New York Department of Public Service

Staff Preliminary Proposal

For Energy Efficiency Program

Design and Delivery

August 28, 2007

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Energy Efficiency Portfolio Standards

Staff Proposal

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I. Executive Summary

By an order issued on May 16, 2007, the New York Public Service Commission (the Commission) instituted Case 07-M-0548 - Proceeding on Motion of the Commission Regarding an Energy Efficiency Portfolio Standard (EPS). [1] The May 16 EPS Order used a target goal for electricity usage that echoed an April 19, 2007 statement from New York's Governor Eliot Spitzer in which he called for a 15% reduction in usage in 2015 compared to the projected level for that year.

This is the most ambitious energy reduction goal, in terms of total energy savings, of any program in the nation. The EPS Proceeding, as set forth by the Commission, calls for a similarly ambitious energy reduction target for natural gas as well. Achieving success in meeting the EPS goals will require the deployment of energy efficiency resources at a much faster rate than the State's energy usage is growing. The New York Independent System Operator (NYISO) predicts increases in electric sales of approximately 1.3% per year through 2015. Therefore, the 2015 electricity target reflects electricity consumption lower than today's levels. Recently, natural gas usage has been increasing at an annual rate of about 2.2%.

The May 16 EPS Order explained that the benefits of energy efficiency include: reducing the need for new generation; reducing use of finite fossil fuels; lowering the energy cost component of utility bills; reducing energy imports; and mitigating the environmental impacts of burning and transporting fossil fuel for energy, including greenhouse gas emissions. In addition, more efficient use of energy has potential to foster economic development through productivity improvements and job growth by encouraging technology advances related to the delivery of

[1] Case 07-M-0548, Proceeding on Motion of the Commission Regarding an Energy Efficiency Portfolio Standard, Order Instituting Proceeding (issued May 16, 2007) (May 16 EPS Order)

energy efficiency services and products to consumers. Increased spending on programs such as weatherization could spur job growth, which will have a salutary effect on the State's economy.

The EPS Proceeding is one of several interrelated Commission proceedings and initiatives now underway which consider resource, pricing, and environmental issues. These proceedings and initiatives involve renewable portfolio standards efforts, advanced metering initiatives, long term contracts and planning, revenue decoupling mechanisms, mandatory hourly pricing, the Regional Greenhouse Gas Initiative (RGGI), the High Electric Demand Days initiative, and distributed generation (DG). Moreover, several recently-filed rate cases include proposals for energy efficiency programs.

Clearly, the EPS Proceeding will be a complex undertaking and will require thoughtful planning, communication, and extensive coordination among the many entities that are or will be delivering energy efficiency programs and among inter-related proceedings. Section I addresses these facts and circumstances and explains why the most reasonable framework for pursuing the EPS goals is one in which the Commission acts as the coordinator for the planning, implementation, and evaluation of programs that will be administered within the EPS framework. There are a number of reasons why the Commission is especially well suited to play the role of coordinator. First, many of the existing energy efficiency programs are being funded by utility ratepayers via the electric System Benefits Charge (SBC), which is under the jurisdiction of the Commission. Furthermore, there are a number of other important related cases (listed above) which address complementary policy matters that also fall under the Commission's jurisdiction. Finally, the Commission's continued oversight of energy efficiency program administration will ensure consistency and focus, will help to avoid duplication of effort, and will allow for necessary modifications based on program experience.

Section II of this report presents general principles applicable to both natural gas and electricity programs and for all customer classes. The principles reflect the knowledge and experience gained from energy efficiency programs and providers in New York State and nationwide.

In Section III of this document, Staff describes current program delivery practices as well as descriptions of potential changes for the future. Currently, many entities are involved in the provision of energy efficiency services in New York State.[2] Developing a framework for energy efficiency programs going forward should start by building upon the most effective elements of the existing system for delivering these programs, and should emphasize coordination and communication among parties. The goal is to achieve the Commission's energy efficiency targets without duplicating efforts, causing customer confusion, or abandoning successful programs. Likewise, the ultimate delivery framework should take advantage of opportunities that can benefit the most from increased attention and funding. If additional funding is made available for energy efficiency efforts, as is expected, will be necessary, then it may be possible to design completely new program approaches that were not feasible in the past.

Funding of expanded energy efficiency efforts could come from, among other sources, increasing the SBC, introducing a volumetric surcharge on firm gas and/or electricity consumption, increasing private sector interest in providing funding for energy efficiency projects, and increasing funding for tax-supported programs, such as green building credits. The need for additional funding sources could be significantly mitigated through an accelerated effort to increase the energy efficiency levels embodied in building codes and the energy efficiency

[2] An excellent resource for obtaining information about current energy efficiency programs in New York State is the report "Conservation Coordination Task Force Report to the Governor and Legislature", dated January 30, 2007.
The report can be obtained at the following internet link:
http://www.nyserda.org/publications/CCTFREPORT-complete.pdf

standards for various appliances and equipment. Increased activity from the private sector to encourage use of energy efficient products and services could also reduce the need for public support as the means to achieve EPS targets. The greater use of existing financing mechanisms as well as the creation of new financing mechanisms needs to be fully explored to lessen the need for increased surcharges on energy consumption. We encourage parties, in their responses to Staff's proposal, to comment on these suggestions to offer additional funding approaches.

Section IV of this report identifies new programs and enhancements to existing energy efficiency programs, by customer class and fuel type, which can be implemented on a fast track in early 2008 to accelerate the deployment of energy efficiency resources. As a result, New York State will be able to enjoy the benefits of expanded program offerings, relying on program implementation approaches with proven track records for delivering energy efficiency savings effectively, during 2008. Quickly implementing these proven programs as an interim step provides a window of time to establish a more robust and ongoing multi-year energy efficiency portfolio planning process. Such a process will allow time to benefit from the best thinking of interested parties to develop a more strategic and comprehensive energy efficiency portfolio management approach, which would define initiatives expected to be implemented in 2009 and beyond. Staff's preliminary analysis indicates that a combination of enhanced energy efficiency programs and significantly upgraded building codes and appliance efficiency standards could achieve approximately 77% of the EPS electric goal by 2012 at annual costs ranging from $100 million to approximately $350 million. The fast track programs proposed by Staff were analyzed for cost effectiveness using the Total Resource Cost Test. Implementation roles are proposed for various entities for each of the fast track programs.

When coupled with efforts by LIPA, NYPA, and other energy efficiency providers, and combined with other energy efficiency initiatives (programs that will need longer development times and initiatives that are not direct end use programs) the EPS goals can be achieved by 2015.

Section V of this report addresses evaluation and monitoring. For an effort as large as the EPS Proceeding to succeed, there is a need for rigor and uniformity in program evaluation to ensure that energy efficiency improvements are fully realized. It is also essential that costs and benefits are compared in a reasonable and accurate manner. This section identifies the need for clear directions, presented in an easy to use format, for those performing evaluation and monitoring work.

Section VI of the report explains Staff's best thinking for establishing a natural gas energy efficiency goal to be reached by 2015. Unlike electric energy efficiency, where a goal of a 15% reduction compared to the 2015 forecast has already been established, a natural gas energy efficiency goal still needs to be developed. The downstate region has been experiencing a steady increase in natural gas load growth, while the upstate region consumption has remained flat. Several utilities already have gas efficiency programs in place, and NYSERDA electric programs have indirectly resulted in some natural gas savings.

A recent gas efficiency study conducted for NYSERDA by Optimal Energy, Inc. concluded that the maximum achievable savings through the year 2016 is 18%, with most of this savings coming from the industrial market sector. While end-user consumption has been decreasing, there could be a trend toward increased consumption due to increased reliance upon gas for electric generation, switching from electric to gas appliances for efficiency purposes, and increased gas-fired distributed generation and conversion from petroleum fuels. Increased

natural gas usage associated with electric generation, distributed generation, and conversions from petroleum fuels should be excluded from calculations of energy savings. For the remaining firm residential, commercial, and industrial sectors, Staff's preliminary analysis indicates potential savings in the range of 13 to 17% may be possible. This consists of savings from existing natural gas efficiency programs conducted by NYSERDA and LDCs, proposed new efficiency programs at LDCs, an expected increase in SBC spending, and updates to codes and appliance standards. Staff's preliminary analysis indicates potential savings of six to ten percent by 2015 from new and existing gas efficiency programs (see Section VI of this report) with expenditure levels of $80 million per year statewide. These programs could be funded by a bill surcharge similar to the SBC, which could be collected by local distribution companies (LDCs) and split between NYSERDA programs and LDC-administered programs. The final version of this Staff report, scheduled to be issued in October 2007, will provide additional precision to Staff's analysis.

Finally, based on Staff's discussions with groups that are involved in energy efficiency programs, it is readily apparent that many interesting ideas do not fit into traditional end use program models or would require planning and refinement to achieve. Many of these ideas have the potential for large, long-term energy savings and deserve careful consideration. Attachments 1 and 2 capture these concepts, dividing them into short term and long term efforts. These cover a wide range of ideas, some of which are contradictory, but all of which could be used by working groups as a starting point for further discussions. Attachment 3 summarizes Staff's preliminary cost benefit analysis for the proposed fast track programs.

II. General Principles

This section of the Staff Proposal describes initial observations that apply to energy efficiency programs for all customer classes as well as to both electricity and natural gas. These general principles consolidate program delivery and design concepts that Staff has gathered through its experience with programs in New York, review of programs in other states, and input from parties in this proceeding. These principles are intended to provide a foundation for development and implementation of this proceeding's short and long-term initiatives for achieving energy usage reduction targets.

1. All New Yorkers benefit when cost-effective energy efficiency improvements are implemented.

Customers who participate in energy efficiency programs will see reduced energy bills and may also enjoy improvements in productivity, health, safety, and comfort. As energy efficiency improvements are undertaken by individuals, all New Yorkers benefit due to a reduced need for energy supply, and delivery facilities and resources. The increased productivity has economic development benefits as a result of making individual customers and the state as a whole more competitive. Greater deployment of energy efficiency has the potential to produce lower and more stable energy costs for all consumers. Other important public benefits are reduced depletion of energy resources and lower emissions of greenhouse gases and other pollutants associated with electricity generation and burning of natural gas, including NOX, SOX, and carbon dioxide. Energy efficiency programs also can advance environmental justice by serving low-income New Yorkers not able to afford cost-effective, bill-reducing improvements to their homes and residences.

2. Where possible, the marketplace should be providing services without the need for ratepayer support.

The potential for increased use of existing and innovative financing mechanisms needs to be fully explored and exploited to further reduce the level of ratepayer financial support required. Furthermore, barriers to effective operation of the free market for energy efficient solutions should be identified and eliminated. Enhanced energy standards for buildings and appliances can also play a large role in helping to achieve the EPS targets without a significant need for ratepayer support. End use programs should be employed in those instances where market-based solutions are not likely to produce a better outcome.

3. Market transformation strategies are a powerful method for improving the effectiveness, availability, and costs of energy efficiency equipment, technologies, and services.

Market transformation efforts involve working with the supply markets for energy efficiency goods and services, with potential incentives for manufacturers, retailers, service providers, and others, to influence the rate at which improved energy efficiency options become commercially available to customers. For example, refrigerators, in general, are much more energy efficient than those of twenty years ago as a result of programs that encourage manufacturers and retailers to improve the energy efficiency of the models sold to customers. In general, market transformation is less costly and more effective in the long run than using financial incentives to achieve efficiency improvements. Market transformation programs can be most effective if the programs are consistent statewide, regionally, and nationally. Coordination of programs with other states should be encouraged.

Examples of market transformation outcomes that should be encouraged include:

- *Continuous improvements in the effectiveness of and falling costs for energy efficient equipment, materials, and services*
- *Increased stocking and promotion of energy efficient equipment and materials by retailers and the availability of point of purchase information to allow customers to evaluate choices*
- *Increased awareness by consumers of the amount and types of energy they use, their costs, and how to shop for energy efficiency measures and services*
- *Development of a robust energy services delivery infrastructure that can be relied on to provide high quality installations and is responsive to the needs of customers*
- *Job growth in energy efficiency-related trades and professions*

4. Getting energy price signals better aligned with the costs of providing services is a critical part of effectively developing energy efficiency as a resource.

Advanced metering and commensurate implementation of more cost-causal, time-differentiated delivery and energy service rates and rate structures should be encouraged. End-use retail rates and rate structures should more accurately reflect the manner in which various costs (i.e,. supply, transmission, and distribution) are incurred by utilities in responding to customer demands for service, and, conversely, should more accurately reflect the costs avoided by utilities when customers exercise strategic discretion in the timing and volume of their use of services. Implementation of more sophisticated time-differentiated (TOU) rate designs, especially hourly load-integrated pricing rate options, not only provide customers with stronger and more meaningful price signals to consider in developing rational strategic (managed) energy-use responses, they also reduce the need to consider institution of supplemental incentives (or subsidies) that otherwise might be required to encourage end-use customers' participation in the programs.

5. The entity administering a given EPS program should be determined based on what makes the most sense for that energy efficiency application and consumer sector.

Criteria that should be considered when determining who is best equipped to administer energy efficiency programs include:

- *Access to the most appropriate economic resources*
- *Experience in this marketplace*
- *Effective relationship to the target customer base*
- *Entity likely to engender the broadest level of participation*
- *Can ramp up quickly and cost effectively enough to meet the savings targets*

Emphasis also needs to be place on increasing the seamless and complementary interactions between various stakeholders in the marketing and delivery of services. No matter who takes the lead in program administration, coordination and sharing of information among parties will be critical to the success of energy efficiency program delivery.

6. The attainment of higher levels of energy efficiency in new residential and commercial construction is of the utmost priority.

Incorporating energy efficiency into new structures is often the most cost effective method for deploying energy efficiency resources. It also minimizes the need at some point in the future to replace elements prematurely to incorporate higher efficiency at much higher cost (i.e., "lost opportunities"). High efficiency features that are incorporated into new construction also can become sought-after upgrades for the renovation of existing structures.

7. Energy efficiency delivery entities should be encouraged to develop programs that use the commissioning and continuous commissioning concepts, which aim at improving performance of whole buildings or building systems. Both electricity and natural gas efficiency options should be considered.

The commissioning concept refers to practices and systems that continually monitor building automation data and use this information to optimize a building's energy efficiency performance and minimize emissions. Some technologies allow continuous commissioning, which monitors system performance remotely and alerts operators to performance problems. A continuous commissioning approach is an especially valuable energy savings tool in new construction, where energy efficient design is considered from the beginning of the project. These practices also offer significant savings for existing buildings.

8. Energy efficiency programs should be clearly defined and designed to encourage customer participation.

The most effective energy efficiency programs appear to be those that send a clear message to customers about how they can take action and simplify participation. Conversely, programs that involve filling out complicated forms or that have extensive rules for participation discourage customers from even investigating energy efficiency options. While program performance

requires a certain level of measurement and verification of savings for evaluation purposes, better program designs keep these aspects out of the customer interaction as much as possible.

9. Independent energy efficiency program providers can play a significant role in achieving the New York EPS goals.

The independent energy efficiency program providers have the resources and ability to play a significant role in achieving the State's energy efficiency goals. This could take several forms. There is currently a high level of awareness and interest in "green" building design and products. Some manufacturers and contractors may want to market energy efficient products or services independently, without the benefit of public funding. This approach will help reduce the funding needed via utility charges required to meet energy efficiency targets and is, therefore, strongly encouraged. Barriers to marketplace solutions should be identified and removed wherever possible. In addition to these unsubsidized efforts, private entities might become involved via competitive solicitations for specific services that are offered by traditional energy efficiency providers. Creating a third-party "white tags" market that taps private-sector investment more effectively than traditional program designs should also be considered. Furthermore, reviving and expanding New York's Green Buildings tax incentives should be examined, possibly in connection with a new green mortgage-backed securities market developing on Wall Street. Other models for private energy efficiency providers' participation are also possible and should continue to be considered.

10. Incentives to influence customer energy efficiency decisions should be aligned with customers' needs, be designed to elicit the action that is desired, and be consistent with current market conditions and program objectives. Care should be taken to avoid unintended consequences.

Incentives to customers need to be sufficient to get customers' attention and action, but not so high that they unnecessarily deplete program funds; they should not exceed the incremental cost of installing the measure. Incentives can be monetary, in the form of rebates, interest buy-downs, sales bounties, free or reduced cost for services, etc. However, incentives do not always need to be direct or monetary. For example, some municipalities have had great success with programs that significantly shorten the time needed to obtain building permits if the building meets Leadership in Energy and Environmental Design (LEED) certification criteria. Some utilities have considered connection cost reductions to developers where buildings or communities meet energy and capacity performance standards. Current market conditions for energy efficiency products and services needs to be monitored closely and prompt adjustments must be made to program incentives to avoid overpayment and to meet program objectives.

11. Incentives to utilities may be necessary to encourage their participation in and support of energy efficiency efforts. If utility incentives are used, they should be linked to the achievement of specific programmatic energy reduction targets that in turn lead to the achievement of the EPS goals within the service territory and the State as a whole.

Achieving the EPS goals will require concerted, long-term effort by numerous entities. To focus utility attention on attaining targets, use of incentives can be considered. The incentive structure

could include both an upside and downside component and should encourage implementation of cost effective programs. Incentives do not necessarily require that the program implementation being measured be administered by the utility, however, recognition needs to be given to the role the utility has regarding the outcome (i.e., lead role versus support program or administrative role).

12. The required program delivery infrastructure should be considered and put in place early in the EPS process (e.g., college curricula on energy efficient building design, training for HVAC installers, certification of energy efficiency auditors, etc.)

An expanded energy efficiency program will not be able to achieve its potential unless there is a robust infrastructure – both technological and human - in place to support the effort. Building the necessary infrastructure can be time-consuming and could take years to fully implement. Consequently, the process of identifying resource needs and implementing appropriate solutions needs to begin early in the EPS implementation process. Funding should be provided in stages so that infrastructure improvements can be in place before rapidly expanding programs. Using a staged approach also allows a better understanding of how much energy efficiency can be gained through non-subsidized marketplace solutions.

13. Retail and manufacturer partnerships are essential for attaining success through market transformation program initiatives. Energy efficiency programs are most effective if the programs are consistent statewide, regionally, and nationally. Coordination of programs with other states should be encouraged.

Mass marketers, local retailers, and major manufacturers and their distribution networks can be powerful allies in achieving energy efficiency goals. Retailers can set up displays for energy efficient products, offer promotions, and describe energy efficiency benefits in their advertisements. Since many retailers and other market players operate throughout New York State, as well as regionally and nationally, having program consistency makes it much easier and more cost effective to market these concepts. In addition, in many parts of the State the advertising shown in a local market will be seen by customers of more than one utility. By using the same program design, the reach of this advertising can be maximized. This both reduces total program costs and improves program consistency, preventing market confusion.

Just as energy efficiency programs have a greater reach when advertising can apply to more than one New York utility's service territory, the same concept applies beyond state borders. In addition, retailers operating in numerous states can expand a campaign to an entire region. Regional coordination is also important in developing appliance standards. By banding together with common goals, a region can have a much bigger influence on manufacturers' offerings than a single state would have.

14. Partnerships between energy efficiency program providers and other entities (e.g., trade groups, governmental entities, and local community organizations) that can help get energy efficient products and services into the hands of consumers should be encouraged.

A number of the general principles listed here involve traditional energy efficiency providers working with other groups to maximize the energy efficiency savings that can be achieved. This covers a wide range of opportunities, including such things as: working with architectural firms and professional associations to develop more energy efficient building design; working with colleges and other institutions, such as the State's Board of Cooperative Educational Services (BOCES) network; using local groups to install energy efficient measures in low income housing; and working with all levels of government to improve energy efficiency in their operations.

15. A rigorous evaluation and monitoring framework is essential to monitor progress toward the EPS goals, modify programs to maximize efficiency, ensure that projected energy efficiency savings are realized, and offer accountability to ratepayers and taxpayers. It is critical to ensure the measurability and persistence of energy efficiency measures that New York State will count on as substitutes for new generation and delivery facilities.

A program of the magnitude and complexity of the EPS Proceeding requires a comprehensive, yet practicable and cost-effective evaluation and monitoring framework. All programs selected to be part of the EPS program portfolio will be required to include an effective evaluation and monitoring plan. Emphasis should be placed on securing early feedback on how new or enhanced programs are performing in the field, measurement and verification (M&V) of energy savings, and regular and reliable reporting of program data. M&V programs should maximize the use of current resources and capabilities and leverage innovative advances in metering technologies, related data communications, and processing capabilities.

16. The EPS planning framework should include a mechanism to account for technologies that could increase electricity or natural gas usage but would be beneficial from a total resource cost and/or an environmental standpoint.

Some technologies that would reduce overall greenhouse gas emissions could involve fuel switching that might actually drive up demand for natural gas or electricity. Some examples include plug-in electric vehicles and programs that promote natural gas water heating. Rather than rejecting such options because they conflict with the EPS target, the parties in the EPS Proceeding should consider ways to account for these projects (e.g.,excluding the energy associated with beneficial fuel switching in the energy savings calculations for determining progress toward 2015 goals).

17. New York should take advantage of nationally recognized branding opportunities.

Consumers are generally familiar with ENERGY STAR® *appliances and are becoming familiar with* ENERGY STAR® *homes as well. Using this name recognition is an important tool for marketing energy efficiency concepts to customers. In recent years, Leadership in Energy and Environmental Design (LEED) certification has been gaining increasing recognition as a*

building standard and is another branding opportunity that the State can use to encourage energy efficient building design.

18. A comprehensive and effective outreach and education program is the underpinning that will support the success of the EPS initiative. To ensure that consumers are informed throughout the development and implementation of the EPS effort, and have adequate opportunities to participate in the process and resulting programs, outreach and consumer education must be an integral part of this process.

An effective outreach and education program must provide consistent, understandable, unbiased, and easily accessible information about the issues and choices involved in achieving the EPS targets; must include the development of materials that reflect diverse audiences to eliminate language, educational, socioeconomic, and other potential barriers to awareness, understanding and action; and must create opportunities, through multiple vehicles, for all interested parties and stakeholders to have input in the development of the EPS program and for all eligible customer classes to participate in the resulting programs.

Today's children will be the beneficiaries of a successful effort to reduce energy usage and produce concomitant reductions in greenhouse gases. Sustaining the gains that the EPS Proceeding envisions will require lifestyle choices that should be part of everyday habits. These patterns can best be established through education about the consequences of choices, with this education beginning at an early age. Examples of similar education programs for young people that have been highly successful are the value of seat belt use and recycling campaigns. New York has pioneered school-based energy efficiency programs and should draw on the lessons learned from those efforts.

III. Current Practices and Recommendations for Change

A. Program Delivery

1. Current Delivery Configuration

In New York State, there are many entities that provide energy efficiency services to customers. This section describes the roles of some of the major players. For additional details on energy efficiency programs in New York State and their budgets, see, as noted earlier, the Conservation Coordination Task Force Report to the Governor and the Legislature, January 30, 2007. The information in the following table, taken from that report, shows annual expenditures on energy efficiency[3] for each New York State Agency involved in delivering these services.

12 Month Program Expenditures ($,000)

Agency	Current Annual Budget	Most Recent 12-month Program Expenditures	Most Recent 12-month Program Commitments	Current Outstanding Commitments/ Encumbrances	Most Recent Quarterly Disbursements (Expenditures)
NYSERDA	$188,232	$130,639	$133,786	$206,181	$29,561
NYPA	$102,806	$103,092	$106,755	$316,513	$34,986
LIPA	$36,499	$27,592	$27,592	$-	$6,898
DHCR	$55,875	$55,299	$55,299	$-	$18,921

On the utility side, Con Edison has also conducted programs geared at energy reduction. In 2006, it spent nearly $5 million on these programs ($3.6 million for electric programs and $1.4 million on a gas efficiency pilot program). Other New York utilities are in the beginning stages of developing energy efficiency programs.

[3] These figures also include expenditures for distributed generation activity.

NYSERDA

In the 1980's and early 1990's, energy efficiency programs in New York State were operated by the utility companies with funding included in rates paid by their own customers. In 1996, the Commission established a System Benefits Program to fund public policy initiatives not expected to be adequately addressed by New York's competitive electricity markets, including energy efficiency. The Commission designated NYSERDA as the System Benefits Charge (SBC) Program administrator.[4] NYSERDA operates SBC-funded programs under a Memorandum of Understanding with the Commission and the Department of Public Service, which oversees those programs. An independent advisory group also provides guidance on program evaluation.

In 1998, the Commission established SBC funding levels for a three year period to provide, among other things, statewide energy efficiency programs for commercial and industrial, residential, and low income customer sectors, and energy research and development. The Commission renewed the SBC for a five-year period in 2001 with increased funding and additional focus on programs designed to achieve peak load reductions. In December 2005, the Commission extended the SBC program for an additional five year period (7/1/2006-6/30/2011) with an annual funding level of $175 million.

The SBC energy efficiency programs are designed to serve the diverse needs of New York energy consumers from residential homeowners and tenants to manufacturing plants and commercial office buildings. With New York's programs administered through a central entity, it has been possible for resources to be consolidated, providing the ability to engage in market transformation activities that might have been difficult for a single utility to undertake. As

[4] The New York State legislature established NYSERDA as a public benefit corporation in 1975 with the mission of conducting energy research and development programs.

explained in the 2003 document, Who Should Administer Energy Efficiency Programs? (Ernest Orlando Lawrence Berkeley National Laboratory, page 17): "NYSERDA has also been able to capture economies of scale by administering statewide programs and has offered end users and service providers in New York consistent statewide programs, which reduces transaction costs of participating." The statewide approach also has promoted consistency in program evaluation and consumer education activities.

NYSERDA contractually arranges for most of the services it provides, which has stimulated the development of independent energy efficiency delivery entities. NYSERDA also works with a variety of groups that provide the infrastructure needed to deliver energy efficiency services. In addition, it is involved with the building industry to encourage green construction practices, and works with other entities to improve building codes and appliance standards.

New York Power Authority (NYPA)

NYPA is the nation's largest state-owned power-providing organization. As part of its mission, NYPA provides energy-efficiency services to its customers and to public schools and other government facilities, including projects for some customers that are served by utilities.[5] NYPA has undertaken more than 1,500 energy-efficiency projects at about 2,300 public buildings across the State. NYPA reports that it has spent a total of over $1 billion on energy efficiency programs in New York State. These measures have reduced demand by about 200 MW and lowered the electric bills of State and municipal governments by more than $93 million a year. NYPA's programs are generally designed to address all energy efficiency improvements within a building through a single, comprehensive effort. When NYPA finances an energy efficiency project, it recovers its costs by sharing in the resulting electric bill savings. Once the loan is repaid, the participants retain all the savings.

[5] By law, NYPA offers energy efficiency service to all schools in the state, both public and private.

NYPA frequently partners with NYSERDA or other entities that can provide energy efficiency resources, serving as the interface for customers seeking to obtain energy efficiency services. In situations where NYSERDA and NYPA offer joint programs,[6] they perform separate functions. NYPA conducts energy audits and designs, constructs, and finances the project. NYSERDA provides funding to the project through its Flex Tech, C/I Performance Program (a performance-based incentive program), Technical Assistance, and stand-alone Program Opportunity Notices (PON). NYPA has standardized its front-end audit reports so that the work product it develops for the participant is acceptable to NYSERDA for the programs listed above.

Long Island Power Authority (LIPA)

LIPA is a non-profit electric service provider for Long Island. In May 1999 the LIPA Board of Trustees approved the Clean Air Initiative, a five-year $160 million effort designed to provide energy and capacity savings. The program was later expanded to a ten-year, $355 million commitment through 2008. LIPA is now in the process of reevaluating its programs with the intention of expanding its commitments to energy efficiency. LIPA has serious concerns with demand on peak days, so its programs have an emphasis on demand reduction.

Division of Housing and Community Renewal

The New York State Division of Housing and Community Renewal (DHCR) is responsible for the supervision, maintenance, and development of affordable, low-and moderate-income housing in New York State. DHCR administers the federally-funded low-income Weatherization Assistance Program (WAP) in New York through which it weatherizes 12,000 dwelling units each year. DHCR also administers the New York State HOME Program that

[6] In many instances, NYPA provides services to entities that are customers of the utilities and, consequently, pay the SBC.

provides funding for housing projects and encourages energy conservation improvements, and the Rent Administration Program that, among other functions, encourages use of metering in individual housing units.

Utilities

In the 1980s and early 1990s, New York State electric utilities ran large scale energy efficiency programs that emphasized services and financial incentives, generally in the form of rebates targeted directly at their customers.[7] Utility annual spending on energy efficiency programs reached a high point of $286 million in 1992. Total utility spending during the period of 1990-1996 exceeded $1.2 billion and achieved 5,744 GWh of energy savings.

With the establishment of the SBC in 1996 and the designation of NYSERDA as the administrator, utility energy efficiency programs were scaled back significantly. Over the years, many utility employees who had been involved in energy efficiency programs were reassigned to other duties or left the companies; the expertise that had been resident at the utilities in the early 1990s has been seriously attenuated. Recently, however, the utilities have demonstrated a renewed increased interest in energy efficiency programs. Consolidated Edison of New York, Inc. (Con Edison) has had a targeted energy efficiency program since 2003, which uses a Request for Proposal solicitation process to acquire predetermined levels of demand reduction from third party providers within a defined geographical area for the purpose of deferring planned distribution and transmission projects. As part of Con Edison's current electric rate plan, approved in March 2005, the targeted program has had a goal of achieving at least 150 MW of load reduction. Funding is capped at $112 million plus appropriate administrative and evaluation fees. Several other electric and gas utilities have proposed energy efficiency

[7] Some pilot market transformation programs also were undertaken.

programs and revenue decoupling mechanisms as part of recent electric and natural gas rate case filings.

Independent Energy Efficiency Services Providers

NYSERDA typically uses a competitive solicitation process to select vendors to implement its energy efficiency programs. Over the years, a well-established workforce of technical service providers has arisen in New York. These are generally private companies with expertise in one or more specific phases of the energy efficiency delivery business. Many of these companies respond to solicitations for specific NYSERDA-managed programs. In addition, DHCR distributes funds to 64 not-for-profit agencies, which do businesses in every county in the State, to implement the Weatherization Assistance Program (WAP). These community-based agencies also have trained a well-established workforce of technical service providers.

Independent Energy Efficiency Services Providers have also introduced services and technologies into the marketplace that do not necessarily require ratepayer funding to enable market penetration. At the ISO Symposium and the Overview Forum, attended by many of the parties participating in the EPS proceeding, speakers described a wide range of technologies with the potential to help New York State achieve its energy efficiency targets via actions in the marketplace. Ideas proposed included use of: advanced meters, micro-CHP systems, energy curtailment technology, distributed generation, and electricity storage systems.

2. Proposed Delivery Configuration

Staff's proposal for delivery of energy efficiency program services begins with the premise that New York now has in place an effective system for energy efficiency programs, but

much more can be done. In a recent ranking of state energy efficiency programs[8] New York ranked seventh in the nation, behind several states from New England and the west coast. New York State lagged the leading states in spending on energy efficiency per customer.[9] Program participation rates in some New York State programs are also considerably lower than in other states.

There are significant benefits that can be gained by building upon existing statewide programs, where appropriate. This will assist in developing an infrastructure of builders, educational institutions, installers, etc. that can all operate under a unified framework and will help in establishing relationships with manufacturers that foster the introduction of cost-effective equipment and materials, and promotional partnerships with retailers. In addition, there are numerous opportunities for a wide variety of entities to help utility customers take advantage of these programs, to educate customers about the need for energy efficiency, to explain to customers how they can participate, and to provide services that meet the specific needs of particular localities. A proposal for creating uniform statewide programs and meeting the needs of individual communities under a single framework is described below.

There are valuable roles for utilities, municipalities, and independent energy efficiency service providers as gateways for customers to learn about and take advantage of energy efficiency opportunities. These entities can assist customers by advertising the availability of energy efficiency programs, promoting energy efficiency by example within their own operations, and packaging energy efficiency services in ways that customers will find attractive.

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[8] This information comes from "The State Energy Efficiency Scorecard for 2006", prepared by American Council for an Energy-Efficient Economy.

[9] On a scale of 0 to 15 on spending per capita in the State Energy Efficiency Scorecard analysis, New York had a score of 5. Vermont, which had a score of 15, spends $22.54 per customer per year, while New York spends $7.63.

This model encourages use of community resources to help deliver services in a low-cost way that helps to build consumer interest in participating in energy efficiency programs.

As is evident, the magnitude of the effort needed to meet the Commission's goals by 2015 will be much larger than that which is currently in place. To support this expanded effort, it is crucial that the necessary infrastructure, including the personnel needed to install the energy efficiency measures, is in place and trained before new programs are widely advertised. If programs are not ramped up in a thoughtful, deliberate way, the likely result will be customer confusion and dissatisfaction. This has the potential to set back the program and make achievement of the EPS targets difficult.

At the same time, programs need to ramp up quickly in the near term to place the State on track to meet the overall savings targets for 2015. For this reason, a set of proven programs that can be scaled up rapidly without market disruptions should be deployed on a "fast track" basis, with a more extended process for planning the balance of the program portfolio needed to meet the 2015 goal.

