NEW YORK INDEPENDENT SYSTEM OPERATOR
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MEMORANDUM

May 15, 2009

TO: **Paul A. DeCotis, Chairman, New York State Energy Planning Board**

FROM: **Henry Chao, Vice President, System & Resource Planning**
Elaine D. Robinson, Director, Regulatory Affairs
Carl F. Patka, Senior Attorney

RE: **Comments on the Interim Report of the Energy Coordinating Working Group Regarding the 2009 New York State Energy Plan**

I. Introduction

The NYISO appreciates this opportunity to provide comments to the State Energy Planning Board (the Board) Energy Coordinating Working Group on the March 31, 2009 Interim Report. We previously provided extensive written comments to the Board and will not repeat them here. As requested, our remarks herein focus on the preliminary findings contained in the Interim Report.

In summary, we find that there is a great deal of congruence between the Working Group's preliminary findings on electric power system policy matters and the NYISO's market mechanisms, planning processes and vision for the future. Specifically, as set forth in Section II below, we support the Interim Report's preliminary findings regarding: (A) the importance of adding renewable resources and demand response resources to build the State's clean energy sector (Finding 1); (B) the need for additional natural gas infrastructure (Finding 3); (C) preparing for the advent of plug-in hybrid electric vehicles (Finding 4); (D) modernizing and expanding New York's aging electric system infrastructure (Finding 5); (E) integrating cleaner, more efficient resources that will help the State meet its environmental goals (Finding 7); (F) promoting intrastate and interregional collaboration (Finding 9); and (G) maintaining sufficient liquid fuel storage capability (Finding 10). Finally, based on the facts outlined in Section III below, we urge that the draft State Energy Plan reflect and build upon the successes of New York's competitive, wholesale electric markets.

II. The Preliminary Findings in the Interim Report, Relating to the Bulk Electric System, Represent Good Public Policy.

A. Preliminary Finding 1: Growing the Clean Energy Sector.

We concur with the preliminary finding that "the State's clean energy sector is built on a foundation of investments in energy efficiency and renewable energy." (Interim Report (IR), at 2-3, 4-1). The clean energy sector in New York is benefiting from competitive wholesale electricity markets and experiencing unprecedented growth. Whereas New York had 424 Megawatts (MWs) of wind generating capacity interconnected in early 2008, the NYISO now has 1,275 MWs interconnected so far in 2009, a 200 percent increase. There may be hundreds more MWs of wind generation on line in

New York before the end of this year. More than 8,000 MWs of additional wind projects are seeking approval for interconnection from the NYISO. The construction and servicing of these wind generation projects will continue to generate jobs and economic activity in New York. These wind power resources are key to New York's achievement of its 30 percent Renewable Portfolio Standard goal by 2015.

New York's demand response programs have attracted significant investment in these resources in the Special Case Resources and Emergency Demand Response programs. While 712 MWs of demand response resources were in the NYISO's programs in 2001, the NYISO now has 2,147 MWs of those resources committed to its programs in 2009, another 200 percent increase. Such demand response programs have contributed to avoiding the need to add new power plants in New York and to the fact that, as the Interim Report points out, there are no reliability needs on the bulk power system through 2018 (IR at 4-11). Our planning processes treat demand response resources on an equal footing with generation and transmission. Finally, these resources complement demand side energy efficiency programs by supporting reductions in consumption as a resource to meet New York's electricity needs.

B. Preliminary Finding 3: Building New Natural Gas Infrastructure.

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. Eighty percent of the generating capacity added in New York since the year 2000 was added to the Hudson Valley, the lower Hudson Valley, New York City and Long Island. By far the lion's share of that capacity is fired by natural gas as its primary fuel. Natural gas, particularly in modern combustion turbines with combined-cycle technology applications, is clean-burning and highly efficient. New generation capacity under construction or soon to be under construction in the eastern and southern regions of New York will also stake their entry into the bulk power system on the availability of ample supplies of natural gas. New York has limited local fuel resources, and 60 percent of the total generating capacity in New York depends on gas and oil to fuel it.

