

2009 New York State Energy Plan

INTERIM REPORT

**PRESENTED BY THE
ENERGY COORDINATING WORKING GROUP**

MARCH 31, 2009

Energy Coordinating Working Group (ECWG)

The lead members of the ECWG are:

Thomas Congdon, Executive Director

Sarah Osgood, Deputy Director

Jeffrey Cohen, Department of Public Service

Keith Corneau, Empire State Development

Mike Deering, Long Island Power Authority

Donald Duvall, Division of Budget

Steve Hammond, Department of Environmental Conservation

Nancy Kim, Department of Health

Victoria Simon, New York Power Authority

George Stafford, Department of State

John Williams, New York State Energy Research and Development Authority

John Zamurs, Department of Transportation

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Introduction

By Executive Order, Governor David A. Paterson created the State Energy Planning Board in April 2008.¹ The Governor charged the Board with analyzing a broad range of matters related to the State's energy systems, including, but not limited to, the reliability of delivery networks for electricity, natural gas and petroleum products and the interrelated effects of New York's production and use of energy on the State's economy, environment and transportation systems. The Board will also address the impact of energy production and use on public health, particularly among the State's most vulnerable populations. The Governor's 2009 Energy Plan (Plan) will contain policies, programs and strategies that will address these matters over the 2009 through 2018 planning horizon.

Although the analytical work required to finalize the 2009 Energy Plan is not complete, significant progress has been made by the State agencies and authorities charged with developing the Plan. Clear trends are emerging from this work. Based on these, a set of preliminary findings have been selected for discussion in this Interim Report.² This Interim Report and these findings, in particular, are intended to convey a sense of direction for the Plan and to enable public comment on substantive issues under consideration. The Draft 2009 State Energy Plan will be released on July 15, 2009 followed by at least six public hearings held at various locations around the State. The Final 2009 State Energy Plan will be published on October 15, 2009.

¹ Executive Order No. 2 (April 9, 2008) http://www.nysenergyplan.com/presentations/EO_2.pdf

² The preliminary findings in this Interim Report are neither a comprehensive set of findings, nor have they been endorsed by the State Energy Planning Board. They represent staff work, to date, all of which is still in draft form. Data contained in this Interim Report that is not otherwise cited has been extracted from draft staff reports.

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Executive Summary

For decades, New York has been transforming the ways in which energy is produced and used through a combination of regulatory reform and market innovation.¹ New York must now lay the path for another transformation of its energy and transportation systems – a transformation made more challenging by the downturn in the national and global economy. This effort should not be forestalled because of the economic pressures facing the State; rather, it should be planned and managed with care and a clear sense of purpose.

A realistic appraisal of New York’s energy and transportation sectors underscores the need to act now. The State’s economic situation increases this urgency. Demand for energy and on-road travel is increasing and these needs are being met with aging infrastructure. Action must be taken on climate change. Employment is being lost throughout the State. Given these factors, the challenges to be addressed by the 2009 Energy Plan are:

1. To reliably meet the State’s immediate and near-term needs for electricity, natural gas and liquid fuels, consistent with public health and environmental standards
2. To establish a framework for systematic changes to the State’s energy and transportation systems so that future requirements can be met sustainably
3. To create economic development and employment opportunities through New York’s energy policies and programs
4. To address the affordability of all forms of energy for the State’s residents and businesses
5. To reduce greenhouse gas emissions

New York chooses to meet these challenges through the development and build-out of its clean energy industries.

New York’s clean energy programs are well aligned with the federal government’s energy priorities as evidenced by the allocation of \$45 billion for energy-related programs nationwide in the American

¹ Some examples of this are: (i) New York’s pioneering efforts to use demand side reduction programs in utility planning more than thirty years ago; (ii) the restructuring of the State’s electric utility sector in the mid-1990s, an effort which culminated in the creation of a competitive wholesale power market; and (iii) the 2004 State adoption of a 25 percent Renewable Portfolio Standard which has supported, among other technologies, the development of over 1,100 megawatts of wind powered generation.

Recovery and Reinvestment Act of 2009.² The vast majority of these dollars will be spent on deployment of energy efficiency and renewable energy programs, electric system reliability projects, or on research and development in these areas. A portion of these funds may be allocated for various federal programs, such as weatherization assistance. New York expects to receive more than \$500 million in direct federal aid from the Recovery Act.

The U.S. Department of Energy (DOE) will also select projects to receive discretionary economic stimulus funds. A number of energy projects in advanced stages of development in New York are well-positioned to secure a portion of these funds.

The 2009 Energy Plan will focus the State's efforts on the continued growth of its clean energy sector using a balanced set of policies, programs and strategies to make progress toward this goal. Importantly, the opportunities and risks of implementing the portfolio of recommendations under consideration are being analyzed, including potential effects on energy prices, the environment and the competitive position of the State for the purpose of attracting and retaining businesses. Approaches being considered are those which: contain or lower energy costs for citizens and businesses, and reduce price volatility; preserve and enhance the reliability of energy and transportation delivery systems; expand reliance on energy efficiency and renewable energy, and diversify fuel sources across end use sectors; and provide multiple pathways for lowering greenhouse gas emissions and other pollutant emissions from stationary and mobile sources.

The value that the State places on the clean energy sector of its economy is made evident by its consistent commitment of financial and institutional resources to energy efficiency and renewable energy, and by its history of innovation in these areas. More than thirty years ago, New York pioneered the development and deployment of demand side management programs as an electric system resource to be considered in parallel with conventional generation and transmission facilities in utility planning. In 2009, Governor David A. Paterson called for 45 percent of the State's electricity needs to be met through improved energy efficiency and clean renewable energy by the year 2015. The "45 by 15" plan expands upon the important work undertaken in response to earlier statewide programs and goals.³

The State is not alone in recognizing the value of a clean energy economy. With nine other Northeastern states, New York successfully launched the nation's first cap-and-trade auction designed to reduce greenhouse gas emissions from power generation. Governor Paterson has committed to use the auction revenues to "continue [the State's] commitment to break free from traditional fossil fuels with dedicated funding for clean and renewable energy initiatives."⁴ Working with these same regional partners, New York is now analyzing other strategies for coordinating clean energy development on- and off-shore, as well as developing low carbon fuel options⁵ to create a market-based, technology-neutral program that will improve energy reliability and security, promote economic development, and address greenhouse gas emissions from the transportation and buildings sectors.⁶

² The American Recovery and Reinvestment Act, Pub. L. No. 111-5

³ These programs are the 2004 Renewable Portfolio Standard and the State's electricity reduction goal adopted in 2007. The goals of these programs have been combined into a single clean electricity program goal which will maximize the use of efficiency resources and expand significantly the amount of electricity that will be provided by wind, hydro, solar, fuel cells, and biomass and delivered to customers by 2015.

⁴ Press release. Governor Paterson Hails New York's First Sale of Carbon Dioxide Pollution Allowances as a Success. Dec. 19, 2008. http://www.ny.gov/governors/press/press_121908.html

⁵ For the low carbon fuel standard initiative, see http://mass.gov/Eoeea/docs/pr_lcfs_attach.pdf

⁶ The "buildings sector" generally refers to the existing stock of residential, commercial and industrial homes, buildings and facilities.

Timing of Policy Recommendations

The 2009 Energy Plan will contain policies and program recommendations designed to be implemented over its 10-year planning horizon. Certain activities will begin in the early years of the planning horizon (the first three years after the Plan is issued or the “short-term”) while other actions will be undertaken in the later years (the final seven years of the planning horizon or the “medium to long-term”). The discussion of the preliminary findings follows this convention.

Cognizant that energy planning issues will need to be addressed beyond the year 2018, Executive Order No. 2 provides for the study of issues that extend beyond the planning horizon of the 2009 Energy Plan. A discussion of those issues and a process for addressing them will be presented in the Plan.