In the description of the fast track programs that follow, Staff describes the model programs that have been chosen using real programs that have proven successful. Staff has examined the budget required for these existing programs and the energy savings that resulted. Using reasonable assumptions, we have scaled these programs for implementation in New York with a projected budget level and savings target. In addition, over $30 million has been approved for utility gas energy efficiency programs. There could be some additional costs as utilities set up energy efficiency programs for the first time and costs for the programs will be higher in later years as the programs are ramped up.

The fast track programs by themselves will not meet the EPS targets. However, when linked to enhanced efforts on codes and standards, they can get New York to approximately 80% of the goal. When coupled with other energy efficiency initiatives (programs that will need longer development times and initiatives that are not direct end use programs – see Attachments 1 and 2) the EPS goals can be achieved by 2015.

Funding to cover expansion of energy efficiency efforts could come from a number of sources. Some possibilities include:

- An increase in the SBC charge per KWh
- Introduction of a volumetric charge on firm gas and/or on electric consumption
- Funding obtained through Regional Greenhouse Gas Initiative (RGGI) CO_2 allowance auctions
- Increased funding for tax supported programs (e.g., low income weatherization or expansion of Green Building Tax Credits)
- Funding obtained from utility supply and demand resource auctions
- Increased eligibility of types of buildings that can be covered by NYPA funds
- Wall Street funding of energy efficiency project portfolios
- Sale of "white tags"[10]
- Funding arrangements that take advantage of either NYPA or the New York Dormitory's access to low cost financing

We encourage parties, in their responses on Staff's report, to comment on these suggestions or to offer additional funding approaches.

Some approaches have the potential for large energy savings with minimal investment. Chief among these are improvements in building codes and enhanced appliance and equipment

[10] White tags are an energy trading system where the commodity being traded is the value of energy efficiency sold in units of one MWh. The concept is similar to trading for renewable energy certificates,

standards. While these are not under the Public Service Commission's authority, the Commission and parties in this proceeding can play a significant role in influencing decisions affecting future codes and standards. Consequently, there should be a high level of attention given to implementing aggressive codes and standard, which will be an important factor in a reinvigorated energy efficiency planning process. An important first step would be separating the energy building code from the entire New York building code, which would allow updates to be made more readily.

NYSERDA

NYSERDA's energy efficiency programs have been recognized nationally, and it is considered a leader in energy efficiency program design. The programs frequently aim at market transformation and attempt to address all achievable energy efficiency opportunities for a designated building, to the extent possible.

Because the SBC applies only to electricity payments, opportunities for gas efficiency have not been pursued through State programs to a great extent.[11] If the Commission implements a gas energy efficiency surcharge, this funding could be used, in part, to support more comprehensive energy efficiency programs developed by NYSERDA. These programs could identify all cost effective energy efficiency opportunities within a target building, both electric and gas, and recommend steps that the customer can pursue to take advantage of them. New natural gas programs could be integrated into existing electric programs, and, in addition, programs could be considered to address other gas savings opportunities.

Implementing the EPS targets will require the participation of new entities and enhanced roles for existing entities. NYSERDA will be involved in many of these relationships and it is

[11] Some programs, such as those addressing building envelope, apply to both electricity and natural gas and have been part of NYSERDA programs.

imperative that roles and responsibilities for joint projects be clearly delineated and understood. Cooperation among entities will be the key to delivering energy efficient programs in the most cost-effective manner.

NYPA and LIPA

NYPA and LIPA frequently partner with NYSERDA and take advantage of its expertise. In addition, they do outreach to customers and provide targeted programs that meet the needs of a local area. Continuation of these approaches would feed into the overall State effort to achieve the EPS targets. If LIPA partners directly with KeySpan Gas Corporation (KeySpan) - Long Island, joint electric/gas programs can be developed and implemented on Long Island.

Division of Housing and Community Renewal

DHCR can be expected to continue with the energy efficiency functions currently under its jurisdiction. Means should be explored, however, for increased funding levels for its low-income weatherization projects so that more customers can be served.

Utilities

As the Joint Utilities pointed out in their July 11, 2007 response to Staff's questions in the EPS Proceeding, "The unique characteristics of each utility's service area and customers need to be taken in to consideration not only in determining the actions, programs and measures to be implemented but also in increasing services to energy consuming sectors that may be currently underserved by the existing portfolio of energy efficiency programs…" Utilities can take advantage of their unique understanding of their customers by serving as the gateway to energy efficiency services. Under this approach, utilities would inform customers about energy efficiency programs (including those offered by NYSERDA or other governmental entities), encourage them to participate, bundle cost-effective services together in a package that

customers find easy to use and attractive, and offer targeted programs to meet the needs of their service territory that are not covered by existing energy efficiency programs. To provide just one example, utilities could implement a Project Expediter energy efficiency program which uses local engineers and contractors selected via a Request for Qualifications proposals to assist customers in identifying and implementing energy efficiency measures, with customers paying for the expediters and program incentives providing the inducement for customers to participate.[12]

Parties could work with the New York Independent System Operator (NYISO) to create a forward market where utility and other market participants could bid in energy efficiency resources. The revenues generated from the utility programs could be used to fund end use energy efficiency programs.

If a gas energy efficiency surcharge is not implemented, programs for gas energy efficiency could be funded through utility rate cases and be coordinated with electric programs to the extent feasible.

In recent rate cases, both electric and gas utilities have suggested that performance incentives might be provided for them to offer energy efficiency programs for customers. Properly designed incentives can play a role in aligning the financial interests of a utility for energy efficiency goals. Elements of a properly designed incentive should include:

- A focus on encouraging exemplary performance
- Incentives linked to program goals at the high end of the expected range to encourage long-term commitment
- An incentive level that is sufficient to encourage high performance, but not so high as to burden ratepayers with unnecessary expense

[12] National Grid runs such a program in Massachusetts that has been well received and contributed substantial savings to the company's energy efficiency program. See E-Source "Project Expediters: A Vendor Alliance That Delivers: September 2005.

- A structure that is easy to understand, administer, and monitor
- A design tailored to meet the needs of specific program types
- Scaled incentive benefits for meeting or exceeding goals to avoid the disincentive of "all or nothing" achievement
- Downside provisions to protect against poor performance

A report issued in October 2006 by the American Council for an Energy-Efficient Economy (ACEEE) examined recent performance incentives programs in several states. The report found that, while details varied, the performance incentives generally ranged in amounts representing about 5-10% of the program budgets.[13]

For New York State, utilities could be allowed to receive an incentive based on the value of the primary goal of the program -- saving energy and reducing peak demand. An advantage of using a share of net resource benefits achieved is that if a utility can make more economic energy efficiency investments than originally planned; improve program management, resulting in lower program costs; or both, the value of the net resource benefits increase. Such mechanisms have to be designed so that program and portfolio goals for achieving equity across customer classes are not sacrificed nor is the need to achieve specific market penetration objectives sacrificed in an effort to maximize net benefits. This results in a larger incentive for the utility and better programs for the ratepayer. Negative revenue adjustments could be used for inferior performance. The utility could pay a lump sum penalty for significant underperformance and a percentage revenue decrease based on the underperformance below a designated threshold. On

[13] Source: "Aligning Utility Interests with Energy Efficiency Objectives: A Review of Recent Efforts at Decoupling and Performance Incentives", American Council for an Energy-Efficient Economy, October 2006.

the upside, utilities could be granted a larger incentive percentage for incremental performance that exceeds a threshold that has been designed to reward outstanding performance.[14]

Independent Energy Efficiency Service Providers

Currently, there are many opportunities for private companies to provide energy efficiency services in response to requests for bids to perform energy efficiency services, both for NYSERDA and utility program delivery, and for procurements that seek performance contracting services to deliver savings. These opportunities are expected to grow as the volume of program offerings increases.

As the Retail Energy Supply Association (RESA) points out in its July 11, 2007 comments on Staff's questions, ESCOs[15] now supply energy service to over 1.3 million customers throughout the State. ESCOs have an opportunity to attract customers by offering packages that feature energy efficiency savings, including helping customers take advantage of programs provided by government entities, such as NYSERDA programs and tax rebates for energy efficient actions. The ESCO programs might include low cost loans to customers, share-the-savings approaches, or savings tied to use of advanced metering technology. As RESA also observes, the ESCOs have unique marketing expertise that might be tapped by utilities or municipal organizations to encourage energy efficiency. Other opportunities for ESCOs may also be available, so creative thinking is welcome on the role that energy marketers might play in delivering energy efficiency services.

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[14] The California Public Utilities Commission recently issued a detailed proposed decision on energy efficiency incentives.

[15] The reference here is to energy service companies in the sense we have most recently used in New York State – companies that have successfully completed a certification process with the New York State Department of Public Service, the utilities, and the NYISO (in the case of electricity ESCOs) and that sell commodity to end use customers. In the energy efficiency community, the term ESCO is frequently used to denote parties that deliver energy efficiency services and do not necessarily also sell electricity and/or gas. To avoid confusion, we are using the term independent energy efficiency service providers to encompass both groups.

Another approach that applies to the independent energy efficiency service provider community is the bidding out of energy efficiency services. A sum of money could be made available for funding competitively-selected proposals for providing energy efficiency services. Alternatively, blocks of energy/capacity savings could be put out to bid and bids accepted up to a cost limit. Criteria would need to be established about which classes of customers were being targeted, what type of projects and technology categories would be considered, and how bids would be evaluated. Bids would then be ranked based on the cost to produce a MWh of savings and other evaluative criteria, with projects being selected up to the point where the total funding is expended or the total block of KW/KWh is totally filled. To ensure that bidders are encouraged to propose whole-building "deep savings" projects, proposals could also be ranked by total net benefits or total energy savings per square foot. This type of approach could be put in place quickly and be scaled up or down based on immediate needs. It would provide intangible benefits as well, such as encouraging creative thinking and building interest in energy efficiency.[16]

City of New York

With its PlaNYC, New York City has declared its intention to address energy efficiency in a serious way. As the City points out in its responses to Staff's questions: "Fully 33% of New York State's electricity is expected to be consumed within New York City." The City says that by implementing all of the energy initiatives in PlaNYC it can reduce its electricity consumption by approximately 14-15% by 2015. New York City has opportunities to mobilize its citizens through advertising campaigns, point them to energy saving opportunities that are available to

[16] Standard offer approaches could also be considered, where a project that meets pre-set conditions would be paid a pre-determined amount.

them, and lead by example through visible energy efficiency improvements in municipal buildings and services.[17] This model is applicable to municipalities throughout New York State.

New York City's interest in energy efficiency is laudable, especially if it addresses some of the entrenched rules and regulations and operating practices, built up over generations, which have made energy efficiency goals difficult to achieve. For example, when electricity and/or natural gas are included in the rent paid by a tenant, it is difficult to engender a sense of the need for conservation. Furthermore, when space is rented, which is often the case in cities like New York City, tenants face a basic market barrier in that they are unable to make investment decisions about energy efficiency features of their buildings. Wherever possible, steps that result in more consumers of electricity and/or natural gas becoming responsible for paying for the energy they use should be encouraged. Incentives also need to be designed to overcome the more fundamental "principal-agent" barrier so that building owners will consider energy efficiency when constructing a new building or doing major retrofits. The GreeNYC energy awareness campaign is an example of how government can help create a climate where customers can be made aware of the opportunities available to them and how to take advantage of programs and resources in their local communities.

Municipalities

The role that New York City plans to take advertising energy efficiency opportunities, working with existing programs to ensure that the needs of the local community are met, and leading by example make sense for communities of all sizes. A possible program design might be to designate a sum of money, tied to savings targets, which would be used to fund grass roots

[17] New York City has committed $80 million in the fiscal year 2008 budget toward energy efficiency measures in City government buildings.

energy efficiency efforts. Municipalities could present proposals and the best of these would be given grants to conduct programs and build interest in energy efficiency in their communities.

Local governments are also critical in building code implementation. They should be encouraged to become more active in energy code enforcement. In this process, they could also train builders and architects on advanced building design methods and utility/NYSERDA energy efficiency programs.

B. Multi-Year EPS Planning Process

Achieving the EPS energy efficiency goals will require a thoughtful and sustained multi-year planning effort that is transparent and enables input from interested parties and stakeholders. Similar models have been employed in other jurisdictions on the west coast and New England, and have evolved into highly successful energy efficiency delivery operations. The scope of the issues to be addressed in the planning effort is quite broad and will require significant research and analyses. The issues to be taken up will include the development of baseline planning information and assumptions; market research; program monitoring and evaluation; portfolio analysis; program design and delivery; state-wide accounting for energy savings; utility performance incentive structures; research and development policies and goals; innovative financing initiatives; energy efficiency building codes and appliance standards; outreach and education; pricing initiatives; and alignment of programs, policies, and roles.

The output of the multi-year planning process would be recommendations to the Commission for EPS programmatic and funding approvals on a two or three year budget cycle, with the option for mid-course corrections, as appropriate. Using a multi-year planning horizon will provide stability of funding while allowing for updates to programs based on how the energy efficiency marketplace and available technology develop within the State.

The Department of Public Service will serve as the Public Service Commission's resource for providing guidance and facilitation of the multi-year EPS planning and implementation processes. Recommendations emanating from the EPS planning process may also have relevance for informing and supporting other State agency processes and initiatives which have potential implications for state-wide energy efficiency and environmental initiatives, as appropriate. Transparency in the multi-year planning effort will be achieved through a collaborative planning model with numerous opportunities for input from and collaboration with interested parties.

An Executive Steering Working Group (ESWG) could provide a useful support to the EPS multi-year planning process. Its purpose would be to create and provide guidance to standing working groups and ad hoc working groups focused on specific tasks and issues. The ESWG would establish priorities and arbitrate cross-cutting issues or impasses within and between working groups. The ESWG could provide periodic reports to the Commission on the status of its activities.

The collaborative process model will include standing working groups such as: Planning and Analysis; Monitoring and Evaluation; Residential Programs; Commercial and Industrial Programs; Low Income Programs; Institutional and Governmental Programs; Codes and Standards; Education and Outreach; Financing, etc. Each standing working group could have subgroups to address specific programs and issues.

Using a multi-year planning horizon will provide funding stability for programmatic funding while allowing for updates to programs based on how the energy efficiency marketplace develops. The EPS planning process should be closely integrated with other planning processes that examine energy requirements and resources statewide.

By the end of 2008, Commission-approved plans should be in place for EPS programmatic initiatives in 2009 and 2010. The plans should include specific program goals, budgets, marketing plans, description of the services provided, and clearly articulated roles and responsibilities. As part of the planning process, consideration should be given to various ways of organizing the energy efficiency delivery system to produce a system that delivers services efficiently and cost effectively. Efforts would be made to ensure that service procurement is obtained as cost effectively as possible. For example, recommendations could be made to consider program delivery alternatives whereby the Commission would issue a request for proposals from entities that would bid to manage the state-wide energy efficiency program for a multi-year period, with the most cost-effective operator that can demonstrate its ability to manage the overall portfolio winning the contract, similar to the approach used by Efficiency Vermont.

IV. Energy Efficiency Programs that Can Be Implemented Quickly

Achieving the goals of the EPS will require major increases in the energy savings obtained from energy efficiency programs. In this section of the report, Staff identifies programs with a proven track record for energy efficiency savings that can be implemented quickly and cost effectively. These programs, which we characterize as fast track programs, are categorized by customer class and fuel type. The programs presented are based on successful programs with a proven ability to produce energy usage reductions in a cost effective manner and can be implemented quickly or are needed to address under-served markets. Many are expansions of efforts already in place. Others are programs that can be initiated quickly or that are needed to address underserved markets. Some are programs that are expected to provide large savings in future years that should be piloted soon to maximize savings by 2015.

Staff recommends that these fast track programs be put in place as quickly as possible in 2008 to give a rapid boost to energy efficiency savings and awareness while a longer term, more comprehensive portfolio planning process is undertaken to thoughtfully and collaboratively design a longer term energy efficiency program portfolio. The fast track programs can also provide a space of time to more accurately gauge the contribution to achieving the EPS goals that can be made by enhancing building codes and appliance standards and by employing other financing and procurement options.

The program areas identified here are not intended to be all-inclusive. Staff expects that programs in addition to those listed here will be part of the overall EPS. Staff believes that the programs presented here have the potential quickly to place New York on a path to reach the EPS targets. More analysis is needed to determine how the fast track program goals should be allocated to individual utility service territories; that process may also modify the scale of the

programs. Staff has not analyzed the potential for increased deployment of energy efficiency programs by the Long Island power Authority (LIPA), the New York Power Authority (NYPA) or other entities which are not under the Commission's jurisdiction. Staff expects that there will be extensive coordination between LIPA, NYPA, and the Commission's jurisdictional entities to ensure consistent implementation of programs across the State to the maximum extent possible.

A preliminary benefit cost analysis has been performed on all of the proposed fast track programs, except for one, which will require more research and analysis. All of the programs analyzed appear to pass the Total Resource Cost Test. Details regarding Staff's analysis are included as Attachment 3.

Staff has provided for discussion, some preliminary thinking on the roles of various entities in the delivery of the fast track programs. Achievement of more aggressive energy efficiency goals will require greater engagement of the utilities, NYSERDA, and other interested parties in the implementation process. Implementation of the proposed programs will also necessitate some adjustments to the current SBC portfolio in both scope and scale.

A. Residential Energy Efficiency Programs

On any given day, when residential customers watch the news on television or read the newspaper, they are likely to encounter information about energy prices, global warming, or "green technologies." This information is constantly in the media, which makes the present an opportune time to get customers to focus on energy saving opportunities. Below is a listing of programs with the potential to produce significant energy efficiency savings.

1. New Building Construction – Single and Multi-family Housing (electric and gas)

Current Practice in New York: NYSERDA currently manages two programs that deal with new construction for residential housing. These programs,,with estimated cumulative five year energy savings for the period 2006-2011shown in parentheses, are: New York ENERGY STAR® Labeled Homes (6.5 GWh), and Multi-family New Construction (9 GWh). LIPA also

operates a Residential new Construction program that provides incentives for achieving the Energy Star performance level.

New York ENERGY STAR® LABELED HOMES is an enhanced version of the U.S. Environmental Protection Agency's (US EPA) ENERGY STAR® Labeled Homes program that provides technical assistance and financial incentives to one-to-four-family home builders and Home Energy Rating System (HERS) raters. The program encourages the adoption of energy-efficient design features and the selection and installation of high efficiency equipment in new construction and substantial renovation projects. Participating homes use approximately 30% less energy than conventionally-built homes.

Multi-family New Construction is assisted by the ResTech program which provides technical assistance to building owners in the form of energy assessments, design and construction assistance and loan interest write downs. In addition, the Comprehensive Energy Management Program (CEM) provides technical and financial incentives for the installation of advanced metering and direct load control technologies, and conducts several pilot programs to help implement real-time based electricity pricing. In 2004, NYSERDA began a pilot initiative for the construction of energy-efficient multifamily buildings. A proposal developed by a multi-state working group was approved by the U.S. EPA in January 2006.

Description of Fast Track Program: It is desirable to influence construction at the early stages of building planning and design, including decisions about the building envelope, as well as HVAC efficiency, sizing, and ducting to ensure that easily obtained energy efficiency opportunities are not overlooked. Efficient homes can be promoted on the basis of energy cost savings as well as the improved market value of the resulting structure. The purpose of this effort is to increase the market penetration of existing programs and boost per housing unit energy savings. A short-term program goal is to capture savings in homes being built now by using practices that will later become mandatory with the revision of the state building code for energy efficiency. A medium term goal is to support revision of the building code to approximate the level of current ENERGY STAR® New Home Standards, a building code level that has already been adopted by several Long Island towns. Existing programs will also be expanded to include additional gas energy efficiency measures. Features of the program will include:

- Incentives for builders to complete houses that meet ENERGY STAR® standards
- Cooperative marketing of ENERGY STAR® homes with certified ENERGY STAR® builders
- Establish training and certificate programs for building designers and builders in cooperation with architects' and builders' associations
- A pilot program focused on new apartment buildings.
- Low cost financing (e.g., lower mortgage rate for program participants)
- Incentives for incorporation of proven, cost-effective renewable technologies such as geothermal applications and solar hot water systems.
- Utility incentives to builders/developers, such as reduced connection fees, service upgrades such as buried lines, etc.

- Local government incentives such as builder impact fee credits, accelerated permitting and code inspections, and property tax abatement

Real World Experience: According to the U.S. EPA, participation rates in ENERGY STAR® New Homes programs are as high as about 60% of new homes in some states (e.g., 64% in Alaska and 57% in Iowa). Program administrators in New Jersey and Vermont estimate participation rates of about 25% and 43%, respectively. These programs are reducing energy usage by at least 15% relative to prevailing local building codes. An analysis of the costs and savings associated with these programs indicates an average total resource cost for the Vermont and New Jersey programs of about $6 per million Btu of primary energy savings (e.g., gas at the furnace or at the power plant). Since residential gas rates in New York averaged about $25 per million Btu in the first half of 2007 (and electric rates are even higher), these programs are highly cost effective.

Benefit/Cost Estimate for Fast Track Program: 2.0 (through 2012)

Importance: New construction represents the most important "lost opportunity" market in that it offers a one-time opportunity to design the building with energy efficiency as an important goal. Current practices have developed building designs with significant energy savings that can be realized at little or no net capital cost because of cost savings in downsized mechanical systems. The features that are incorporated have the potential to produce continuing energy savings for decades. If this opportunity is missed, it will be much more expensive to retrofit these homes later. The New York ENERGY STAR® New Homes program is currently reaching about 10% of new homes while programs in other leading states have higher market shares of over 20%, up to 50%.

Major Barriers: Builders are unlikely to focus on energy efficiency unless they are encouraged to do so because of first cost and construction schedule considerations, uncertainty about customer demand, lack of awareness about cost-effective ways to upgrade their homes or insufficient incentives to implement energy efficient designs and building techniques.

Program Delivery: The core program support services can be developed and administered by NYSERDA. The potential to use utilities, municipalities, etc. as front line marketers for the program needs to be further explored. There are numerous opportunities for partnerships with builders, builders' associations, and installers, and manufacturers of energy efficient equipment. Realtors should be encouraged to promote energy efficient homes, perhaps through a rating system that values the energy efficiency of the dwelling. Opportunities to more aggressively market new technologies through a new homes program, such as high efficiency lighting and appliances, geo-thermal HVAC systems, and passive and active solar technologies needs to be more fully explored, including how these technologies could contribute to long terms goals of developing zero net energy dwellings.[18]

[18] A zero energy building (ZEB) or zero net energy building is a term applied to a building with a net energy consumption of zero over a typical year. This can be measured in different ways (relating to cost, energy, or carbon emissions).

2. Statewide Residential Point-of-Sale Lighting Program (electric)

Current Practice in New York: LIPA runs a residential lighting and appliances program that coordinates with programs undertaken by the Northeast Energy Efficiency Partnership (NEEP) and NYSERDA initiatives to make high-efficiency products available to residential customers. LIPA's program offers consumers rebates to lower the price premiums for lighting and efficient washing machines. It also provides marketing and training assistance to retailers to make stocking and selling efficient products easier for them.

During the period 1999-2007 NYSERDA has run a program for residential lighting focused on market transformation. The program partners with retailers for increased stocking of compact fluorescent lamps (CFLs) and to promote these products in stores. The program also includes an extensive Energy Star marketing campaign, in association with efforts to promote efficient appliances. These steps have substantially increased use of CFLs in New York State, with evaluations showing an average of 1.5 CFLs sold per New York State household in 2005. The program only makes limited use of incentives, partnering with fixture manufacturers to cost-share incentives paid to retail stores for CFL fixtures that are sold.

Description of Fast Track Program: The Statewide Residential Lighting program will cover residential lighting measures, expanded efforts to increase CFL sales, and a significant emphasis on lighting fixtures that are designed for pin-based compact fluorescent bulbs. Staff believes that accelerated and stepped-up efforts are needed to increase the annual number of CFLs purchased to more than 3.0 per household per year. This could be achieved through increased partnering with manufacturers to provide incentives to retailers for CFL bulbs and fixtures sold. By providing incentives to retailers, they can sell products to consumers for a lower price. The program will also include significantly increased marketing efforts. More retail channels can be developed and opened with this approach since the manufacturers' reach is much broader than other market actors.

Through these efforts to buy down the cost of energy efficient lighting products, customers would receive a discount of approximately $5 to $10 per unit for hardwired indoor or outdoor lighting fixtures, as well as a $10 discount for torchiere floor lamps. Discounts for CFLs would vary depending on the type of bulb. The program has cross-cutting attributes in that some lighting products go to non-residential facilities by virtue of the open market nature of the retail outlet approach.

All qualifying products should be ENERGY STAR® labeled. There are at least 14 manufacturers that have participated in such upstream residential lighting programs including: Broada Lighting; Buffalo Lite; Dura Lamp; Feit Electric Company; General Electric; Greenlite Corporation; Lights of America; Maxlite; Osram Sylvania; Sunpark Electronics Corp.; Sunrise Lighting, Inc.; Technical Consumer Products Inc.; ULighting America and USPAR Enterprises Inc.

Potential Enhancements: One other component that could be considered is short-term coupons provided directly to consumers with their electric bills. Such coupons would be good for only a few months (so as not to create long-term disturbances in the marketplace) and would be timed

to coincide with major campaigns to increase stocking in retail stores (i.e., stores would receive advance notice of the campaign so that they can stock sufficient product).

Some utilities have had success with issuance of a lighting catalog, either in hard copy or on-line, that includes hard-to-find fixtures and bulbs. Items in the catalog could have subsidized pricing to make their use especially attractive to customers.

Real World Experience: In California the statewide Single-Family Energy Efficiency Rebates (SFEER) program provides rebates on various home improvement products. The Upstream Lighting element resulted in the sale of 5,560,000 energy saving lighting products through 190 retailers or chains. In the northwest (Washington, Oregon, Idaho, and Montana) more than 10 million CFLs were sold in 2006, strongly pushed by a decade-long market transformation strategy. Current programs emphasize expanding availability in grocery, drug, and hardware stores and reducing CFL prices in these outlets. The Northwest expects to raise regional sales to 23 million in 2009.

Benefit/Cost Estimate for Fast Track Program:	Lighting Fixtures	1.8 (through 2012)
	Bulbs	6.5 (through 2012)

Importance: This program has a proven track record of stimulating sales for energy efficient lighting. Switching to more energy efficient lighting is an easy step for customers to take that, in the aggregate, can have a significant impact on energy usage. Energy efficient lighting programs can be used as a stepping stone to get customers interested in additional energy efficiency opportunities.

Major Barriers: Setting up a delivery system with the manufacturers and retailers will take some time and effort. Before implementing a large lighting campaign, it is important to ensure that the product is of high quality and that there is adequate product availability. Otherwise, the program could lead to customer dissatisfaction and the impression that using energy efficiency products means getting by with lower levels of service or quality. Customer inertia is also a barrier. Showing customers the difference in energy usage via graphic displays is a powerful way to get customers' attention and persuade them to take action. Proper disposal of CFLs, which contain trace amounts of mercury, also needs to be addressed as part of the program design. Staff will work with the Department of Environmental Conservation to prepare a workable solution.

Program Delivery: Mass market, product specific programs lend themselves to a statewide centralized administration, since the program needs to be identical for all participating manufacturers and retailers. NYSERDA is well equipped to fulfill this role, working closely with retailers and manufacturers. A turn-key third party with demonstrated experience in delivering residential lighting mass market programs could also be employed. Utilities can provide assistance in making customers aware of the existence of these programs.

3. Residential Central Air Conditioning – Efficient Equipment and Quality Installation (electric)

Current Practice in New York: LIPA's residential new construction program offers financial incentives for central air conditioning that reaches ENERGY STAR® performance. It offers full incremental cost incentives for homes with both central cooling and either electric or gas heat. Partial incremental cost incentives are offered for homes without central air conditioning or without gas or electric heat. As part of its Residential HVAC Efficiency program, LIPA offers financial incentives for customers buying high efficiency central electric cooling; efficiency standards and incentive levels are designed to be consistent with neighboring New Jersey utilities and HVAC contracts must provide documentation of proper sizing and installation.

Description of Fast Track Program: This program addresses one of the major contributors to peak demand downstate – residential central air conditioning. The program will promote use of ENERGY STAR® air conditioners (and even more efficient units) when new equipment is being purchased and emphasize quality installation. Qualified heat pumps would also be included. Program components include cooperative advertising with air conditioning distributors and contractors, training for salespersons on up-selling for high efficiency, financial incentives for high efficiency units, training for contractors in quality installation (such as proper sizing, refrigerant charge and airflow, and duct sealing), and certification of quality installers based on both training and quality-control procedures using the Check-Me protocols (now being used by LIPA). This program will expand on successful programs serving Long Island and New Jersey and will focus on downstate regions (upstate uses less air conditioning and there is that danger that upstate promotions could increase sales of central air conditioning systems). The U.S. EPA ENERGY STAR® program has developed training programs for salespersons that can be used and is currently piloting a program to promote and certify quality installations in conjunction with local partners.

Real World Experience: New Jersey has run a program of this type since 1999. It provides training for contractors, requires sizing calculations (to reduce the prevalence of over-sizing), and provides rebates for high-efficiency equipment with rebates increasing as efficiency increases. In 2006, participating customers accounted for about 11-13% of central air conditioners sold in the state. In earlier years, participation was even higher (as high as 30%) but participation declined in 2006 when new federal efficiency standards, that substantially raised the baseline, took effect. On Long Island, LIPA runs a similar program. However, the LIPA program takes an additional step that significantly increases energy savings. It requires contractors to collect key data from the installation and report these via phone to a central location where the data are run through several algorithms to make sure the unit is correctly installed. If the checks are out of normal bounds, the contractor is given information that it can use to improve the installation before leaving the home. LIPA pays an extra incentive of $150 for these quality installations.

Benefit/Cost Estimate for Fast Track Program: 1.7 (through 2012)

Importance: In some portions of the State, residential central air conditioning is the largest contributor to peak demand. More efficient air conditioning can reduce energy use and peak demand by 7-19% and quality installation can add about another 10% savings.

Barriers: Many contractors compete on first cost and sell the least efficient equipment allowed under federal appliance standards. In order to keep costs down, contractors may quickly install systems without paying attention to details so that they can move on to the next job. Salespersons and installers often lack training in how to best do their jobs. Programs for contractor certification and training will need to be established with mechanisms for follow-up quality assurance. Customers are not well-informed about the potential operating cost savings that can result and do not demand more efficient, quality installations.

Program Delivery: LIPA is currently operating a program similar to the one described here. Expansion of this program to other downstate areas could be done by either NYSERDA or Con Edison and Orange and Rockland. These efforts need to be coordinated with the LIPA program and perhaps also with the program in northern New Jersey. Use should be made of ENERGY STAR® experience and materials.

4. Home Performance with ENERGY STAR® (electric and gas)

Current Practice in New York: Home Performance with ENERGY STAR® is intended to implement comprehensive energy efficiency-related improvements and technologies by qualified contractors. The program increases the capacity and expertise of home improvement contractors through training, certification of individual technicians, and accreditation of firms. Included in the comprehensive improvements offered by the program are building shell measure, heating and cooling measures, electric measures, and health and safety features. Participating homes typically reduce their energy use by 25-30%. This program is projected to save 15.8 GWh over the period 2006-2011.

Description of Fast Track Program: The current program is budget limited and not heavily promoted. This fast track effort will seek to more than double the size of the program over a five-year period with an increased focus on measures that produce natural gas savings. Increased promotion, contractor training, and budgets will be increased so that the program can increase from an estimated 4,500 homes in 2007 to 12,000 home completions by 2012. The majority of the expansion will take place upstate where colder weather makes the program particularly attractive and where there are more contactors experienced with program procedures. However, the program will continue to devote substantial resources to increasing the number of contractors operating downstate.

Benefit/Cost Estimate for Fast Track Program: 1.2 (through 2012)

Importance: New York has millions of eligible homes. This expanded program will allow more homes to be served and achieve the substantial energy and bill savings, and comfort benefits of the program.

Major Barriers: Many consumers are not aware of specific opportunities to improve their homes to reduce energy usage and improve comfort. They also do not know where to go to find contractors they can trust. The up-front costs to consumers to make these changes to their housing are considerable.

Program Delivery: NYSERDA is already running this program and is the logical agency to oversee this expansion. Contractors, utilities, and municipalities can help with promotion.

5. Residential Retrofit Program (mostly gas)

Current Practice In New York: NYSERDA's residential programs that focus on whole building approaches (e.g., multi-family buildings, Home Performance with ENERGY STAR® and New York ENEGY STAR Labeled Homes), while not directly focused on gas retrofits, do include measures that produce natural gas savings through better insulation, tighter building envelope, better windows, etc. A similar effect applies to LIPA's energy efficiency programs that focus on residential whole building approaches.

Description of Fast Track Program: This program will provide a simpler, lower cost option than Home Performance with ENERGY STAR® for weatherization services. Home Performance tends to target the remodeling market (although it includes some retrofit jobs); this program will offer a package of home energy-savings services, including:

- Blower door and duct blaster tests to assess homes for high air infiltration and duct leakage
- Sealing of air and duct leaks where these are substantial
- Low-flow showerheads, faucet aerators, and water-heater tank wrap, where needed
- CFL bulbs and installation
- Insulation assessments and rebates where insulation needs upgrading
- In-home customer education

Program components will also include technical and customer service training for vendors, and outreach through direct mailers targeting high gas users. Staff recommends that customers pay part of the cost of this program (e.g., $200 customer co-pay) so as not to undermine the Home Performance program under which customers are expected to pay for services.

