused on reducing energy consumption in New York City facilities.[55] Since then, steps have been implemented to achieve its goals, such as Executive Order 109, signed in October 2007 that committed the City to spend 10 percent of its annual energy budget on energy efficiency programs. New York City has a target of reducing the City government's greenhouse gas emissions and associated energy consumption by 30 percent by 2017. The City issued a long term plan to achieve the 2017 target and launched 132 City government energy efficiency projects in Fiscal Year 2008, and has been actively engaged in making its codes and standards more energy-efficient through the "Greening the Codes" process, led by the U.S. Green Building Council. The "Greening the Codes" process brings together technical experts to identify barriers and suggest additions to the building, construction and fire codes to increase building efficiency and encourage the use of distributed generation.

7.1.2 Local Benchmarking Legislation

Local laws have also been proposed, including one requiring benchmarking of energy use, and others that address energy audits, retro-commissioning and retrofitting of building systems. The "benchmarking program" would apply to all city-owned buildings and all buildings (larger than 10,000 square feet) for which New York City pays annual energy bills, and for most privately owned buildings larger than 50,000 square feet. Benchmarking entails the public issuance of a building's energy consumption, indexed against buildings of comparable size and use. Underlying indexing software and building data has been developed by the U.S. Environmental Protection Agency (EPA), but would be modified to more accurately reflect the types of buildings found in New York City. Owners would be responsible for complying with the benchmarking requirement.

The energy audit, retro-commissioning and retrofitting proposal, would generally require owners of any building exceeding 50,000 gross square feet, or multiple buildings on the same tax lot that together exceed 50,000 gross square feet, to have an energy professional prepare an audit report identifying all

[55] New York City. *A Greener, Greater New York (PlaNYC)*. 2007. http://www.nyc.gov/html/planyc2030/html/home/home.shtml

reasonable retro-commissioning[56] and retrofit[57] measures having a payback[58] of not more than seven years. Initially, due dates for covered buildings would be assigned on a staggered basis over an initial 10-year period. Subsequent audits would be performed every 10 years. The owner would be required to implement all identified measures prior to filing the audit report.

7.1.3 Local Energy Conservation Construction Codes

Article 11 of the Energy Law allows municipalities to adopt and enforce a local energy conservation construction code more stringent than the Energy Code. Such programs are referred to as "Stretch Codes," or "beyond code" programs. Currently, a program is in development with NYSERDA for a stretch code for existing homes. For new residential construction, the International Code Council's (ICC's) ICC-700-2008 is in strong consideration due to its seamless fit with the ICC based uniform codes. Alternatively, ENERGY STAR programs are acceptable as a "Stretch program" because they possess a proven track record. ENERGY STAR has been in use in New York State for approximately 15 years. Note that ENERGY STAR is not a code; it is a performance standard that raises the energy efficiency level of a structure beyond code levels. The Energy Code must still be used to show compliance, since ENERGY STAR does not contain all provisions of the Energy Code, which is required by Article 11.

On Long Island, the Town of Babylon has been at the forefront of innovative energy efficiency programs. In late 2008, the Town unveiled a new program, the "Long Island Green Homes Program," which provides financing to homeowners for energy efficiency improvements. Prior to this program, Babylon became the first town on Long Island to adopt ENERGY STAR standards for new homes, and subsequently established a requirement that all new commercial and industrial buildings over 4,000 sq. ft. meet the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) certification standards. Eight other Long Island towns have followed suit by adopting ENERGY STAR standards as a mandated minimum for residential construction.[59]

[56] Retro-commissioning refers to non-capital work such as repairs and maintenance that optimize a building's energy performance.

[57] Retrofitting refers to capital additions such as the installation of new equipment or insulation that reduce energy consumption.

[58] The payback period is defined as the investment for the measure divided by the projected annual energy cost savings.

[59] Of New York State towns reporting, the towns of Greenburg, Hempstead, Babylon, Yorktown, Southampton, Brookhaven, Riverhead, Smithtown, and Clarkstown have adopted ENERGY STAR as a mandated minimum for residential construction.

7.2 Federal ENERGY STAR

ENERGY STAR is a voluntary labeling and recognition program sponsored by EPA and DOE and intended to accelerate the adoption of clean and efficient domestic energy technologies. In New York, NYSERDA and other energy efficiency program administrators promote ENERGY STAR qualifying products and services in their various initiatives. Meeting or exceeding the ENERGY STAR efficiency requirements is typically the requirement for customers to receive financial incentives or other benefits from participation in energy efficiency programs. The ENERGY STAR program provides an opportunity to combine financial resources at the State and federal level to increase energy consumers' awareness regarding the availability specific energy efficiency products and services.

7.3 Federal Tax Incentives

The Emergency Economic Stabilization Act of 2008 (EESA) extends tax credits related to energy efficiency measures for both consumers and builders of residential or commercial buildings. Pursuant to EESA, consumers are eligible to receive tax credits for energy-efficient home improvements, such as window, door and roof insulation, and HVAC or non-solar water heater replacements, made during 2009. Home builders are eligible for a $2,000 tax credit per new home that achieves 50 percent energy savings for heating and cooling over the 2004 International Energy Conservation Code (IECC).[60] In addition, EESA provides a $1,000 tax credit to home builders for each manufactured home that achieves 30 percent energy savings for heating and cooling over the 2004 IECC[61] and supplements or meets the Environmental Protection Agency's requirements under the ENERGY STAR program. EESA also provides owners or designers of new or existing commercial buildings, under certain conditions, with the opportunity to receive a tax deduction for buildings that save at least 50 percent of the heating and cooling energy of a building. A partial tax deduction is available for building efficiency measures for improvements to building envelope, lighting, or heating and cooling systems.

In addition, ARRA included federal tax credits for energy efficiency.[62] Consumer tax credits that are available at 30 percent of the cost, up to $1,500, in 2009 and 2010 for existing homes include windows and doors, insulation, metal and asphalt roofs, HVAC, non-solar water heaters, and biomass stoves. Additional tax credits are available at 30 percent of the cost, with no upper limit through 2016, for existing homes and new construction; include geothermal heat pumps, solar panels, solar water heaters, small wind energy systems, and fuel cells.

[60] One-fifth of the efficiency savings must stem from building envelope improvements.

[61] One-third of the savings must come from building envelope improvements.

[62] ENERGY STAR. *Federal Tax Credits for Energy Efficiency*. 2009. http://energystar.gov/taxcredits