Preliminary Findings

1. The State’s clean energy sector is built on a foundation of investments in energy efficiency and renewable energy. The growth of this sector will expand economic development opportunities across many industries and regions in New York. Energy investments create local jobs, reduce the outflow of dollars to pay for energy imports and make the State more energy independent and secure.
2. New York has been a leader in addressing climate change through the Regional Greenhouse Gas Initiative (RGGI) and its commitment to improvements in energy efficiency and renewable energy generation, among other actions. However, the growing dangers posed by climate change suggest the need to adopt additional carbon reduction strategies over the planning horizon.
3. Demand for natural gas is expected to grow over the planning period. New infrastructure may be needed to support this growth in demand to ensure adequate and reasonably priced supplies.
4. New York’s transportation sector will use many strategies to significantly reduce its reliance on petroleum-based fuels over the long run. The most important of these are likely to target the increased market penetration and use of electric vehicles. In the short and mid-term, transportation system efficiencies will be improved, mass transit will be supported, and alternative fuels will be used to add to the fuel diversity of this sector.
5. The modernization and expansion of the bulk electricity transmission grid within and beyond the State’s borders, with emphasis on Smart Grid technologies, will be an important means to optimize cleaner generation resources and provide the ability to manage energy systems with greater efficiency.
6. The New York Power Authority (NYPA) is a valuable State asset which may provide even greater value through a restructuring of the Authority’s economic development programs.
7. New York has made considerable progress in reducing environmental impacts and health risks associated with energy production and use, and further emission reductions across all sectors of the economy will likely be necessary over the planning horizon.
8. The State continues to identify policies and strategies to make systematic progress in addressing energy-related concerns of Environmental Justice communities.
9. New York may progress towards a number of its critical energy, economic, and environmental objectives through strategic inter-state and intra-state regional collaboration efforts.

10. Near-term investment in infrastructure to support liquid fuels for the buildings and electric sectors will be necessary to ensure supply reliability and flexibility over the short run.

It is important to note that the State has limited ability to directly affect outcomes in certain areas covered by these preliminary findings. In particular, New York shares certain responsibilities and jurisdiction with federal and local governments with regard to the State's transportation sector and transmission infrastructure. New York works collaboratively, whenever possible, in areas of shared jurisdiction and, at times, the State may exercise its leadership by clearly articulating its vision for the future of New York's energy and transportation systems and adopting policies to support that vision.

Section III of this report provides a brief procedural background of the 2009 Energy Plan development process to date. Section IV contains a discussion of the 10 preliminary findings and relies heavily upon draft Issue Briefs and Assessments, some of which use extensive computer modeling. These supporting papers will be available for public review and comment when the Draft Plan is published on July 15, 2009. The final section of this Interim Report reviews the next steps leading up to the issuance of the Draft Plan.

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Procedural Background

Executive Order No. 2 initially called for the 2009 Energy Plan to be published by June 30, 2009. In light of matters brought before the Board and the Energy Coordinating Working Group (ECWG) between April 2008 and December 2008, and the complexity of new modeling initiatives, the timeline for producing the Final 2009 Energy Plan has been moved to October 15, 2009, with a Draft Plan to be issued in mid-July.

The ECWG issued a Draft Scope for the Plan on May 30, 2008 to explain to the Board and the general public the manner in which the Plan would be developed. The ECWG met with more than 70 stakeholder organizations in Albany, Buffalo, New York City and on Long Island to discuss the Draft Scope and received written comments from over 65 stakeholders.

The Board met on August 7, 2008 to hear a summary of stakeholder input and accepted a revised Draft Work Scope, which reflected these comments. The Board met next on December 11, 2008 to receive detailed reports on key issues identified by the ECWG. These included an overview of the condition of the State's energy delivery infrastructure and challenges to improving those systems; a discussion of the status of renewable energy development in New York; a summary of the challenges that New York, the nation and the world face in confronting the consequences of global warming and climate change; and an overview of the extensive computer modeling efforts underway to provide the technical and economic analyses essential to developing a set of balanced and actionable policy recommendations for the 2009 Energy Plan.

In light of the status of numerous parallel related planning initiatives which may affect deliberations about the Plan and in consideration of the magnitude and complexity of the technical modeling efforts, the Board requested and was granted a modification to the original schedule. The modified schedule includes the publication of this Interim Report from the ECWG to the Energy Planning Board on March 31, 2009. The publication will be followed by a 45-day public comment period during which interested stakeholders may submit written comments related to this Interim Report. The Draft 2009 State Energy Plan will be released on July 15, 2009 followed by at least six public hearings held at various locations around the State. The Final 2009 State Energy Plan will be published on October 15, 2009.

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Preliminary Findings

- 1. The State's clean energy sector is built on a foundation of investments in energy efficiency and renewable energy. The growth of this sector will expand economic development opportunities across many industries and regions in New York. Clean energy investments create local jobs, reduce the outflow of dollars to pay for energy imports and make the State more energy independent and secure.**

The 2009 Energy Plan envisions a State economy sparked by a clean energy sector. An economy, growing on a broad base of clean energy sector activities, will create new business opportunities for the State's energy industries and enable the integration of clean energy technologies, practices and services across all economic sectors. To maximize the growth of its clean energy sector, the State should direct its efforts to the following essential components:

- Refocus New York's existing manufacturing sector toward the production of advanced energy technologies and their component parts. Developing a new business attraction strategy to build capacity in advanced energy technology manufacturing should be a priority for economic development programs offered by the State, its authorities and utilities.
- Take steps to ensure that the State's workforce can meet the needs of 21st century clean energy sector economic activity. The growth of the State's clean energy sector can provide significant opportunities for skilled workers and for re-training new workers for these areas of job growth.
- Tap into the intellectual and professional resources that reside in New York's universities and colleges, research and development organizations, trade unions, non-profit organizations, and marketing and advertising firms to support the growth of the State's clean energy sector. This support can take the form of further development of advanced energy technologies, from concept to production, workforce training, consumer education, business attraction, and market penetration of clean energy technologies.
- Address access to adequate capital, both public and private, to meet the State's clean energy agenda. Where necessary and appropriate, the State may facilitate this access in order to target investments to realize strategic policies and programs.
- Ensure that policies and programs that generate demand for new energy efficiency and renewable energy products and services are secure and robust. Market development for these products and services are key components for meeting the State's targets. Energy market development programs can also provide a platform for the export of New York efficiency and renewable products to meet growing global demand.

New York has pursued market development for efficiency and renewable technologies creating a base of activity for its clean energy sector. Progress in these areas is discussed below.

Energy Efficiency. Two primary goals of New York’s energy efficiency programs are to save energy and to develop a self-sustaining market infrastructure for energy efficiency services and products. Over the past decade, the State, through its primary program administrators, the New York State Energy Research and Development Authority (NYSERDA), NYPA, and the Long Island Power Authority (LIPA), has made significant progress toward this goal. This has been accomplished, in part, through the delivery of a consistent and diverse portfolio of programs to end users and service providers across the State. For example, strategies are crafted to reach distributors, contractors, trade associations and manufacturers and build permanent structural changes in the marketplace. Another goal of New York’s energy efficiency programs is to foster changes in consumer behavior so that the adoption of energy efficient services and technologies becomes second-nature.

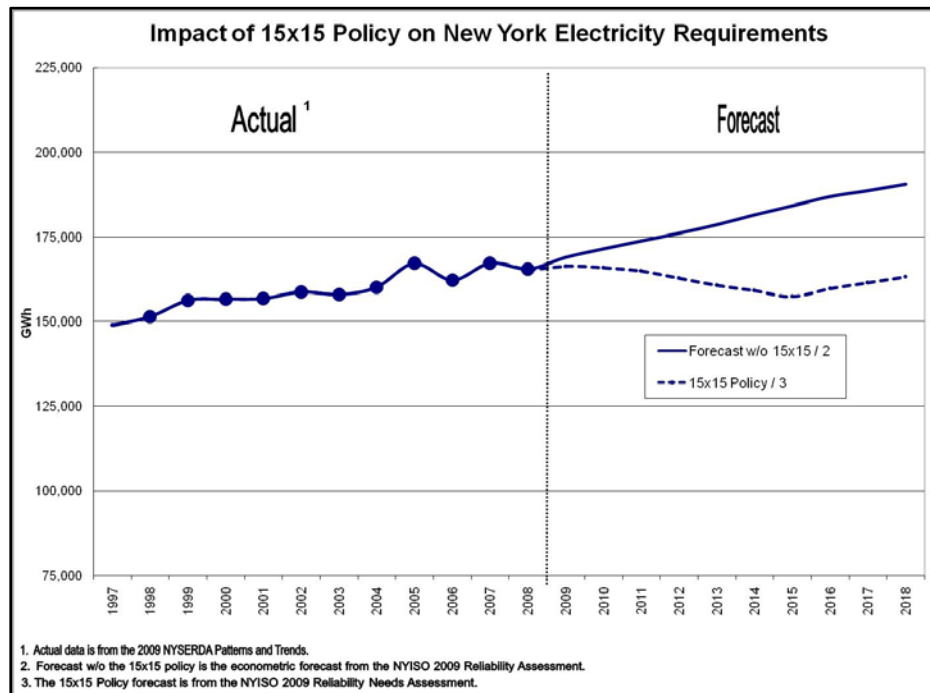
The State’s policy and programmatic commitments to energy efficiency resources – as structured by the 2007 “15 by 15” energy efficiency program¹ - provide significant economic and environmental benefits to New York. Figure 4-1 illustrates the magnitude of the reductions in electricity requirements² that are expected to be realized with a full implementation of “15 by 15” energy efficiency program.³ Demand for electricity in the “15 by 15” policy is forecast to decrease until 2015 and then to rise slightly.⁴ It is worth noting that the State’s energy efficiency and renewable energy program goals have target dates of 2015 while the planning horizon for the 2009 State Energy Plan extends to the year 2018. Among the many issues under consideration for the 2009 Plan are mechanisms to develop and support the next generation of efficiency and renewable energy programs so as to extend the benefits of the existing programs.