Examples of this type of program are the Home Performance with ENERGY STAR® program offered through NYSERDA or KeySpan's Residential Weatherization Program in Massachusetts and New Hampshire (KeySpan proposes in its current rate filing to copy its New England programs in its New York markets).

Real World Experience: The Home Energy Solution (HES) program offered jointly by gas and electric utilities in Connecticut provides the same services as the proposed New York program. Customers with gas and electric-heated homes are serviced for free; oil/propane heated homes are charged a co-pay of $200. Customers pay for insulation, minus the utility-provided rebates. There are currently 17 crews participating in the program that have been trained and are working in the field. Customer surveys have been highly favorable since the launch of the program in 2007.

Benefit/Cost Estimate for Fast Track Program: 1.2 (through 2012)

Importance: Since there is a considerable stock of existing housing with gas heat (more than 4 million units in the state) and since Home Performance with ENERGY STAR® is only serving about 4,500 homes per year, there is a substantial untapped potential for this program.

Major Barriers: Most consumers are unaware of the opportunities for reducing energy use through air and duct sealing. They also do not know where to look for contractors experienced in providing these services. The up-front costs to consumers to make these changes to their housing are also considerable, creating a barrier for many homeowners. In addition, many consumers will not replace a furnace or water heater until the current one is no longer able to function, so it is important to catch their attention at the time they need to make a decision.

Program Delivery: NYSERDA is already operating the Home Performance with ENERGY STAR® Program. It could also offer this "Home Performance Lite" program. Alternatively, natural gas utilities could take the lead. In either case, there should be joint marketing of the Home Performance and "Lite" programs so homeowners can choose the best option for them (e.g.,"Lite" gives roughly 10% energy savings; "Home Performance" is better with roughly 25-30% savings). Also, referrals should be made between "Lite" and the full Home Performance program to encourage additional savings and address home problems not addressed by "Lite". Contractor training is essential, so that they can provide quality installations and refer customers to this program.

6. Residential Efficient Appliances and Equipment Purchases Program (gas)

Current Practice in New York: Currently, New York energy efficiency program providers are not offering a point of sale program for residential gas appliances and equipment.

Description of Fast Track Program: This program will promote efficient furnaces, boilers, water heaters, clothes washers (most of their energy use is for hot water), solar hot water technology, and hot water conservation measures. Measures promoted will include efficient gas furnaces and boilers (meeting ENERGY STAR® levels), efficient new water heaters (including efficient tank-type units as well as even more efficient direct-vent, indirect, condensing and instantaneous water heaters), efficient clothes washers (significantly exceeding ENERGY STAR® requirements)[19], low-flow showerheads, and faucet aerators. Three mechanisms will be used to promote these measures: (1) point-of-sale rebates for retail sale of efficient products; (2) marketing training for heating contractors and plumbers and rebates to these trade allies for efficient equipment they sell; and (3) discounted sales of low-flow showerheads, faucet aerators and tank wraps via the Internet and mail order.

Real World Experience: KeySpan's High Efficiency heating program, which is jointly operated with the Regional GasNetworks program, has been running since 2002. The program

[19] Incentives will probably not be needed for clothes washers since there is a very good chance that Congress will establish fairly generous federal tax incentives for the most efficient clothes washers. Legislation has passed the House of Representatives and has been reported out of the Senate Finance Committee.

aims to increase the demand for residential high-efficiency heating equipment by offering participants financial incentives for the purchase of efficient furnaces and boilers, and providing training to trade allies. Nearly 7,000 residential customers participated in the program in 2005. In the same year, the program achieved natural gas savings of 1,142,193 therms with a benefit/cost ratio of 3.67. In 2007, residential heating customers are eligible for a rebate of up to $500 for high-efficiency furnaces and boilers. The High Efficiency Water Heating program, also a part of the Regional GasNetworks Program, achieved natural gas savings of 91,245 therms and a benefit/cost ratio of 1.90 in 2005. Nearly 1,200 customers received $300 rebates for high efficiency water heaters, encouraging the purchase of and customer awareness of both indirect and tankless water heaters.

Benefit/Cost Estimate for Fast Track Program: 3.5 (through 2012)

Importance: Space heating is the largest use of natural gas in residential applications and water heating is the second largest use.

Major Barriers: Efficient equipment is more costly than conventional equipment. Many contractors and plumbers compete on first cost and do not try to "up-sell" to more efficient equipment. Also, consumers tend to replace equipment only when it is no longer functioning; when equipment fails, there is only a brief period to influence the new purchase.

Program Delivery: The program needs to be developed on a statewide basis so that qualifying equipment and rebate levels are the same since many participating contractors and retailers work across utility system boundaries. NYSERDA should play some role since it currently offers ENERGY STAR® product programs. Utilities in other states currently offer programs of this type, which involve rebates for new space and water heating equipment and some New York utilities have proposed to offer these programs in the future. This program needs to be coordinated with the proposed Residential Central Air Conditioning Program since many of the same HVAC contractors will be involved in both.

7. Low Income Residential Energy Efficiency and Weatherization (electric and gas)

Current Practice In New York: The New York State Division of Housing and Community Renewal administers a program that uses the federally-funded Weatherization Assistance Program (WAP) to provide weatherization services to low income customers in all counties in New York State. The program is designed to obtain heating cost savings regardless of the heating fuel used, and to remediate health and safety problems found in the residences served. Due to limited funding, priority for services is given to the elderly, households with children, persons with disabilities, and those with high fuel costs. The WAP program currently serves about 12,000 households annually with a budget of $55 million. In addition, NYSERDA uses electric SBC funds to run several programs for low and moderate income customers. Major programs include:

- EmPower New York – A program for low-income households that provides weatherization and energy efficiency services, coordinated with the WAP. EmPower New York was designed to provide bill-reducing energy efficiency services to low

income customers who are participating in electric utility low-income payment assistance programs, and it also accepts some referrals of other income-eligible households. The program's primary focus is on achieving electricity savings.[20] It has a budget of $9.9 million per year until 2011 and has an annual goal to serve 6,300 households. EmPower New York is expected to provide 51.1 MWh of electricity savings during the period 2006-2011.

- Assisted Home Performance with ENERGY STAR®– A variation of the Home Performance with ENERGY STAR®, but with extra financial incentives and assistance to serve the needs of moderate-income households.
- Buying Strategies – Discounts on heating oil and heating system preventive maintenance services. This also includes technical assistance on heating equipment repair and replacement.
- Energy Awareness – Workshops and other outreach strategies in low-income communities.

Description of Fast Track Program: Energy efficiency and weatherization services will be provided to eligible low-income households by expanding two existing programs – DHCR's Weatherization Assistance Program (WAP) and NYSERDA's EmPower New York program. Both programs contract with community groups across the state to provide these services. There is a large overlap in contractors between the two programs and there is coordination in the operation of the programs to promote complementary and timely services to households. Expansion of the WAP program will allow more households to be served, including some households not targeted by EmPower New York. Staff is projecting a 50% increase in homes served in year three and thereafter, with a ramp-up in years one and two. Expansion of EmPower New York will allow additional services to be provided to WAP participants beyond the WAP services and also targets payment-troubled customers. The two programs together provide a good set of services for the low income sector.

Under the WAP program, blower door assisted audits will be used to identify air-sealing opportunities. A whole-house approach will be used with a goal of providing all cost-effective electric and gas energy saving measures, including insulation, weather stripping, caulking, space and water heating systems repair and replacement, and electric lighting and appliance replacement with ENERGY STAR® fixtures and appliances. The EmPower New York program provides additional services not covered by WAP, with an emphasis on measures that save electricity. For both programs, an eligibility criterion will be used that is the same as that used for the current WAP and EmPower New York programs, as well as the HEAP program; household income must be at or below 60% of the state median, adjusted for family size. Service will be provided at no cost to participants.

Real World Experience: Both the EmPower New York and WAP programs have extensive experience. The EmPower program, for example, has been recognized by the American Council for an Energy-Efficient Economy as one of the U.S.'s most exemplary low-income programs.

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[20] EmPower New York also has been used as a vehicle to deliver gas efficiency improvements to low-income gas heating customers with separate utility funding outside the SBC under National Grid's Low Income Gas Efficiency Program, approved in Cases 05-G-0668 and 07-G-0733.

Another example of successful services in this sector is Connecticut Light & Power Company's Weatherization Residential Assistance Program (WRAP), which in 2006 helped 10,192 low-income customers save energy and improve living comfort. 2006 WRAP program energy savings were 10,814 MWh, yielding a peak load reduction of 1.4 MW. Similarly, United Illuminating Company's UI Helps low income program served 6,500 customers and saved 8,105 MWh and reduced peak loads by 1.1 MW. And, Southern California Edison's Low-Income energy efficiency program served 53,017 low-income customers. Energy savings were 26,753 MWh and peak load reduction was 5.8 MW.

Benefit/Cost Estimate for Fast Track Program: Expand EmPower NewYork 2.5 through 2012
Expand WAP 1.2 through 2012

Importance: There are approximately 2.2 million low-income households statewide that meet the family income criterion described above. Current programs serve only a small fraction of those that are eligible.

The Commission Order initiating the EPS case states that the ALJ and parties should:

> Develop energy efficiency programs to ensure all New Yorkers, especially those with low incomes, have the opportunity to benefit from lower bills resulting from lowered usage and consider environmental justice concerns in program design.

Low-income families tend to live in older building stock that was built when energy was far less expensive and that has been less well maintained and is generally less energy efficient than other housing in the State. Consequently, there is a large potential for cost-effective savings per household in this sector. Because existing programs are unable to serve all eligible customers as a result of inadequate funding, expanding application of existing programs is an opportunity to use this large energy efficiency resource and to better serve this segment of the population. The program will produce additional, non-energy benefits, such as improved housing stock and better health and safety conditions for low-income residents.

Also, low income families tend to spend a larger portion of their total income on energy costs and can be at risk of losing utility service because they can not afford their energy bills. Energy efficiency and weatherization programs are among the most effective long-term strategies for making energy bills more affordable for low-income New Yorkers.

Further, programs for low-income customers promote environmental justice. Parties in this case have commented that EPS programs can promote environmental justice by ensuring that customers that otherwise cannot afford to make bill-saving energy efficiency improvements, and those that have traditionally borne a disproportionate share of the environmental cost of energy generation, distribution and use, receive services under EPS programs. Some parties have specifically urged that the EPS program should address the long waiting lists for WAP program services that currently exist in many parts of the state. The program can, therefore, effectively serve multiple policy goals.

Major Barriers: Lack of timely, accurate information about cost-effective energy savings opportunities, a barrier in all residential settings, applies to the low-income marketplace and the problems caused by this barrier are exacerbated by limited ability to finance these improvements. Low-income families are less able than others to afford investments in even the most cost-effective energy efficiency measures despite the potential for net energy bill savings over the long run. Landlords of apartment buildings may not be able to recover the energy efficiency investment costs in acceptable time frames without making rents unaffordable for tenants. The nature of the "split incentive" problems depends on whether utility costs are included in rents.

Currently, access to funding needed to provide low income energy efficiency programs is a major impediment to fully addressing the needs of the targeted customer sector. For example, waiting lists of two or more years for WAP services are common in many parts of the State.

Program Delivery: Both NYSERDA and the Division of Housing and Community Renewal have established state-wide networks to deliver services to the targeted sector and both should continue these programs with expanded funding to serve more households. These programs employ Independent Energy Efficiency Service Providers, including community-based organizations, to install the energy efficiency measures.

8. New York City Apartment Building Energy Efficient Program Design (electric and gas)

Current Practice in New York: Currently, NYSERDA operates several programs targeting multifamily buildings, but these mostly serve townhouses and low-rise buildings. There is no current New York energy efficiency program targeting high-rise apartment buildings. While this program does not exist in the form presented here, it is needed to address an underserved market in New York City.

Description of Fast Track Program: The program will include the following features:

- Incentive payments for specific measures:
  - Common area lighting
  - Efficient air conditioning or combined heat and cooling units
  - Gas heating or water heating efficiency upgrades
  - Recommissioning measures
  - Customized incentive for the installation of a combined heat and power unit, where a minimum of 60% of the waste heat can be utilized on average, or for solar installations

- Other program features could include:
  - Free low-cost measures at the individual apartment level using a "blitz" approach in which the program notifies tenants in advance of the date and time of the visit and then goes door-to-door on the appointed day to deliver services, such as free CFLs and low flow showerheads and faucet aerators.
  - For buildings with room air conditioners, bulk purchases of replacement ENERGY STAR® (or even higher efficiency level)air conditioners, provided to

tenants at below the bulk purchase cost, provided the tenant trades in a functioning, existing room air conditioner
  - Training and certification opportunities for building managers related to operating building energy systems efficiently
  - Outreach efforts for building occupants about energy efficiency
  - Lost cost financing for installation of energy efficiency measures
  - Coupons for discounts on upgrading appliances to ENERGY STAR® rated appliances with even higher incentives for products meeting "Save More" efficiency levels

- The following participation requirements will apply
  - For coops and condos, the governing board has the clear authority to execute a project agreement without requiring individual owner consent or voting. Alternatively, a rental property can demonstrate that there is unlikely to be a tenant originated or other legal impediment to project initiation and completion.
  - Payment of 50% of the project assessment costs upfront. If 60% of the identified savings are covered in an executed project agreement, then the building's share of the assessment cost will be returned at the completion of the project.

- Incentives will be structured as follows:
  - The program will cover the incremental cost of high efficiency replacement equipment over the cost of a current standard efficiency replacement or the minimum efficiency required by governing authorities.
  - Combined heat and power or solar incentives will comport to NYSERDA incentives for those measures.

Importance: There are more than 82,000 multi-family apartment buildings, including coops and condos, in the metropolitan New York City area that have been underserved by existing energy efficiency programs.

Major Barriers: Since this is a new initiative, outreach and education for building owners and occupants of the target market will be essential.

Program Delivery: The possibility of implementing the program through the New York City Economic Development Authority (NYCEDC) should be explored. The NYCEDC currently does work with the City's real estate interests and oversees redevelopment projects within the City and, therefore, understands the unique aspects of undertaking such projects in the City. NYSERDA and the local utilities could provide support for program planning and implementation. If it turns out that it is not feasible for NYCEDC to undertake the effort, then NYSERDA, the utilities, or a third party entity could be considered for the lead administrative role.

B. Commercial and Industrial Energy Efficiency Programs

Energy efficiency programs for commercial and industrial customers typically have a much lower average cost per KWh than programs for other customer classes, especially in retrofit market segments. Programs that increase energy efficiency in commercial and industrial applications have an enormous potential to result in significant cost-effective energy efficiency savings that will need to be addressed to enable New York to achieve its EPS targets. For instance, the New York Energy $mart commercial and industrial programs use 34.6% of the SBC funding, yet are achieving 76% of the GWh savings and have the highest benefit/cost ratios. The keys to encouraging customer participation in these programs are taking advantage of opportunities to let customers know that assistance is available and making it straightforward for customers to participate. Small commercial and industrial customers are concerned with payback periods and upfront investments, so low interest loan programs or on-bill financing can be effective methods for encouraging customer participation. The NYPA approach of a turnkey program that includes energy audits, design services, construction, and project management services, with access to low cost financing, is an especially appropriate methodology for these customers.

Below is a list of fast track programs for commercial and industrial applications that can be designed to be implemented in 2008.

1. New Commercial Buildings – "Whole Building Design" (electric and gas)

Current Practice in New York: NYSERDA has a program called High Performance New Buildings that aims at creating long-term changes in design practices by integrating energy efficiency and green building concepts into new building designs. The program offers a performance-based approach in which incentives are determined by total electricity savings and are tiered to reward progressively better designs. Through design team incentives and recognition, the program promotes green building projects as well as projects planned for Leadership in Energy and Environmental Design (LEED) certification.

Description: The goal of the whole building design approach is to create a high-performance energy efficient building by applying an integrated team approach during the project planning, design and construction phases. One aspect of the program will be to focus on achieving savings of around 30% per building, a level of performance that ASHRAE is targeting for its 2010 model building code. By familiarizing developers, architects, and engineers with this level of performance, New York can be an early adopter of the new ASHRAE standard. Incorporation of renewable technologies, such as geothermal installations, can help achieve the target savings levels.

Real World Experience: Two of the leading programs in the country are operated in the neighboring states of Massachusetts and Connecticut – the National Grid Design 2000 Plus and the NU/UI Energy Conscious Blueprint. Evaluations a few years ago showed that Design 2000 Plus was reaching about 50% of new commercial floor area being constructed and program staff believe that this figure has increased in recent years. The program emphasizes a comprehensive design approach that strives to reduce building energy usage by 20% related to baseline practice. Prescriptive incentives are also offered. Data from 2002 and 2006 indicate an average cost of saved energy of just over four cents per KWh. The Energy Conscious Blueprint program is generally similar but serves a larger area, has lower incentives, and includes a greater emphasis on technical assistance. In 2006, statewide, the program saved about 67 GWh and reduced summer loads by 13.5 MW, with total utility expenditures of $12.6 million. The cost of saved energy was about 1.8 cents per KWh.

Benefit/Cost Estimate for Fast Track Program: 3.9 (through 2012)

Importance: Businesses and institutional sectors account for about 50% of NY's primary energy use. Whole building design approaches reduce the "lost opportunities" for incorporating energy efficient equipment and energy systems in new buildings. Designing buildings to take advantage of energy saving opportunities (e.g., lighting controls, programmable thermostats, continuous commissioning equipment etc.) can significantly reduce energy usage and lower peak demand. Retrofitting these buildings later in their life will be much more expensive than building them right the first time, and may not be accomplished by 2015.

Major Barriers: As in all new buildings markets, the principal-agent problem typically splits the builder's incentive to minimize first costs from the final occupant's incentive to minimize total occupancy costs. In addition, the fragmentation of the construction industry limits optimizing building design and performance because the various energy-related components are rarely designed well to work as a system. Getting the key players/decision makers to the table early in the process is essential to the whole building design approach. In addition, adequate infrastructure (experienced and knowledgeable technical support in the various planning, design and construction sectors) needs to be in place to aggressively target the new building sector.

Program Delivery: NYSERDA currently has several programs that provide incentives to promote whole building design approaches through its "High Performance New Buildings" program. NYSERDA programs need to be reviewed to evaluate the potential to increase market penetration and the level of per unit savings (i.e., possibly increasing financial and infrastructure support to aggressively promote these programs to capture the energy savings potential for all

new commercial building construction). The roles that utilities and municipalities can play in program marketing needs to be explored. A program feature should be promoting these programs early in the planning phase to key customers in their service territories and offering assistance to the customer.

2. Small Business Direct Installation Program (electric and gas)

Current Practice in New York: There is no comparable direct installation program currently being offered in New York. However, LIPA has had experience with a program that involved extensive use of independent providers to install energy efficiency measures; LIPA's experiences should be considered when preparing the program design.

Description: This program will deliver energy efficient hardware retrofits for electric and gas customers, targeting small commercial/industrial customers with monthly peak demand or energy usage less than a designated amount. Eligible customers would be reached through a combination of direct outreach by contractors and utility customer representatives. Measures to be addressed in this type of program typically include lighting and selected refrigeration maintenance. Some programs pay 100% of the cost of measures, other require some customer cost sharing. The former has higher participation; the latter has lower costs. Additional research is needed before a recommendation on the best approach can be made. This concept could also be extended to include gas energy efficiency measures.

The energy efficiency provider, typically a utility, would work through a set of approved contractors and third-party implementers who are empowered to promote, enroll, and audit qualified customers to the program and to install measures at reduced or no cost to participants. On bill financing or low cost loans could also be included as part of this program. This combination of a dedicated delivery mechanism providing low cost installation and using local contractors and community agencies creates a powerful engine to encourage participation by historically non-participating customers.

Real World Experience: Two of the leading programs are operated in the neighboring states of Massachusetts and Connecticut. The Massachusetts program pays nearly all measure costs and, over a decade, served more than 30% of eligible customers at an average cost of saved energy of just over 4 cents per KWh.

Connecticut Light and Power (CL&P) runs the Small Business Energy Advantage Program, which provides turnkey, energy-saving products and services for small business customers. CL&P pays substantial incentives (50% of installed cost) for retrofit lighting measures and other eligible energy-efficiency measures and offers on-bill 0% financing for the remaining 50%, which lowers the cost to the utility to about 2 cents per KWh. The program targets all business customers with an average 12 month peak demand of between 10 KW and 200kW, with an emphasis on customers with loads below 50 kW. CP&L goes out to bid every two years and generally receives 50-60 contractor proposals. Contractors are asked to bid on 200-300 retrofit scenarios. Contractors must market the program, have varied geographic coverage, possess technical expertise, and provide a minimum number of leads and projects per month. Contractor performance is monitored quarterly and trends evaluated. Project costs can be as high as $30,000

with a project average of $10,000. The most recent year's program activity saw 900 projects completed. Program annual budgets range from $2.9-$3.1 million, but motivated contractors and interested customers oversubscribe the project. In 2006, the program saved approximately 518,159 MWh and reduced peak loads by 3.2 MW.

Southern California Edison has a direct installation program with a 2006-2008 project program budget of $48.4 million. Projected program impacts are estimated at 348,848 MWh and the program cost effectiveness, as stated by a Program Administrator Cost test ratio, is 3.82. The Program Administrator Cost compares the same quantifiable life-cycle benefits against implementation costs as NYSERDA's Program-Efficiency Test. In 2006, the program saved 62,706 MWh and reduced peak load by 9.6 MW.[21]

Benefit/Cost Estimate for Fast Track Program: 2.5 (through 2012)

Importance: Small businesses provide a significant source of historically untapped potential for cost-effective energy efficiency. This program is designed to overcome the barriers that typically prevent participation by this customer segment.

Major Barriers: Limited capital resources, lack of confidence in timely financial benefit and generally high finance option interest rates are the primary barriers to participation. In addition, the majority of these customers occupy short-term leased facilities. Consequently, there is also a split incentive barrier to adoption of energy efficiency improvements. Only direct installation programs address these barriers.

Program Delivery: This program would be administered by utilities, working with installation contractors that offer turnkey partnerships with local governments, community based organizations, and other selected organizations.

3. Solicitation to Meet Need for a Block of Energy Efficiency Funds (electric and gas)

Current Practice in New York: There is no comparable program currently being offered in New York.

Description: This program, designed primarily for industrial applications, would designate a block of money available for bidders to compete to obtain incentives with innovative project proposals. Qualifications and bid requirements explaining what would be accepted could be established ahead of time in a manner that will make evaluation of alternate proposals straightforward. Unlike NYSERDA's current C/I performance program, this program would be open to bids from end-users, in addition to the ESCOs and third parties who participate in the current NYSERDA program. Qualifying proposals would be selected based on cost per KWh or therm saved as well as some measure of the depth of savings achieved (to balance "cream skimming"). It may be useful to put a cap on the proportion of savings that come from lighting upgrades, so that this does not become primarily a lighting program. This is an easy program to put in place quickly and can be scaled up or down based on current needs. The program may have a limited lifetime if the program is heavily used, so this program should be thought of as a

[21] www.sce.com/nrc/aboutsce/regulatory/eefilings/quarterly/2006/4thQuarter2006EEReport032907.xls

jump start to stimulate interest in energy efficiency opportunities and to encourage creative approaches. Participation will also be affected by other retrofit programs offered at the same time, such as C/I Performance and Flex Tech.

Real World Experience: Northeast Utilities ran this program from 2000-2003, achieving savings of about 130 GWh and 13 MW from about 100 projects. The cost per lifetime KWh saved ranged from 1-1.5 cents.

Benefit/Cost Estimate for Fast Track Program: 3.3 (through 2012)

Importance: This could be a mechanism for getting significant energy savings measures in place quickly. Once short term goals are achieved, the program could be discontinued.

Major Barriers: Certain types of programs, such as lighting programs, are low cost and easy to achieve and could become the bulk of the program offerings. To encourage other types of ideas, the program announcement could include stipulations such as no more than 70% of the savings can come from lighting measures. Third party measurement and verification will be essential to ensure that measures have been installed properly and that expected savings have been achieved.

Program Delivery: This program is well suited to delivery by utilities or NYSERDA. Bids will likely come from ESCOs, and other third party vendors. Customers could be among the bidders for this program. The amount put out for bid could be scaled up or down depending on the pace needed to meet area or service territory specific goals and the performance of the program in relation to other options.

4. Commercial Building Retro-commissioning (electric and gas)

Current Practice in New York: NYSERDA currently offers the enhanced Commercial/Industrial Performance Program which offers several strategies to assist customers in obtaining financial incentives for energy efficiency projects. The program is divided into three tiers: Tier I offers pre-qualified incentives for the purchase and installation of energy-efficient equipment such as lighting and controls, motors, HVAC equipment, variable-speed drives, commercial refrigeration, and kitchen equipment. Tier II enables eligible participants to receive incentives based on KWh saved through the installation of energy efficiency measures. A technical engineering analysis of the energy savings is required. Tier III provides performance-based financial incentives to contractors/energy service companies who implement energy efficiency projects for eligible customers.

Description: This program will assist building owners and property management companies for large commercial buildings to tune up building systems and initiate on-going operations and maintenance programs. The tune up process, often called retro-commissioning, is somewhat similar to new building commissioning, but is designed for existing buildings. Opportunities abound to promote efficient lighting, advanced building controls, building management systems, advanced heating, ventilation and air conditioning (HVAC) system, and other energy efficiency measures. Customers will be made aware of energy efficiency opportunities available to them and will be offered support in installing cost effective measures.

The program will include initial scoping studies to assess whether a building is a good candidate for retro-commissioning (using procedures developed in a recent NYSERDA pilot program), commissioning services for buildings where appropriate, using experienced commissioning providers, technical and financial assistance for implementing commissioning recommendations, assistance developing on-going operations and maintenance procedures, and building operator training and certification (a program that has been very successful in New England and other regions and has recently been piloted in New York).

Real World Experience: Centerpoint Energy (serving greater Houston) began its Retro-Commissioning Program in 2004, successfully completing five projects and meeting its energy savings and cost-effectiveness goals. The program targets buildings that are 300-400 thousand square feet and have a high energy-use per square foot. The facility owner must be willing to commit to implementing a minimum of $10,000 in efficiency measures. Managed by a third party administrator (Nexant, Inc.), the program provides participants with a free planning phase engineering study and a detailed investigation study. However, completing implementation of the project is the responsibility of the building owner/facility representative. Sixteen projects were completed in 2005 and another 15 projects were taken on in 2006. Completed and verified savings from 9 of the 15 projects in 2006 resulted in program savings of 3,234 KW demand reduction and over 12 million KWh in energy savings.

Xcel Energy's Recommissioning program is an example of another successful model. The program covers up to 50% of the recommissioning study cost through incentives (up to $15,000) and provides rebates of up to $200 per KW for implementing measures (for measures with a 1-15 year payback). In 2006, its program that operates in Minnesota has achieved cost-effective savings of 1,455 kW, over 12 million KWh in electricity savings, and natural gas savings of nearly 64,000 MCF. Thirty-five buildings implemented measures to achieve these savings.

Benefit/Cost Estimate for Fast Track Program: 6.0 (through 2012)

Importance: There are still significant opportunities for energy usage and demand reductions in the existing building sector. Savings of 10% or more are common with retro-commissioning since many buildings are not properly maintained. A variety of previous studies have found that retro-commissioning offers some of the largest energy-efficiency savings opportunities due to substantial savings per building and the large number of buildings that can benefit from commissioning. Many of the savings achieved are with HVAC systems, and thus peak demand savings are also substantial. Retro-commissioning has moderate costs per KWh and therm saved, making it highly cost-effective. Retro-commissioning particularly makes sense for buildings of 100,000 square feet and up. Consequently, we recommend that initial efforts target the New York City area, with its substantial number of large buildings.

Major Barriers: Barriers that need to be overcome include high first costs for building owners, split incentives between the owner/occupant, lack of customer knowledge about available technologies, lack of technical assistance (infrastructure support), insufficient outreach and education, and length of the payback period. Many building owners are unfamiliar with retro-commissioning and there are a limited number of service providers in New York. Addressing

these barriers will take time and thus this program should start gradually and steadily build. Program design should include easy customer access ("one stop shopping") to technical assistance and access to affordable financing for energy efficiency measures.

Program Delivery: NYSERDA has done several pilot retro-commissioning programs, and thus is well-positioned to take the lead. New York City featured retro-commissioning prominently in its *Greener, Greater New York Plan* and can play a useful role. For example, a new program at CUNY is modeled after a Texas program that has played a central role in developing commissioning for existing buildings. Overall, these programs can be delivered by NYSERDA, LIPA, and NYPA with utility and ESCO support.

5. Commercial Target Sectors (electric and gas)

Current Practice in New York: NYSERDA has a program called Business Partners that focuses on market development, where business partners agree to work with NYSERDA to promote energy-efficient products and services. In exchange, business partners gain access to special training, tools, guidelines, and performance incentives. NYSERDA has also recently begun a pilot Energy Smart Focus Program to target schools, commercial real estate, and several other commercial sectors in a focused and sustained manner.

Description: To obtain deep market penetration, it can be helpful to determine the networks in which key customer segments participate, such as real estate management groups, hospitals, and higher education engineering associations, retailers associations, contractors associations, etc. This allows the program to reach the entire network through a focused effort and also builds credibility and confidence in the programs. Utilities can help recruit participants and stimulate interest in the program.

By concentrating on building sectors that are especially common in New York, much experience can be gained and readily replicated and existing networks within these sectors can be used to help "spread the word". This program will identify 3-5 commercial sectors to target and will work with leaders and trade associations in each sector to develop appropriate services, incentives, and case studies. This approach is now a cornerstone of several leading commercial sector programs including target sector programs, as described below. Many useful resources can also be provided by the EPA ENERGY STAR® Buildings program. NYSERDA has already begun to focus on the school, healthcare, commercial real estate (e.g., rental office buildings), state buildings, and hospitality (hotel/motel) sectors through the Energy Smart Focus program; these are likely targets for an expanded effort.

Real World Experience: The Northwest Energy Efficiency Alliance is now focusing its commercial sector efforts on three sectors – hospitals, groceries, and commercial real estate. The hospital initiative was started first and is already working with hospitals accounting for 31% of the beds in the region, primarily by focusing on hospital chains and large community hospitals. Initial results are 10-20% energy savings in existing hospitals and higher savings in new construction. Connecticut Light and Power has similarly targeted the hospital sector with a program administered by the Connecticut Hospitals Association that provides no-interest loans for energy-efficiency projects, targeting the 31 acute care hospitals in the state. The program

also provides technical assistance to the Hospitals and includes quality assurance by independent contractors. The scope of work and contractors to do the work are selected by the hospitals.

In Rhode Island, National Grid has had a special focus on schools and has provided services to more than 50% of the schools in the state. National Grid and Connecticut Light and Power have also provided focused services to municipalities and state facilities in their service areas. National Grid, in addition to focused attention from their suite of efficiency programs, helped support the development of new rules for state facilities to specify that new buildings must be LEED certified, including a minimum of 20% energy savings over ASHRAE standard 90.1-2001 (a national model building code).

In Vermont, sector-based approaches are a substantial part of the marketing efforts. Likewise, the major California utilities have reorganized their commercial programs to focus on more than a dozen major sectors. For example, in 2006, Southern California Edison's Business Incentives and Services program provided energy efficiency incentives and energy surveys, resulting in annualized energy savings of 255,879 MWh and 40.2 MW in peak load reduction. Impacts are tracked by sector and are summarized below:

SCE 2006 Impacts by Commercial Segment	kWh	kW	% Energy
Agricultural	2,371,405	284	0.9%
Assembly	12,691	1	0.0%
College/University	368,539	70	0.1%
Grocery Store	13,175,389	879	5.1%
Hospital	1,511,714	205	0.6%
Hotel/Motel	14,555,868	1,756	5.7%
Industrial	88,975,289	11,671	34.8%
Medical Clinic	1,910,771	224	0.7%
Miscellaneous Commercial	72,203,416	13,025	28.2%
Nonrefrigerated Warehouse	17,584,550	3,893	6.9%
Office	12,216,782	2,671	4.8%
Refrigerated Warehouse	4,600,760	1,008	1.8%
Restaurant	4,913,605	313	1.9%
Retail Store	18,254,893	3,446	7.1%
School	3,223,052	744	1.3%
	255,878,725	40,188	

Benefit/Cost Estimate for Fast Track Program: 1.5 (through 2012)

Importance: The school, healthcare, commercial real estate, state/municipal government, and hospitality sectors account for a large percentage of commercial building floor area in New York. Reaching these sectors can provide large energy savings.

Barriers: Barriers vary by sector but can include split incentives (fuel costs are passed onto tenants), lack of knowledge by owners and operators of best practice energy management techniques and competing priorities for management attention.

Program Delivery: NYSERDA is already operating a pilot program of this type, however, utilities or third parties should be considered for lead implementation roles. Key trade associations in each sector should be heavily involved and appropriate roles discussed for local

utilities. ESCOs may also decide to specialize in delivery of energy efficiency services to particular market segments.