While greater diversity of fuel supply is clearly desirable, the reality is that the State has become increasingly dependent on natural gas, and the continued supply of this product is thus a necessity. The fact is that natural gas prices are volatile, and wholesale market-clearing prices of electricity in New York are largely tied to the price of natural gas fuel. In the second half of 2008, natural gas prices decreased 43 percent, while the statewide average cost of wholesale power dropped 51 percent. This phenomenon also works in reverse, however, and future increases in natural gas prices will lead directly to increases in the price of electricity exactly because New York has tied its generation portfolio to natural gas. There are many good reasons why we rely on natural gas, given its environmental and efficiency characteristics. Nevertheless, given the laws of supply and demand, it is imperative that New York add to its natural gas infrastructure in order to assure the supply of reasonably-priced gas to the new generation fleet, including supplies of domestic, Canadian and liquefied natural gas.

Critical electric reliability reasons should also drive New York to make additions to its natural gas infrastructure a high priority. In periods of high demand for natural gas during the winter months, natural gas supplies to power plants can quickly be curtailed. In January 2004, a cold snap in New England limited gas supplies to electric generation and highlighted the need for better coordination and communication between the gas and electric industries. To help ameliorate this condition, the Federal Energy Regulatory Commission called for better coordination of gas supplies needed for electric generation. Accordingly, the NYISO adopted a gas-electric coordination protocol to identify winter

and even summertime gas curtailment conditions, and to establish a process for generators to seek emergency gas supplies to maintain their electric supply schedules to avoid brownouts, or worse.

Summertime offers its own unique challenges to gas supply. Generation in New York City and on Long Island is so dependent on natural gas that, during peak load conditions for air conditioning and other needs, the loss of gas due to a contingency on the natural gas system could cause the loss of generation and the need to brown-out or even shed customer loads to avoid collapse of the bulk power system in a broader blackout. Although demand response may meet some of the need for peaking capacity going forward, generating resources will continue to be needed to meet unexpected peaks, support system voltages, provide balancing and reserves, and to provide blackstart service in the event of an outage. For these reasons, both Consolidated Edison Company of New York, Inc., and the Long Island Power Authority have adopted fuel switching requirements that require generators to burn oil instead of gas to guard against loss of gas supply causing loss of electricity supply and potentially affecting air quality during the ozone season. Switching generators to oil during these peak periods is expensive. Additions to natural gas infrastructure serving New York City, Long Island and other parts of the downstate regions of New York State would help ameliorate these challenges to maintaining electric system reliability and reasonable electricity prices.

C. Preliminary Finding 4: Plug in Hybrid Electric Vehicles.

The preliminary finding that "New York's transportation sector will use many strategies to significantly reduce its reliance on petroleum-based fuels over the long run is correct. The most important of these strategies are likely to target the increased market penetration and use of electric vehicles." Using electricity as a source of energy for the transportation sector is not new to the electric industry. Many electric generation and distribution systems were initially built to support electric railroads and trolley systems to spur the economic development of the nation. Nevertheless, highway transportation primarily has been the dominion of internal combustion engines and petroleum fuel. Replacing a portion of the source of transportation energy – gasoline – with electricity generated in the electric sector can improve energy security, environmental quality, and electric system utilization.

We have begun to asses the potential impact of Plug-in Hybrid Electric Vehicles (PHEVs) on the bulk power system while recognizing that the timing and magnitude of potential PHEV load will be determined by consumer acceptance of PHEVs, battery technology, and charging infrastructure and economics. Current design targets for PHEVs would represent a new daily load in the range of 8-12 kWh with a demand of 1-6 kW per vehicle. Two noteworthy studies, one by Oak Ridge National Laboratory and one done jointly by the Electric Policy Research Institute and the Natural Resources Defense Council, concluded that incremental electric load for PHEVs in New York would be in the range of three to four percent by 2030, or approximately 2,500 gigawatt hours (GWhs) per year. These studies are based upon similar market penetration rates of 25 to 50 percent by 2030. The studies concluded that significant penetration of PHEVs could be served by the existing New York bulk power system if charging patterns are managed properly. Without such management, the studies estimate that an additional 5-9 GW of capacity would be required. Retail rate design to encourage off-peak charging coupled with time-of-use rates, and Smart Grid and Advanced Metering initiatives should facilitate desirable charging behaviors.