¹ “15 by 15” refers to an electricity reduction goal of 15 percent of forecasted statewide electricity requirements in the year 2015. The policy goal was articulated by Governor Spitzer in April 2007. In May 2007, the New York State Public Service Commission (PSC) instituted a proceeding (Case 07-M-0548, *Proceeding on Motion of the Commission Regarding an Energy Efficiency Portfolio Standard. Order Instituting Proceeding*, May 16, 2007) to investigate and establish means for achieving that goal.

² Electricity requirements are the in-state electricity generation and net imports necessary to meet final end use electricity demand.

³ The forecast without the “15 by 15” policy represents what New York electricity generation is likely to be in the absence of the “15 by 15” policy.

⁴ Current program goals and funding do not extend beyond 2015 which explains the slight increase in electricity demand post-2015.

Figure 4-1 – Impact of 15x15 Policy on New York Electricity Requirements

Annual funding committed to efficiency programs by New York’s utilities and energy authorities began with a modest \$25 million in 1984 and rose to approximately \$321 million by 2008. Approximately half of these funds are generated through a System Benefits Charge (SBC) collected from the customers of the State’s jurisdictional utilities.⁵ NYPA, LIPA and other agencies have established separate efficiency programs for their customers which account for the balance of the annual expenditures.

Between 1998 and 2008, the portfolio of SBC-funded programs is estimated to have reduced peak electric load by 1,284 megawatts – an amount equivalent to the size of one of the largest operating nuclear or fossil-fueled electric generation plants in the State. These peak load reductions, and the associated decreased use of electricity, combined with programs that achieved reductions in the use of natural gas and fuel oil provided the following benefits to the State in 2008:

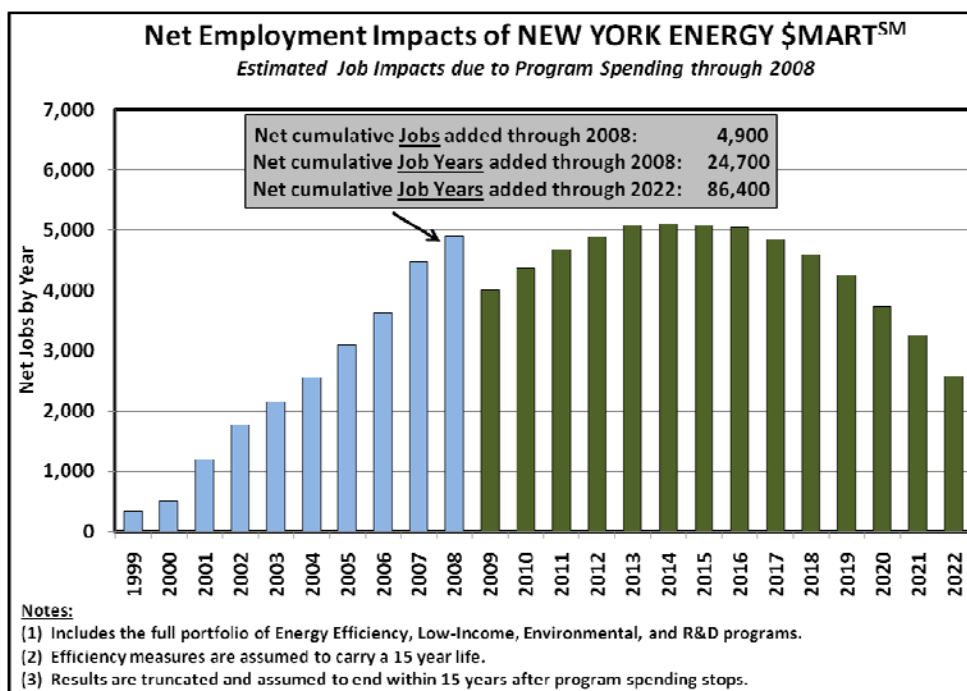
- \$590 million in annual energy bill savings (electric, oil, and natural gas) for New York consumers
- 2,725 tons of annual nitrogen oxides (NO_x) emission reductions
- 4,960 tons of annual sulfur dioxide (SO₂) emission reductions
- 2.1 million tons of annual carbon dioxide (CO₂) emission reductions (equivalent to removing 425,000 automobiles from New York’s roadways).

⁵ The Public Service Commission (PSC) regulates investor-owned utilities that, for the most part, are now transmission and distribution companies providing electric and natural gas service to retail customers. The PSC’s regulatory authority includes the determination of charges, such as the SBC, which may be collected by the utilities. Utilities that fall under the jurisdiction of the PSC are the Consolidated Edison Company, New York State Electric & Gas, Orange & Rockland Utilities, National Grid, Rochester Gas & Electric and Central Hudson.

Expenditures on energy efficiency programs also have substantial macroeconomic impacts that go beyond direct financial benefits to participants. Purchases of goods and services through these programs set off a financial ripple effect that influences many sectors of the New York economy and the level and distribution of employment and income in the State.

Macroeconomic effects are estimated by a NYSEERDA analysis of 10 historical years of SBC-funded energy efficiency programs (1999-2008) and 14 years following program implementation (2009-2022).⁶ as shown in Figure 4-2. The analysis indicates that energy efficiency programs provide net macroeconomic benefits to New York in the form of increased employment, labor income, and Gross State Product. Figure 4-2 shows the timing of the 4,900 net new jobs, estimated to be created through 2008. In 2008, the program is estimated to increase personal income by \$293 million and Gross State Product by \$644 million. Net benefits continue long after energy efficiency measures are installed due to energy bill savings and increased productivity.

Figure 4-2 – Net Employment Impacts of New York Energy \$mart Program



New York State is developing multiple strategies to achieve its “15 by 15” goal which will allow energy efficiency to satisfy a significant portion of the State’s electricity resource requirements over the planning horizon. Among these strategies are programs to increase participation rates among residential and small commercial customers, which will also help to lower electricity bills for participating utility customers. Adoption of the most recently published Building Energy Codes, in addition to utilizing certified energy professionals for training and assistance to municipalities in energy code enforcement may be another. Additional rigorous measurement and evaluation of energy efficiency resources, as was recently authorized by the Public Service Commission (PSC), will allow electric system planners to place a higher degree of confidence on energy efficiency resources to meet future electricity requirements.

⁶ A fifteen-year period was selected to represent the average life of efficiency measures installed.

With regard to energy efficiency programs over the planning horizon, the following issues, among others, are likely to be addressed: (i) the growing role of electric and gas utilities in providing energy efficiency services and hardware to their customers; (ii) possible solutions to the difficulties of encouraging greater efficiency in existing multi-family housing and commercial office buildings; (iii) the opportunities for providing energy use and cost information to consumers at key decisional moments, such as hours of peak electricity demand or on the occasion of purchasing a new home or leasing an apartment; (iv) the opportunities to provide more accessible financing to residential and commercial consumers interested in making energy efficiency improvements; and (v) the opportunities for the State to maximize the effectiveness of all of the energy efficiency programs it offers to its citizens and businesses.

Renewable Energy Resources. Historically, the State has realized the economic and environmental benefits of large and small hydro-electric generation resources, in particular, those developed, owned and operated by NYPA over the past 50 years. The 2004 adoption of a Renewable Portfolio Standard (RPS) by the PSC launched the State on an aggressive path to substantially increase the amount of electricity generated in New York by a diverse portfolio of renewable resources including, among others, wind, sustainable biomass, and solar energy systems. The 2004 RPS set a goal such that 25 percent of electricity delivered to New York consumers by 2013 would be generated by these clean, low- or zero-emission resources. Governor Paterson has proposed increasing this goal to 30 percent by the year 2015.

The RPS program administered by NYSERDA, to date, has supported 28 large-scale projects that include wind generation, hydropower upgrades, biomass plants and approximately 332 completed customer-sited projects that include solar energy systems, fuel cells, small wind systems and anaerobic digesters. Over 1,100 megawatts of renewable capacity, principally large wind generation facilities supported by the RPS program, is currently installed and an additional 65 megawatts of capacity is expected to be operational by the end of 2009.