NYPA, by law, plays a major role in providing energy efficiency services to schools in the state. It also has played a large part in improving energy efficiency in governmental buildings. Opportunities for an expanded NYPA role in other sectors of the New York State economy should also be explored, along with an examination of the role that NYPA might play in financing these projects.

6. Commercial Lighting Rebate Program (electric)

Current Practice in New York: NYSERDA currently offers two programs – the Smart Equipment Choices and the Small Commercial Lighting programs that provide rebates for installation of efficient lighting. However, these programs are budget limited and not heavily promoted.

Description: This program would offer pre-determined rebates based on specified energy efficient lighting installations. For standard fixtures, rebates could be obtained at the check-out counter. The program could also be offered on a targeted basis to buildings that are preparing to undergo large scale lighting changeovers. This is a relatively easy program to put in place quickly and can be scaled based on current needs. The program may have a limited duration if it is heavily used. Therefore, it can be designed to stimulate interest in energy efficiency opportunities and to capture substantial savings in the next few years. Measures to be emphasized include "Super T8" fluorescent lamps and ballasts, pulse and ceramic metal halide lamps, and occupancy sensors. These are significantly more efficient than the T8 lamps and ballasts and probe start metal halide lamps promoted in the 1990s.

Real World Experience: In 2006, Southern California Edison's Business Incentives and Services program provided energy efficiency incentives and energy surveys resulting in lighting efficiency upgrades yielding annualized energy savings of 117 GWh and 21.2 MW in peak load reduction.

Benefit/Cost Estimate for Fast Track Program: 3.8 (through 2012)

Importance: This is a key program for getting significant energy savings measures in place quickly. Lighting accounts for approximately 40% of commercial electricity use and the measures discussed above can reduce this usage by 15% or more.

Major Barriers: The major concern with this program is the substantial amount of interest that it may generate, so controlling the level of intake will be important. Customer rebates above a certain level may need to be pre-approved and rebates may need to have strictly controlled expiration dates to avoid oversubscription. In developing program details, attention will be paid to such items as ballast factor and fixture spacing so that the more efficient products primarily save energy without significant increases in lighting levels.

Program Delivery: This program should be developed as a statewide program (common measures and incentives) with delivery either by NYSERDA or utilities.

7. Flex Tech Including Industrial Process Improvements (electric and gas)

Current Practice in New York: NYSERDA's Flex Tech Technical Assistance program provides customers with objective and customized information to facilitate wise energy efficiency, energy procurement, and financing decisions. The program is available to all commercial and industrial customers. Cost-shared technical assistance is provided for detailed energy efficiency studies from energy engineers and other experts. Small customers are eligible for quick walkthrough energy audits, with the cost share reimbursed upon implementation of recommendations. Participants may use NYSERDA-contracted or customer-selected consultants.

Description: Flex Tech has been one of the most successful programs under the NYSERDA electric SBC set of programs. The program provides cost-shared technical assessments of specific energy-saving opportunities to large commercial and industrial customers, using expert private consultants. Customers then implement a large proportion of recommendations, 70% at their own costs (the other 30% take advantage of other SBC incentives), resulting in an average cost of saved energy of less than ½ cent per KWh. Given the success to date, this program should be expanded. Staff estimates that the program size can be roughly doubled with increased expenditures.

Flex Tech is also the primary SBC program that serves industry and it is the industrial portion of the program in particular that should receive extra attention and resources in a program expansion. Industry typically requires "boutique" approaches to energy efficiency. Each production line is different, so a targeted approach is necessary to ensure that all energy efficiency improvement opportunities are identified and addressed. Industrial applications often involve motors and lighting projects. Since the NYSERDA Flex Tech Technical Assistance program has been successful, with large, highly cost-effective savings and good feedback from customers, we propose to significantly expand these programs with larger budgets, more technical assistance providers, and increased outreach.

Real World Experience: Connecticut Light and Power (CL&P) has a program, known as Process Reengineering for Increased Manufacturing Efficiency (PRIME) that seeks to lower costs through reduced energy consumption, improved manufacturing productivity, reduced inventory requirements and associated costs, and reduced floor space requirements. Customers with average demand of 1500 KW or less are eligible. CL&P provides 100% reimbursement of the cost for qualifying projects. Manufacturers can pre-qualify via an energy audit.

NYSERDA's Flex Tech program is one of the most successful programs in the country and received recognition as a "Best Practice" program by ACEEE in a 2003 study, one of 35 programs receiving this recognition nationally. As of March 31, 2007, this program has achieved savings of 738 GWh per year and peak savings of 136 MW, at a cost of only $22.1 million, making for an average cost of saved energy of 0.3 cents per KWh.

Benefit/Cost Estimate for Fast Track Program: 1.3[22] (through 2012)

Importance: Industrial applications provide opportunities for large energy efficiency gains with relatively short pay back periods.

Barriers: Customers are reluctant to spend money on capital improvements that have multi-year pay back periods. Many industries do not want to risk interruptions or losses in production lines that efficiency investments may introduce. Credibility and quality of technical assistance is essential.

Program Delivery: NYSERDA with support of utilities. Selected experts with credibility in key industries should also be engaged to overcome barriers to acceptance. Services will largely be delivered by specialized engineering contractors selected via a competitive bidding process.

C. Cross-Cutting Program – Residential, Commercial, and Industrial Sectors

Enhancements to building codes and appliance and equipment standards have a huge potential to help New York State achieve its energy efficiency goals. As shown in Attachment 4, nearly one third of the EPS target levels could be achieved through increased attention and focus on improving the energy efficiency building codes and appliance and equipment standards.

Building Codes

The New York State Energy Conservation Construction Code (Energy Code) is mandatory across New York State for all new construction and substantial renovation of residential and commercial buildings. New York's Energy Code is a component of the broad health and life safety Buildings Code and is linked to the International Energy Code Council (IECC) documents and update cycles. The New York State Department of State (DOS) administers and supports the Energy Code; local municipalities and their code officials enforce it. The code officials usually conduct building plan reviews and field inspections for residential buildings. For commercial projects, the code officials (while still responsible for plan checks and buildings) may rely more heavily on certification of plans by architects and engineers.

[22] Note: This calculation will be rechecked since a recent evaluation of the current Flex Tech program found a B/C ration of 3.1. Reasons for differences between the two estimates will be investigated.

NYSERDA has provided technical analysis to Energy Code updates to assist the DOS and has secured federal Department of Energy grant funds to provide training, to support DOS participation in the national IECC process.

Updates to the Energy Code must comply with Article 11 of the New York Energy Law. Any proposed changes to the Energy Code must be cost-effective over a ten-year simple payback period. For 2010, ASHRAE is proposing to increase the energy efficiency level of the 90.1 standard to be 30% more stringent than ASHRAE 90.1-2004. The New York Energy Code has not been updated since 2001. This version of the Energy Code was based upon 2001 IECC and ASHRAE 90.1-1999. The new proposed 2007 New York Energy Code is based upon the following, with minor New York enhancements.

- Residential component based on 2004 IECC version
- Commercial Provisions are based on ASHRAE 90.1-2001

The Energy Code Technical Subcommittee has completed a review of the proposed code updates, along with the review by the Code Council. The proposed Energy Code has gone through review by the Governor's Office of Regulatory Reform and a public review process. The new 2007 Energy Code is scheduled to go into effect later in 2007.

Appliance and Equipment Standards

In mid-2005, New York amended its Energy law to authorize the development of appliance and equipment energy efficiency standards for 14 products. Subsequently, Congress established federal standards for 10 of the 14 products, preempting state standards in these areas. New York is in the process of establishing standards though the regulatory process for the four remaining products specified in the 2005 law. As part of this effort, New York has participated with other states in developing a multi-state certification system. New York is also considering

establishing efficiency standards for a number of additional products. Of the new products, standards for light bulbs will deliver, by far, the largest energy and environmental benefits. Standards for two of the products, residential furnaces and boilers, would require waivers of preemption from the federal government. In related activities, New York has established energy efficiency purchasing standards applying to equipment for state agencies in 18 product areas to decrease energy usage.

1. Appliance and Equipment Standards and Building Codes

Current Practice in New York: In 2005, the New York State legislature enacted new state appliance and equipment efficiency standards on several products. Some standards were set in the legislation while others are being developed by NYSERDA and the DOS. New York State, represented by NYSERDA, sometimes participates in rulemakings and negotiations on federal efficiency standards but time for this activity is limited. DOS, with input from NYSERDA and others, is responsible for revisions to the energy sections of the state building code. Further state-specific amendments to this code are now being developed by DOS, with hope of finalizing this amendment in 2008.

Description: Appliance and equipment standards can result in large, highly cost-effective savings. New York has used these strategies for many years, but in order to meet the EPS goals, efforts should be redoubled. There are also likely to be increased opportunities for progress on standards and codes in the next few years due to pending federal legislation, opportunities for state legislation, pending federal rulemakings on standards for more than 20 products, a new commercial building standard now being developed by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), and activities on Long Island to adopt residential building codes based on ENERGY STAR® specifications.

To address this opportunity, this initiative will have several components:

1. Providing input to the Lieutenant Governor's taskforce on opportunities for new state efficiency standards, building on standards either adopted or pending in other states.
2. Participating actively in federal rulemakings and federal legislative activities to urge adoption of standards which are in the best interests of New York State.
3. Doing preparatory work and participating in the ASHRAE process, so that New York can be an early adopter of the new ASHRAE standard, when it is completed (ASHRAE's goal is to reduce energy use 30% compared to the current standard, a standard that is likely to be contained in the 2008 version of the New York State Energy Code).
4. Assisting interested municipalities in developing workable codes and procedures based on ENERGY STAR® Home specifications, and efforts to adopt these codes and procedures statewide.
5. Providing training to building code inspectors as updated codes are implemented

Real World Experience: The California investor-owned utilities helped underwrite codes and standards development efforts in that state and an evaluation of their efforts attributed savings of about 600 GWh/year and 180 MW three years after completion, with savings steadily mounting in the latter years as more equipment is replaced and more new buildings are constructed.

Benefit/Cost Estimate for Fast Track Program: 8.9 (through 2012)

Importance: Preliminary estimates are that these measures can save more than 10,000 GWh in 2015 and more than 2,000 MW of peak demand in New York. These savings can be achieved at low cost since benefits are typically several thousand times the direct costs of standard and code development and adoption. Even when the higher cost of efficient equipment is included in the calculations, benefits are typically at least around five times costs.

Major Barriers: Manufacturers and contractors most affected by new standards and codes frequently object to standard and code changes. The legislative and regulatory processes can be slow and cumbersome at times.

Program Delivery: A full-time coordinator should be hired to lead this effort and have a moderate budget to hire consultants to perform technical work to develop and analyze possible new standards and codes for New York. This staff person would probably be a state employee; NYSERDA is already heavily working in this area and could also play a role in coordinating this effort. The Department of State, which has legal authority for code revisions, should also be involved. Utilities can also lend support to these initiatives, as they have done in California. We recommend a budget for code training since building codes are implemented locally and good implementation can reduce building energy use significantly.

The table on the next page shows the projected savings that are possible through a concentrated effort to improve building codes and energy standards. As the table shows, the potential savings are 10,500 GWH, 2,100 MW of peak capacity, and 19 trillion Btu of natural gas. This is an area that deserves further attention and follow-up.

Appliance and Equipment Standard Savings in New York State in 2015

Category and Product	Effective Year	New York State Savings GWh	MW	Billion Btu
Federal legislation - 2007				
BR and R20 reflector lamps	2008	389	96	
External power supplies	mid 2008	333	46	
Metal halide lighting fixtures	2009	354	116	
Walk-in coolers and freezers	2009	162	38	
Residential dishwashers	2010	9	3	134
Electric motors	2011	72	20	
Residential dehumidifiers	2013	33	11	
Residential boilers	2013			736
General service incandescent lamps	2012-2015	3537	435	
Subtotal		4890	764	870
Federal rulemakings				
Distribution transformers	2011	101	12	
Fluorescent lamps	2012	646	175	
Incand. reflector lamps	2012	502	136	
Ranges & ovens	2012			431
Clothes washers (commercial)	2012			134
Supermarket refrigeration	2012	129	25	
Commercial boilers	2012			192
Water heaters (res)	2013	31	6	
Water heaters (res)	2013			1,019
Pool heaters	2013			178
Beverage vending machines	2013	24	5	
Direct heaters	2013			100
PTACs/PTHPs	2013	26	21	
Refrigerators	2014	128	16	
Fluorescent ballasts	2014	176	48	
Clothes dryers (residential)	2014	27	7	
Clothes dryers (residential)	2014			67
Room AC	2014	23	27	
Battery chargers	2014	57	6	
Furnaces	2015			699
Subtotal		1,870	483	2,820
NY Standards the State could elect to establish				
Furnace fans	2011	480	31	
Fluorescent fixtures	2011	449	135	
HID ballasts	2011	314	47	
Nightlights	2011	163	12	
Neon sign power supplies	2011	153	10	
Microwave ovens	2011	146	7	
Subtotal		1,224	211	

Note: Items in the two categories above can also be included in state standards. There are also other opportunities for state standards.

TOTAL FOR STANDARDS		7,984	1,458	3,690
Building Code Savings in New York State in 2015				
Residential -- 30% savings	2011	853	231	7,187
Commercial -- 35% savings	2011	1,692	459	8,306
TOTAL FOR CODES		2,545	690	15,493
GRAND TOTAL -- STANDARDS & CODES		10,529	2,148	19,184

D. Fast Track Program Implementation Process

To effect the implementation of an enhanced energy efficiency portfolio in the first quarter of 2008, the Commission would need to approve programmatic implementation plans by early 2008. This timing would necessitate recommendations for new or enhanced energy efficiency initiatives which delineate program lead administration roles be presented to the Commission for approval soon after Staff's final report in the EPS Proceeding is issued in October. Once the Commission has approved the new EPS portfolio, then those entities designated as the lead administrator role for a specific program would need to file detailed program specific implementation plans in sufficient time to receive approval no later than March 2008.

E. Fast Track Coordination with SBC Programs

Implementation of the fast track programs is likely to require some adjustment and reprogramming of the existing SBC programs. Some SBC programs are recommended for enhanced funding and the provision of additional services. Other programs may need to be scaled down or phased out during the transition to avoid program duplication; some existing program implementation roles also may be restructured to allow for increased implementation support from utilities or third parties. Staff will address these issues in its final report.

Summary of Proposed Roles for Fast-Track Programs

Program	Current Situation	Fast-Track/Transition
Residential		
New construction expansion	NYSERDA and NYHBA run Energy Star New Homes program	Program expands, and continues to be run by NYSERDA and NYHBA. Utilities help with marketing.
Central air conditioning	LIPA runs a program on Long Island	Utilities or NYSERDA run program in southern part of state, coordinating with LIPA
Gas equipment	KeySpan program just approved. Other gas utility proposals pending.	All gas utilities run the same program (comparable eligibility levels and incentives). Coordinate marketing of Energy Star brand with NYSERDA.
Home performance with Energy Star	NYSERDA runs program	Program expands and continues to be run by NYSERDA
Gas retrofit lite	KeySpan has a more limited program just approved; not as comprehensive as Staff proposal	Either utilities run, making program more comprehensive than in utility plans or NYSERDA runs as a simpler option in association with Home Performance. In either case, marketing for Home Performance and gas retrofit should be coordinated.
CFL expansion (including fixtures)	NYSERDA runs program	Expand program; NYSERDA continues to run
Low-income - WAP	DHRC runs program	Program expands and continues to be run by DHCR
Low-income - EmPower NY	NYSERDA runs program	Program expands and continues to be run by NYSERDA
NYC apartment building program	No current program	Possibly NYCEDC develops and runs program with some help from NYSERDA, Con Edison and KeySpan
Commercial and industrial		
New construction	NYSERDA runs program	Program expands and continues to be run by NYSERDA. Utilities help market program.
Flex Tech (including industrial)	NYSERDA runs program	Program expands and continues to be run by NYSERDA. Utilities help market program.
RFP program	Con Edison has done some recent solicitations	Program could be run by utilities, NYSERDA, or third parties

Retrocommissioning	NYSERDA runs pilot efforts	Program expands and continues to be run by NYSERDA. Utilities help market program.
Small Commercial and Industrial	NYSERDA has lighting rebates for small customers	Transition to a direct installation program run by utilities
Lighting rebates	NYSERDA offers rebates but not heavily promoted	Transition to utility rebates, with extensive promotion
Commercial focus sectors	NYSERDA runs pilot program	Expanded program could be run by utilities, NYSERDA, or third parties
Cross-Cutting		
Standards and codes	NYSERDA provides analysis, Dept. of State prepares regulations. Both work on implementation.	Program expands with additional staffing and a training/implementation budget.

V. Evaluation and Monitoring

A. Evaluation

Evaluation and monitoring are key components of the EPS program. Reliable and rigorous evaluation and monitoring are necessary to monitor progress towards goals, evaluate the effectiveness of specific programs, identify ways to improve program services, document energy savings, and offer accountability to ratepayers and taxpayers. From a planning perspective, reliable forecasts and validation of achieved energy impacts are critical for estimating future electricity generation, transmission, and distribution requirements.

All programs that are selected to be part of the EPS program portfolio will be required to include a comprehensive evaluation and monitoring plan. The details of the plans will vary with the size, scope and type of programs, but all the evaluation plans will be guided by the core principles of providing reliable, timely, and transparent results. A comprehensive plan should include process evaluation (i.e., evaluation of program design, delivery, and implementation) and impact evaluations (i.e., measures to verify gross energy savings, attribute energy savings to the program, and identify other impacts such as job creation).

While Staff recognizes that there can be significant differences in program designs and evaluation strategies, it is important that the evaluation plans be based on agreed-upon evaluation framework and protocols. The evaluation process will need to review the EPS efforts, both at the individual program level and at the aggregate and cumulative levels, to track overall progress toward the Commission's EPS energy reduction goals. Achieving this objective will require consistency in the evaluation process. While we do not want to discourage innovative evaluation

techniques, we want to avoid having the EPS portfolio evaluated with a multitude of methodologies, which would result in incompatible data and confusing results.

The evaluation framework also needs to emphasize the need for early feedback on how new or enhanced programs are working in the field. Evaluation efforts should review how program delivery formats are working from the perspective of customers, service delivery entities, program administrators, and other key stakeholders.

Staff proposes the establishment of an Evaluation Standards and Protocol Task Force to guide the implementation of the EPS evaluation effort. This group would focus on issues such as establishing common terminology, direct measurement standards, statistical standards, and measurement and verification protocols. An equally important task in this area would be providing guidance to help coordinate the evaluation efforts, especially when customers may be participating in multiple programs, implemented by multiple organizations.

In addition, the issue of tracking energy savings initiatives across all sectors and delivery entities in a consistent manner needs to be addressed. For electricity, the methodology needs to be compatible with the New York Independent System Operator's (ISO) forecast and facilitate the measurement of whether or not energy efficiency is meeting the requirements of the ISO's Reliability Needs Assessment process and related processes. Budgeting methodologies also need to be compatible so that comparisons across organizations can be made on a comparable basis.

A second major responsibility of the Task Force will be to coordinate studies, funded by the EPS program implementers, and to address evaluation issues that cut across most program categories and are more effectively approached and funded on a statewide basis. Examples of possible projects include a study of the impact of EPS on the State's economy, an analysis of the best approaches to effectively quantify non-energy benefits, and baseline/market research.

Staff recognizes the need to balance evaluation costs and data reliability. While we are not prepared to specify an evaluation budget at this time, we expect that the budget would fall within a range of 2-6 percent of the overall program budget. Staff considers it important to target evaluation efforts at the programs most "at risk" (e.g., largest expected impacts; most critical resource needs, such as load pocket areas; biggest budgets; and most customers) and it is not always necessary to conduct a major program evaluation of every program, every year.

B. Reporting

Program evaluation can be a time consuming process and results for some programs may not appear for a year or more after program measures are implemented. All of the EPS programs must have a process for sharing program statistics on a quarterly basis. These reports should highlight progress indicators, such as the number of services provided, expenditures, estimated energy savings, and progress toward goals. In addition to the evaluation effort as a whole, the report format and terminology need to be coordinated so that the collective progress of the EPS portfolio can be regularly monitored.

C. Benefit Cost Tests

Benefit cost (B/C) tests can serve as valuable tools for assessing accomplishments and, on a prospective basis, screening potential programs. There are several B/C tests in common use to evaluate energy efficiency programs including total resource, participant, ratepayer, and program administrator. Each test has strengths and weaknesses.

The Total Resource Cost Test (TRC) has historically been, and continues to be, the primary test used by the Commission. Simply stated, the TRC calculates the benefits as the avoided energy costs attributable to the program as determined at the utility level. Costs are the sum of the appropriate program and customer costs. While the basic formula is simple, there can

be controversy over factors used, such as the exact determination of avoided energy costs and the appropriate rate for discounting future net benefits.

The TRC should continue to be the primary test used to assess program effectiveness. Staff recognizes that the TRC values non-energy benefits (e.g., environmental, economic development, and improved consumer health, safety, and comfort) as zero. As a result, programs with high societal value and a fairly high program expense per unit of energy saved, such as residential low-income programs, might fail the TRC test but still be important components of the EPS program portfolio. It also raises questions about the inclusion of environmental externalities as a benefit, especially when mitigation of global climate impacts is an important impetus for the implementation of the EPS program. In the early 1990s, the Commission allowed consideration of environmental externalities in the TRC and California currently includes them. While we endorse the TRC as the primary B/C test, it is also important to allow enough flexibility to guard against vital programs being eliminated, or not funded, because of a failure to pass this test.

It is also important to consider program-related costs that are not a component of traditional benefit cost tests. For example, some utilities are advocating generous incentives for successfully administering energy efficiency programs. These incentives can add considerable costs to program administration.

D. Bill Impacts

Staff proposes that the bill impacts should be calculated on a uniform basis for the various utilities. Moreover, Staff proposes that the following factors be considered for the bill impact analyses for each utility:

- Customer growth rate
- Sales growth rate

- Customer participation rate in energy conservation
- Average energy conservation rate by participating customer
- Commodity price savings
- EPS program cost
- Revenue decoupling mechanism reconciliation factor

Bill impacts will be calculated for participant and non-participants. Staff expects that customers participating in energy efficiency programs will experience bill reductions while non-participants will experience net bill increases. Depending on the level of involvement, program participants may see a wide range of bill impacts. For example, if a participant takes advantage of all available energy efficiency opportunity, his or her bill might be decreased significantly.

In general, all customers are expected to benefit from cost savings due to reduced energy and capacity purchases, and lower projected average market prices of energy; further benefits will result from the reduced future need for new installed capacity, reduced emissions, and increased economic development associated with the creation of new jobs . Historically, participation rates have been low, so to the extent they can be increased through new or expanded programs, bill savings for a greater number of customers should result.

Staff expects that during the course of the EPS Proceeding, program budgets will be determined and the method for allocating the program costs to the various utilities will be developed. Once the program costs have been allocated to the utilities, the method for allocating the costs to the various service classifications within a utility should be uniform for all utilities. Finally, Staff proposes that a Revenue Decoupling Mechanism, to remove financial disincentives to proactive utility participation in energy efficiency initiatives, should be modeled, and should subsequently be considered in individual rate cases.

VI. Quantification of an Energy Efficiency Goal for Natural Gas

A. Introduction

The EPS Proceeding uses as its electricity target, a goal of reducing electricity consumption by 15% by 2015. The Initiating Order in the EPS Proceeding did not, however, specify a companion goal for natural gas consumption. Since the goal was not specified, the Order Instituting Proceeding, issued on May 16, 2007, stated that "targets should also be established and programs designed to optimize the State's efficient use of natural gas."[23] Further, that Order directed that the ALJ and parties should "(d)evelop target goals and timetables for natural gas usage efficiency." Presented below is Staff's preliminary analysis using available resources to develop a recommendation for the statewide reduction of natural gas consumption, and the timetables for which the efforts should be undertaken. Staff's analysis indicates that a natural gas reduction target of 15% percent by 2015 may be feasible. It should be noted that this target applies to residential, commercial, and industrial firm load, and not total gas usage, as discussed below.

Some natural gas utilities currently have energy efficiency programs, and NYSERDA's SBC programs result in incidental natural gas efficiencies. A higher level of commitment can produce further natural gas savings. In addition, it is expected that changes to building codes and appliance standards would boost gas savings levels. Staff recommends that local distribution companies (LDCs) and NYSERDA work together to plan a core of statewide programs that would serve all firm gas customers and identify appropriate roles for the utilities and NYSERDA in implementing these programs. These programs should integrate with electric efficiency programs where reasonable. Following this process, by year's end, LDCs should be required to submit filings to the Commission outlining how they will implement their natural gas efficiency

[23] Order Instituting Proceeding, p. 3.

programs to meet the Staff's proposed goal, how programs will be administered, and describe the best mechanisms for doing so (e.g., should a gas energy efficiency surcharge be established or should LDCs instead contract with NYSERDA for services). Collaborative meetings should then be held by each LDC with interested parties and final individual LDC plans filed with the Commission for Staff review. Implementation would begin during the first quarter of 2008.

B. Natural Gas Industry in New York State

Although there are a total of 18 natural gas local distribution companies (LDCs) in the State, several are very small and therefore were not included in Staff's analysis, which focused on the major LDCs.[24] Generally, these can be divided into upstate and downstate regions, with Con Edison, O&R, KEDNY/KEDLI, and Central Hudson being considered downstate LDCs and the rest being considered upstate LDCs.

The downstate region has been experiencing steady natural gas load growth. Although use per customer has been declining due to weatherization and the replacement of outdated equipment with newer, more efficient models, new customer attachments have been continuing. These attachments result from both conversion of oil or electric heat/hot water customers to natural gas usage and from new construction. The downstate load growth continues to constrain existing capacity. The upstate region has relatively stagnant growth, with shrinking use per customer generally offset by new customer attachments, except in the case of NFG, which is experiencing shrinking throughput on an annual basis.

At the present time, National Grid, Con Edison, and KEDNY/KEDLI have natural gas efficiency programs in place, and NFG has a natural gas efficiency program pending before the

[24] Those LDCs are the following: Central Hudson Gas and Electric Corporation (Central Hudson), Consolidated Edison Company of New York, Inc. (Con Edison), Corning Natural Gas (Corning), KeySpan Energy Delivery (KEDNY/KEDLI), National Fuel Gas (NFG), National Grid, New York State Electric and Gas (NYSEG), Orange and Rockland Utilities (O&R), Rochester Gas and Electric (RG&E), and St. Lawrence.

Commission. Some natural gas savings have also been achieved as an indirect benefit of the electric efficiency programs administered by the New York State Energy Research and Development Authority (NYSERDA), funded by the System Benefits Charge (SBC) program.

C. Efficiency Potential

There are several factors which need to be considered when developing reasonable goals, timetables, and programs for natural gas usage efficiency. First, while use per customer of electricity continues to increase due to innovations in consumer products (such as computers, cell phones, etc.), use per customer of natural gas continues to decline due to the lack of new end-use applications, increased efficiency of space and water heating equipment, and building envelope improvements. Second, natural gas is an important fuel choice for the generation of electricity, including micro combined heat and power distributed generation applications. Third, some electricity applications have natural gas fueled alternatives, such as clothes drying and water heating, which are generally more efficient than their electric counterparts. Finally, natural gas competes directly in many applications with petroleum products, including residual and distillate products, but natural gas contributes much fewer greenhouse gas emissions than petroleum products when providing the same level of service.

The focus of this Staff analysis is on residential, commercial, and industrial natural gas usage efficiency. There is potential for increased natural gas usage from possible increased use of distributed generation, from the conversion of existing power plants to natural gas fuel from petroleum or coal, and the construction of new gas fired power plants. That potential is not quantified in this analysis.

The potential for reductions in natural gas usage due to cost-effective energy efficiency improvements consists of several elements. They are: the savings to be achieved via the new

efficiency programs, savings from existing natural gas efficiency programs, natural gas savings resulting from existing and possibly expanded SBC programs, and savings resulting from new building codes and standards. These elements are discussed below.

Potential Savings from New Programs

On October 31, 2006, NYSERDA released its study entitled "Natural Gas Energy Efficiency Resource Development Potential in New York" prepared by Optimal Energy, Inc. (Optimal Study). The Optimal Study objectives include:[25]

- Evaluate potential cost-effective natural gas efficiency savings (economic potential) in New York over a 10 year horizon
- Evaluate natural gas efficiency program designs and recommend programs for implementation
- Estimate the potential cost-effective natural gas efficiency savings in New York over a 10 year horizon resulting from the implementation of a portfolio of recommended efficiency programs given a specified funding level (program scenario)

The Optimal study concludes that the New York State economic potential is a 28% reduction in forecasted 2016 residential, commercial, and industrial gas demand. However, the authors of the study caution readers interpreting and using the analysis. They state that "the Economic Potential estimates do not account for market barriers to adoption of efficiency technologies or the costs of market intervention strategies to overcome those barriers." Based on the professional judgment of the authors, the maximum achievable savings potential is about 65% of the Economic Potential, or 18% of the expected 2016 residential, commercial, and industrial gas load, excluding power generation load[26]. The study finds the greatest potential savings could be realized from the commercial and residential sectors with the balance,

[25] Optimal Study, p. E-1. Optimal also performed a similar study for the Con Edison sales territory.

[26] The achievable savings as a percent of total gas demand (which includes power generation gas use) was not established, but would be about 12%, if use of gas for power generation remained unchanged from the predicted level.

approximately 14% of savings, derived from the industrial market sector. Costs associated with the maximum achievable savings, however, are prohibitive. Optimal estimates the net present value, in 2005 dollars, cost of the Economic Potential (28% savings) to be about $14 billion in net present value in 2005 dollars. However, Optimal estimates that costs to pursue maximum achievable savings would require spending about 30% in excess of measure costs to cover program delivery costs such as marketing, tracking, and monitoring, and evaluation, so that if the maximum achievable represents 65% of the Economic Potential, it would cost almost $12 billion (65% of $14 billion plus 30%) through 2015.

The Optimal Study offered a Program Scenario, which is a subset of the maximum achievable savings potential, at a funding level of $80 million per year for five years (or approximately 1% of statewide gas utility revenues). When developing the allocation of funds for this scenario, the study sought to meet certain goals, including: "maintaining equity across sectors by matching sector-level spending to existing sector revenues; providing low income services, set at 50% of the residential budget; and providing a balance between short-term resource acquisition efforts and long-term market-transformation benefits. In addition, the study sought to provide program services targeting all New York gas customers and to address all important end uses. Finally, the study explicitly designed the recommended programs around broad markets, rather than specific customers and technology types." Measuring the results after ten years, Optimal projects that the efficiency savings would be 1.5% of the forecast residential, commercial, and industrial gas demand,[27] with total program costs of $400 million.[28]

As part of its analysis, Staff reviewed other natural gas efficiency programs in the country, in addition to the programs currently underway at some of New York State's LDCs. Of

[27] It should be noted that Optimal included interruptible customers in its analysis.

[28] Total expenditures do not include needed customer investments. For instance, the LDC may give a rebate of $300 for installation of a high efficiency furnace, but the furnace may cost the customer $3,000.

these, the KeySpan program stood out because KeySpan has been administering a natural gas efficiency program at its New Hampshire and Massachusetts affiliates for about ten years. KeySpan recently proposed to extend that program to its New York affiliates. The proposal was approved by the Commission and commenced implementation on August 1, 2007. KeySpan estimated natural gas savings of about 1.5% in the third year of the program for a cost of about $30 million, or about 1% of 2004 combined total operating revenues for the two LDCs. KeySpan also indicated that it expected to experience savings in that range for an extended period of time, as much as ten years.

Staff sought to reconcile the differences between the results of the Optimal Program Scenario and the KeySpan Efficiency Program. First, KeySpan's initial estimates of savings percentages were based on 2005 actual throughput. When the percentages were recalculated as a percent of forecasted sales for the future period, the expected savings dropped to about 1.25%, since future load is expected to be higher. Second, the Optimal Study Program Scenario features expenditures for only five years. Optimal agrees that savings would certainly be higher in 2016 if expenditures continued at $80 million per year, after year five of their Program Scenario. Finally, the Optimal Program Scenario‘s program elements and expenditures differ from those of KeySpan.

The result of this analysis, to date, is that there appears to be a range of expected savings for the 2015 program year of about 6-10% of load, with spending of 1% of revenues. Additional analysis being performed by Staff will narrow this range.

KeySpan proposed ramping up its program spending to a level of $30 million for its New York affiliates, KEDNY and KEDLI, by the third year of the program. This fully ramped up

funding level equates to roughly 1% of the combined total revenues of the two LDCs. If KeySpan's program were expanded to cover the entire state, it would equal about $80 million.

D. Savings from Existing Natural Gas Efficiency Programs

During the gas year of 2006-2007, there were some efficiency programs in place that resulted in savings of expected natural gas consumption. These fell into two categories: LDC programs and NYSERDA programs. Although NYSERDA does not currently have any major programs which specifically target natural gas efficiency, savings of natural gas is an auxiliary benefit of many of the System Benefits Charge (SBC) programs it administers. According to NYSERDA, the cumulative annual fuel savings of natural gas resulting from their SBC programs for 2006 was 2,888,854 MMBTU, or about 2,889 Mdt[29] This equals about one-third of a percent of expected total residential, commercial, and industrial natural gas load for 2007 of 847,707,192 decatherms.[30]

Two LDCs, Consolidated Edison Company of New York, Inc. (Con Edison) and National Grid, had gas efficiency programs in place during 2006-2007. Both programs are administered by NYSERDA. In the most recent quarterly report, NYSERDA estimated that the Con Edison program saved customers a total of about 34 Mdt, which on an annual basis would equate to about 136 Mdt.[31] National Grid's program, which served only low income gas heating

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[29] New York Energy $mart Program Evaluation and Status Report, Year Ending December 31, 2006, Final Report, released March 2007.