A variety of issues, however, need to be addressed to gain important additional insight on how successful deployment of PHEVs will impact New York's electricity system. Further analysis is required to understand:

(i) The ability of the electric system to meet incremental loads associated with PHEVs;

(ii) Changes in retail rate design to encourage desirable vehicle charging behavior; and
(iii) Development of communication protocols and Smart Grid systems between the recharging location and power system control centers.

D. Preliminary Finding 5: Transmission System Modernization and Expansion

The preliminary finding is correct in that "[t]he 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." The infrastructure supporting the supply and delivery of electric energy to the residents and businesses of New York is aging and the cost of replacement is high. Nearly half of the State's generating capacity is over 30 years old, and 17% of the state's capacity comes from power plants that began operating in the 1960s or earlier. Although nearly 1,000 MWs of transmission capacity has been built connecting Long Island to neighboring control areas in New England and the PJM system, the last major in-state transmission line, the Marcy-South line, was built by the New York Power Authority in the mid-1980s. The New York Transmission Owners have recognized the need to carefully evaluate the status of the State's transmission system and determine the most efficient means to continue to provide an adequate and reliable delivery system to support the economy in the future. The NYISO is providing support for the State Transmission Assessment and Reliability Study (STARS) recently begun by the Transmission Owners for this purpose.

In order to take full advantage of increased supplies of clean, renewable resources, there is a need to stimulate investment in the transmission infrastructure. The State's wind resources are located in the sparsely populated regions in the north and west, and substantial hydroelectric resources also exist further north in Canada. At the same time, the regions of greatest concentration of demand, highest prices, and least fuel diversity are found in the southeast part of the State. Providing enhancements to the existing transmission infrastructure by utilizing existing rights-of-way to the maximum extent practicable will mitigate the environmental and siting impacts of expanding the system. The NYISO's new economic planning process, in conjunction with the STARS project recently begun by the State's utilities, may provide the vehicle for accomplishing these objectives. Transmission infrastructure improvements will also bring new jobs and energy industry opportunities to the upstate New York economy. The Energy Plan could be of great value if it were to address means by which the rural communities of our State could see continuing benefits from the transmission that must traverse their territory.

Finally, it has become axiomatic that the expanded use of advanced metering and "Smart Grid" technologies can help facilitate the integration of renewable resources and advanced technologies such as PHEVs, as discussed above. Smart Grid technologies can also improve the efficiency and reliability of operating the bulk transmission system. Although there are many definitions of Smart Grid, the ultimate concept/goal includes the increased use of digital information, compatible communications protocols, and controls to improve performance of the electric system and allow for increased interaction with and by small demand side resources and individual consumers.

At the bulk power level, the grid is smart and the intelligence level of substations is improving steadily with remote data access and controls. The NYISO will continue to collaborate with the Board, state and federal agencies, national and state research and development entities, and other Independent System Operators and Regional Transmission Organizations (ISO/RTOs) to establish Smart Grid standards and programs. We will also continue to support the New York Public Service Commission's Advanced Metering Infrastructure program. Finally, the Energy Independence and Security Act of

2007 and the American Recovery and Reinvestment Act together designated up to $4.5 billion in federal matching funds for the demonstration and the deployment of Smart Grid projects. The NYISO is collaborating with the NYPSC, the New York State Energy Research and Development Authority, the New York State Foundation for Science, Technology and Innovation, the New York Power Authority, the Long Island Power Authority, and the investor-owned New York Transmission Owners to identify opportunities to seek federal grant funding for Smart Grid projects in New York.

E. Preliminary Finding 7: Environmental Performance

It is clearly correct that "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." From the perspective of efficiency and environmental impacts, the facts support a finding that New York's fleet of generators have increased their thermal efficiency in producing power since the inception of competition in New York's wholesale electricity markets in 1999.