Public sector investment in large-scale renewable projects has been \$475.6 million. The economic development benefits associated with this investment can be evaluated by measuring jobs created, property and other local tax benefits that flow to host communities, royalty payments to landowners and purchase of in-state materials, goods and services.

Looking ahead, New York recognizes the opportunities and challenges to be addressed if the State is to achieve its renewable energy goals. Significant potential remains for the development of large-scale wind generation, both on-land and off-shore in the coastal waters of New York. As a power generation resource, wind provides intermittent energy to the system,⁷ and the wind turbines must be located at sites of greatest potential for electricity generation. The intermittent nature of these resources presents technical challenges to integration with the bulk transmission system so that system reliability is not adversely affected. These challenges have been met successfully to date for the amount of wind generation interconnected to the New York grid. However, large additions of new wind resources will make additional demands on the bulk transmission system and grid operators.

The optimal locations for new on-land and off-shore wind generation indicate that additional transmission resources will likely be needed to deliver these indigenous resources to New York customers; however, siting of these renewable generation facilities, and their associated infrastructure can be controversial.

⁷ Wind and solar resources are referred to as intermittent because they are generally limited to providing power to the electric grid when the relevant fuel sources (wind and sun) are available. Adequate reserve and balancing power capability, usually provided by conventional electric system resources, must be available to reliably integrate intermittent generation resources into the bulk power system.

Recommendations to meet these challenges will be discussed in the 2009 Energy Plan.

Workforce training. Lending further support to developing the State's clean energy sector, NYSERDA, in partnership with the State University of New York (SUNY) and City University of New York (CUNY) colleges, Boards of Cooperative Education Services (BOCES), Association for Energy Affordability, unions and trade associations, has established a network of renewable energy and energy efficiency training programs. This six-year-old workforce development initiative currently has two main components. The first is a Center for Energy Efficiency and Building Sciences training program which provides building science instruction to technicians, architects, engineers and other building professionals. This program, headquartered in the Hudson Valley Community College, is offered in 10 learning centers around the State. The second component is focused on the development of clean energy workforce training programs in the technology areas of photovoltaic, wind, solar-thermal and geothermal systems at institutions across the State.

Workforce training programs at the Department of Labor and the Division of Housing and Community Renewal are integral components of the above activities. The Department of Labor is in the process of undertaking an inventory of existing workforce training programs to ensure existing resources are used in the most optimal manner.

These and other related matters will be more fully developed in the Draft Energy Plan and particularly in the Renewable Energy, and Energy Efficiency Assessments as well as the Issue Briefs addressing Energy Costs and Economic Development and Energy Infrastructure.

2. New York has been a leader in addressing climate change through the Regional Greenhouse Gas Initiative (RGGI) and its commitment to improvements in energy efficiency and renewable energy generation, among other actions. However, the growing dangers posed by climate change suggest the need to adopt additional carbon reduction strategies over the planning horizon.

From a climate change perspective, New York's current energy systems are not sustainable. To stabilize atmospheric greenhouse gas concentrations at levels that minimize the most severe risks from climate change, New York State is considering establishing a long-term greenhouse gas reduction strategy with an achievable medium-term target. Given the 10-year planning horizon of the 2009 Energy Plan, it is likely that the Plan will recommend policies and programs to achieve near-term reductions that put the State on the pathway necessary to reach long-term mid-century goals. An inventory of the State's current greenhouse gas emissions has been done by NYSERDA, and it provides a logical starting point for developing a range of strategies that will need to be deployed across all sectors of the State's economy in order to reduce and stabilize greenhouse gas emissions.

This inventory demonstrates that, in 2007, CO₂ comprised the vast majority (approximately 88 percent) of New York's greenhouse gas emissions. Almost all of these emissions (approximately 98 percent) result from fossil fuel combustion. NYSERDA's analysis also shows that the transportation sector is responsible for 36 percent of CO₂ emissions, the buildings sector (industrial, commercial and residential on-site combustion of fossil fuel) accounts for 40 percent of these emissions and the electric generation sector contributes the remaining 24 percent of CO₂ emissions.

The State is addressing greenhouse gas emissions through a number of ongoing initiatives: participation in the RGGI; discussion of the development of a regional low carbon fuel standard; ongoing funding and support for renewable energy sources, energy efficiency programs and climate smart communities⁸; and the demonstration of carbon capture and sequestration.

While these initiatives are a promising start, New York will obviously need to do more to significantly reduce greenhouse gas emissions. In the electric generation sector, the State will need to evaluate the trade-offs involved in the development of new baseload generation resources capable of supporting zero- or low-carbon electric grid. Strategies to address the buildings sector, through a combination of codes and standards and new energy efficient heating, cooling and power technologies, will figure prominently in the State's going forward strategy. Increased deployment of distributed renewable energy sources such as solar-thermal, geothermal and photovoltaic systems may play a critical role in addressing greenhouse gas emissions from the buildings sector.

The transportation sector will require a broad spectrum of approaches to reduce its greenhouse gas emissions given the sector's almost total reliance on petroleum products. Strategies to reduce vehicle-miles-traveled (VMT) will reduce transportation energy demand and emissions. Increased electrification of the transportation sector could transition demand from gasoline to electricity generated with zero- or low-carbon resources. Strategies that shorten vehicle travel routes would allow for greater market penetration of electric-powered vehicles. The development of battery and other energy storage technologies, as in the research and development initiative announced recently by Governor Paterson, is expected to alleviate the distance constraints associated with electric powered vehicles. Addressing greenhouse gas emissions from the transportation sector may require a level of technology and infrastructure development not seen since the creation of the Interstate Highway System began more than 50 years ago.

A continuing requirement for liquid fuels will remain a feature of the transportation sector. Reducing the carbon intensity of these liquid fuels will be another essential strategy for addressing greenhouse gas emissions. To this end, New York State and its RGGI partners have begun to develop a policy framework to explore developing a low carbon fuel standard for the Northeast. The framework, as discussed to date, would be a market-based, technology neutral program that will lower the carbon content of fuels by requiring reductions in the average lifecycle greenhouse gas emissions per unit of useful energy. Fuels that comply with a low carbon fuel standard will have the potential for use in transportation, buildings, and electric generation.

The development of biofuels, potentially using cellulosic feedstocks, may play a significant role in the future low-carbon transportation sector. However, the creation of an environmentally sustainable biofuels program – one which does not create unintended consequences with respect to greenhouse gas emissions – requires further study, as recommended by Governor Paterson's Renewable Energy Task Force. Expected to be published by the end of 2009, this assessment will guide the State's policy on renewable biofuels.

Decision makers today cannot assemble an optimal set of technical and policy options to meet long term climate change goals. Today, the State can plan an intensive effort to identify and implement the best set of policies that can be launched within the planning horizon. This effort would include a quantification of the costs of acting, and not acting, on greenhouse gas emissions and assessing those cost effects in the

⁸ Press Release, Commissioner Grannis Calls on N.Y. Communities to Go Climate Smart (Feb. 16, 2009) <http://www.dec.ny.gov/press/51727.html>.

context of the State's overall energy, environment and economic development agenda. In the longer term, flexibility and adaptability, on the part of policy makers and infrastructure systems, will be central to ultimately containing greenhouse gas emissions. These and other matters will be more fully described in the Energy Plan, and particularly in the Climate Change, Transportation and Environmental Impacts and Regulation Issue Briefs, as well as the Siting and Energy Infrastructure Issue Briefs and the Energy Efficiency Assessment.

3. Demand for natural gas is expected to grow over the planning period. New infrastructure may be needed to support this growth in demand to ensure adequate and reasonably priced supplies.

Demand for natural gas is expected to increase in New York State over the planning horizon. Complying with environmental regulations, responding to greenhouse gas mitigation strategies and repowering existing generation to run on natural gas may contribute to increased demand in the electricity generation sector. Under certain policy options to mitigate emissions, there could be immediate and pressing needs for expansion of delivery capacity in the downstate regions of New York City and Long Island where a preponderance of the State's gas-fired and dual-fuel generation operates.

In 2007, the electric generation sector used about 398 billion cubic feet of natural gas or 34 percent of state's total natural gas consumption. Natural gas has become and will continue to be the fuel of choice for new and replacement electric generation in the State for the next several years due to its economic, operational and environmental advantages. Between 2001 and 2007, approximately 5,000 megawatts of new natural gas fired combined cycle and combustion turbine capacity was built. In 2007, about 31 percent of electricity generated in New York was fueled by natural gas. The electric sector's demand for natural gas, combined with its reliance on interruptible delivery service, have combined to create reliability concerns and a potential need for additional pipeline capacity in certain areas of the State.