[30] From the EEA load projections contained within the Optimal Study.

[31] Case 03-G-1671, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Gas Service, Gas Efficiency Program Quarterly Report for the Period Ending March 27, 2007, prepared by the New York State Energy Research and Development Authority.

customers, saved about 32 Mdt in the 2006-2007 gas year.[32] The total of these two programs represents less than a tenth of a percent of expected 2007 natural gas load statewide.

KEDNY/KEDLI recently implemented a natural gas efficiency program for the coming year; they estimate first year natural gas savings of about 843 Mdt for New York and 364 Mdt for Long Island. While NFG does not provide estimated savings for its program, if this program is as successful as KeySpan expects its own program to be, it should see savings in the neighborhood of 600 Mdt. Totaling all LDC programs and the NYSERDA existing program savings, current spending on natural gas efficiency should result in savings of about 4,864 Mdt for the upcoming year. This represents about 0.6% of existing firm natural gas load from programs operated in a single year. Many of these programs are just starting, so as further experience is gained some ramp-up in savings can be expected.

The existing natural gas efficiency programs statewide would deliver annual savings of just over five tenths (0.5) percent of 2015 expected natural gas load. After nine years of operation (2007-2015), savings will be roughly 5% of 2015 firm load. Since some of those savings result from NYSERDA's programs, a significant increase in SBC funding would result in increased natural gas savings. Overall, increases to gas utility programs could save an additional 1,300 Mdt per year and increases to NYSERDA program could save perhaps 3,800 Mdt per year.

E. Building Codes and Appliance Standards

Changes in building codes at the State level would make new construction in both the residential and commercial sector more energy efficient. Changes in appliance standards, such as making residential dishwashers or commercial boilers more energy efficient, could be

[32] National Grid Low-Income Gas Customer Energy Efficiency Program Quarterly Report for the Period Ended March 31, 2007.

accomplished through federal legislation or rulemakings or through New York State standards. It is expected that changes in building codes and appliance standards will result in savings of about another 2% of 2015 expected natural gas load.[33]

If existing programs, expected increases to the SBC programs, and expected changes in codes and standards are totaled, it would equal about 11% of expected 2015 load. If additional efficiency could be gained by implementing new natural gas efficiency programs totaling 2 to 6% of 2015 load, which is possible with spending of about 1% of total statewide annual natural gas utility revenue, savings of about 13 to 17% of 2015 load is achievable. Increasing spending on new programs to 1.5% of total revenues could raise that to the range of 16 to 20%.

F. Potential for Increased Gas Usage

There are some factors which need to be considered when developing reasonable goals, timetables, and programs for natural gas usage efficiency. First, while use per customer of electricity continues to increase due to innovations in consumer products (such as computers, cell phones, etc.), use per customer of natural gas continues to decline due to the lack of new end-use applications and continually more efficient space and water heating equipment, and building envelope improvements. Second, natural gas is an important fuel choice for the generation of electricity, including micro combined heat and power applications. Third, some electricity applications have natural gas fueled alternatives, such as clothes drying and water heating, which are generally more efficient than their electric counterparts. Finally, natural gas competes directly in many applications with petroleum products, including residual and distillate products, but natural gas contributes much less greenhouse gas emissions than petroleum products.

[33] An American Council for and Energy-Efficient Economy study shows that total saving from codes and standards is expected to be about 19,000 billion BTU of gas in 2015.

The focus of Staff's analysis is on residential, commercial, and industrial natural gas usage efficiency. There is potential for increased natural gas usage from possible increased use of distributed generation from the conversion of existing power plants to natural gas fuel from petroleum or coal, or the construction of new gas fired power plants. That potential is not quantified in this analysis.

It is possible that some electricity efficiency measures will cause customers to switch to natural gas appliances from electric appliances, which will result in increases in natural gas usage. Since it is often more efficient to run an appliance on natural gas than to use that natural gas to generate electricity and then run an appliance on electricity, it would be more efficient from a total fuel use perspective to use natural gas appliances.

It is also true that electricity efficiency measures often create substantial natural gas savings at the residential level. Due to thermal losses in the electricity system, one unit of electricity end-use savings results in several units of generation fuel savings. In this sense, some electricity-natural gas fuel switching measures may actually reduce natural gas usage in the larger natural gas market. This should be accounted for in developing fuel-switching policies and accounting methods.

Staff recommends that increased natural gas usage due to conversions and fuel switching be excluded from future calculations of energy savings. Actual savings from efficiency programs should be calculated before load increases from conversions and fuel switching are considered. Staff recommends that LDCs develop the data needed to separately account for increased gas usage due to such conversions.

G. Funding For Natural Gas Efficiency Programs

A bill surcharge, similar to the SBC on electric bills, could collect revenues for natural gas efficiency programs. However, three of the State's LDCs, namely KEDNY, KEDLI, and NFG, do not have electric divisions, and therefore have a limited relationship with NYSERDA and the SBC. In addition, there are substantial natural gas efficiency programs in place at KEDNY, KEDLI, and Con Edison, with a program being planned for NFG, as mentioned above, and a low income program at National Grid. For these reasons, Staff recommends that the Natural Gas Efficiency Surcharge (Surcharge), after being collected by the LDCs through customer bills, be split between NYSERDA programs and programs administered by the LDCs.[34] The split for each LDC should depend on the program in place at each LDC, and should be proposed by the LDCs as part of a filing to the Commission.

Total statewide revenues from the LDCs in 2006 totaled approximately $8 billion. Therefore, a Surcharge of 1% would result in $80 million of expenditures for efficiency programs. To place this in context, the current SBC is 1.42% of electric revenues. Natural gas customers are, for the most part, also electric customers who face potential increases in their SBC charges. For that reason, Staff recommends that ratepayers not face unreasonable natural gas bill impacts or pay twice for the same programs

The Surcharge should be collected on a volumetric basis from all firm customers, so that customers who use more natural gas will have an additional incentive to reduce their usage. It is recommended that the cost of the LDCs' existing programs be funded from the Surcharge.

LDCs that do not currently have natural gas efficiency programs in place or planned should be directed by the Commission to do so as soon as possible. Such programs should feature the fast track measures outlined in this report, and be funded by the Surcharge. Central

[34] It is expected that LDC run programs would be contracted out to vendors, such as ESCOs, to some extent.

Hudson, NYSEG, Orange and Rockland and RG&E should be directed to file a proposal with the Commission for review prior to implementation. National Grid should make a filing for all new elements over and above their existing low income program.

In preparing their filings, it is important that LDCs coordinate their efforts with each other and with NYSERDA to the fullest extent possible in order to avoid duplication and undesired intrusion into customers' lives. For the most part, Staff believes that most programs should be the same statewide, so that customers and trade allies do not get confused with differing program requirements from utility to utility. Such an approach is used for many gas programs in Connecticut, Massachusetts, and California where utilities work together to plan common programs that individual utilities administer in their service territories. In addition, since NYSERDA operates most current electric programs and there are natural synergies between many electric and gas programs (e.g., new buildings, home retrofits, etc.) Staff recommends that NYSERDA and the LDCs form a task force that will meet prior to LDC filings and to discuss and hopefully reach consensus on appropriate programs and roles for NSYERDA and LDCs. If LDC representatives and NYSERDA representatives are separately marketing similar programs and contacting customers for participation, it will lead to customer confusion and possible negative attitudes toward efficiency programs.

Staff recommends that interruptible sales and transportation customers of LDCs be exempted from mandatory participation in energy efficiency programs. Many of these customers are dual-fueled, with their alternative to natural gas being oil. Any increase to natural gas rates could cause them to burn more oil, which would result in higher greenhouse gas emissions. In addition, part of the margin resulting from sales to interruptible customers flows back to firm ratepayers and has the effect of reducing bills for firm customers. An increase in natural gas

costs to interruptible customers could result in reduced margin from these customers and increased bills for firm customers. Interruptible customers could, however, be given the option to participate in energy efficiency programs if it makes economic sense for them and does not cause them to simply switch to oil.

Attachment 1

Activities with the Potential for Significant Short Term Energy Efficiency Savings

This attachment captures ideas that do not fit into traditional end use energy efficiency program categories.

Addressing Barriers to Energy Efficiency

Form a working group to address key market barriers, especially the principal-agent/ split incentives issue and information transaction costs.

Examine process for customer enrollment in energy efficiency programs and look for ways to simplify/streamline the process

Identify barriers to contract for performance approaches to energy efficiency

Consider use of loading order concept used in California that puts energy efficiency first in order of methods for meeting load

Consider use of a green house gas adder when evaluating fuel use decisions

Continue to consider revenue decoupling initiatives in rate cases

Consider extending net metering to micro-CHP units

Appliances

Accelerate market transformation programs by:

- Meeting with key market players to develop a plan
- Accelerating retail information/promotion
- Adding incentives such as rebates since they are effective in ramping up market share
- Using rebates to drive the use of new energy efficient technologies (e.g., tankless water heaters, solar water heating) that currently have a small market presence
- Exploring bulk purchase options for appliance replacement

Work with other states to create more stringent appliance standards for lighting, appliances, and commercial equipment.

Bid Program

Examine concept of a white tag trading system (i.e., energy efficiency certificates)

Energy Audits

Rethink energy audit approach to make the process user friendly, to give customers a stake in the outcome, and to make sure that measures identified are actually installed. For professionals, develop analysis methods that go beyond the "parametric" screening approach that prioritizes measures one by one based on benefit cost ratio. To get deeper savings, bundles of measures with interactive benefits should be included in measure selection methods. For example, bundling efficient windows, lighting, and cooling measures can justify deeper savings and higher levels of investment than considering each measure singly.

Energy Efficiency Studies

Pay the design assistance costs for builders/designers that want to perform energy efficiency performance modeling/studies. This can be very effective in new construction and also in developing retrofit projects for larger and more sophisticated customers, such as in the industrial sector.

Financing

Make low or no cost loans available to customers that want to install energy efficient measures.

Financing is just one component in program design. Financing must be made easy for customers and bundled with other services needed to make a transaction occur. Creditworthiness is also a limiting factor that makes financing more effective for some market segments than others.

Explore on-bill financing options for C/I customers, including the possibility of services specified in utility tariffs.

HVAC

Accelerate market transformation by encouraging retailers to stock energy efficient systems, possibly by paying them incentives for dedicating shelf space to energy efficient models.

Set quality installation standards to make sure energy efficiency programs are not giving incentives for installing units that are larger than necessary or which have inadequate refrigerant charge or airflow. Distribution system efficiency should also be part of HVAC installation standards. Quality control procedures should also be included.

Encourage use of technologies that use existing HVAC equipment more efficiently.

Leveraging Opportunities

Increase the funding and application of the Energy Smart Communities program, which looks at comprehensive energy usage

Work with other states to propose strong federal appliance standards, discuss the concept of a white tag marketplace, and standardize M&V protocols throughout the region.

Work with the United States Department of Energy (DOE) to encourage strong new standards when EOE revises equipment efficiency standards. Also consider setting state equipment efficiency standards for products that are not federally regulated.

Use SBC and utility programs to familiarize builders, developers, and designers with advanced construction practices in order to facilitate periodic upgrades to state building codes.

Involve community organizations in installation of basic energy efficiency equipment, especially for low income customers.

Work with multi-family building owners to let them know of opportunities for energy efficiency funding available to them.

Engage major private sector actors, such as the real estate development industry, the finance industry, corporate leaders, and others to devise sector-specific, large-scale initiatives that go beyond current program designs.

Ensure that protocols for tracking the budgets and energy savings for energy efficiency programs are standardized so that programs can be compared on an apples-to-apples basis.

Train members of the community to do energy audits and install appropriate energy efficiency measures, especially in low income programs.

Lighting

Work with manufacturers and others in the supply chain to get a variety of high-efficiency lighting products into the New York market on an accelerated schedule. These include CFLs, but also high-efficiency incandescent products, LED products, advanced fluorescent and HID products, and others.

Get more CFL bulbs into customers' hands – there are a variety of options, including customer education about savings available, coupons (or in-store rebates) for subsidized light bulbs, partnerships with retailers and manufacturers, low cost bulbs sold by civic organizations, etc. Also, work "upstream" to provide incentives to manufacturers and retailers.

Subsidize the cost of fixtures that use CFLs, focusing where possible on pin-based or other "hardwired" solutions.

Provide incentives for use of lighting occupancy sensors (e.g., lights come on when you enter a room and go off when you leave it).

Consider a direct installation lighting program for small C&I customers.

Examine opportunities for energy savings associated with street lighting and traffic signals.

Measurement and Verification

Consider aligning the measurement and verification protocols with those being developed for other policy initiatives, such as RGGI.

Gather better data on how much electricity the average NY household uses for various types of applications – Use this information in the development of cost curves and to determine the persistence of measures.

Motors

Investigate additional opportunities to encourage use of energy efficient motors. Largest savings are in larger motor systems, where adjustable-speed drives and control systems and system optimization approaches can significantly reduce total usage beyond nominal motor efficiency.

Opportunities with Additional Funding

Allow more customers to participate in successful energy efficiency programs that are currently oversubscribed.

Expand marketing efforts to the general public, such as the ENERGY STAR® campaign.

Give added focus to market ready, underused technologies (e.g.,hybrid cooling, LED lighting).

Outreach and Education

Get energy conservation messages to the public via multiple outreach vehicles (e.g., fairs, billboards, bill inserts, media ads, bus signs, mall kiosks, etc.).

Enlist senior elected officials, celebrities, sports figures, and other opinion leaders to appear in media programs and other channels.

Let the public know what steps they can take that are easy and inexpensive.

Use case studies to build the case for green buildings and continuous commissioning approaches.

Give away low cost energy efficient items at fairs, including bigger items as part of drawings.

Develop enhanced materials that teachers can request that address energy efficiency issues.

Use train the trainer sessions for teachers about energy efficiency topics. Link school-based programs to facility operational savings through programs like Green Schools.

Develop Speakers' Bureau to do outreach to community groups.

Develop materials for energy efficiency reviews that students can use with their families in their own homes.

Develop a smart living center that demonstrates energy efficient operations and can be used to train contractors on energy efficient installation techniques.

Programs to Reduce Cooling Load

Encourage use of programs that integrate load control with air conditioning.

Promote planting of shade trees to reduce air conditioning load.

Promote low solar heat gain windows in downstate window replacement markets.

Promote a Cool Roof program and explore other uses of spectrally selective materials, including roofing materials and paints.

Examine opportunities for more efficient refrigeration in grocery stores and food warehouses.

Rate Design

Investigate use of innovative cost based rate designs with the potential to encourage energy efficiency (e.g., peak activated pricing, rate discounts for beating established usage reduction thresholds, voluntary time-of-use rates for residential customers that encourage off-peak electricity usage, etc.).

Whole House Approaches

Expand the Home Performance with ENERGY STAR® Program.

Complement the Home Performance with ENERGY STAR® program with a simpler, less expensive approach emphasizing sealing of duct and air leaks. This approach will also allow many more customers to be served and will meet the needs of customers who do not want to pursue the full comprehensive Home Performance route.

Attachment 2

Activities with the Potential for Significant Energy Efficiency Savings in the Long Term

This attachment captures ideas that do not fit into traditional end use energy efficiency program categories.

Appliances

Investigate collaborative ways to improve energy efficiency of appliances and electronic equipment. Meet with manufacturers to develop collaborative approaches to making new generations of products dramatically more efficient. This may require a regional or national coordination approach.

Construction

Create a planning process that seeks to fully offset energy and demand additions for new construction, such that total program impacts more than compensate for the energy and capacity additions that flow from new service connections.

Update current building code standards and continue to update them on a frequent, streamlined timetable.

Examine California's building codes dealing with energy efficiency and determine whether any of these measures should be incorporated into the New York State building code.

Examine building code scope to include more electricity measures. Codes mainly target heating loads but could be expanded to include measures like residential lighting.

Create a time-dependent valuation method for building code compliance. This would place higher value on measures that reduce electricity usage at peak times. Currently, all BTUs are treated equally in codes – they should be differentiated based on their importance for utility system impacts.

Improve training for building inspectors. Link code training to voluntary high performance programs. Encourage new buildings to adhere to green building standards (e.g., LEED, Energy Smart Homes, etc.). Set minimum energy performance standards for LEED buildings.

Improve the building inspection process, including enforcement mechanisms, to ensure energy efficiency requirements are properly implemented.

Encourage municipalities to use higher building standards than state law requires (e.g., LEED as the base requirement).

Include energy efficient electronics and reductions in plug loads as part of updated building codes.

Increase the requirements to qualify for a NY Energy Smart home.

Participate in national efforts to design Zero Net Energy Buildings by 2030. In the meantime, use a Net Zero planning approach to the overall energy "footprint" of new buildings in the aggregate. This means making sure that total efficiency program impacts are high enough to more than offset energy and capacity additions from new buildings.

Encourage more energy efficient home and commercial building design through partnerships with architectural and engineering schools.

Work closely with the architect/engineer community in each major metropolitan area to achieve major shifts in design practices.

Develop a report card/home energy rating system for prospective homebuyers on the energy efficiency of appliances and the home as a whole.

Pay a bounty to builders that achieve a higher HERS rating than average.

Require a higher energy efficiency standard for buildings over a predetermined size. This could take the form of a progressive connection fee for every KW above a set minimum.

Monitor issuance of new building permits for C/I construction and intervene as early as possible to introduce energy efficiency information so that it can be used in the building design process. Develop a system whereby those seeking building permits automatically receive information about energy efficiency opportunities available to them or require them to certify that they have contacted NYSERDA and/or the local utility about energy efficiency programs.

Encourage utilities and municipalities to create incentives for high-efficiency new buildings, such as accelerated permit processing, reduced utility connection fees, and reduction of local impact fees.

Leverage the federal energy tax deductions for commercial buildings and tax credits for new homes. Consider renewing/expanding New York green building tax credits.

Install energy efficiency measures and take first year saving as payment (or partial payment).

Extend and expand New York State's Green Building Tax Credit Program.

<u>Data</u>

Determine which multifamily buildings and commercial real estate have the highest energy costs per square foot and concentrate energy efficiency programs at these locations.

Collect data on customer appliance usage using smart grid technology and design energy efficiency programs based on that information.

Use smart grids to provide customers with up to date information about how their energy is being used.

Education

Develop an energy efficiency curriculum for use in New York schools. Draw on past experience with Green Schools and other programs.

Leading By Example

Enlist prominent corporate leaders to endorse the state's program overall, and to make specific commitments to set accountable goals for their industries. Downstate, the real estate,finance, and corporate world offers opportunities that could generate major savings with low public investment.

Work with leading builders to develop energy efficient designs and encourage other builders to follow this example.

Work with government at all levels to implement energy efficient projects and advertise the resultant savings.

Set ambitious energy efficiency goals and challenge groups (e.g., universities or municipalities) to meet them.

Involve college students in on-campus efficiency programs.

Hold an annual awards ceremony for leaders in implementation of energy efficient measures.

Leveraging resources

Work with the Governor's Task Force on Renewable Energy to develop legislation needed to improve energy efficiency.

Include New York in energy efficiency initiatives already underway in other states.

Work with trade associations to develop low cost loan funding mechanisms for energy efficiency projects.

Lighting

Set a goal and develop programs of fully replacing all magnetic-ballast and T-12 lighting systems by 2010.

Create lighting catalogs, including an online version, that include CFL lights and fixtures, including hard-to-find items like dimmable CFLs and promote this through multiple channels.

Investigate programs to introduce expanded use of LED lighting as soon as practicable, including commercial refrigeration, commercial general illumination, and residential general service applications.

Marketplace opportunities

Create forward capacity market where energy efficiency and DG can participate – could use revenues to fund end use energy efficiency programs.

Allow additional opportunities for small customer aggregation to participate in demand response markets.

Consider planning that also includes the transportation sector.

Coordinate load management and efficiency program delivery. For example, air conditioning cycling could be marketed in tandem with air conditioner replacement programs. Private-sector companies like Comverge, Site Controls, and EnerNOC are actively developing demand response markets that also include efficiency technologies; they should be encouraged to create new channels for efficiency and load management delivery.

Metering

Expand penetration of sub-metering in master-metered multi-family buildings.

Expand time sensitive pricing to additional customers.

Offer a voluntary TOU rate for all customer classes, everywhere in the state.

Redesign residential voluntary TOU rates to make them more attractive to customers.

Examine potential applications for a smart grid using meters that enable two-way communication.

Consider a “critical peak” pricing program for residential and small C&I customers, such as California is now implementing.

Install upgraded meters that can capture better data on how electricity is used and that can provide two-way communication to allow for control of appliances, lighting, air conditioning etc.

Encourage use of automated demand response programs.

Design metering and communication protocols to support efficiency and load management program evaluation. Advanced metering offers the opportunity to better determine the load

shape impacts of efficiency measures, which is important in documenting the capacity benefits from efficiency programs.

Requirements that Energy Efficiency Measures Be Installed

Put requirements in tariffs that utility service will not be turned on unless specified energy efficiency measures are in place.

Have requirements for energy efficiency measures at the time of sale of a building and create financing mechanisms to allow for efficiency measures to be financed in mortgages.

Include requirements in economic development funding that specified energy efficiency measures must be undertaken before funding will be made available.

Allow utilities to establish electrical connection fees based on the energy efficiency of the building.

Metering

Revise metering rules to increase the number of situations where customers will be responsible for paying for their actual energy usage.

Introduce legislation that would require metering of all living units.

Targets

Use a strategy of least cost procurement.

Set target energy efficiency savings level that each utility would need to deliver.

Tax Incentives

Provide expanded tax incentives for energy efficiency measures, including:

- Sales tax exemptions for efficient products
- Income tax credits and deductions for new buildings and retrofit measures

Transmission/Distribution/Generation

Encourage additional research into high temperature super conductors and look for additional opportunities to reduce line losses, especially at the distribution level.

Investigate opportunities to reduce power losses via better reactive power control.

Examine additional opportunities for use of CHP.

Examine potential for additional savings from MTA and Long Island Rail Road operations.

Install more energy efficient transformers, building on the expected federal standard.

Remove constraints that lead to out-of-merit dispatch of generation to improve the efficiency of the generation fleet.

Utility Savings Targets

Set target energy efficiency savings level that each utility would need to deliver. That will be important to drive accelerated utility program efforts.

Attachment 3

Preliminary Benefit Cost Analysis of Fast Track Programs

Below is a description of the assumptions used in a program-by-program benefit-cost analysis of "fast-track" energy efficiency programs as part of the EPS Proceeding. Tables showing the results of the analyses follow.

Benefit Elements

The benefits of energy efficiency measures include the avoided costs of providing electricity and natural gas. Staff valued electricity at price levels from recent MAPS runs and the trajectory of electricity prices from the U.S. Energy Information Administration's (EIA) reference case forecast.[35] Staff valued transmission and distribution at EIA's forecast, which is somewhat higher than the most recent estimates for upstate New York, but far below recent estimates for New York City and, therefore, well below the statewide average. Avoided costs of electricity include costs of capacity and energy in generation, and capacity in transmission and distribution. Staff valued natural gas at $7,500/bBTU, in 2007 dollars, based on a review of numerous sources. This is also on the low side for an estimate of avoided costs.

In keeping with Commission Order 04-E-0572, Staff did not include any external costs of electricity or natural gas. There is a tension here, because these external costs could well be the primary justification for government support of energy efficiency. Other reasons for government to support energy efficiency include the under-incentive for the private market to disseminate information about energy efficiency and the difference between the appropriate social rate of discount and the private cost of borrowed funds. For a social benefit-cost analysis, future benefits and costs should be discounted at the social rate of discount. End-users, however, can be expected to discount future benefits and costs at their own cost of borrowed funds. The social

[35] Annual Energy Outlook, 2007, DOE/EIA-0383(2007), Table 8, Prices by Service Category.

rate of discount is much lower, and costs of energy efficiency measures tend to be front-loaded, while the benefits accrue over much longer spans of time. As a result, socially beneficial energy efficiency measures can easily fail to be cost-effective to private end-users.

Staff does not include price-suppression in the markets for electricity or natural gas as a benefit of energy efficiency measures. The benefit of price-suppression to consumers is exactly offset by the cost to producers. To be consistent, including price-suppression in electricity and natural gas numbers as a benefit would also require including upward impacts on prices in the market for energy efficiency as a cost.

Cost Elements

The costs of energy efficiency measures include costs of acquisition to program operators and participants and costs of marketing and administration to program operators.

Gross Versus Net Savings

The savings in use of electricity and natural gas are net of factors such as free ridership, spillover, and snap-back.

Time Horizon

The analyses look forward to 2030, which is as far as the EIA price-forecasts go. This period of time is sufficient for the savings from most of the energy efficiency measures to emerge as the measures are acquired and then to dissipate as the measures finish their expected useful lives.

Table 1 assumes that new installations of energy efficiency measures cease after 2015. When it is assumed that new installations stop after 2012, results are as shown in Table 2.

Discount Rate

Arrow (1995), writing for the International Energy Agency, cites a "well-known formula" for the real rate of discount implied by a utilitarian welfare criterion: rate of discount = $a + \theta b$, where a is the pure rate of time preference, θ is the coefficient of relative risk aversion in a constant relative risk aversion utility function $\left(U = c^{1-\theta} / 1-\theta\right)$, and b is the rate of growth in consumption per capita.[36] Staff assumes that personal consumption per capita in the state of New York will grow at 1.74% annually to 2030, which is the rate of growth in personal income per capita in New York from 1982 to 2006; this looks backward as far as it looks forward.[37] An estimate of θ just over 1.5, which is typical, with no pure time preference, implies a real discount rate of 2.6%.

[36] Arrow, Kenneth J., "Intergenerational Equity and the Rate of Discount in Long-Term Social Investment", IEA World Congress, December 1995. See page 11.

[37] See http://www.nylovesbiz.com/nysdc/Economic/Pers_Inc_Home.asp.

Table 1: Summary of Fast-Track Programs to 2015

8/27/2007

Program	Electric Benefits (m2007$)	Natural Gas Benefits (m2007$)	Costs (m2007$)	NPV (m2007$)	B/C
Standards and Codes	22,158	3,377	2,870	22,664	8.9
Residential ENERGY STAR Compact Fluorescent Light Bulbs (CFLs)	1,242	0	190	1,052	6.5
Retrocommissioning	249	0	42	207	5.9
C&I Lighting Rebates	601	0	156	445	3.8
Commercial New Construction Expansion	608	152	204	556	3.7
Residential Gas Equipment (Heating and Water Heating)	0	1,104	314	791	3.5
C&I RFP Program	846	0	260	586	3.3
Residential Central Air Conditioning	440	0	167	274	2.6
Low Income Program -- Expand EmpowerNY	152	84	95	142	2.5
Small C&I	866	0	352	514	2.5
Residential ENERGY STAR Lighting Fixtures	1,640	0	790	850	2.1
Residential New Construction (1-4 family) Expansion	20	175	105	90	1.9
Flex Tech Expansion	242	105	233	114	1.5
Commercial Sector Focus	944	307	845	407	1.5
Industrial Process: Flex Tech Expansion	343	338	548	133	1.2
Residential Gas Retrofit	22	106	104	24	1.2
Home Performance with Energy Star Expansion	43	217	217	43	1.2
Low Income Program -- Expand Weatherization Assistance Program	28	133	140	21	1.2
Total[1]				6,040	2.3

[1] Excludes Standards and Codes

Table 2: Summary of Fast-Track Programs to 2012

8/28/2007

Program	Electric Benefits (m2007$)	Natural Gas Benefits (m2007$)	Costs (m2007$)	NPV (m2007$)	B/C
Standards and Codes	22,158	3,377	2,870	22,664	8.9
Residential ENERGY STAR Compact Fluorescent Light Bulbs (CFLs)	733	0	114	620	6.5
Retrocommissioning	132	0	22	110	6.0
Commercial New Construction Expansion	237	59	77	220	3.9
C&I Lighting Rebates	601	0	156	445	3.8
Residential Gas Equipment (Heating and Water Heating)	0	557	158	399	3.5
C&I RFP Program	493	0	150	343	3.3
Low Income Program -- Expand EmpowerNY	85	47	53	79	2.5
Small C&I	500	0	203	296	2.5
Residential New Construction (1-4 family) Expansion	10	88	49	49	2.0
Residential ENERGY STAR Lighting Fixtures	752	0	417	335	1.8
Residential Central Air Conditioning	223	0	129	95	1.7
Flex Tech Expansion	143	62	138	67	1.5
Commercial Sector Focus	434	142	398	179	1.5
Industrial Process: Flex Tech Expansion	217	214	340	91	1.3
Residential Gas Retrofit	11	55	54	12	1.2
Home Performance with Energy Star Expansion	22	110	108	24	1.2
Low Income Program -- Expand Weatherization Assistance Program	17	79	81	16	1.2
Total[1]				3,270	2.3

[1] Excludes Standards and Codes

Appendix

Year-by-Year Benefits and Costs by Program

Residential New Construction (1-4 family) Expansion

Version date: 8/28/07

	Item	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
1	Number of customers eligible	24,694	24,990	25,290	25,594	25,901	26,212	26,526	26,844	27,139	27,450	27,762	28,073	28,382	28,691	28,999	29,308	29,620	29,929	30,237	30,547	30,856	31,166	31,475
2	Participation rate (% eligible who participate)	15%	19%	23%	27%	31%	35%	39%	43%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%
	Basecase (2007)	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%
	Incremental increase	4%	8%	12%	16%	20%	24%	28%	32%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3	Incremental number of participants	988	1,999	3,035	4,095	5,180	6,291	7,427	8,590	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	kWh saved/participant	938	950	975	500	525	550	575	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600
5	kW saved/participant (summer peak)	0.14	0.14	0.14	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6	therms saved/participant	674	700	725	375	400	425	450	475	475	475	475	475	475	475	475	475	475	475	475	475	475	475	475
7	Direct program operator costs/participant (2007$)	2,000	1,900	1,800	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850	850
8	Participant costs per participant (2007$)	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
9	Marketing and administrative costs (% of row x)	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
10	Incremental program costs (millions)	4.3	8.6	12.6	12.4	15.6	19.0	22.4	25.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	Incremental GWh saved from current year installations	0.9	1.9	3.0	2.0	2.7	3.5	4.3	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	Incremental MW saved from current year installations	0.1	0.3	0.4	0.3	0.4	0.4	0.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	Incremental billion Btu saved from current year installations	67	140	220	154	207	267	334	408	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	Incremental GWh saved from current & prior year installations	0.9	2.8	5.8	7.8	10.6	14.0	18.3	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4
15	Incremental MW saved from current & prior year installations	0.1	0.4	0.8	1.1	1.5	1.9	2.4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
16	Incremental billion Btu saved from current & prior year installations	67	207	427	580	787	1,055	1,389	1,797	1,797	1,797	1,797	1,797	1,797	1,797	1,797	1,797	1,797	1,797	1,797	1,797	1,797	1,797	1,797
17	Average measure life (years)	24																						
18	Total Avoided Cost (millions 2007$)	0.6	1.8	3.6	4.9	6.6	8.8	11.6	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
19	Electricity	0.1	0.2	0.4	0.5	0.7	0.9	1.2	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
20	Natural Gase	0.5	1.5	3.2	4.4	5.9	7.9	10.4	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5
21	Discounted Benefits (millions 2007$)	0.6	1.7	3.3	4.4	5.8	7.5	9.7	12.2	11.9	11.6	11.3	11.0	10.7	10.4	10.2	9.9	9.7	9.4	9.2	9.0	8.7	8.5	8.3
22	Electricity	0.1	0.2	0.4	0.5	0.6	0.8	1.0	1.2	1.2	1.2	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9
23	Natural Gase	0.5	1.5	3.0	3.9	5.2	6.8	8.7	11.0	10.7	10.4	10.1	9.9	9.6	9.4	9.2	8.9	8.7	8.5	8.3	8.0	7.8	7.6	7.4
24	Discounted Costs (millions 2007$)	4.2	8.1	11.7	11.2	13.8	16.3	18.7	21.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	Present-Valued Benefits	194.9																						
26	Electricity	19.8																						
27	Natural Gas	175.1																						
28	Present-Valued Costs	105.1																						
29	Net Present Value (millions 2007$)	89.8																						
30	Benefit/Cost Ratio	1.9																						

Notes (tied to row numbers in left column):

1 In 2006, the Census Bureau estimates 30,906 building permits issued for 1-4 unit homes. We take 85% of this, since not all permits result in completions. We also multiply by 94% to exclude the LIPA service area which in the first half of 2007 accounted for 6% of NYS permits (Census data). We assume the same number of new homes in 2008 (2007 is running a little lower).Thereafter we assume growth of 1.2%/year, in line with historic Dodge data.
2 Energy Star reports a 13% participation rate in NYS in 2006 for single-family. We assume this increases to 16% in 2007 but then multiply by 2/3's to account for the fact that single-family are 2/3's of 1-4 unit new homes per Census Bureau data. Program operators in NJ and VT report rates of about 25% and 43% respectively in 2006. EPA estimates a 57% participation rate in Iowa in 2006.
3 Row 1 times Row 2
4 First year figure derived from New York Energy $mart Program Evaluation and Status Report, May 2006. NYSERDA program staff estimate they can gradually increase this by about 25 kWh/year and 25 therms/yr. Savings and costs reduced 50% come 2011 since substantial savings will be captured by new building code.
5 Same as for Row 4 but we do not assume an increase in kW savings from year to year.
6 Same as for Row 4.
7 Estimates provided by NYSERDA program staff based on results in recent years for this program. Assume costs reduced 50% come 2011 since substantial savings will be captured by new building code.
8 Estimate by NYSERDA for current program.
9 Rough estimate of ACEEE and NYSERDA staff.
10 Row 3 * Row 7 * (1 + Row 9)
11 Row 3 * Row 4 / 1,000,000 kWh/Gwh
12 Row 3 * Row 5 / 1000 kW/MW
13 Row 3 * Row 6 / 10,000 therms/billion Btu
14 Row 11 + Row 14 from previous year
15 Row 12 + Row 15 from previous year
16 Row 13 + Row 16 from previous year
17 NYSERDA evaluations estimate 18 years for electric savings and 30 years for gas savings. We take midpoint.