According to the United States Environmental Protection Agency (EPA) Clean Air Markets Data, generator efficiency as measured by system gross heat rate[1] improved 21 percent during the period 1999-2008. These efficiency improvements have come about from investments by asset owners, including repowering of older, less efficient units, and the addition of new, more efficient units that compete against older, less efficient units. The structure of the State's competitive wholesale markets contributes to such investment. Unlike regulated markets, in which generating units receive revenue regardless of their efficiency, plant owners in New York can receive energy revenues only when they are selected to run, and in today's world, selection depends in major part on thermal efficiency. Units with a lower heat rate emit less pollution per kilowatt hour of electricity produced. As newer, more efficient units enter the wholesale markets, higher-emitting units are dispatched less often by the NYISO. Air emissions are also reduced as renewable generation, such as wind, is added to New York's power grid. Altogether between 2000 and 2009, about 3,700 MWs of gas fired generators with oil backup have been added, more than 1,000 MWs of coal-fired generation has retired, uprates at nuclear and pump storage hydroelectric facilities have added capacity, and 1,275 MWs of wind energy has been added to the power system in New York. These changes have helped clean up the air in New York. Although new programs are on the horizon to make further reductions, New York electricity production currently ranks 10th lowest emitting in the United States for carbon dioxide, 12th lowest in nitrogen oxides, and 13th lowest in emissions of sulfur dioxide.[2] New York's progress in reducing air emissions to date is admirable. As the state identifies program enhancements to further reduce air emissions, it will be important to consider the electric system reliability impacts of such programs.

F. Preliminary Finding 9: Intrastate and Interregional Collaboration

We agree that "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." Within New York, the NYISO conducts an open and transparent stakeholder governance process that includes changes to market rules facilitating the addition of new resources and technology types and conducts short-term and long-term planning to interconnect those resources and technologies and

[1] Heat rate is a measurement of how efficiently a generator uses heat energy. It is expressed as the number of British Thermal Unites (BTUs) of heat required to product a kilowatt hour of electric energy. United States EPA, Clean Air Markets Data.

[2] United States EPA, Clean Air Markets Data; United States Energy Information Administration, Generation Data.

assess the reliability needs and economic expansion opportunities on New York's bulk power system. The NYISO's planning processes include numerous working groups and governance committees for operations and business issues that review and advise on the NYISO's studies, approve changes to the NYISO's market rules, and facilitate the addition of new generation, demand response, transmission and other resources to the New York Grid. Nearly all actions require approval of at least one governance committee, the Management Committee and the NYISO's Independent Board of Directors, and rights of appeal are provided to protect the rights of participants who are in the minority. As the Interim Report states (IR at 4-11), the NYISO is the primary electric system planning entity in New York. Other statewide studies are also progressing with the NYISO's participation, as the Interim Report notes, including the New York State Transmission Assessment and Reliability Standards (STARS) transmission planning study. The NYISO's stakeholder process can serve as an open forum for development of policy priorities identified by the Board that affect New York's bulk electric power system.

On an interregional basis, we participate in a number of electric system planning efforts that are also open to state agencies and authorities to assist with implementation of policy priorities on a broader geographical basis. Moreover, ISO New England, PJM and the NYISO work together under the Northeast Coordinated System Planning Protocol (NCSPP), to analyze cross-border issues and produce a regional electric reliability plan for the northeastern United States. The most recent Northeast Coordinated System Plan was completed on March 27, 2009, and can be accessed on our website at the following address: www.nyiso.com/public/webdocs/services/planning/ipsac/NCSP03-27-09.pdf. This effort encompasses eastern Canada as well, with the participation of Hydro-Québec, TransÉnergie, Independent Electric System Operator of Ontario, and the New Brunswick System Operator. Current activities under the Protocol include a reliability and market efficiency analysis focusing on the eastern PJM/southern New York region, as well as further investigation of the potential for an upgrade to the interconnection between New York and New England in the northern part of the State.

In the face of calls for an interconnection-wide planning authority and ideas for a high-voltage overlay network in Washington, broader planning efforts have also commenced across the entire Eastern Interconnection, which runs from the Rocky Mountains to the Atlantic Ocean and from Canada to the Gulf of Mexico. Together with ISO New England, the NYISO expressed its concerns that the high-voltage overlay concept that was being pursued under the Joint Coordinated System Planning (JCSP) initiative, led by mid-western entities, might be to the detriment of northeastern coordinated regional efforts to tap into renewable resources closer to home. Accordingly, the NYISO has recently begun participating in the Eastern Interconnection Planning Collaborative (EIPC) with other ISOs, Regional Transmission Organizations, transmission planning authorities and stakeholders. The EIPC will provide an integrated, interconnection-wide view of existing regional plans and provide analysis identifying any gaps relative to state, regional or federal policy goals. While it is in its formative stages, the Collaborative may extend to examining the effectiveness and system impacts of a variety of transmission alternatives, including cross-border projects. It is expected that the EIPC will also interface with Hydro Québec, the Western Electric Coordinating Council (WECC) and the Electric Reliability Council of Texas (ERCOT). EIPC will use open and transparent processes that will be open to the Board and its member agencies and authorities as well as other stakeholders and interested parties.