The natural gas transmission system is sized to supply fuel to customers with firm contracts whose gas needs peak in the winter. For the most part, electric generators rely upon interruptible service, which uses available capacity when it is not needed, to serve customers with firm contracts. Generally, the peak need for gas for electric generation occurs in the summer. However, some dual fuel electric generators may require gas during peak winter months.

In order to assess the adequacy of the natural gas delivery system to meet winter peak requirements, the combined gas requirements of the electric generation and residential, commercial and industrial gas utility customers must be considered together and compared to available pipeline delivery capacity at peak periods. This is the analytical challenge that is being addressed through modeling the interaction of New York's natural gas and electric systems, a first for a State energy planning process. The results of this analysis will assist policy makers who must consider various alternatives for meeting these needs. Under certain policy scenarios, it may be that the capacity of the natural gas delivery system in New York will need to be expanded over the planning horizon, whether to meet the demands of the electricity or buildings sectors.

These and related matters will be more fully developed in the Energy Plan, particularly in the Issue Briefs addressing Energy Infrastructure, Siting Infrastructure, Environmental Impact and Regulation of Energy Systems, and the Natural Gas Assessment.

- 4. New York's transportation sector will use many strategies to significantly reduce its reliance on petroleum-based fuels over the long run. The most important of these long-term strategies are likely to target the increased market penetration and use of electric vehicles. In the short- and mid-term, transportation system efficiencies will be improved, mass transit will be supported and alternative fuels will be used to add to the fuel diversity of this sector.**

New York's extensive and diverse transportation system covers all modes of transportation. Local public transportation systems (subway, rail and buses) play a significant role in the safe and efficient movement of many of the State's citizens, and rail and waterborne transportation are efficient ways to transport freight. The energy inefficient vehicle – often occupied by a single person – is a focus of discussion and concern for the 2009 Energy Plan.

While the State's transportation system is diverse, its fuel portfolio is not. Petroleum fuels account for 98 percent of this sector's energy supply, and transportation accounted for 70 percent of all petroleum fuel usage in New York State in 2007. This dependence extracts a heavy price on the State's economy, environment and public health. In 2007, total statewide expenditures on all petroleum fuels equaled \$32.6 billion. The transportation sectors' share was \$24.6 billion. Combustion of petroleum fuels in the transportation sector accounts for approximately 36 percent of New York's CO₂ emissions. And when all mobile sources are counted, the transportation sector is responsible for much of air emissions that cause health problems – the ozone-precursors (nitrogen oxides and volatile organic compounds), particulate matter, and air toxics like benzene. Mobile source emissions are usually concentrated at ground level, often in densely populated areas, which tends to put more people at risk for higher levels of exposure.

The most significant factor in reducing petroleum reliance will be the steady diversification and eventual replacement (to the maximum extent possible) of energy sources that power the vehicles upon which the State's citizens and its economy have come to depend. New York will likely need to use multiple approaches that focus on vehicle technology, transportation fuels and transportation system efficiencies such as expanding the use of mass transit to reduce the transportation sector's reliance on petroleum. A strategy to reduce VMT and improve transportation system efficiency, coupled with efforts to change federal and State transportation funding, will be critical.⁹ State and local government entities that are in a position to shape future transportation choices should be encouraged to incorporate land-use planning principles which minimize the need for on-road travel.

Very significant financial challenges confront New York's transportation sector over its planning horizon. Over the next twenty years, the cost to maintain, invest in and operate the multimodal transportation system in New York is conservatively estimated to exceed half a trillion dollars. Transportation revenues from federal, State and local sources, fares, tolls and fees will not be sufficient to cover these costs.

For example, of the 114,000 miles of road in New York State, only 27,500 miles of the State's roads are eligible for federal financial aid. Without the additional infusion of substantial funds, New York will not be able to maintain and operate the transportation system, let alone support market initiatives to encourage the use of innovative transportation programs. Planning energy efficient future transportation choices is a complex undertaking because multiple jurisdictional entities exercise varying degrees of authority over components of the transportation system and transportation system planning. In addition,

⁹ Current federal transportation funding formulae are structured to allocate funds based on vehicle-miles-traveled (VMT). This creates a perverse incentive for States when considering transportation strategies that address VMT. Federal funding formulae should be changed to encourage States to reduce VMT, which will reduce petroleum use and greenhouse gas emissions.

local governments are responsible for zoning regulations that greatly influence local land use patterns. The incorporation of “Smart Growth”¹⁰ land use planning principles by the State and local governments should guide these entities towards energy efficient transit alternatives.

These matters will likely be more fully developed in the 2009 Energy Plan and particularly in the Transportation Issue Brief and the Petroleum, Natural Gas and Renewable Energy Assessments.

5. The modernization and expansion of the bulk electricity transmission grid within and beyond the State’s borders, with emphasis on Smart Grid technologies, will be an important means to fully optimize cleaner generation resources and provide the ability to manage energy systems with greater efficiency.

The restructuring of the electric utility industry, in New York and other regions of the country, has had a significant effect on the use of the transmission system and the potential for its expansion. In the era of the vertically integrated utility company, transmission was built to satisfy a utility’s local area reliability needs and serve its local customers. A utility might choose to expand its transmission system rather than add a new supply resource if transmission expansion proved to be the more cost-effective option. In the context of a vertically integrated company structure, a utility had a simpler case to make before its regulators that its transmission investments were prudently made and therefore merited cost recovery.

Electric industry restructuring -- which in New York spun off the supply of generation from the transmission and distribution functions of the vertically integrated utility – changed the financial, operational and planning paradigm for utility companies and new entrants to the electricity marketplace. While restructuring has worked well in New York in terms of maintaining the reliability of the bulk power system -- that is, the transmission system and its integrated supply sources – it has not worked as well in the area of expansion and modernization of the transmission system.

Given that market and public policy demands are likely to place a premium on the capabilities of the State’s high-voltage transmission grid over the planning horizon and beyond, the 2009 Energy Plan will suggest steps that can be taken toward its expansion and modernization.

High-voltage transmission lines allow electricity to move within and beyond the State’s borders. Bulk power is typically transmitted over long distances through overhead power lines, although in New York City, underground circuits are used despite their high cost of installation and maintenance.

These well-understood challenges of siting, permitting, financing and constructing major transmission facilities make these infrastructure projects among the most ambitious to undertake. For evidence of this, one need only look to the few significant additions to the State’s bulk transmission grid since the 1980s – the Marcy South line, NYPA’s Sound Cable Project, the Neptune line and LIPA’s Cross Sound Cable. Before electric industry restructuring, cost recovery for transmission investments loomed as an additional regulatory hurdle to overcome. Today’s electricity market structure adds complexity to the determination of the primary beneficiaries of transmission projects – particularly when considering cross-border transmission projects – ultimately adding more uncertainty to the critical elements of cost allocation and cost recovery. To put the limitations of the existing transmission grid into context, a brief overview follows.

¹⁰ Smart Growth refers to an approach to land use planning which reduces dependence on automobile travel, and thus reduces VMT, gas consumption, dependence on foreign oil and transportation-based greenhouse gas emissions. Smart Growth, which concentrates on compact development, avoids sprawl. While sprawl increases dependence on automobile travel and distances traveled in vehicles, Smart Growth integrates land use planning and transportation to create communities that use less energy because they rely on walking, biking or public transit.

Physical and operational limitations. Currently, the bulk transmission system in New York can move about 3,050 megawatts of power between the western and northern portion of the State into the Hudson Valley and can move about 5,150 megawatts from the lower Hudson Valley into New York City and Long Island. There is insufficient transmission to move all the available power from upstate New York, Ontario, Quebec and New England at all times to the major load centers in New York. Given the concentrated load in New York City and Long Island, these areas are subject to locational capacity requirements.¹¹ New York City needs to maintain generation resources within the City equal to at least 79 percent of its peak load and Long Island must maintain generation resources equal to at least 97 percent of its peak load to ensure reliability. Increased transmission into either of these areas could reduce these locational requirements.

On the New York system, it is likely that a different configuration of generation and transmission could provide economic benefits by reducing congestion, which may lower the cost of energy downstate, although this configuration would not be needed for the purpose of meeting reliability criteria. Climate change strategies, which may include a greater reliance on zero- or low-carbon electric resources and energy independence, are examples of public policy considerations that may also drive the development of transmission for reasons other than reliability and economics.

Intra-state and regional transmission planning. Today, the primary electric system planning entity in the State is the New York Independent System Operator (NYISO). Its reliability planning function considers all components of the electricity system – not just transmission – and the NYISO has found that no new facilities are required to maintain system reliability over the 2009 – 2018 planning horizon. Other planning entities have emerged recently and initial studies are nearing completion. The New York State Transmission Assessment and Reliability Standards (STARS) transmission planning study, undertaken by the New York utilities, and the work of the New York City Energy Planning Board are prominent among these. The siting of electric transmission facilities falls under Public Service Law (PSL) Article VII which provides the Public Service Commission with exclusive authority to site such facilities and to prevent overly restrictive local requirements from frustrating development.