Residential Central Air Conditioning

Version date: 8/28/07

	Item	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
1	Annual unit sales	113,333	115,600	117,912	120,270	122,676	125,129	127,632	130,184	132,423	134,889	137,351	139,805	142,245	144,670	147,088	149,515	151,982	154,412	156,841	159,272	161,708	164,146	166,585
2	Participation rate (% eligible who participate)	6%	12%	18%	24%	30%	32%	34%	36%	0%	0%	0%	0%	0%	0%	0%	-5%	0%	0%	0%	0%	0%	0%	0%
3	Annual number of participants	6,800	13,872	21,224	28,865	36,803	40,041	43,395	46,866	0	0	0	0	0	0	0	(6,800)	-	-	-	-	-	-	-
4	kWh saved/participant	533	533	533	533	533	533	533	533	533	533	533	533	533	533	533	533	533	533	533	533	533	533	533
5	Ratio of kW/kWh savings	Not needed for this program																						
6	kW saved/participant (summer peak)	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17
7	therms saved/participant	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	Direct program operator costs/participant	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550
9	Participant costs per participant	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10	Marketing and administrative costs (% of row x)	50%	50%	50%	50%	50%	50%	50%	50%	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11	Incremental program costs (millions)	5.6	11.4	17.5	23.8	30.4	33.0	35.8	38.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	GWh saved from current year installations	3.6	7.4	11.3	15.4	19.6	21.3	23.1	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	MW saved from current year installations	8.0	16.2	24.8	33.8	43.1	46.8	50.8	54.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	Billion Btu saved from current year installations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	GWh saved from current & prior year installations	3.6	11.0	22.3	37.7	57.3	78.7	101.8	126.8	126.8	126.8	126.8	126.8	126.8	126.8	126.8	119.5	112.1	100.8	85.4	65.8	44.5	21.4	-3.6
16	MW saved from current & prior year installations	8.0	24.2	49.0	82.8	125.8	172.7	223.5	278.3	278.3	278.3	278.3	278.3	278.3	278.3	278.3	262.4	246.2	221.3	187.6	144.5	97.6	46.9	-8.0
17	Billion Btu saved from current & prior year installations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	Average measure life (years)	15																						
19	Total Avoided Cost (millions 2007$)	0.9	2.9	6.1	10.6	16.7	22.5	28.7	35.5	38.2	39.6	40.8	41.6	42.6	43.6	44.5	42.2	39.8	35.9	30.3	23.4	15.8	7.6	-1.3
20	Electricity	0.9	2.9	6.1	10.6	16.7	22.5	28.7	35.5	38.2	39.6	40.8	41.6	42.6	43.6	44.5	42.2	39.8	35.9	30.3	23.4	15.8	7.6	-1.3
21	Natural Gase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	Discounted Benefits (millions 2007$)	0.9	2.8	5.7	9.5	14.6	19.3	24.0	28.9	30.3	30.6	30.7	30.5	30.5	30.4	30.3	27.9	25.7	22.5	18.6	14.0	9.2	4.3	-0.7
23	Electricity	0.9	2.8	5.7	9.5	14.6	19.3	24.0	28.9	30.3	30.6	30.7	30.5	30.5	30.4	30.3	27.9	25.7	22.5	18.6	14.0	9.2	4.3	-0.7
24	Natural Gase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	Discounted Costs (millions 2007$)	5.5	10.9	16.2	21.5	26.7	28.3	29.9	31.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	Present-Valued Benefits	440.4																						
27	Electricity	440.4																						
28	Natural Gas	0.0																						
29	Present-Valued Costs	166.6																						
30	Net Present Value (millions 2007$)	273.8																						
31	Benefit/Cost Ratio	2.6																						

Notes (tied to row numbers in left column):

1 According to industry experts, approximately 200,000 central AC & HP sold in NYS in 2006. We estimate that half of these are downstate outside of LIPA (LIPA alone is just over 30,000 units/yr) but then multiply by 85% to exclude new Energy Star homes so as not to double-count savings. We estimate sales are growing at roughly 4%/yr (based on limited LIPA data) due to growing installations in new and existing homes.
2 In 2006, NJ had a participation rate of about 11-13%, right after the new federal efficiency standard went into effect. In earlier years, the participation rate was as high as 30%. We assume a ramp-up to 30% in year 5 and then more modest increases thereafter.
3 Row 1 times Row 2
4 Preliminary LIPA estimate for 2007 program. This is for a SEER 15 unit with proper installation. Savings are more for SEER 16, less for 14.
5 Not needed.
6 Same as Row 4.
7 No gas savings.
8 LIPA provides rebates of $250-600 per AC or HP plus $150 for qualify installation. We estimate the average equipment rebate is $400, the middle tier.
9 Not available.
10 Rough ACEEE estimate. This program includes extensive contractor training and marketing.
11 Row 3 * Row 8 * (1 + Row 10)
12 Row 3 * Row 4 / 1,000,000 kWh/Gwh
13 Row 3 * Row 5 / 1000 kW/MW
14 Row 3 * Row 6 / 10,000 therms/billion Btu
15 Row 12 + Row 15 from previous year
16 Row 13 + Row 16 from previous year
17 Row 14 + Row 17 from previous year
18 LIPA estimate.

Residential Gas Equipment (Heating and Water Heating)

Version date: 8/28/07

	Item	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
1	Number of customers eligible	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000
2	Participation rate (% eligible who participate)	0.4%	0.8%	1.2%	1.4%	1.6%	1.8%	2.0%	2.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
3	Annual number of participants	16,800	33,600	50,400	58,800	67,200	75,600	84,000	84,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	kWh saved/participant	Not needed for this program																						
5	Ratio of kW/kWh savings	Not needed for this program																						
6	kW saved/participant (summer peak)	Not needed for this program																						
7	therms saved/participant	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285
8	Direct program operator costs/participant	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345
9	Participant costs per participant	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420
10	Marketing and administrative costs	included in program operator costs																						
11	Incremental program costs (millions)	12.8	25.7	38.5	45.0	51.4	57.8	64.2	64.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	GWh saved from current year installations	Not needed for this program																						
13	MW saved from current year installations	Not needed for this program																						
14	Billion Btu saved from current year installations	478	957	1,435	1,675	1,914	2,153	2,392	2,392	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	GWh saved from current & prior year installations	Not needed for this program																						
16	MW saved from current & prior year installations	Not needed for this program																						
17	Billion Btu saved from current & prior year installations	478	1,435	2,871	4,546	6,460	8,613	11,005	13,398	13,398	13,398	13,398	13,398	13,398	13,398	13,398	12,919	11,962	10,527	8,852	6,938	4,785	2,392	0
18	Average measure life (years)	15																						
19	Total Avoided Cost (millions 2007$)	3.6	10.8	21.5	34.1	48.4	64.6	82.5	100.5	100.5	100.5	100.5	100.5	100.5	100.5	100.5	96.9	89.7	79.0	66.4	52.0	35.9	17.9	0.0
20	Electricity																							
21	Natural Gase	3.6	10.8	21.5	34.1	48.4	64.6	82.5	100.5	100.5	100.5	100.5	100.5	100.5	100.5	100.5	96.9	89.7	79.0	66.4	52.0	35.9	17.9	0.0
22	Discounted Benefits (millions 2007$)	3.5	10.2	19.9	30.8	42.6	55.3	68.9	81.8	79.7	77.6	75.7	73.7	71.9	70.0	68.3	64.1	57.9	49.6	40.7	31.1	20.9	10.2	0.0
23	Electricity																							
24	Natural Gase	3.5	10.2	19.9	30.8	42.6	55.3	68.9	81.8	79.7	77.6	75.7	73.7	71.9	70.0	68.3	64.1	57.9	49.6	40.7	31.1	20.9	10.2	0.0
25	Discounted Costs (millions 2007$)	12.5	24.4	35.7	40.6	45.2	49.5	53.6	52.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	Present-Valued Benefits	1104.4																						
27	Electricity	0.0																						
28	Natural Gas	1104.4																						
29	Present-Valued Costs	313.8																						
30	Net Present Value (millions 2007$)	790.6																						
31	Benefit/Cost Ratio	3.5																						

Notes (tied to row numbers in left column):

1 Derived 2001 EIA Residential Energy Consumption Survey; gas heated homes in NYS.
2 KeySpan Energy equipment programs in MA reached 1.2% of gas accounts in 2005-6; we assume a NYS program will reach this level of participation in year 3. Thereafter, participation increases 0.2% of accounts each year until 2014. In 2015, new federal furnace and boiler standards take effect and program will need a major redesign.
3 Row 1 times Row 2
4 Not needed for this program
5 Not needed for this program
6 Not needed for this program
7 Derived from KeySpan Energy Delivery Energy Efficiency Program Annual Status Report, April 2006 (for MA). New York customer assumed to save 18% more based on relative annual consumption data between the states.
8 Derived from KeySpan Energy Delivery Energy Efficiency Program Annual Status Report, April 2006.
9 Derived from KeySpan Energy Delivery Energy Efficiency Program Annual Status Report, April 2006.
10 Included in program operator costs.
11 Row 3 * Row 8 * (1 + Row 10)
12 Not needed for this program
13 Not needed for this program
14 Row 3 * Row 7 / 10,000 therms/billion Btu
15 Not needed for this program
16 Not needed for this program
17 Row 14 + Row 17 from previous year
18 ACEEE estimate. DOE estimates 9 years for water heaters, 18 years for furnaces and 25 for boilers.

Home Performance with Energy Star Expansion

Version date: 8/28/07

	Item	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
1	Number of customers eligible	Difficult to determine																						
2	Participation rate (% eligible who participate)	Not Applicable																						
3	Annual number of participants	5,500	6,500	8,000	10,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000
	Baseline -- estimated participants in 2007	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500
	Incremental participants	1,000	2,000	3,500	5,500	7,500	7,500	7,500	7,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	kWh saved/participant	1,057	1,100	1,150	1,200	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250
5	kW saved/participant (summer peak)	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
6	therms saved/participant	465	485	505	525	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545
7	Direct program operator costs/participant	2,800	2,600	2,400	2,200	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
8	Participant costs per participant	3,407	3,407	3,407	3,407	3,407	3,407	3,407	3,407	3,407	3,407	3,407	3,407	3,407	3,407	3,407	3,407	3,407	3,407	3,407	3,407	3,407	3,407	3,407
9	Marketing and administrative costs (% of row x)	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
10	Incremental program costs (millions)	6.8	13.1	22.0	33.3	43.5	43.5	43.5	43.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	Incremental GWh saved from current year installations	1.1	2.2	4.0	6.6	9.4	9.4	9.4	9.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	Incremental MW saved from current year installations	0.2	0.3	0.6	0.9	1.2	1.2	1.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	Incremental billion Btu saved from current year installations	47	97	177	289	409	409	409	409	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	Incremental GWh saved from current & prior year installations	1.1	3.3	7.3	13.9	23.3	32.6	42.0	51.4	51.4	51.4	51.4	51.4	51.4	51.4	51.4	51.4	51.4	51.4	51.4	51.4	51.4	51.4	51.4
15	Incremental MW saved from current & prior year installations	0.2	0.5	1.0	1.9	3.1	4.3	5.5	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7
16	Incremental billion Btu saved from current & prior year installations	47	144	320	609	1,018	1,427	1,835	2,244	2,244	2,244	2,244	2,244	2,244	2,244	2,244	2,244	2,244	2,244	2,244	2,244	2,244	2,244	2,244
17	Average measure life (years)	23																						
18	Total Avoided Cost (millions 2007$)	0.4	1.3	2.9	5.5	9.1	12.8	16.4	20.1	20.1	20.1	20.2	20.1	20.1	20.1	20.1	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2
19	Electricity	0.1	0.2	0.5	0.9	1.5	2.1	2.7	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.4	3.4	3.4	3.4	3.4	3.4	3.4
20	Natural Gase	0.3	1.1	2.4	4.6	7.6	10.7	13.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8
21	Discounted Benefits (millions 2007$)	0.4	1.2	2.7	5.0	8.0	11.0	13.7	16.3	15.9	15.6	15.2	14.8	14.4	14.0	13.7	13.3	13.0	12.7	12.4	12.1	11.8	11.5	11.2
22	Electricity	0.1	0.2	0.5	0.8	1.3	1.8	2.2	2.7	2.6	2.6	2.5	2.4	2.4	2.3	2.2	2.2	2.2	2.1	2.1	2.0	2.0	1.9	1.9
23	Natural Gase	0.3	1.0	2.2	4.1	6.7	9.2	11.5	13.7	13.3	13.0	12.7	12.4	12.0	11.7	11.4	11.1	10.9	10.6	10.3	10.0	9.8	9.5	9.3
24	Discounted Costs (millions 2007$)	6.6	12.4	20.4	30.0	38.3	37.3	36.4	35.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	Present-Valued Benefits	259.9																						
26	Electricity	42.9																						
27	Natural Gas	216.9																						
28	Present-Valued Costs	216.7																						
29	Net Present Value (millions 2007$)	43.1																						
30	Benefit/Cost Ratio	1.2																						

Notes (tied to row numbers in left column):

1 The prime market is homeowners planning to remodel, and this is a difficult market to estimate.
2
3 Doubling in 4-5 years, with growth slower in earlier years and accelerating. Steady after 5 years.B2
4 Derived from Energy $mart Evaluation Report, 3/07. Can grow 4-5%/year as new measures added to program.
5 Derived from Energy $mart Evaluation Report, 3/07. Growing peak savings more difficult than energy savings.
6 Derived from Energy $mart Evaluation Report, 3/07. Can grow 4-5%/year as new measures added to program.
7 Estimated by program staff. Can gradually decline as contractors can better market on their own.
8 Current program has average participant costs of $6813.19. We take half of this amount since evaluations of the program show that participants attribute about half of their contributions towards energy savings and half towards non-energy benefits such as tilt-out easy to clean windows.
9 Based on recent experience with this program.
10 Row 3 * Row 7 * (1 + Row 9)
11 Row 3 * Row 4 / 1,000,000 kWh/Gwh
12 Row 3 * Row 5 / 1000 kW/MW
13 Row 3 * Row 6 / 10,000 therms/billion Btu
14 Row 11 + Row 14 from previous year
15 Row 12 + Row 15 from previous year
16 Row 13 + Row 16 from previous year
17 NYSERDA evaluations estimate 16 years for electric savings and 30 years for gas savings. We take midpoint.

Residential Gas Retrofit

Version date: 8/28/07

	Item	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
1	Number of customers eligible	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000
2	Participation rate (% eligible who participate)	0.1%	0.2%	0.3%	0.4%	0.5%	0.5%	0.5%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
3	Annual number of participants	4,200	8,400	12,600	16,800	21,000	21,000	21,000	21,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	kWh saved/participant	297	297	297	297	297	297	297	297	297	297	297	297	297	297	297	297	297	297	297	297	297	297	297
5	Ratio of kW/kWh savings	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	kW saved/participant (summer peak)	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
7	therms saved/participant	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144	144
8	Direct program operator costs/participant	747	747	747	747	747	747	747	747	747	747	747	747	747	747	747	747	747	747	747	747	747	747	747
9	Participant costs per participant	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
10	Marketing and administrative costs	Included in program operator costs																						
11	Incremental program costs (millions)	4.0	8.0	11.9	15.9	19.9	19.9	19.9	19.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	GWh saved from current year installations	1.2	2.5	3.7	5.0	6.2	6.2	6.2	6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	MW saved from current year installations	0.3	0.5	0.8	1.1	1.3	1.3	1.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	Billion Btu saved from current year installations	60	121	181	242	302	302	302	302	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	GWh saved from current & prior year installations	1.2	3.7	7.5	12.5	18.7	24.9	31.2	37.4	37.4	37.4	36.2	33.7	29.9	24.9	18.7	12.5	6.2	0.0	0.0	0.0	0.0	0.0	0.0
16	MW saved from current & prior year installations	0.3	0.8	1.6	2.7	4.0	5.4	6.7	8.1	8.1	8.1	7.8	7.3	6.5	5.4	4.0	2.7	1.3	0.0	0.0	0.0	0.0	0.0	0.0
17	Billion Btu saved from current & prior year installations	60	181	363	605	907	1,210	1,512	1,814	1,814	1,814	1,753.9	1,633.0	1,451.5	1,209.6	907.2	604.8	302.4	0.0	0.0	0.0	0.0	0.0	0.0
18	Average measure life (years)	10																						
19	Total Avoided Cost (millions 2007$)	0.6	1.7	3.3	5.5	8.2	10.9	13.6	16.3	16.4	16.4	15.9	14.8	13.1	11.0	8.2	5.5	2.7	0.0	0.0	0.0	0.0	0.0	0.0
20	Electricity	0.1	0.3	0.6	0.9	1.4	1.8	2.3	2.7	2.7	2.8	2.7	2.5	2.3	1.9	1.4	1.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
21	Natural Gase	0.5	1.4	2.7	4.5	6.8	9.1	11.3	13.6	13.6	13.6	13.2	12.2	10.9	9.1	6.8	4.5	2.3	0.0	0.0	0.0	0.0	0.0	0.0
22	Discounted Benefits (millions 2007$)	0.5	1.6	3.1	4.9	7.2	9.3	11.4	13.3	13.0	12.7	12.0	10.8	9.4	7.6	5.6	3.6	1.8	0.0	0.0	0.0	0.0	0.0	0.0
23	Electricity	0.1	0.3	0.5	0.8	1.2	1.6	1.9	2.2	2.2	2.2	2.1	1.9	1.6	1.3	1.0	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0
24	Natural Gase	0.4	1.3	2.5	4.1	6.0	7.8	9.5	11.1	10.8	10.5	9.9	9.0	7.8	6.3	4.6	3.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0
25	Discounted Costs (millions 2007$)	3.9	7.6	11.0	14.4	17.5	17.0	16.6	16.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	Present-Valued Benefits	127.7																						
27	Electricity	21.7																						
28	Natural Gas	106.0																						
29	Present-Valued Costs	104.1																						
30	Net Present Value (millions 2007$)	23.6																						
31	Benefit/Cost Ratio	1.2																						

Notes (tied to row numbers in left column):

1 Derived 2001 EIA Residential Energy Consumption Survey; gas heated homes in NYS.
2 CL&P's Home Energy Solutions program achieved 0.2% participation in 2007. We assume a NYS program will reach this level in its second year and will continue to ramp up at 0.1% of eligible participants each year until reaching 0.5% in year 5.
3 Row 1 times Row 2
4 Derived from Joint CL&P/UI Quarterly Reports, 2006.
5 Not needed for this program
6 A rough estimate is savings are 40% of those of the Home Performance program, based on ratio of kWh savings between the two programs. Data from Joint CL&P/UI Quarterly Reports, 2006 imply much higher peak savings but we think their data is off. We are trying to get better data from them.
7 NYS household's used an average of 589 therms for space heat and 175 therms for water heat (RECS 2001). This program targets high-use customers, so we multiply by 1.25. We estimate this program will reduce these by 20% each in 75% of homes (the other 25% don't need specific measures). [(589+175) * 1.25 * 0.2 * 0.75 = 144 therms saved]. Connecticut's 2007 Plan estimates an average of 82 therms, but their data appears to be off. We are trying to get better data from them.
8 From Connecticut's Joint 2007 Natural Gas Conservation Plan. However, costs are running higher, so we add $200 in the line below.
9 Recommended customer co-pay.
10 Included in program operator costs
11 Row 3 * Row 8 * (1 + Row 10)
12 Not needed for this program
13 Not needed for this program
14 Row 3 * Row 7 / 10,000 therms/billion Btu
15 Not needed for this program
16 Not needed for this program
17 Row 14 + Row 17 from previous year
18 ACEEE estimate

Residential ENERGY STAR Compact Fluorescent Light Bulbs (CFLs)

Version date: 8/28/07

	Item	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
1	Number of households eligible (Thousand)	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100
2	Participation rate (#CFLs sold per household)	2.0	2.5	3.0	3.0	3.0	3.0	3.0	3.0	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
	Baseline participation rate (2007, estimated)	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
	Incremental participation rate	0.3	0.8	1.3	1.3	1.3	1.3	1.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	Annual number of CFLs sold (Thousand)	12,200	15,250	18,300	18,300	18,300	18,300	18,300	18,300	10,370	10,370	10,370	10,370	10,370	10,370	10,370	10,370	10,370	10,370	10,370	10,370	10,370	10,370	10,370
	Incremental annual number of CFLs sold (Thousand)	1,830	4,880	7,930	7,930	7,930	7,930	7,930	7,930	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	kWh saved/CFL	94.7	94.7	94.7	94.7	94.7	94.7	94.7	94.7	94.7	94.7	94.7	94.7	94.7	94.7	94.7	94.7	94.7	94.7	94.7	94.7	94.7	94.7	94.7
5	Ratio of kW/kWh savings	Not needed for this program																						
6	kW saved/CFL (summer peak)	0.0056	0.0056	0.0056	0.0056	0.0056	0.0056	0.0056	0.0056	0.0056	0.0056	0.0056	0.0056	0.0056	0.0056	0.0056	0.0056	0.0056	0.0056	0.0056	0.0056	0.0056	0.0056	0.0056
7	therms saved/CFL	N/A - not considering possible reduced cooling costs related to CFLs																						
8	Direct program operator costs/program year	$800,000	$800,000	$650,000	$600,000	$600,000	$600,000	$550,000	$500,000	$500,000	$500,000	$500,000	$500,000	$500,000	$500,000	$500,000	$500,000	$500,000	$500,000	$500,000	$500,000	$500,000	$500,000	$500,000
8a	Direct program operator costs/CFL sold	$0.07	$0.05	$0.04	$0.03	$0.03	$0.03	$0.03	$0.03	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05	$0.05
8b	Direct incentive/bulb	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50
8c	Percentage CFLs sold through buydown vs all CFLs sold	25%	25%	25%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
8d	Program incentive and manufacturer partner costs/CFL sold	$0.38	$0.38	$0.38	$0.30	$0.30	$0.30	$0.30	$0.30	$0.30	$0.30	$0.30	$0.30	$0.30	$0.30	$0.30	$0.30	$0.30	$0.30	$0.30	$0.30	$0.30	$0.30	$0.30
9	Household costs per CFL sold	$3.63	$3.63	$3.63	$3.70	$3.70	$3.70	$3.70	$3.70	$3.70	$3.70	$3.70	$3.70	$3.70	$3.70	$3.70	$3.70	$3.70	$3.70	$3.70	$3.70	$3.70	$3.70	$3.70
10	Annual Marketing and administrative costs (% of row 8)	200%	200%	180%	170%	150%	150%	130%	120%	120%	120%	120%	120%	120%	120%	120%	120%	120%	120%	120%	120%	120%	120%	120%
10a	Marketing and administrative costs per CFL sold	$0.13	$0.10	$0.06	$0.06	$0.05	$0.05	$0.04	$0.03	$0.06	$0.06	$0.06	$0.06	$0.06	$0.06	$0.06	$0.06	$0.06	$0.06	$0.06	$0.06	$0.06	$0.06	$0.06
11	Total program operator and participant budget (millions)	$48.91	$60.54	$71.59	$72.08	$71.96	$71.96	$71.72	$71.56	$40.87	$40.87	$40.87	$40.87	$40.87	$40.87	$40.87	$40.87	$40.87	$40.87	$40.87	$40.87	$40.87	$40.87	$40.87
	Current program and participant budget (millions)	$40.09	$40.09	$40.09	$40.87	$40.87	$40.87	$40.87	$40.87	$40.87	$40.87	$40.87	$40.87	$40.87	$40.87	$40.87	$40.87	$40.87	$40.87	$40.87	$40.87	$40.87	$40.87	$40.87
	Incremental program costs (millions)	$8.82	$20.45	$31.50	$31.21	$31.09	$31.09	$30.85	$30.69	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
12	Incremental GWh saved from current year installations	130	347	563	563	563	563	563	563	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	Incremental MW saved from current year installations	8	20	33	33	33	33	33	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	Billion Btu saved from current year installations	N/A																						
15	Incremental GWh saved from current & prior year installations	130	477	1,040	1,603	2,166	2,729	3,293	3,726	3,379	2,816	2,253	1,690	1,126	563	0	0	0	0	0	0	0	0	0
16	Incremental MW saved from current & prior year installations	8	28	61	95	128	161	195	220	200	167	133	100	67	33	0	0	0	0	0	0	0	0	0
17	Incre. Billion Btu saved from current & prior year installations	N/A																						
18	Average measure life (years)	7.0																						
19	Total Avoided Cost (millions 2007$)	8.6	30.5	64.1	93.9	122.5	153.4	184.0	208.6	186.7	156.8	125.8	93.2	61.9	30.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	Electricity	8.6	30.5	64.1	93.9	122.5	153.4	184.0	208.6	186.7	156.8	125.8	93.2	61.9	30.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	Natural Gase																							
22	Discounted Benefits (millions 2007$)	8.4	29.0	59.4	84.7	107.7	131.4	153.6	169.7	148.0	121.2	94.7	68.4	44.3	21.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23	Electricity	8.4	29.0	59.4	84.7	107.7	131.4	153.6	169.7	148.0	121.2	94.7	68.4	44.3	21.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	Natural Gase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	Discounted Costs (millions 2007$)	8.6	19.4	29.2	28.1	27.3	26.6	25.8	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	Present-Valued Benefits	1242.0																						
27	Electricity	1242.0																						
28	Natural Gas	0.0																						
29	Present-Valued Costs	190.0																						
30	Net Present Value (millions 2007$)	1052.0																						
31	Benefit/Cost Ratio	6.5																						

Notes (tied to row numbers in left column):

1 Households eligible for SBC
2 Program goal. NYSERDA Market Characterization report (not yet published) estimates 2005 sales of ENERGY STAR CFLs at 1.5 per HH. Note it is estimated that there are about 30 lamps per HH, and with CFLs lasting 10 years, it is not reasonable to expect more than 3 purchases of CFLs per HH per year in the long term. Initial replacements at higher rates may be reasonable in the first few years.
3 Row 1* Row 2
4 Derived from NYSERDA M&V contractor Deemed Savings Value for CFL
5 Not used for this program
6 Derived from NYSERDA M&V contractor
7 N/A
8 Program estimate based on current level of effort (approx $500,000 per year) + additional staff needed to increase sales
8a Row 8/(Row 3*1000)
8b Program estimate based on previous buydowns, shared 50/50 by NYSERDA and manufacturer. Could also include short-term consumer coupons.
8c Program estimate based on market activity and expanding program reach into other retail locations. Note market effects reduce need for incentives in later years.
8d Row 8c*Row 8b
9 Estimate of the average cost of a 13 W CFL
10 Program estimate to ramp up based on experience. Note market effects reduce need for marketing funds in later years
10a Row 8 * Row 10 / (Row 3*1000)
11 Rows (8a+one half of 8d+10a) * Row 3 / 1,000
12 .75 * Row 3 * 1000 * Row 4 / 1,000,000 kWh/Gwh. Note NYSERDA's Market Characterization contractor estimates 75% of CFLs purchased are installed at a later date; to be conservative, we do not include these in the savings estimates.
13 .75 * Row 3 * 1000 * Row 15 / 1000 kW/MW
14 N/A - not considering possible reduced cooling costs related to CFLs
15 Row 12 + Row 15 from previous year
16 Row 13 + Row 15 from previous year
17 N/A - not considering possible reduced cooling costs related to CFLs
18 NYSERDA estimates 7-10 years. We use the low end, to be conservative. An 8000 hour bulb used 3 hours/day will last 7.3 years.B34

Residential ENERGY STAR Lighting Fixtures

Version date: 8/28/07

	Item	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
1	Number of households eligible (Thousand)	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100	6,100
2	Participation rate (# ES FIXTURES sold per household)	0.15	0.25	0.40	0.50	0.60	0.70	0.80	0.90	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
	Baseline participation rate (2006, estimated)	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
	Incremental participation rate	0.06	0.16	0.31	0.41	0.51	0.61	0.71	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	Number of ES FIXTURES Sold (Thousand)	528	1,525	2,440	3,050	3,660	4,270	4,880	5,490	528	528	528	528	528	528	528	528	528	528	528	528	528	528	528
	Incremental annual number of FIXTURES Sold (Thousand)	387	997	1,912	2,522	3,132	3,742	4,352	4,962	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	kWh saved/FIXTURE	115.59	115.59	115.59	115.59	115.59	115.59	115.59	115.59	115.59	115.59	115.59	115.59	115.59	115.59	115.59	115.59	115.59	115.59	115.59	115.59	115.59	115.59	115.59
5	Ratio of kW/kWh savings	Not needed for this program																						
6	kW saved/FIXTURE(summer peak)	0.0078	0.0078	0.0078	0.0078	0.0078	0.0078	0.0078	0.0078	0.0078	0.0078	0.0078	0.0078	0.0078	0.0078	0.0078	0.0078	0.0078	0.0078	0.0078	0.0078	0.0078	0.0078	0.0078
7	therms saved/FIXTURE	N/A - not considering possible reduced cooling costs related to CFLs																						
8	Direct program operator costs/program year	$1,000,000	$1,000,000	$1,000,000	$800,000	$600,000	$400,000	$300,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000	$200,000
8a	Direct program operator costs/FIXTURE sold	$1.89	$0.66	$0.41	$0.26	$0.16	$0.09	$0.06	$0.04	$0.38	$0.38	$0.38	$0.38	$0.38	$0.38	$0.38	$0.38	$0.38	$0.38	$0.38	$0.38	$0.38	$0.38	$0.38
8b	Direct program incentive (split w/ manufacturers)	$40.00	$40.00	$30.00	$30.00	$20.00	$20.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00	$15.00
8c	Percentage fixtures sold through buydown vs all ES fixtures sold	30%	40%	40%	30%	30%	30%	30%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
8d	Program incentive (including manufacturer costs)/all ES fixtures sold	$12.00	$16.00	$12.00	$9.00	$6.00	$6.00	$4.50	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00	$3.00
9	Household costs per ES fixture sold	$48.00	$44.00	$48.00	$41.00	$39.00	$34.00	$30.50	$32.00	$32.00	$32.00	$32.00	$32.00	$32.00	$32.00	$32.00	$32.00	$32.00	$32.00	$32.00	$32.00	$32.00	$32.00	$32.00
10	Annual Marketing and administrative costs (% of row 8)	300%	300%	300%	300%	300%	250%	250%	200%	200%	200%	200%	200%	200%	200%	200%	200%	200%	200%	200%	200%	200%	200%	200%
10a	Marketing and administrative costs per ES fixture sold	$5.68	$1.97	$1.23	$0.79	$0.49	$0.23	$0.15	$0.07	$0.76	$0.76	$0.76	$0.76	$0.76	$0.76	$0.76	$0.76	$0.76	$0.76	$0.76	$0.76	$0.76	$0.76	$0.76
11	Total program operator and participant budget (millions)	$32.51	$83.30	$135.76	$141.98	$156.12	$159.39	$160.87	$184.52	$16.95	$16.95	$16.95	$16.95	$16.95	$16.95	$16.95	$16.95	$16.95	$16.95	$16.95	$16.95	$16.95	$16.95	$16.95
	Current program and participant budget (millions)	$6.818	$23.282	$25.394	$21.698	$20.642	$18.002	$16.154	$16.946	$16.946	$16.946	$16.946	$16.946	$16.946	$16.946	$16.946	$16.946	$16.946	$16.946	$16.946	$16.946	$16.946	$16.946	$16.946
	Incremental program costs (millions)	$25.694	$60.018	$110.366	$120.277	$135.478	$141.388	$144.716	$167.569	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000
12	Incremental GWh saved from current year installations	40.3	103.7	198.9	262.4	325.8	389.3	452.7	516.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	Incremental MW saved from current year installations	2.7	7.0	13.4	17.7	22.0	26.3	30.6	34.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	Billion Btu saved from current year installations	N/A																						
15	Incremental GWh saved from current & prior year installations	40.3	144.0	342.9	605.3	931.1	1,320.4	1,773.1	2,289.3	2,289.3	2,289.3	2,289.3	2,289.3	2,289.3	2,289.3	2,289.3	2,289.3	2,289.3	2,289.3	2,289.3	2,289.3	2,249.0	2,145.3	1,946.4
16	Incremental MW saved from current & prior year installations	2.7	9.7	23.1	40.8	62.8	89.1	119.6	154.5	154.5	154.5	154.5	154.5	154.5	154.5	154.5	154.5	154.5	154.5	154.5	154.5	151.8	144.8	131.3
17	Incre. Billion Btu saved from current & prior year installations	N/A																						
18	Average measure life (years)	20.0																						
19	Total Avoided Cost (millions 2007$)	2.7	9.3	21.4	36.0	53.5	75.4	100.6	130.2	128.7	129.8	130.2	128.8	128.4	127.9	127.1	128.4	129.4	129.9	129.7	129.8	127.9	122.9	111.5
20	Electricity	2.7	9.3	21.4	36.0	53.5	75.4	100.6	130.2	128.7	129.8	130.2	128.8	128.4	127.9	127.1	128.4	129.4	129.9	129.7	129.8	127.9	122.9	111.5
21	Natural Gase																							
22	Discounted Benefits (millions 2007$)	2.6	8.9	19.8	32.4	47.0	64.6	84.0	105.9	102.0	100.3	98.0	94.5	91.8	89.1	86.3	85.0	83.5	81.7	79.5	77.5	74.4	69.7	61.6
23	Electricity	2.6	8.9	19.8	32.4	47.0	64.6	84.0	105.9	102.0	100.3	98.0	94.5	91.8	89.1	86.3	85.0	83.5	81.7	79.5	77.5	74.4	69.7	61.6
24	Natural Gase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	Discounted Costs (millions 2007$)	25.0	57.0	102.2	108.5	119.1	121.1	120.8	136.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	Present-Valued Benefits	1640.3																						
27	Electricity	1640.3																						
28	Natural Gas	0.0																						
29	Present-Valued Costs	790.1																						
30	Net Present Value (millions 2007$)	850.2																						
31	Benefit/Cost Ratio	2.1																						

Notes (tied to row numbers in left column):

1 Households eligible for SBC
2 Program goal. Baseline: NYSERDA Market Characterization report (not yet published) estimates 2006 sales of ES FIXTURES at 6% of 8.8 M sold in NYS (8.8/6.1 * 6% =8.7%). With 8.8 M fixtures sold/yr, max participation is 1.4 per HH/yr. A reasonable ES penetration is 60%, meaning 0.9 fixtures per HH is maximum expectation.
3 Row 1* Row 2
4 Derived from NYSERDA M&V contractor Deemed Savings Value for CFL fixture.
5 Not used for this program
6 Same as Row 4.
7 N/A
8 This is an estimate of the effort needed to achieve these goals. This includes the approximately $50,000/yr currently being spent. These figures assume a parallel CFL bulb program, to share many costs. Costs decline in out years as market gains momentum.
8a Row 8/(Row 3*1000)
8b Program estimate based on previous buydowns, shared 50/50 by NYSERDA and manufacturer. Could also include short-term consumer coupons. Note market effects allow reduced incentives in later years.
8c Program estimate based on market activity and expanding program reach into other retail locations. However, we expect a higher proportion of fixtures to receive incentives than for CFLs and appliances and have adjusted these estimates accordingly. Note market effects reduce need for incentives in later years.
8d Row 8c*Row 8b
9 Estimate of the average cost of a CFL fixture. This will come down some over time as the market increases and manufacturers compete for market share.
10 Program estimate to ramp up based on experience. Note market effects reduce need for marketing funds in later years.
10a Row 8 * Row 10 / (Row 3*1000)
11 Rows (8a+one half of 8d+10a) * Row 3 / 1,000
Current fixture level of effort within program is about $50,000/yr, much less than that for CFLs.
12 0.9 * Row 3 * 1000 * Row 4 / 1,000,000 kWh/Gwh. Note NYSERDA's Market Characterization contractor estimates 25% of CFLs purchased are installed as a later date. For fixtures, which are much more expensive, we estimate 90% will be installed.
13 0.9 * Row 3 * 1000 * Row 15 / 1000 kW/MW. See Row 12 for explanation of "0.9".
14 N/A - not considering possible reduced cooling costs related to CFLs
15 Row 12 + Row 15 from previous year
16 Row 13 + Row 16 from previous year
17 N/A - not considering possible reduced cooling costs related to CFLs
18 EPA Energy Star estimate.