G. Preliminary Finding 10: Liquid Fuel Storage

We support the preliminary finding that "[n]ear-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." As stated above in Response to Preliminary Finding 3 with respect to natural gas infrastructure, in New York City and on Long Island summer peak load conditions for air conditioning and other needs rely heavily on natural gas, and the loss of gas due to a contingency on the natural gas system could cause the loss of generation and the need to brown-out or even shed customer loads to avoid collapse of the bulk power system in a broader blackout.

Moreover, dual fuel capability is critical to maintaining electric service under cold winter conditions that could cause a curtailment of natural gas supplies to generators as gas is directed to other needs, such as residential heating. Maintaining adequate fuel switching capability necessitates adequate supplies of backup petroleum liquid fuels. Accordingly, maintaining and adding to liquid fuel storage capability is important to maintaining dual fuel capability in generators that are essential to keeping the lights on.

III. The Draft State Energy Plan Issued in July Should Recognize the Value of New York's Competitive Wholesale Electricity Markets.

Consistent with the NYISO's prior comments on the importance of New York's continued reliance on competitive markets, the following is a summary of the improvements that have taken place since the inception of competitive wholesale electricity markets in New York:

Since the inception of New York's competitive wholesale electricity markets:

- Wholesale electricity prices - adjusted for fuel costs – have declined
  - *If the cost of fuel used to generate electricity were the same today as it was in 2000, wholesale electricity costs would have dropped by 18 percent -- $2.23 billion in savings on a current annual basis.*[3]
  - *In March 2009, average wholesale electricity prices, accurately reflecting worldwide fuel costs, dropped to the lowest level since 2003.*
- New generation and interstate transmission have been added
  - *More than 7,600 MW of new generation built by public power and private suppliers, with 80 percent sited where demand is greatest (New York City, Long Island, and the Hudson Valley).*
  - *Nearly 1,000 MW of transmission added to provide increased access to out-of-state markets.*
- Power plant efficiency and availability has improved
  - *System-wide heat rate of fossil-fueled generation improved 21 percent.*

[3] These savings include capacity cost savings that reflect: (i) average capacity prices from the NYISO's auctions; (ii) the effects of new capacity additions; (iii) the implementation of Demand Curves that in part determine the price of capacity in New York, and (iv) changes to market power mitigation measures approved by FERC.

- *Average plant availability increased from 87.5 percent (1992–1999) to 94.7 percent (2001–2007), adding the equivalent of 2,400 MW in capacity – the approximate amount of capacity that would be provided by four medium-sized power plants.*

- Reliability has been strengthened
  - *Surplus capacity to cover summer peak demand has improved. In 2000, there was a deficit of 1,200 MW. In 2009, there is a surplus of 916 MW.*
- Renewable "green power" resources are increasing
  - *There are 1,275 MW of wind generation in operation and approximately 8,000 MW planned for grid connection, assuming adequate transmission is available.*
- Demand-side innovations have been fostered
  - *More than 2,100 MW are now available from Demand Response programs that provide incentives for electricity customers to reduce their power use during times of peak demand.*

As the facilitator and administrator of market-based improvements to New York's power grid for the last decade, the NYISO is proud to have contributed to the implementation of electric restructuring under the orders issued by the New York State Public Service Commission and the FERC. The markets have provided incentives for billions of dollars in investments by Market Participants that have improved New York's environment, helped our struggling economy, and furthered the policy goals highlighted in this Interim Report. Wholesale power markets will be an important vehicle to achieve the policy goals highlighted in the Interim Report for the future.

IV. Conclusion

The NYISO's executives and staff will continue to provide assistance in the form of facts, analysis and energy industry expertise to Board members and the Working Group. The NYISO remains strongly committed to working with the Board and the Energy Coordination Working Group. We will continue to conduct and provide support for the modeling conducted by the New York State Energy Research and Development Authority (NYSERDA) and Department of Public Service Staff (DPS) for the electric system assessments. Please do not hesitate to call upon us if we can provide any additional support to the efforts of the Working Group or the Board.