The NYISO and its regional counterparts have taken initial steps to identify opportunities for economic transmission upgrades to relieve congestion on the system which places high priority on understanding the economic opportunities and market efficiencies that could be realized with New York's neighbors.

Economic opportunities are likely available for cross border solutions, but studies to provide the information have not established timeframes to produce results. Such studies must also produce solid information on constraints, possible projects that could resolve congestion, and appropriate methodologies to share costs of mutually beneficial projects. An acceptable cost allocation formula for cross-border transmission facilities will be the single most important feature in making these facilities a reality.

Smart Grid and Advanced Metering. There are many working definitions of a Smart Grid and a wide variety of technologies that will be employed in a Smart Grid initiative. In a report prepared for the DOE, the Smart Grid is described as one which would make the grid into “a more intelligent, resilient, reliable, self-balancing and interactive network that enables enhanced economic growth, environmental

¹¹ The New York State Reliability Council (NYSRC) is responsible for establishing an annual statewide installed capacity requirement to ensure an acceptable level of reliability. The New York Independent System Operator (NYISO) sets specific capacity requirements for New York City and Long Island consistent with the statewide requirement.

stewardship, operational efficiencies, energy security and consumer choice.” Or, more simply, “the Smart Grid is defined as a broad range of solutions that optimize the energy value chain.”¹²

A robust, 21st century Smart Grid may transform the functionality of the integrated electric grid in a manner similar to the transformation in business and personal communications and decision-making brought about by the internet. A New York Smart Grid will bring greater opportunities to the State’s clean energy sector.

New York has taken initial steps to integrate Smart Grid technologies into the bulk grid. The PSC’s recent order on Advanced Metering established specific minimum functionality requirements for any advanced metering hardware and ordered the parties to the proceeding to establish a uniform cost/benefit methodology for use in justifying advanced metering proposals. Several utility pilot projects are under review. LIPA has begun an advanced metering pilot program, and Orange and Rockland Utilities will upgrade certain substations and distribution circuits to perform as “intelligent” networks with advanced sensors, on-line decision-making software and improved communications.

The evolution of today’s bulk power grid into a 21st century Smart Grid will require substantial investment and time. It is not an effort that is likely to be completed during the 2009 Energy Plan time horizon. However, the Plan is likely to recommend actions that will accelerate the pace of this transformation.

That the State’s power grid needs to be modernized and expanded is not in question. However, policy makers are left with many questions about the best path forward given the opportunities and risks associated with the multiple options for in-state and regional efforts.

These matters will likely be more fully developed in the 2009 Energy Plan and, particularly, in the Issue Briefs concerned with Siting and Energy Infrastructure.

6. The New York Power Authority (NYPA) is a valuable State asset which may provide even greater value through a restructuring of the Authority’s economic development programs.

NYPA, a public benefit corporation of the State of New York, is the nation’s largest state-owned electric utility. NYPA’s 18 generating facilities totaling approximately 6,200 megawatts of hydropower and fossil-fueled facilities along with its power purchases from the wholesale market provides a quarter of the State’s electricity. NYPA is the largest owner of 345kV and above transmission in New York State with more than 1,400 circuit-miles of high-voltage transmission lines. The most important of these are the Massena Marcy 765kV line and the 345kV Marcy South project that moves power from the Canadian border to Dutchess County. The electricity generated by NYPA’s large hydropower facilities, which went into commercial operation more than 45 years ago, is the cleanest and least expensive power delivered through the bulk transmission grid.

NYPA occupies a singularly important position in the State’s energy sector and its economy. As an electric utility company, it combines a depth of experience with a favorable financial structure which, over the decades, has allowed it to undertake the construction of some of New York’s largest energy facilities. As an economic development agent, NYPA supports rural upstate communities by providing extremely inexpensive electricity to 47 municipal and four rural electric cooperative systems. NYPA also administers nine economic development programs that supply electricity to businesses which support more than 420,000 jobs across the State.

¹² “Smart Grid,” Report of the Electric Advisory Committee to the U.S Department of Energy, December 2008.

The basic business model under which NYPA operates today, for both its sales to municipal utilities and rural cooperatives and economic development programs, was established by State law more than 75 years ago.¹³ Although there have been numerous State and federal legislative actions directed towards NYPA since that time, none have dislodged the basic premise that power generated by NYPA's facilities may only be sold to certain eligible entities specified in legislation and, further, that the power sold to those eligible entities has, in most cases, been directly tied to the output of a particular facility. For example, certain customers within a 30-mile radius of the Niagara facility qualify for an allocation of Niagara hydropower that has, for decades, been priced at approximately 1.07 cents per kilowatt-hour.

At the same time, the Power for Jobs economic development program, originally authorized in 1997 and intended to provide discounted electricity rates to businesses and not-for-profit corporations that commit to create or retain jobs in New York, lost its designated power source – the Fitzpatrick Power Project – when NYPA sold the plant in 2000. Since that time, the power allocations made under this program have been primarily supported through purchases made by NYPA in the wholesale market, which has diluted the economic development benefits for program participants.

NYPA owns and operates a portfolio of electric generation resources for the benefit of New York State. Yet, the legislative requirements under which NYPA must operate places strict limits on the way in which the State may use that portfolio to support its economic development agenda. NYPA is also an experienced, proven developer of significant electric system infrastructure in the State. The challenges to more fully realizing these dual benefits of NYPA are not insignificant. They will likely be addressed in the 2009 Energy Plan. Other matters related to the interaction of New York's energy sector and the economic competitiveness of the State will be more fully developed in the Energy Plan and, particularly, in the Energy Costs and Economic Development Issue Briefs.

7. New York has made considerable progress in reducing environmental impacts and health risks associated with energy production and use, and further emission reductions across all sectors of the economy will likely be necessary over the planning horizon.

New York State has a proud history of protecting the health of its citizens and preserving the quality of its natural resources through its environmental regulation of the utility, transportation and building sectors. New York's stringent environmental regulations, in concert with efficiency programs and other initiatives, have produced impressive reductions in the harmful emissions that result from burning fossil fuels. Since 1990, emissions of sulfur dioxide (SO₂) from fossil fuel fired power plants have been reduced 74 percent and nitrogen oxide (NO_x) emissions from the same sources have been reduced by approximately two-thirds.¹⁴ The story is much the same for automobiles and other mobile sources. Despite a nearly 40 percent increase in VMT between 1990 and 2008, carbon monoxide emissions from mobile sources have declined by 76 percent, emissions of volatile organic compounds by 71 percent, NO_x emissions by 55 percent and SO₂ emissions by 88 percent.¹⁵

These emission reductions have had substantial benefits for air quality and public health. National ambient air quality standards (NAAQS) are established by the U.S. Environmental Protection Agency (EPA) to protect public health and welfare.¹⁶ The entire State now meets the NAAQS for carbon

¹³ The 1931 Power Authority Act.

¹⁴ USEPA Clean Air Markets Division. <http://camddataandmaps.epa.gov/gdm/index.cfm?fuseaction=emissions.wizard>.

¹⁵ New York State Department of Environmental Conservation, Bureau of Air Quality Planning, MOBILE6 Emission Files

¹⁶ 42 U.S.C. § 7409

monoxide while, in 1990, neither New York City nor Syracuse had been able to meet the federal requirement. Ozone levels have also decreased. Although New York City, Poughkeepsie, the Capital District, Rochester, Buffalo-Niagara Falls, Jamestown and Watertown areas did not meet the 1997 ozone NAAQS, current data show that only New York City metropolitan area remains out of compliance. Monitoring data also show that particulate matter levels have improved around the State, and acid deposition is on the decline in the Adirondacks.

As impressive as these gains are, more remains to be done. Throughout much of New York, ozone levels remain above the health-based 2008 NAAQS and in the New York City area particulate levels are above the applicable national standard.¹⁷ These elevated pollution levels contribute to increased risk of respiratory illness and cardiovascular disease.

Similarly, despite the progress made in reducing acid deposition, the combustion of coal, both within and outside New York, still causes degradation of the State's forests and waterways. Reducing nitrogen oxide and sulfur dioxide emissions, as required by the Clean Air Act, will contribute to improved visibility.

These and related matters will likely be addressed in the 2009 Energy Plan and, in particular, in the Environmental Impact and Regulation of the Energy System and Health Impacts Issue Briefs.

8. The State continues to identify policies and strategies to make systematic progress in addressing energy-related concerns of Environmental Justice communities.