Low Income Program -- Expand EmpowerNY

Version date: 8/28/07

	Item	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
1	Number of customers eligible	Not available																						
2	Participation rate (% eligible who participate)	Not used for this program																						
3	Incremental annual number of participants	3,150	6,300	9,450	12,600	12,600	12,600	12,600	12,600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	kWh saved/participant	2,930	2,930	2,930	2,930	2,930	2,930	2,930	2,930	2,930	2,930	2,930	2,930	2,930	2,930	2,930	2,930	2,930	2,930	2,930	2,930	2,930	2,930	2,930
5	kW saved/participant (summer peak)	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39
6	therms saved/participant	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
7	Direct program operator costs/participant	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320
8	Participant costs per participant	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	Marketing and administrative costs (% of row x)	Included in Row 7																						
10	Total program operator incremental budget (millions)	4.2	8.3	12.5	16.6	16.6	16.6	16.6	16.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	Incremental GWh saved from current year installations	9.2	18.5	27.7	36.9	36.9	36.9	36.9	36.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	Incremental MW saved from current year installations	1.2	2.4	3.6	4.9	4.9	4.9	4.9	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	Incremental billion Btu saved from current year installatio	44	88	132	176	176	176	176	176	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	Incremental GWh saved from current & prior year installa	9.2	27.7	55.4	92.3	129.2	166.1	203.1	240.0	240.0	240.0	240.0	240.0	240.0	230.7	212.3	184.6	147.7	110.8	73.8	36.9	0.0	0.0	0.0
15	Incremental MW saved from current & prior year installat	1.2	3.6	7.3	12.1	17.0	21.9	26.7	31.6	31.6	31.6	31.6	31.6	31.6	30.4	27.9	24.3	19.4	14.6	9.7	4.9	0.0	0.0	0.0
16	Incremental billion Btu saved from current & prior year ins	44	132	264	439	615	791	967	1,143	1,143	1,143	1,143	1,143	1,143	1,098.6	1,010.7	878.9	703.1	527.3	351.5	175.8	0.0	0.0	0.0
17	Average measure life (years)	13.5																						
18	Total Avoided Cost (millions 2007$)	1.0	3.0	5.8	9.4	12.9	16.6	20.2	23.8	23.8	24.0	24.1	24.0	24.0	23.1	21.3	18.6	14.9	11.2	7.5	3.7	0.0	0.0	0.0
19	Electricity	0.7	2.0	3.8	6.1	8.3	10.6	12.9	15.3	15.3	15.5	15.6	15.5	15.5	14.9	13.7	12.0	9.7	7.3	4.8	2.4	0.0	0.0	0.0
20	Natural Gase	0.3	1.0	2.0	3.3	4.6	5.9	7.3	8.6	8.6	8.6	8.6	8.6	8.6	8.2	7.6	6.6	5.3	4.0	2.6	1.3	0.0	0.0	0.0
21	Discounted Benefits (millions 2007$)	1.0	2.8	5.4	8.5	11.4	14.2	16.8	19.4	18.9	18.6	18.2	17.6	17.2	16.1	14.4	12.3	9.6	7.1	4.6	2.2	0.0	0.0	0.0
22	Electricity	0.7	1.9	3.5	5.5	7.3	9.1	10.8	12.4	12.1	11.9	11.7	11.3	11.1	10.4	9.3	7.9	6.2	4.6	3.0	1.4	0.0	0.0	0.0
23	Natural Gase	0.3	0.9	1.8	3.0	4.1	5.1	6.1	7.0	6.8	6.6	6.5	6.3	6.1	5.7	5.1	4.4	3.4	2.5	1.6	0.8	0.0	0.0	0.0
24	Discounted Costs (millions 2007$)	4.1	7.9	11.5	15.0	14.6	14.2	13.9	13.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	Present-Valued Benefits	236.3																						
26	Electricity	152.2																						
27	Natural Gas	84.1																						
28	Present-Valued Costs	94.8																						
29	Net Present Value (millions 2007$)	141.5																						
30	Benefit/Cost Ratio	2.5																						

Notes (tied to row numbers in left column):

1 Not available.
2 Not used for this program.
3 EmPower New York Program has a goal of serving 6300 households/year. We assume this program doubles from current levels by 2009 and triples from current levels by 2011.
4 Derived from New York Energy $mart Program Quarterly Evaluation and Status Report, May 2007.
5 Same as for Row 4.
6 Same as for Row 4.
7 Derived from New York Energy $mart Program Evaluation and Status Report, March 2007. Program staff report that these data are more representative of long-term costs than the data in the report referenced in Row 4 (cost data in Row 4 reference cover only a short-term period).
8 Services provided at no cost to the participating household.
9 Included in Row 7.
10 Row 3 * Row 7 * (1 + Row 9)
11 Row 3 * Row 4 / 1,000,000 kWh/Gwh
12 Row 3 * Row 5 / 1000 kW/MW
13 Row 3 * Row 6 / 10,000 therms/billion Btu
14 Row 11 + Row 14 from previous year
15 Row 12 + Row 15 from previous year
16 Row 13 + Row 16 from previous year
17 From NYSERDA evaluation of the program.

Low Income Program -- Expand Weatherization Assistance Program

Version date: 8/28/07

	Item	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
1	Number of customers eligible	Not available																						
2	Participation rate (% eligible who participate)	Not used for this program																						
3	Incremental annual number of participants	1,355	2,710	5,420	5,420	5,420	5,420	5,420	5,420	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	kWh saved/participant	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923	923
5	kW saved/participant (summer peak)	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
6	therms saved/participant	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375
7	Direct program operator costs/participant	4,349	4,349	4,349	4,349	4,349	4,349	4,349	4,349	4,349	4,349	4,349	4,349	4,349	4,349	4,349	4,349	4,349	4,349	4,349	4,349	4,349	4,349	4,349
8	Participant costs per participant	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	Marketing and administrative costs (% of row x)	Included in Row 7																						
10	Total program operator incremental budget (millions)	5.9	11.8	23.6	23.6	23.6	23.6	23.6	23.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	Incremental GWh saved from current year installations	1.2	2.5	5.0	5.0	5.0	5.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	Incremental MW saved from current year installations	0.2	0.3	0.7	0.7	0.7	0.7	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	Incremental billion Btu saved from current year installatio	51	101	203	203	203	203	203	203	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	Incremental GWh saved from current & prior year installa	1.2	3.7	8.7	13.7	18.7	23.7	28.7	33.7	33.7	33.7	33.7	33.7	33.7	33.7	33.7	33.7	33.7	33.7	33.7	32.5	30.0	25.0	20.0
15	Incremental MW saved from current & prior year installat	0.2	0.5	1.2	1.8	2.5	3.1	3.8	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.3	3.9	3.3	2.6
16	Incremental billion Btu saved from current & prior year ins	51	152	355	558	761	964	1,167	1,370	1,370	1,370	1,370	1,370	1,370	1,370	1,370	1,370	1,370	1,370	1,370	1,319	1,218	1,015	812
17	Average measure life (years)	18.3																						
18	Total Avoided Cost (millions 2007$)	0.5	1.4	3.3	5.1	6.9	8.8	10.6	12.4	12.4	12.4	12.5	12.5	12.5	12.5	12.4	12.5	12.5	12.5	12.5	12.0	11.1	9.3	7.4
19	Electricity	0.1	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.0	1.7	1.3
20	Natural Gase	0.4	1.1	2.7	4.2	5.7	7.2	8.8	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	9.9	9.1	7.6	6.1
21	Discounted Benefits (millions 2007$)	0.5	1.3	3.0	4.6	6.1	7.5	8.8	10.1	9.8	9.6	9.4	9.1	8.9	8.7	8.5	8.3	8.1	7.9	7.7	7.2	6.5	5.3	4.1
22	Electricity	0.1	0.3	0.6	0.8	1.1	1.3	1.5	1.7	1.7	1.7	1.6	1.6	1.6	1.5	1.5	1.5	1.4	1.4	1.4	1.3	1.2	0.9	0.7
23	Natural Gase	0.4	1.1	2.5	3.8	5.0	6.2	7.3	8.4	8.1	7.9	7.7	7.5	7.3	7.2	7.0	6.8	6.6	6.5	6.3	5.9	5.3	4.3	3.4
24	Discounted Costs (millions 2007$)	5.7	11.2	21.8	21.3	20.7	20.2	19.7	19.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	Present-Valued Benefits	160.8																						
26	Electricity	28.3																						
27	Natural Gas	132.5																						
28	Present-Valued Costs	139.8																						
29	Net Present Value (millions 2007$)	21.0																						
30	Benefit/Cost Ratio	1.2																						

Notes (tied to row numbers in left column):

1 Not available.
2 Not used for this program.
3 DHCR plan is to serve 10,840 units in 2007. We assume 12.5% more units in year 1, 25% more in year 2, and 50% more in year 3.
4 From DHCR plan for 2007, assume half the new units are multifamily and half 1-4 units.
5 Based on ratio of kW to kWh savings for EmpowerNY program.
6 Same as for Row 4. We assume the extra money goes to electric- and gas-heated homes and not to homes with oil heat.
7 Same as for Row 4.
representative of long-term costs than the data in the report referenced in Row 4 (cost data in Row 4 reference cover only a short-term period).
8 Services provided at no cost to the participating household.
9 Included in Row 7.
10 Row 3 * Row 7 * (1 + Row 9)
11 Row 3 * Row 4 / 1,000,000 kWh/Gwh
12 Row 3 * Row 5 / 1000 kW/MW
13 Row 3 * Row 6 / 10,000 therms/billion Btu
14 Row 11 + Row 14 from previous year
15 Row 12 + Row 15 from previous year
16 Row 13 + Row 16 from previous year
17 ACEEE estimate. Midway between Home Performance with Energy Star and EmpowerNY.

Commercial New Construction Expansion

Version date: 8/28/07

	Item	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
1	Square feet of floor area eligible (millions)	116	118	119	121	122	124	125	127	128	130	132	133	135	136	138	140	141	143	144	146	147	149	151
2	Participation rate (% eligible who participate)	15%	20%	25%	30%	35%	40%	45%	50%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%
	Basecase (2007)	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%
	Incremental increase	3%	8%	13%	18%	23%	28%	33%	38%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3	Incremental annual participation (million square feet)	3	9	15	22	28	35	41	48	0	0	0	0	0	0	0	-3	-9	-15	-22	-28	-35	-41	-48
4	kWh saved/sq. foot	3.7	4.1	4.5	3.3	3.6	4.0	4.4	4.8	5.3	5.8	6.4	7.1	7.8	8.5	9.4	10.3	11.4	12.5	13.7	15.1	16.6	18.3	20.1
5	kW saved/sq. foot (summer peak)	0.0008	0.0009	0.0010	0.0007	0.0008	0.0009	0.0010	0.0011	0.0012	0.0013	0.0015	0.0016	0.0018	0.0019	0.0021	0.0023	0.0026	0.0028	0.0031	0.0034	0.0038	0.0042	0.0046
6	therms saved/sq. foot	0.09	0.10	0.11	0.08	0.09	0.10	0.11	0.12	0.13	0.15	0.16	0.18	0.20	0.22	0.24	0.26	0.29	0.32	0.35	0.38	0.42	0.46	0.51
7	Incentive $ per kWh saved	0.19	0.23	0.23	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
8	Marketing, TA and administrative costs (% of row x)	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%
9	Participant costs per kWh saved	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
10	Incremental program costs (millions)	3.7	11.5	20.9	19.8	28.3	38.3	50.3	64.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	Incremental GWh saved from current year installations	12.9	38.4	69.5	71.4	101.7	138.0	181.2	232.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-35.9	-106.8	-193.4	-298.4	-424.9	-576.4	-757.0	-971.3
12	Incremental MW saved from current year installations	2.9	8.7	15.8	16.2	23.1	31.4	41.2	52.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-8.2	-24.3	-44.0	-67.8	-96.6	-131.0	-172.0	-220.8
13	Incremental billion Btu saved from current year installations	33	97	176	181	258	350	460	590	0	0	0	0	0	0	0	-91	-271	-491	-758	-1,079	-1,464	-1,922	-2,466
14	Incremental GWh saved from current & prior year installations	12.9	51.3	120.7	192.2	293.9	431.9	613.1	845.6	845.6	845.6	845.6	845.6	845.6	845.6	845.6	809.7	702.8	509.4	211.0	0.0	0.0	0.0	0.0
15	Incremental MW saved from current & prior year installations	2.9	11.7	27.4	43.7	66.8	98.2	139.3	192.2	192.2	192.2	192.2	192.2	192.2	192.2	192.2	184.0	159.7	115.8	48.0	0.0	0.0	0.0	0.0
16	Incremental billion Btu saved from current & prior year installations	33	130	307	488	746	1,097	1,557	2,147	2,147	2,147	2,147	2,147	2,147	2,147	2,147	2,056	1,785	1,293	536	0	0	0	0
17	Average measure life (years)	14.7																						
18	Total Avoided Cost (millions 2007$)	1.3	5.1	11.8	18.3	27.6	40.3	56.9	78.4	79.2	80.3	81.0	80.9	81.3	81.6	81.8	78.9	68.9	50.0	20.7	0.0	0.0	0.0	0.0
19	Electricity	1.0	4.1	9.5	14.6	22.0	32.1	45.2	62.3	63.1	64.2	64.9	64.8	65.2	65.5	65.7	63.4	55.5	40.3	16.7	0.0	0.0	0.0	0.0
20	Natural Gase	0.2	1.0	2.3	3.7	5.6	8.2	11.7	16.1	16.1	16.1	16.1	16.1	16.1	16.1	16.1	15.4	13.4	9.7	4.0	0.0	0.0	0.0	0.0
21	Discounted Benefits (millions 2007$)	1.3	4.8	10.9	16.5	24.3	34.5	47.5	63.8	62.8	62.0	61.0	59.4	58.1	56.9	55.6	52.2	44.4	31.5	12.7	0.0	0.0	0.0	0.0
22	Electricity	1.0	3.9	8.8	13.2	19.4	27.5	37.7	50.7	50.0	49.6	48.9	47.6	46.6	45.7	44.6	42.0	35.8	25.4	10.2	0.0	0.0	0.0	0.0
23	Natural Gase	0.2	0.9	2.1	3.3	4.9	7.0	9.7	13.1	12.8	12.4	12.1	11.8	11.5	11.2	10.9	10.2	8.6	6.1	2.5	0.0	0.0	0.0	0.0
24	Discounted Costs (millions 2007$)	3.6	11.0	19.3	17.9	24.8	32.8	42.0	52.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	Present-Valued Benefits	760.1																						
26	Electricity	608.5																						
27	Natural Gas	151.6																						
28	Present-Valued Costs	204.1																						
29	Net Present Value (millions 2007$)	556.0																						
30	Benefit/Cost Ratio	3.7																						

Notes (tied to row numbers in left column):

1 Current program goal is 14 million sf/yr. NYSERDA estimate they have a 12% market share. 14/0.12=116.
2 NYSERDA staff estimate 12% in 2006/2007. National Grid is achieving more than 50% in MA and RI, but this is after more than a decade of operation and without the budget constraints of the current NYSERDA program.
3 Row 1 times Row 2
4 Estimate by NYSERDA based on recent program activity. Assume increases by 10%/yr due to efforts to increase uptake of comprehensive approach to optimizing building performance. We assume savings and costs decline by 1/3 in 2011 when new building code takes effect, which will capture some of the available savings.
5 Same as above.
6 From results of Xcel Minnesota Energy Design Assistance Program. Declines by 1/3 in 2011 as per note to Row 4.
7 For year one, estimate by NYSERDA based on recent program activity. For subsequent years, assume 20% higher as part of efforts to increase savings per building. Current incentives are lower than programs in most neighboring states. Declines by 1/3 in 2011 as per note to Row 4.
8 Rough NYSERDA estimate. This is higher than other programs since marketing and technical assistance costs are high due to 1-on-1 nature of these efforts.
9 NYSERDA staff estimate the current program pays about 40-50% of measure costs. We assume that when incentives go up, customers will do more measures and thus the customer cost per kWh saved will be similar to the current program.
10 Row 3 * Row 4* Row 7 * (1 + Row 8)
11 Row 3 * Row 4 / 1,000,000 kWh/Gwh
12 Row 3 * Row 5 / 1000 kW/MW
13 Row 3 * Row 6 / 10,000 therms/billion Btu
14 Row 11 + Row 14 from previous year
15 Row 12 + Row 15 from previous year
16 Row 13 + Row 16 from previous year
17 Weighted average from National Grid Massachusetts Design 2000 Plus program in 2006.

Flex Tech Expansion

Version date: 8/28/07

	Item	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
1	Number of customers eligible	Not needed for this estimate																						
2	Participation rate (% eligible who participate)	Not needed for this estimate																						
3	Incremental annual number of participants	50	100	150	150	150	150	150	150	0	0	0	0	0	0	0	-50	-100	-150	-150	-150	-150	-150	-150
4	kWh saved/participant	424,000	424,000	424,000	424,000	424,000	424,000	424,000	424,000	424,000	424,000	424,000	424,000	424,000	424,000	424,000	424,000	424,000	424,000	424,000	424,000	424,000	424,000	424,000
5	Ratio of kW/kWh savings	0.000184	0.000184	0.000184	0.000184	0.000184	0.000184	0.000184	0.000184	0.000184	0.000184	0.000184	0.000184	0.000184	0.000184	0.000184	0.000184	0.000184	0.000184	0.000184	0.000184	0.000184	0.000184	0.000184
6	kW saved/participant (summer peak)	78.02	78.02	78.02	78.02	78.02	78.02	78.02	78.02	78.02	78.02	78.02	78.02	78.02	78.02	78.02	78.02	78.02	78.02	78.02	78.02	78.02	78.02	78.02
7	MMBtu saved/participant	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742
8	Direct program operator costs/participant	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
9	Participant costs per participant	233,700	233,700	233,700	233,700	233,700	233,700	233,700	233,700	233,700	233,700	233,700	233,700	233,700	233,700	233,700	233,700	233,700	233,700	233,700	233,700	233,700	233,700	233,700
10	Marketing and administrative costs (% of row x)	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
11	Incremental Program Costs (millions 2007$)	12.6	25.2	37.8	37.8	37.8	37.8	37.8	37.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	GWh contracted in current year	15	30	45	45	45	45	45	45	0	0	0	0	0	0	0	-15	-30	-45	-45	-45	-45	-45	-45
13	MW contracted in current year	3	5	8	8	8	8	8	8	0	0	0	0	0	0	0	-3	-5	-8	-8	-8	-8	-8	-8
14	Billion Btu contracted in current year	61	122	183	183	183	183	183	183	0	0	0	0	0	0	0	-61	-122	-183	-183	-183	-183	-183	-183
15	GWh saved from current year installations	4	19	33	45	45	45	45	45	33	0	0	0	0	0	0	-4	-19	-33	-45	-45	-45	-45	-45
16	MW saved from current year installations	1	3	6	8	8	8	8	8	6	0	0	0	0	0	0	-1	-3	-6	-8	-8	-8	-8	-8
17	Billion BTU saved from current year installations	15	76	137	183	183	183	183	183	137	0	0	0	0	0	0	-15	-76	-137	-183	-183	-183	-183	-183
18	GWh saved from current & prior year installations	4	22	56	100	145	189	234	278	312	312	312	312	312	312	312	308	289	256	211	167	122	78	33
19	MW saved from current & prior year installations	1	4	10	18	27	35	43	51	57	57	57	57	57	57	57	57	53	47	39	31	23	14	6
20	Billion Btu saved from current & prior year installations	15	91	229	412	594	777	960	1,143	1,280	1,280	1,280	1,280	1,280	1,280	1,280	1,265	1,189	1,052	869	686	503	320	137
21	Average measure life (years)	15																						
22	Total Avoided Cost (millions 2007$)	0.4	2.4	5.8	10.2	14.6	19.0	23.4	27.8	31.3	31.6	31.8	31.8	31.9	31.9	31.9	31.8	30.0	26.6	22.0	17.3	12.7	8.1	3.5
23	Electricity	0.3	1.7	4.1	7.2	10.2	13.2	16.2	19.2	21.7	22.0	22.2	22.2	22.3	22.3	22.3	22.3	21.1	18.7	15.4	12.2	9.0	5.7	2.5
24	Natural Gase	0.1	0.7	1.7	3.1	4.5	5.8	7.2	8.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.5	8.9	7.9	6.5	5.1	3.8	2.4	1.0
25	Discounted Benefits (millions 2007$)	0.4	2.3	5.4	9.2	12.9	16.3	19.5	22.6	24.8	24.4	24.0	23.3	22.8	22.3	21.7	21.0	19.4	16.7	13.4	10.4	7.4	4.6	1.9
26	Electricity	0.3	1.6	3.8	6.5	8.9	11.3	13.5	15.6	17.2	17.0	16.7	16.3	15.9	15.6	15.2	14.7	13.6	11.8	9.5	7.3	5.2	3.3	1.4
27	Natural Gase	0.1	0.7	1.6	2.8	3.9	5.0	6.0	7.0	7.6	7.4	7.2	7.0	6.9	6.7	6.5	6.3	5.8	5.0	4.0	3.1	2.2	1.4	0.6
28	Discounted Costs (millions 2007$)	12.3	23.9	34.9	34.1	33.2	32.3	31.5	30.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	Present-Valued Benefits	346.7																						
30	Electricity	242.1																						
31	Natural Gas	104.6																						
32	Present-Valued Costs	232.9																						
33	Net Present Value (millions 2007$)	113.8																						
34	Benefit/Cost Ratio	1.5																						

Notes (tied to row numbers in left column):

3 Based on SBC participation rate but with increased marketing and also adjusted for higher average study cost due to higher caps. Current program does ~150 projects per year, of which 125 are non-industrial.
4 Derived from New York Energy $mart Program Evaluation and Status Report, May 2007 adjusted due to higher caps.
5 Derived from New York Energy $mart Program Evaluation and Status Report, May 2007.
6 Row 4 * Row 5
7 Derived from New York Energy $mart Program Evaluation and Status Report, May 2007 adjusted due to higher caps.
8 Double SBC average spending based on a $1,000,000 cap per customer every four years.
9 Derived from New York Energy $mart Program Evaluation and Status Report, May 2007.
10 Rough NYSERDA and ACEEE estimate.
11 Row 3 * Row 8 * (1 + Row 10)
12 Row 3 * Row 4 / 1,000,000 kWh/Gwh. Reduced by 30% to eliminate double-counting with C/I Performance Program.
13 Row 3 * Row 5 / 1000 kW/MW. Reduced by 30% to eliminate double-counting with C/I Performance Program.
14 Row 3 * Row 6 / 1,000 mmBTU/billion Btu. Reduced by 30% to eliminate double-counting with C/I Performance Program.
15 Based on Row 12; assumes 25 % installed in first year and a 12 month installation lag thereafter.
16 Based on Row 13; assumes 25 % installed in first year and a 12 month installation lag thereafter.
17 Based on Row 14; assumes 25 % installed in first year and a 12 month installation lag thereafter.
18 Row 15 + Row 18 from previous year
19 Row 16 + Row 19 from previous year
20 Row 17 + Row 20 from previous year
21 ACEEE estimate. NYSERDA assumes 20 years.

Industrial Process: Flex Tech Expansion
Version date: 8/28/07

Item	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
1 Number of customers eligible	Not needed for this estimate																						
2 Participation rate (% eligible who participate)	Not needed for this estimate																						
3 Annual number of participants	20	30	35	35	35	35	35	35	0	0	0	0	0	0	0	-20	-30	-35	-35	-35	-35	-35	-35
4 kWh saved/participant	1,700,000	1,700,000	1,700,000	1,700,000	1,700,000	1,700,000	1,700,000	1,700,000	1,700,000	1,700,000	1,700,000	1,700,000	1,700,000	1,700,000	1,700,000	1,700,000	1,700,000	1,700,000	1,700,000	1,700,000	1,700,000	1,700,000	1,700,000
5 Ratio of kW/kWh savings	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015
6 kW saved/participant (summer peak)	255.00	255.00	255.00	255.00	255.00	255.00	255.00	255.00	255.00	255.00	255.00	255.00	255.00	255.00	255.00	255.00	255.00	255.00	255.00	255.00	255.00	255.00	255.00
7 MMBtu saved/participant	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
8 Direct program operator costs/participant	525,000	525,000	525,000	525,000	525,000	525,000	525,000	525,000	525,000	525,000	525,000	525,000	525,000	525,000	525,000	525,000	525,000	525,000	525,000	525,000	525,000	525,000	525,000
9 Participant costs per participant	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000
10 Marketing and administrative costs (% of row 9)	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
11 Incremental Program Costs (millions 2007$)	47.6	71.4	83.3	83.3	83.3	83.3	83.3	83.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12 GWh contracted in current year	34	51	60	60	60	60	60	60	0	0	0	0	0	0	0	-24	-36	-42	-42	-42	-42	-42	-42
13 MW contracted in current year	5	8	9	9	9	9	9	9	0	0	0	0	0	0	0	-4	-5	-6	-6	-6	-6	-6	-6
14 Billion Btu contracted in current year	300	450	525	525	525	525	525	525	0	0	0	0	0	0	0	-210	-315	-368	-368	-368	-368	-368	-368
15 GWh saved from current year installations	9	38	53	60	60	60	60	60	45	0	0	0	0	0	0	-6	-27	-37	-42	-42	-42	-42	-42
16 MW saved from current year installations	1	6	8	9	9	9	9	9	7	0	0	0	0	0	0	-1	-4	-6	-6	-6	-6	-6	-6
17 Billion BTU saved from current year installations	75	338	469	525	525	525	525	525	394	0	0	0	0	0	0	-53	-236	-328	-368	-368	-368	-368	-368
18 GWh saved from current & prior year installations	9	47	100	159	219	278	338	397	442	442	442	442	442	442	442	436	409	372	330	289	247	205	164
19 MW saved from current & prior year installations	1	7	15	24	33	42	51	60	66	66	66	66	66	66	66	65	61	56	50	43	37	31	25
20 Billion Btu saved from current & prior year installations	75	413	881	1,406	1,931	2,456	2,981	3,506	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,848	3,611	3,283	2,916	2,548	2,181	1,813	1,446
21 Average measure life (years)	15																						
22 Total Avoided Cost (millions 2007$)	1.2	6.5	13.7	21.4	29.0	36.8	44.5	52.3	58.3	58.7	58.9	58.8	58.8	58.9	58.9	58.3	55.0	50.0	44.4	38.8	33.3	27.8	22.1
23 Electricity	0.6	3.4	7.1	10.8	14.6	18.4	22.1	26.0	29.0	29.4	29.7	29.5	29.6	29.6	29.6	29.5	27.9	25.4	22.5	19.7	16.9	14.2	11.3
24 Natural Gase	0.6	3.1	6.6	10.5	14.5	18.4	22.4	26.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	28.9	27.1	24.6	21.9	19.1	16.4	13.6	10.8
25 Discounted Benefits (millions 2007$)	1.2	6.2	12.7	19.3	25.5	31.5	37.1	42.6	46.2	45.4	44.4	43.1	42.1	41.0	40.0	38.6	35.5	31.5	27.2	23.2	19.4	15.7	12.2
26 Electricity	0.6	3.2	6.5	9.8	12.8	15.7	18.5	21.2	23.0	22.7	22.3	21.7	21.2	20.7	20.1	19.5	18.0	16.0	13.8	11.8	9.8	8.0	6.2
27 Natural Gase	0.5	2.9	6.1	9.5	12.7	15.8	18.7	21.4	23.2	22.6	22.0	21.5	20.9	20.4	19.9	19.1	17.5	15.5	13.4	11.4	9.5	7.7	6.0
28 Discounted Costs (millions 2007$)	46.4	67.8	77.1	75.1	73.2	71.4	69.5	67.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29 Present-Valued Benefits	681.5																						
30 Electricity	343.2																						
31 Natural Gas	338.2																						
32 Present-Valued Costs	548.3																						
33 Net Present Value (millions 2007$)	133.1																						
34 Benefit/Cost Ratio	1.2																						

Notes (tied to row numbers in left column):

3 Based on SBC projects with a major expanded focus on industrial process projects. Current program does about 25 industrial projects/year. Assumes the voluntary participation of some large exempt manufacturers.
4 Based on recent projects and assuming availability of incentives.
5 Based on high hours of operation for industrial process.
6 Calculated Row 4*Row 5
7 Based on recent projects and assuming availability of incentives.
8 Based on a mix of Tier II and Tier III projects, per project caps of $500,000 and $5,000,000 respectively and an average cost of 50% of cap. Also includes incentives based on current incentives under C/I Performance Program.
9 Based on recent projects; assume incentives cover 30% of project cost and customer remaining 70%.
10 Rough NYSERDA and ACEEE estimate.
11 Row 3 * Row 8 * (1 + Row 10)
12 Row 3 * Row 4 / 1,000,000 kWh/Gwh. Reduced by 30% to eliminate double-counting with C/I Performance Program.
13 Row 3 * Row 5 / 1000 kW/MW. Reduced by 30% to eliminate double-counting with C/I Performance Program.
14 Row 3 * Row 6 / 1,000 mmBTU/billion Btu. Reduced by 30% to eliminate double-counting with C/I Performance Program.
15 Based on Row 12; assumes 25 % installed in first year and a 12 month installation lag thereafter.
16 Based on Row 13; assumes 25 % installed in first year and a 12 month installation lag thereafter.
17 Based on Row 14; assumes 25 % installed in first year and a 12 month installation lag thereafter.
18 Row 15 + Row 18 from previous year
19 Row 16 + Row 19 from previous year
20 Row 17 + Row 20 from previous year
21 ACEEE estimate. NYSERDA assumes 20 years.