Environmental justice concerns can assume an important role in the development of energy and environmental regulations, policies and programs as well as in the siting of energy facilities and transportation corridors. New York has already started to integrate environmental justice concerns into agency decision-making.

The New York State Department of Environmental Conservation (DEC), in Commissioner Policy 29, defines environmental justice as the fair treatment and meaningful involvement of all people, regardless of race, color, or income, with respect to the development, implementation and enforcement of environmental laws, regulation and policy. Fair treatment means that no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local and tribal programs and policies. New York is developing criteria that will enable the State to make well-reasoned designations of environmental justice communities.¹⁸ This effort will likely be completed during the early years of the planning horizon.

Moreover, New York has an Environmental Justice Interagency Task Force.¹⁹ The Task Force was charged with developing environmental justice policy recommendations and action plans for each of its participating agencies. The Task Force expects to finalize this work by mid-2009.

¹⁷ It should be noted that the U. S. Court of Appeals has called into question the decision by EPA not to lower the annual PM2.5 NAAQS and has remanded the NAAQS to EPA for further consideration of whether it is set at a level requisite to protect public health. *American Farm Bureau and National Pork Producers Council v. EPA*, U. S. Court of Appeals for District of Columbia Circuit, No. 06-1410, decided February 24, 2009.

¹⁸ A statewide map of potential Environmental Justice communities can be found at <http://www.dec.ny.gov/public/899.html>

¹⁹ Member agencies of the Environmental Justice Interagency Taskforce are: Division of Human Rights, Department of Environmental Conservation, Office of Parks, Recreation and Historic Preservation, Department of Labor, Department of Health, Department of State, Metropolitan Transit Authority, Empire State Development Corporation, Department of Transportation, Department of Agriculture and Markets, New York State Energy Research and Development Authority, Department of Housing and Community Renewal, Department of Public Service, and the New York Port Authority.

A recent example of the integration of environmental justice concerns in a State regulatory process occurred in the PSC's *Energy Efficiency Portfolio Standard proceeding*.²⁰ The purpose of the proceeding is to put in place utility and NYSEDA programs to help meet the State's electricity efficiency target of a 15 percent reduction in projected state-wide electricity use by the year 2015.

In the May 2007 order instituting this case, the Commission charged the parties to the proceeding with considering environmental justice concerns in program design, among numerous other matters. Meeting with environmental justice leaders, the agency heard concerns about the disproportionate number of electric generation peaking units in environmental justice neighborhoods and a request that reliance on such units be studied with the goal of using demand response and energy efficiency measures to reduce this reliance. A working group was convened to consider how demand response could be integrated with energy efficiency and how these specific environmental justice concerns could be addressed. With the participation of environmental justice community members, specific peaking units - in or adjacent to these communities - and their characteristics have been identified.

In recognition of the importance of pursuing demand response initiatives, particularly downstate, the PSC instituted a new proceeding²¹ in February 2009 to specifically promote demand response measures that may reduce reliance on inefficient peaking units with high emission rates. New York City is the focus of this initial effort. The next phase of this proceeding will produce of an assessment of demand response potential through 2015, among other things, and the operation of generating units in environmental justice areas. In assessing benefits and costs, the Commission directed Con Edison to weigh the impacts on environmental justice areas that might result from reduced reliance on peak generation units. The Commission also directed Con Edison to identify a funding source for demand response programs.

Looking beyond the demand response proceeding, the Plan will likely address various means of improving public participation in the State's siting procedures, with methods developed to address the unique needs of environmental justice communities. In addition, work that is emerging from the Environmental Justice Interagency Task force should enable the continued systematic integration of environmental justice principles into government decision-making.

These and other related matters will be addressed in the 2009 Energy Plan and, in particular, in the Environmental Justice and Health Impacts Issue Briefs.

9. New York may progress toward a number of its critical energy, economic, and environmental objectives through strategic inter-state and intra-state regional collaboration efforts.

New York's energy and transportation systems are inextricably linked - physically, economically and environmentally - with its neighboring states and Canada. These linkages create opportunities for strategic regional collaboration where the policies and objectives of New York and its neighbors are in alignment. The State is currently pursuing a range of inter-regional initiatives to advance its clean energy economy and environmental goals.

Inter-regional initiatives. The Regional Greenhouse Gas Initiative (RGGI) may be the best known and most fully developed of these efforts. RGGI is an agreement among 10 Northeastern and Mid-Atlantic States to reduce greenhouse gas emissions from power plants by committing to cap and then reduce the

²⁰ Case 07-M-0548. Order Instituting Proceeding. May 16, 2007.

²¹ Case 09-E-0115. *Proceeding on Motion of the Commission to Consider Demand Response Initiatives*. February 17, 2009

amount of carbon dioxide that certain power plants are allowed to emit, limiting the region's total contribution to atmospheric greenhouse gas levels. This is accomplished through a regional cap-and-trade program using uniform quarterly auctions to sell nearly the entire annual regional emissions budget of approximately 188 million allowances per year. New York's annual emissions budget of approximately 60 million allowances will be auctioned periodically with auction proceeds used to further energy efficiency, renewable energy and carbon abatement programs.

The RGGI State partners and Pennsylvania recently agreed to work jointly to analyze how to reduce the carbon intensity of fuels with a goal of developing a Low Carbon Fuel Standard program. Given the interconnected nature of fuel distribution in the Northeast and Mid-Atlantic States, a regional approach can create significant market potential for low carbon fuels that will in turn hasten the development and deployment of innovative technologies from the private sector.²²

To meet growing energy demand in New York and the Northeast, the open coastal waters of Long Island Sound, the Atlantic Ocean and the Great Lakes are attracting increased attention for development of energy infrastructure, particularly renewable energy generation from wind, currents, tides, as well as liquefied natural gas (LNG) and pipeline projects. Activities on the open waters are managed by federal and State laws, regulations and treaties in a complex jurisdictional environment that define ownership, sovereignty and rights. As a result, off-shore energy development is an area that is ripe for inter-regional collaboration.

New York is a member of The Great Lakes Wind Collaborative which is focused on sustainable off-shore wind power development in the Great Lakes. According to recent DOE findings, the Great Lakes region has the potential to generate \$80 billion in economic activity and 300,000 regional jobs based on the wind power generation sector. It is estimated that there is the potential for 3,000 megawatts of wind capacity off the shore of Lake Erie alone. Interest is increasing in the use of New York's coastal waters for energy infrastructure and this area is likely to remain ripe for regional initiatives.

The Mid-Atlantic region is also an area of growing inter-regional activity for New York's offshore energy development efforts. A September 2008 meeting of the Northeast and Mid-Atlantic States on Clean Energy Cooperation, convened by the Governors of New York and Massachusetts, has led to an effort to establish a "New England-Mid-Atlantic States Joint Planning Agreement," with a goal of establishing, among other matters, a consistent and efficient approach to integrating State and federal activities required to support off-shore development. Looking ahead, Governor Paterson and New Jersey Governor Jon S. Corzine will soon meet with the Governors of Delaware, Maryland and Virginia to launch a formal partnership to address shared challenges facing sustainable development in shared ocean ecosystems.

Intra-state initiatives. Within its own borders, New York is a state of great regional diversity, which also presents challenges and opportunities for the planning and development of energy and transportation networks. New York is a "home rule" state, with local municipalities empowered under State law to undertake comprehensive planning and zoning. While local plans are not required to consider energy issues, the State should work with local governments to integrate energy issues into local plans.

²² New York is developing a "Renewable Fuels Roadmap and Sustainable Biomass Feedstock Study for New York." Among other issues, the Roadmap will address the public health and environmental consequences of renewable fuels compared to fossil fuels; outline sustainability criteria and analyze local, state and regional economic effects of large-scale feedstock and fuel production. The results of the Biofuels Roadmap study will likely assist the recently launched inter-regional effort to study low carbon fuels.

Local plans, regulatory and zoning initiatives could assist the State in the deployment of residential and commercial energy efficiency programs, the use of customer-sited renewable resources, the development of clean energy industries and the establishment of land use patterns that result in greater energy efficiency. The process of integrating energy issues into local plans and land use practices can increase awareness among local governments and citizens about the important role they have to play in helping to realize the State's ambitious energy agenda.

To some extent, the State's energy and environmental goals are already being integrated at the local level. Increasingly, municipalities are working together on either an inter-municipal or regional level to share resources or to address issues at a regional scale. A short list of these efforts is found below:

- Later this year, the New York City Energy Planning Board will present the results of its ambitious regional energy planning process that will address challenges and issues specific to the downstate region.
- Based on a recommendation from the State's Renewable Energy Task Force, an interdisciplinary work group between the LIPA and Consolidated Edison has been formed to study an off-shore wind project 10 miles off the Rockaway Peninsula.
- In upstate New York, the Central New York Green Team, which consists of over 50 partners within government, industry and the academic community, is actively engaged in green sector development. One such recent green initiative is the partnership between the City of Syracuse, Onondaga County and the SUNY College of Environmental Science and Forestry to develop a willow biomass-to-energy plant that initially is expected to provide power to all public facilities within the county.

Regional planning and collaboration enables communities to work collectively to develop a locally-based clean energy economy while addressing regional issues that would be difficult to do as a single municipality. The Draft Plan will likely suggest a number of specific steps that the State can take to support and expand regional collaboration within and beyond New York's borders.

These and related matters will be more fully developed in the 2009 Energy Plan and particularly in the Issue Briefs concerned with Regional Collaboration, Energy Costs and Economic Development and Energy Infrastructure.

10. Near-term investment in infrastructure to support liquid fuels for heating and electricity generation will be necessary to ensure supply reliability and flexibility over the short run.

New York State is a major consumer of petroleum fuels such as gasoline, home heating oil, diesel fuel, propane, and residual fuel oil. The State is the fourth largest petroleum fuel market in the nation exceeded only by Texas, California, and Florida. For reasons discussed elsewhere in this report, the 2009 Energy Plan will likely contain a number of proposals to initiate changes in New York's transportation and building sectors in order to reduce their heavy reliance on petroleum. That change will take time, however, and through the planning, horizon petroleum fuels are expected to remain vital to New York's economy.

It is critical, therefore, that the infrastructure required to store, handle, blend, and dispense the wide range of petroleum fuels is adequate to meet New York's needs. This infrastructure includes retail refueling outlets and large primary and secondary bulk storage facilities. Storage facilities take on particular

importance as the variety of liquid fuels expand through the introduction of biofuels, such as biodiesel, bio-heating oil and ethanol for gasoline blending.

In recent years, petroleum product distribution companies throughout the State have expressed concern over the continuing decline in the number of storage terminals and associated storage capacity. They note that this reduction increases the risk that liquid fuels will not be available to meet consumer demand. Petroleum storage terminal facilities face many of the same environmental, land use, and economic pressures that affect many other businesses. Operators note increasing costs associated with storing petroleum products and a lack of market incentives to add storage capacity in the State as hampering their efforts to add storage.

A severe supply shortfall of distillate fuel (home heating oil, kerosene, and diesel fuel) for heating and electric generation applications occurred during the 2002-2003 heating season. In response, NYSERDA and the PSC conducted a review of supply capabilities to determine what steps could be taken to address the effects of simultaneous high demand for heating fuels by both the residential and electric generation sectors. As a result of this review, new regulatory requirements directed toward dual-fuel customers (typically, electric generators that use natural gas on an interruptible basis and have petroleum fuel as a back-up) have helped to balance demand by these two sectors.

These new rules have been an effective operational tool for averting supply disruptions. However, the underlying fundamentals of the State's petroleum market indicate that investment in liquid fuel infrastructure is needed. Statewide distillate fuel storage capacity, which includes #2 home heating oil, kerosene and diesel fuel, has declined by 15 percent between 1994 and 2007 while demand for these fuels has increased 10.7 percent over the same time period. These figures indicate that while storage capacity is being used more efficiently to meet typical demand, there is significantly less capacity available to meet atypical surges in demand.

These and other related matters will be more fully addressed in the Petroleum Assessment and the Energy Infrastructure Issue Briefs.

5

Next Steps

The immediate next steps in progressing toward the publication of the Draft 2009 State Energy Plan will be to receive and consider public input on this Interim Report. Written comments are welcome anytime, and specific written comments on this Interim Report may be submitted either electronically to www.nysenergyplan.com or by mail to SEP Comments, NYSERDA, 17 Columbia Circle, Albany, NY 12203-6399, no later than May 15, 2009.

Over the next few months, the agencies and authorities charged with preparing the policy and analytical underpinnings of the Draft Energy Plan will finalize those efforts. There is an extensive, multi-part computer modeling effort underway which will assess the effects of policies and programs recommended for adoption on a range of factors relevant to decision-makers. Among them are: the cost of electricity and capacity; forecasted changes in the electricity and natural gas systems including the transfer capabilities of the transmission grid; and emission levels of greenhouse gases and other pollutants. A macroeconomic model will demonstrate the effects of the proposed recommendations on employment and gross state product, among other findings. The results of these modeling efforts will be incorporated into the findings and recommendations contained in Issue Briefs, Assessments and the Draft Energy Plan.

There are a number of State and private sector studies presently underway which are likely to prove relevant to the preparation of the Draft Energy Plan. To the extent practicable, the results of these parallel efforts will be reflected in the Plan. Some of these are noted below although a complete list would be too numerous to list in this Interim Report.

Partial Listing of Relevant Studies and Reports

Interagency VMT Workgroup

The Work Group report will assess various strategies that may contribute to achieving the 10 percent VMT reduction goal. The VMT Report will include a list of specific recommendations related to implementation steps and lead agency action. Report expected year-end 2009.

Electric Grid Impacts of Plug-in Hybrid Electric Vehicles

NYSERDA and the Electric Power Research Institute, Inc. (EPRI) will assess the generation, transmission, and distribution level impacts of plug-in hybrid electric vehicles (PHEVs) in New York State. Report expected in January 2010.

Interagency Environmental Justice Task Force

The Task Force has been charged with developing policy recommendations and action plans for each of the participating agencies in order to bring agency procedures in alignment with the DEC Commissioner Policy on Environmental Justice. Report expected in spring 2009.

Renewable Fuels Roadmap and Sustainable Biomass Feedstock Study for New York

The State has undertaken an extensive study of the environmental and land-use issues related to the development and potential use of biofuels as well as the potential for developing a sustainable biomass feedstock for such fuels. Implications for greenhouse gas emissions related to biofuel development and use will be included. Report expected in year-end 2009.

State Implementation Plans

There are a number of new rules scheduled for adoption in late 2009 that will have an effect on the energy sector as the State seeks to bring non-attainment areas into compliance with the federal 1997 national ambient air quality standards. New rules will affect major stationary sources of air emissions, including industrial facilities and distributed generators.

Development of New York Greenhouse Gas Abatement Cost Curves

NYSERDA will assess the availability, cost, and potential greenhouse gas mitigation benefits from current, emerging, and potential technologies for four sectors: power supply; residential, commercial, and industrial; transportation and land use; and agriculture, forestry, and waste management. Report expected in summer 2009.

Integrated Assessment for Effective Climate Change Adaptation Strategies in New York

With input from stakeholders, NYSERDA will identify critical vulnerabilities, climate risks, and adaptation strategies specific to the State for a range of key sectors: water resources, agriculture, ecosystems, coastal zones, and public health. Report expected in summer 2010.

NYC Transmission Master Plan

The NYC Energy Planning Board is undertaking a comprehensive technical and cost evaluation of various transmission options that would address the Board's identified goals for New York City. These goals are to reduce costs, improve reliability, reduce New York City's "carbon footprint", improve the diversity of fuel supply for New York City and increase competition in the electric markets. Report expected in spring 2009.

STARS Transmission Study

The State's transmission owners, including NYPA and LIPA, are sponsoring a statewide transmission and reliability study (STARS), a long-term, forward looking transmission planning exercise that will assess system needs 11 to 20 years from now. A contractor has been selected and work is underway. This is a multi-phase, multi-year study process.

Northeast Coordinated Electric System Plan

ISO New England (ISO-NE), New York ISO, and PJM each produce annual regional plans covering the needs of their respective regions. In addition, they jointly study interregional electric system issues, developments, and performance and enhance electric system coordination. This plan summarizes current and ongoing activities and studies. Draft report released in January 2009.

State Asset Maximization Commission

The State Asset Maximization Commission was charged with broadly examining the opportunities for forging public-private partnerships and to determine whether asset maximization can benefit the State, as well as whether any specific State assets are suitable candidates for public-private partnerships. The Commission has identified transportation and energy among the asset classes that are being explored in-depth. Final report expected spring 2009.

Market-based Environmental Protection Mechanisms and the Impact on Energy Production and Use Project

NYSERDA will review existing and planned regulatory and voluntary market-based environmental protection mechanisms in place in New York. The review will include the criteria for qualifying for the various allowance and credit types available in the markets, the eligibility requirements and terms that may preclude participation by sources such as high transaction costs. Policy primer and final technical report expected in year-end 2009.

The July 15 publication of the Draft 2009 State Energy Plan will be followed by a minimum of six public hearings to be held at various locations around the State. After considering public comments received on the Draft Plan, a Final Plan will be issued on October 15, 2009.