C&I RFP Program

Version date: 8/28/07

	Item	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
1	Number of customers eligible	Not needed for this program																						
2	Participation rate (% eligible who participate)	Not needed for this program																						
3	Annual number of participants	35	70	140	140	140	140	140	140	0	0	0	0	0	0	0	0	0	-35	-70	-140	-140	-140	-140
4	kWh saved/participant	1,218,000	1,218,000	1,218,000	1,218,000	1,218,000	1,218,000	1,218,000	1,218,000	1,218,000	1,218,000	1,218,000	1,218,000	1,218,000	1,218,000	1,218,000	1,218,000	1,218,000	1,218,000	1,218,000	1,218,000	1,218,000	1,218,000	1,218,000
5	Ratio of kW/kWh savings	Not needed for this program																						
6	kW saved/participant (summer peak)	117	117	117	117	117	117	117	117	117	117	117	117	117	117	117	117	117	117	117	117	117	117	117
7	therms saved/participant	Not available																						
8	Direct program operator costs/participant	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000
9	Participant costs per participant	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000	149,000
10	Marketing and administrative costs (% of row x)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
11	Incremental Program Costs (millions 2007$)	11.0	21.9	43.8	43.8	43.8	43.8	43.8	43.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	GWh saved from current year installations	42.6	85.3	170.5	170.5	170.5	170.5	170.5	170.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-42.6	-85.3	-170.5	-170.5	-170.5	-170.5
13	MW saved from current year installations	4.1	8.2	16.4	16.4	16.4	16.4	16.4	16.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-4.1	-8.2	-16.4	-16.4	-16.4	-16.4
14	Billion Btu saved from current year installations	Not available																						
15	GWh saved from current & prior year installations	42.6	127.9	298.4	468.9	639.5	810.0	980.5	1,151.0	1,151.0	1,151.0	1,151.0	1,151.0	1,151.0	1,151.0	1,151.0	1,151.0	1,151.0	1,108.4	1,023.1	852.6	682.1	511.6	341.0
16	MW saved from current & prior year installations	4.1	12.3	28.7	45.0	61.4	77.8	94.2	110.6	110.6	110.6	110.6	110.6	110.6	110.6	110.6	110.6	110.6	106.5	98.3	81.9	65.5	49.1	32.8
17	Billion Btu saved from current & prior year installations	Not available																						
18	Average measure life (years)	16.8																						
19	Total Avoided Cost (millions 2007$)	3.0	8.6	19.5	29.3	38.7	48.7	58.6	68.9	68.5	69.2	69.5	68.9	68.9	68.8	68.5	69.1	69.7	67.3	62.1	51.7	41.5	31.4	20.9
20	Electricity	3.0	8.6	19.5	29.3	38.7	48.7	58.6	68.9	68.5	69.2	69.5	68.9	68.9	68.8	68.5	69.1	69.7	67.3	62.1	51.7	41.5	31.4	20.9
21	Natural Gase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	Discounted Benefits (millions 2007$)	2.9	8.2	18.1	26.4	34.1	41.8	48.9	56.1	54.3	53.5	52.4	50.6	49.3	47.9	46.5	45.8	44.9	42.3	38.0	30.9	24.2	17.8	11.6
23	Electricity	2.9	8.2	18.1	26.4	34.1	41.8	48.9	56.1	54.3	53.5	52.4	50.6	49.3	47.9	46.5	45.8	44.9	42.3	38.0	30.9	24.2	17.8	11.6
24	Natural Gase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	Discounted Costs (millions 2007$)	10.7	20.8	40.5	39.5	38.5	37.5	36.6	35.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	Present-Valued Benefits	846.3																						
27	Electricity	846.3																						
28	Natural Gas	0.0																						
29	Present-Valued Costs	259.8																						
30	Net Present Value (millions 2007$)	586.5																						
31	Benefit/Cost Ratio	3.3																						

Notes (tied to row numbers in left column):

3 NU was doing about 35 projects/year at the height of their program. We assume a NYS program ramps up to about four times this level over a 3 year period, since NY's electricity demand is more than 4X NU's. This program will be competing with other retrofit programs, so there may be some problems reaching this level of participation.
4 Derived from NU experience over 2000-2002 period.
6 Derived from NU experience over 2000-2002 period.
7 Not available
8 Derived from NU experience over 2000-2002 period. We adjust for inflation to present costs at 3%/year.
9 NU program staff recall that on average program paid about half of measure costs, customers the balance.
10 Derived from NU experience over 2000-2002 period.
11 Row 3* Row 8 * (1 + Row 10)
12 Row 3 * Row 14 / 1,000,000 kWh/Gwh
13 Row 3 * Row 6 / 1000 kW/MW
14 Row 3 * Row 7 / 10,000 therms/billion Btu
15 Row 12 + Row 15 from previous year
16 Row 13 + Row 16 from previous year
17 Row 14 + Row 17 from previous year
18 Weighted average from NU program

Retrocommissioning

Version date: 8/28/07

	Item	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
1	Number of customers eligible	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A															
2	Participation rate (% eligible who participate)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A															
3	Annual number of participants	20	40	60	80	100	100	100	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	kWh saved/participant	1,350,000	1,350,000	1,350,000	1,350,000	1,350,000	1,350,000	1,350,000	1,350,000	1,350,000	1,350,000	1,350,000	1,350,000	1,350,000	1,350,000	1,350,000	1,350,000	1,350,000	1,350,000	1,350,000	1,350,000	1,350,000	1,350,000	1,350,000
5	Ratio of kW/kWh savings	Not needed.																						
6	kW saved/participant (summer peak)	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00	57.00
7	therms saved/participant	N/A																						
8	Direct program operator costs/participant	81,000	81,000	81,000	81,000	81,000	81,000	81,000	81,000	81,000	81,000	81,000	81,000	81,000	81,000	81,000	81,000	81,000	81,000	81,000	81,000	81,000	81,000	81,000
9	Participant costs per participant	40,500	40,500	40,500	40,500	40,500	40,500	40,500	40,500	40,500	40,500	40,500	40,500	40,500	40,500	40,500	40,500	40,500	40,500	40,500	40,500	40,500	40,500	40,500
10	Marketing and administrative costs	Included in program operator costs																						
11	Incremental Program Costs (millions 2007$)	1.6	3.2	4.9	6.5	8.1	8.1	8.1	8.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	GWh saved from current year installations	27.0	54.0	81.0	108.0	135.0	135.0	135.0	135.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	MW saved from current year installations	1.1	2.3	3.4	4.6	5.7	5.7	5.7	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	Billion Btu saved from current year installations	N/A																						
15	GWh saved from current & prior year installations	27.0	81.0	162.0	270.0	405.0	540.0	675.0	783.0	729.0	648.0	540.0	405.0	270.0	135.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	MW saved from current & prior year installations	1.1	3.4	6.8	11.4	17.1	22.8	28.5	33.1	30.8	27.4	22.8	17.1	11.4	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	Billion Btu saved from current & prior year installations	N/A																						
18	Average measure life (years)	7																						
19	Total Avoided Cost (millions 2007$)	1.7	5.1	9.7	15.3	22.2	29.4	36.5	42.4	38.9	34.8	29.0	21.5	14.2	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	Electricity	1.7	5.1	9.7	15.3	22.2	29.4	36.5	42.4	38.9	34.8	29.0	21.5	14.2	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	Natural Gase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	Discounted Benefits (millions 2007$)	1.7	4.8	9.0	13.8	19.5	25.2	30.5	34.5	30.8	26.9	21.8	15.8	10.2	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23	Electricity	1.7	4.8	9.0	13.8	19.5	25.2	30.5	34.5	30.8	26.9	21.8	15.8	10.2	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	Natural Gase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	Discounted Costs (millions 2007$)	1.6	3.1	4.5	5.8	7.1	6.9	6.8	6.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	Present-Valued Benefits	249.4																						
27	Electricity	249.4																						
28	Natural Gas	0.0																						
29	Present-Valued Costs	42.4																						
30	Net Present Value (millions 2007$)	207.0																						
31	Benefit/Cost Ratio	5.9																						

Notes (tied to row numbers in left column):

1 N/A
2 N/A
3 Estimated based on large number of eligible buildings in NY. Centerpoint Energy completed 16 projects in its third year and Xcel Minnesota implemented measures in 35 buildings in the last program year.
4 Assumes 450,000 sq. ft. building and 15% typical savings. Building size and electric intensity data from NYSERDA RCx scoping studies.
5 Not needed for this program
6 Assumes 5% peak demand savings and average peak demand per building from NYSERDA RCx scoping studies.
7 N/A -- need to research further.
8 Assumes average costs of $0.27/sq.ft. (LBNL 2004). We assume program ultimately pays 2/3's of these and customer 1/3.
9 See note for Row 8.
10 N/A
11 Row 3 * Row 8 * (1 + Row 10)
12 Row 3 * Row 4 / 1,000,000 kWh/Gwh
13 Row 3 * Row 6 / 1000 kW/MW
14 N/A
15 Row 12 + Row 15 from previous year
16 Row 13 + Row 16 from previous year
17 N/A
18 Xcel estimate.

Small C&I

Version date: 8/28/07

	Item	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
1	Number of customers eligible	560,000	560,000	560,000	560,000	560,000	560,000	560,000	560,000	560,000	560,000	560,000	560,000	560,000	560,000	560,000	560,000	560,000	560,000	560,000	560,000	560,000	560,000	560,000
2	Participation rate (% eligible who participate)	0.5%	1%	2%	2%	2%	2%	2%	2%															
3	Annual number of participants	2,800	5,600	11,200	11,200	11,200	11,200	11,200	11,200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	kWh saved/participant	17,674	17,674	17,674	17,674	17,674	17,674	17,674	17,674	17,674	17,674	17,674	17,674	17,674	17,674	17,674	17,674	17,674	17,674	17,674	17,674	17,674	17,674	17,674
5	Ratio of kW/kWh savings	Not needed.																						
6	kW saved/participant (summer peak)	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
7	therms saved/participant	N/A																						
8	Direct program operator costs/participant	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476
9	Participant costs per participant	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476	2,476
10	Marketing and administrative costs	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%
11	Incremental Programs Costs (millions of 2007$)	14.8	29.7	59.3	59.3	59.3	59.3	59.3	59.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	GWh saved from current year installations	49.5	99.0	197.9	197.9	197.9	197.9	197.9	197.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	MW saved from current year installations	9.0	17.9	35.8	35.8	35.8	35.8	35.8	35.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	Billion Btu saved from current year installations	N/A																						
15	GWh saved from current & prior year installations	49.5	148.5	346.4	544.4	742.3	940.3	1,138.2	1,336.2	1,336.2	1,336.2	1,336.2	1,336.2	1,286.7	1,187.7	989.7	791.8	593.8	395.9	197.9	0.0	0.0	0.0	0.0
16	MW saved from current & prior year installations	9.0	26.9	62.7	98.6	134.4	170.2	206.1	241.9	241.9	241.9	241.9	241.9	233.0	215.0	179.2	143.4	107.5	71.7	35.8	0.0	0.0	0.0	0.0
17	Billion Btu saved from current & prior year installations	N/A																						
18	Average measure life (years)	12																						
19	Total Avoided Cost (millions 2007$)	3.8	11.2	25.6	38.8	51.9	65.2	78.3	91.9	92.6	94.0	94.9	94.5	91.4	84.6	70.6	56.9	43.0	28.8	14.4	0.0	0.0	0.0	0.0
20	Electricity	3.8	11.2	25.6	38.8	51.9	65.2	78.3	91.9	92.6	94.0	94.9	94.5	91.4	84.6	70.6	56.9	43.0	28.8	14.4	0.0	0.0	0.0	0.0
21	Natural Gase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	Discounted Benefits (millions 2007$)	3.7	10.7	23.7	35.0	45.6	55.8	65.4	74.8	73.4	72.6	71.4	69.4	65.4	59.0	47.9	37.7	27.8	18.1	8.8	0.0	0.0	0.0	0.0
23	Electricity	3.7	10.7	23.7	35.0	45.6	55.8	65.4	74.8	73.4	72.6	71.4	69.4	65.4	59.0	47.9	37.7	27.8	18.1	8.8	0.0	0.0	0.0	0.0
24	Natural Gase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	Discounted Costs (millions 2007$)	14.5	28.2	54.9	53.5	52.2	50.8	49.5	48.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	Present-Valued Benefits	866.1																						
27	Electricity	866.1																						
28	Natural Gas	0.0																						
29	Present-Valued Costs	351.9																						
30	Net Present Value (millions 2007$)	514.1																						
31	Benefit/Cost Ratio	2.5																						

Notes (tied to row numbers in left column):

1 Eligible population was estimated for 1991 for Con Ed, NiMo, and LILCo at 364,900 customers. These utilities accounted for 65% of NYS electric sales then, implying about 560,000 eligible customers. We do not attempt to account for customer growth since then. We then multiply by 0.87 to exclude LIPA (based on 2005 GWh sales). Updated data should be collected before locking in long-term budgets.
2 Based on number of participants handled annually by SCE, adjusting for differences between their annual sales and those in NYS (excluding LIPA). If services were free, experience by National Grid in the 1990s indicates that 3% participation/year may be achievable.
3 Row 1 * Row 2
4 These numbers are from SCE's program for 2007. Numbers are higher for CL&P, lower for National Grid.
5 Not needed for this program
6 Same as for Row 4.
7 Not available.
8 These numbers are from SCE's program for 2007. However, relative to National Grid Massachusetts and CL&P, these numbers seem low for the total cost but in line with utility costs for a program that pays 50% incentives.
9 Program pays 50% of the cost, with the balance paid by the customer and financed on their electric bill.
10 SCE's program for 2007 has 14% marketing and administrative costs, but they do not require a cost-share. We increase this to 20% for a NYS program since marketing and administrative costs will be higher with a customer cost share.
11 Row 3 * Row 8 * (1 + Row 10)
12 Row 3 * Row 4 / 1,000,000 kWh/Gwh
13 Row 3 * Row 6 / 1000 kW/MW
14 N/A
15 Row 12 + Row 15 from previous year
16 Row 13 + Row 16 from previous year
17 N/A
18 Weighted average estimate by National Grid for their program in 2006.

C&I Lighting Rebates

Version date: 8/28/07

	Item	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
1	Number of customers eligible	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	Participation rate (% eligible who participate)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	Annual number of participants	4,000	12,000	17,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	kWh saved/participant	20,827	20,827	20,827	20,827	20,827	20,827	20,827	20,827	20,827	20,827	20,827	20,827	20,827	20,827	20,827	20,827	20,827	20,827	20,827	20,827	20,827	20,827	20,827
5	Ratio of kW/kWh savings	Not needed.																						
6	kW saved/participant (summer peak)	9.85	9.85	9.85	9.85	9.85	9.85	9.85	9.85	9.85	9.85	9.85	9.85	9.85	9.85	9.85	9.85	9.85	9.85	9.85	9.85	9.85	9.85	9.85
7	therms saved/participant	N/A																						
8	Direct program operator costs/participant	1,991	1,991	1,991	1,991	1,991	1,991	1,991	1,991	1,991	1,991	1,991	1,991	1,991	1,991	1,991	1,991	1,991	1,991	1,991	1,991	1,991	1,991	1,991
9	Participant costs per participant	2,578	2,578	2,578	2,578	2,578	2,578	2,578	2,578	2,578	2,578	2,578	2,578	2,578	2,578	2,578	2,578	2,578	2,578	2,578	2,578	2,578	2,578	2,578
10	Marketing and administrative costs	20%	20%	20%	20%	20%	20%	20%	20%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	Incremental Programs Costs (millions of 2007$)	19.9	59.6	86.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	GWh saved from current year installations	83.3	249.9	364.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	MW saved from current year installations	39.4	118.3	172.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	Billion Btu saved from current year installations	N/A																						
15	GWh saved from current & prior year installations	83.3	333.2	697.7	697.7	697.7	697.7	697.7	697.7	697.7	697.7	614.4	364.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	MW saved from current & prior year installations	39.4	157.7	330.1	330.1	330.1	330.1	330.1	330.1	330.1	330.1	290.7	172.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	Billion Btu saved from current & prior year installations	N/A																						
18	Average measure life (years)	10																						
19	Total Avoided Cost (millions 2007$)	8.6	34.4	71.7	70.8	71.1	70.3	69.6	69.4	71.8	73.5	66.0	39.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	Electricity	8.6	34.4	71.7	70.8	71.1	70.3	69.6	69.4	71.8	73.5	66.0	39.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	Natural Gase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	Discounted Benefits (millions 2007$)	8.4	32.6	66.4	63.9	62.5	60.2	58.1	56.4	57.0	56.8	49.7	28.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23	Electricity	8.4	32.6	66.4	63.9	62.5	60.2	58.1	56.4	57.0	56.8	49.7	28.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	Natural Gase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	Discounted Costs (millions 2007$)	19.4	56.6	80.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	Present-Valued Benefits	600.9																						
27	Electricity	600.9																						
28	Natural Gas	0.0																						
29	Present-Valued Costs	156.4																						
30	Net Present Value (millions 2007$)	444.5																						
31	Benefit/Cost Ratio	3.8																						

Notes (tied to row numbers in left column):

1 N/A
2 N/A
3 SCE is doing about 10,000 projects/year. Based on GWh sales, NYS (excluding LIPA) is about 75% larger than SCE. We assume we reach 175% of SCE's level of participation in year 3. Participation in year 1 is about 4X current efforts in NYS, year 2 is projected near the midpoint between year 1 and 3 rates.
4 Based on SCE projections for 2006-2008 and 10,000 projects/year (30,000 over 3 years). This is in line with experience in NYS under the Smart Equipment Choices program.
5 Not needed for this program
6 Same as for Row 4.
7 No gas savings.
8 Initial data from same source as for Row 4. We double these costs to be more in line with experience NYS under the Smart Equipment Choices program. The SCE data imply an average simple payback for lighting measures of about 0.7 years which is unlikely. By doubling costs, the average simple payback, before incentives, is about 1.5 years, which is more in line with our experience.
9 Same as for Row 8.
10 Based on experience by SCE and other utilities.
11 Row 3 * Row 8 * (1 + Row 10)
12 Row 3 * Row 4 / 1,000,000 kWh/Gwh
13 Row 3 * Row 6 / 1000 kW/MW
14 N/A
15 Row 12 + Row 15 from previous year
16 Row 13 + Row 16 from previous year
17 N/A
18 Based on weighted average estimate by SCE for their 2006-2008 program.

Commercial Sector Focus
Version date: 8/28/07

	Item	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
1	Floor area of buildings in targeted sectors (million sf)	1,694	1,711	1,728	1,745	1,763	1,780	1,798	1,816	1,833	1,851	1,868	1,886	1,903	1,921	1,938	1,956	1,974	1,991	2,009	2,026	2,044	2,061	2,079
2	Cumulative participation rate	1%	3%	6%	10%	15%	20%	25%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%
	Incremental participation rate	1%	2%	3%	4%	5%	5%	5%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3	Annual sq. ft. of participating floor area	17	34	52	70	88	89	90	91	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Basecase kWh/sf	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5
5	Basecase therms/sf	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52
6	Average energy savings in participating buildings	5%	7.5%	10%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%
7	kWh saved/sq. ft.	0.7	1.1	1.5	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
8	Ratio of kW/kWh savings	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027
9	kW saved/sf (summer peak)	0.00020	0.00029	0.00039	0.00059	0.00059	0.00059	0.00059	0.00059	0.00059	0.00059	0.00059	0.00059	0.00059	0.00059	0.00059	0.00059	0.00059	0.00059	0.00059	0.00059	0.00059	0.00059	0.00059
10	therms saved/sq.ft.	0.026	0.039	0.052	0.078	0.078	0.078	0.078	0.078	0.078	0.078	0.078	0.078	0.078	0.078	0.078	0.078	0.078	0.078	0.078	0.078	0.078	0.078	0.078
11	Direct program operator costs/sf	0.31	0.47	0.62	0.62	0.62	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47
12	Participant costs per participant	0.31	0.47	0.62	1.25	1.25	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
13	Marketing and administrative costs	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%
14	Total program operator and participant budget (millions)	11.9	36.0	72.7	141.4	178.5	176.9	178.6	180.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	GWh saved from current year installations	12	37	75	152	192	194	196	198	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	MW saved from current year installations	3	10	20	41	52	52	53	54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	Billion Btu saved from current year installations	44	133	268	541	683	690	697	704	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	GWh saved from current & prior year installations	12	50	125	277	468	662	858	1,055	1,055	1,055	1,055	1,055	1,055	1,055	1,055	1,043	1,006	930	779	587	393	198	0
19	MW saved from current & prior year installations	3	13	34	75	127	179	232	286	286	286	286	286	286	286	286	283	273	252	211	159	107	54	0
20	Billion Btu saved from current & prior year installations	44	176	444	986	1,669	2,359	3,057	3,761	3,761	3,761	3,761	3,761	3,761	3,761	3,761	3,717	3,584	3,316	2,775	2,092	1,401	704	0
21	Average measure life	15																						
22	Total Avoided Cost (millions 2007$)	1.4	5.5	13.7	29.7	49.9	70.0	90.1	110.7	112.3	113.8	114.9	115.0	115.6	116.2	116.6	116.0	112.4	104.3	87.1	65.7	44.1	22.3	0.0
23	Electricity	1.0	4.2	10.3	22.3	37.4	52.3	67.2	82.5	84.1	85.6	86.7	86.8	87.4	88.0	88.4	88.1	85.5	79.4	66.3	50.0	33.6	17.0	0.0
24	Natural Gase	0.3	1.3	3.3	7.4	12.5	17.7	22.9	28.2	28.2	28.2	28.2	28.2	28.2	28.2	28.2	27.9	26.9	24.9	20.8	15.7	10.5	5.3	0.0
25	Discounted Benefits (millions 2007$)	1.3	5.2	12.6	26.8	43.8	60.0	75.2	90.1	89.0	87.9	86.6	84.4	82.7	81.0	79.2	76.8	72.5	65.6	53.4	39.2	25.7	12.6	0.0
26	Electricity	1.0	4.0	9.5	20.1	32.8	44.8	56.1	67.1	66.7	66.2	65.3	63.7	62.5	61.4	60.1	58.3	55.2	49.9	40.6	29.9	19.6	9.6	0.0
27	Natural Gase	0.3	1.3	3.1	6.7	11.0	15.2	19.1	22.9	22.4	21.8	21.2	20.7	20.2	19.7	19.2	18.5	17.3	15.6	12.8	9.4	6.1	3.0	0.0
28	Discounted Costs (millions 2007$)	11.6	34.2	67.3	127.6	156.9	151.5	149.1	146.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	Present-Valued Benefits	1251.7																						
30	Electricity	944.4																						
31	Natural Gas	307.3																						
32	Present-Valued Costs	845.0																						
33	Net Present Value (millions 2007$)	406.7																						
34	Benefit/Cost Ratio	1.5																						

Notes (tied to row numbers in left column):

1 NYSERDA data incidate 1746 million sf of floor area in the target sectors, but these data exclude private schools, Courts, community colleges, the Port Authority and hotels with less than 100 rooms or that are not members of NYS Hospitality Association. To address these exclusions, we add 10% to the NYSERDA figures. The total is then reduced by 13% to exclude LIPA. Assume floor area grows 1%/year.
2 NEEA has 30% of hospital beds participating in their program; we take this as the 2015 target and ramp-up to this point.
3 Row 1 * Row 2 Incremental participation
4 From CBECS 2003 data for the Mid-Atlantic region. Where Mid-Atlantic data were not available, we used either East North Central region data (OH, IN, IL, MI, WI and MN) or pro-rated based on ratio of national data to available Mid-Atlantic data.
5 Same as Row 4.
6 Comprehensive retrofits can save 20% or more. To be conservative, we assumed 15% average savings, but ramped up to this level in year 4.
7 Row 4 * Row 6.
8 Average for DSM programs based on ACEEE analysis of EIA data.
9 Row 7 * Row 8.
10 Row 5 * Row 6.
11 An approximate estimate of costs is about 2.25/sf. This comes from the NYS Commercial New Construction program but increasing costs by 50% since retrofits are more expensive. The same figure is arrived at by taking the Federal tax incentive of $2.25, doubling to account for participant costs, dividing by 3 since the federalincentive is based on 50% savings, and adding 50% to account for the difference between new construction and retrofits. Further research is needed to better pinpoint these costs. We assume the program pays 1/2 of these costs for the first 3 years, 1/3 for the next 2 years, and 1/4 thereafter. Incentives decline over time as building owners understand the opportunities and increasingly are willing to pay.
12 See note for Row 11.
13 ACEEE estimate. This program will likely involve more 1-on-1 marketing and TA than other programs.
14 Row 3 * Row 11 * (1+Row 13)
15 Row 3 * Row 7
16 Row 3 * 1,000,000 * Row 9 / 1000 kW/MW
17 Row 3 * 1,000,000 * Row 10 / 10,000 therms/billion Btu
18 Row 12 + Row 15 from previous year
19 Row 13 + Row 16 from previous year
20 Row 14 + Row 17 from previous year
21 ACEEE estimate.

Standards and Codes

Version date: 8/28/07

	Item	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
1	Number of customers eligible	All customers in state																						
2	Participation rate (% eligible who participate)	Incorporated into detailed analysis on next page.																						
3	Annual number of participants	Incorporated into detailed analysis on next page.																						
4	kWh saved/participant	Incorporated into detailed analysis on next page.																						
5	Ratio of kW/kWh savings	Incorporated into detailed analysis on next page.																						
6	kW saved/participant (summer peak)	Incorporated into detailed analysis on next page.																						
7	therms saved/participant	Incorporated into detailed analysis on next page.																						
8	Direct program operator costs/participant (millions)	Not needed for this program.								7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
9	Participant costs	0	0	18	37	55	74	92	111	129	148	166	185	203	222	240	259	277	296	314	333	351	370	388
10	Marketing and administrative costs (% of row x)	0	0	0	0	0	0	0	0															
11	Incremental Program Costs (millions 2007$)	2.5	2.5	21.0	39.5	58.0	76.5	94.9	113.4	131.9	150.4	168.9	187.4	205.9	224.4	242.9	261.4	279.8	298.3	316.8	335.3	353.8	372.3	390.8
12	GWh saved from current year installations	Included in figures below.																						
13	MW saved from current year installations	Included in figures below.																						
14	Billion Btu saved from current year installations	Included in figures below.																						
										1.166667	1.333333	1.5	1.666667	1.833333	2	2.166667	2.333333	2.5	2.666667	2.833333	3	3.166667	3.333333	3.5
15	GWh saved from current & prior year installations	0	0	1,934	3,869	5,803	7,738	9,672	11,606	13,541	15,475	17,410	19,344	21,278	23,213	25,147	27,082	29,016	29,016	29,016	29,016	29,016	29,016	29,016
16	MW saved from current & prior year installations	0	0	493	986	1,479	1,972	2,465	2,959	3,452	3,945	4,438	4,931	5,424	5,917	6,410	6,903	7,396	7,396	7,396	7,396	7,396	7,396	7,396
17	Billion Btu saved from current & prior year installations	0	0	3,197	6,395	9,592	12,789	15,987	19,184	22,381	25,579	28,776	31,973	35,170	38,368	41,565	44,762	47,960	47,960	47,960	47,960	47,960	47,960	47,960
18	Average measure life (years)	15																						
19	Total Avoided Cost (millions 2007$)	0.0	0.0	180.9	353.0	524.6	693.9	861.1	1032.0	1221.6	1417.5	1612.0	1791.1	1981.7	2173.8	2362.8	2562.3	2762.1	2769.8	2766.0	2766.9	2774.3	2789.4	2789.8
20	Electricity	0.0	0.0	157.0	305.0	452.6	598.0	741.2	888.1	1053.7	1225.6	1396.2	1551.3	1717.9	1886.0	2051.1	2226.5	2402.4	2410.1	2406.3	2407.2	2414.6	2429.7	2430.1
21	Natural Gase	0.0	0.0	24.0	48.0	71.9	95.9	119.9	143.9	167.9	191.8	215.8	239.8	263.8	287.8	311.7	335.7	359.7	359.7	359.7	359.7	359.7	359.7	359.7
22	Discounted Benefits (millions 2007$)	0.0	0.0	167.5	318.4	461.1	594.5	718.9	839.6	968.6	1095.3	1213.9	1314.5	1417.3	1515.1	1605.0	1696.2	1781.9	1741.4	1694.7	1652.2	1614.4	1581.9	1541.8
23	Electricity	0.0	0.0	145.3	275.2	397.9	512.3	618.8	722.6	835.5	947.1	1051.4	1138.5	1228.7	1314.6	1393.2	1473.9	1549.8	1515.3	1474.3	1437.4	1405.1	1377.9	1343.1
24	Natural Gase	0.0	0.0	22.2	43.3	63.2	82.2	100.1	117.1	133.1	148.2	162.5	176.0	188.7	200.6	211.8	222.2	232.1	226.1	220.4	214.8	209.3	204.0	198.8
25	Discounted Costs (millions 2007$)	2.4	2.4	19.4	35.6	51.0	65.5	79.3	92.3	104.6	116.2	127.2	137.5	147.3	156.4	165.0	173.0	180.5	187.6	194.1	200.2	205.9	211.1	216.0
26	Present-Valued Benefits	25534.1																						
27	Electricity	22157.6																						
28	Natural Gas	3376.5																						
29	Present-Valued Costs	2870.5																						
30	Net Present Value (millions 2007$)	22663.7																						
31	Benefit/Cost Ratio	8.9																						

Notes (tied to row numbers in left column):

1-8 Analysis done on a separate spreadsheet for 2015 savings and these rows not needed for this analysis.

9 Participant costs for the entire period are calculated based on the value of benefits (at national average energy prices of $0.09/kWh and $10.80/mmBtu gas) and an average benefit/cost ratio of 4.5 for standards (from "Leading the Way", ACEEE, 3/2006) and 2.0 for codes (ACEEE estimate). We then ramp these costs up in a straightline fashion to reach the calculated total. Energy prices are 12 month U.S. average thru April 2007 for electricity and May 2007 for natural gas.

11 ACEEE estimate. $1 million for a full-time coordinator, some support for DOS, and a consultant budget for standards. In addition, we estimate $1.5 million for codes, including implementation training. Grants from DOE are likely to augment this amount.

12-17 Estimates for 2015 from attached spreadsheet. We have not done a year-by-year analysis. Instead, we make the simple assumption that savings ramp-up on a straight-line basis from 2010-2015.

18 ACEEE estimate. 13.7 year simple average for products in standards analysis. Building codes are longer and will raise average.

Table 3: Summary of Saving from Fast-Track Programs
8/28/2007

Program	Savings in 2012 GWh	Savings in 2012 MW	Savings in 2012 bBtu NG	Savings in 2015 GWh	Savings in 2015 MW	Savings in 2015 bBtu NG	Approx. Average Measure Life
Residential							
New construction expansion	11	1.5	787	23	3.0	1,797	24
Central air conditioning	57	125.8	NA	127	278.3	NA	15
Gas equipment	NA	NA	6,460	NA	NA	11,005	15
Home performance with Energy Star	23	3.1	1,018	51	6.7	2,244	23
Gas retrofit lite	19	4.0	907	37	8.1	1,814	10
CFL expansion	2,166	128.1	NA	3,726	220.3	NA	7
CFL fixture expansion	931	62.8	NA	2,289	154.5	NA	20
Low-income expansion	129	17.0	615	240	31.6	1,143	14
Subtotal	3,336	342.4	9,787	6,494	702.5	18,003	15.9
Commercial and industrial							
New construction expansion	294	66.8	746	846	192.2	2,147	14.7
Flex Tech expansion	189	34.8	777	312	57.3	1,280	15
Flex Tech industrial process	278	41.8	2,456	442	66.3	3,900	15
RFP program	639	61.4	NA	1,151	110.6	NA	16.8
Retrocommissioning	405	17.1	NA	783	33.1	NA	7
Small C&I	742	134.4	NA	1,336	241.9	NA	12
Lighting rebates	698	330.1	NA	698	330.1	NA	10
Commercial focus sectors	468	126.9	1,669	1,055	286.0	3,761	15
Subtotal	3,714	813.3	5,649	6,622	1,317.5	11,088	13.2
Total without standards and codes	7,051	1,155.7	15,436	13,116	2,019.9	29,091	14.6
Standards and codes (savings in 2015)	5,803	1,479.3	9,592	11,606	2,958.6	19,184	15
GRAND TOTAL	12,854	2,635.0	25,028	24,723	4,978.5	48,275	14.8
NYDPS goal (preliminary)	16,715	3,356.0	NA	27,389	5,484.0	NA	
% of goal with fast-track programs	77%	79%		90%	91%		