MINUTES OF THE
NEW YORK STATE ENERGY PLANNING BOARD MEETING
HELD ON DECEMBER 11, 2008

Pursuant to notice dated November 25, 2008, the third meeting of the New York State Energy Planning Board ("Board") was convened on December 11, 2008 at 2:00 p.m. in Room 250 of the State Capitol Building in Albany, New York, and was webcast.

The following Energy Planning Board Members (or designees) were present:

- Paul A. DeCotis, Deputy Secretary for Energy and Chairman of the Energy Planning Board
- Judith Enck, Deputy Secretary for the Environment
- Judith Lee, designee of Garry Brown, Chairman of the New York State Public Service Commission
- Robert Callender, Vice President for Programs of the New York State Energy Research and Development Authority ("NYSERDA")
- Dan Shapiro, designee of Lorraine Cortes-Vasquez, Secretary of State
- Richard Daines, Commissioner of the New York State Department of Health
- Robert Zerrillo, designee of Astrid Glynn, Commissioner of the New York State Department of Transportation
- Alexander "Pete" Grannis, Commissioner of the New York State Department of Environmental Conservation
- Nancy Reuss, designee of Laura Anglin, Director of the New York State Division of Budget
- Jennifer McCormick, designee of Marisa Lago, President and CEO of Empire State Development.

Also present were Thomas C. C. Congdon, Assistant Secretary for Energy and the Executive Director of the Board; Echo Cartwright, Assistant Secretary for Renewable Energy and Deputy Director of the Board; Hal Brodie, NYSERDA General Counsel and Counsel to the Board, and David Munro, NYSERDA Deputy Counsel and Secretary to the Board. In addition,

the meeting was attended by members of the Energy Coordinating Working Group ("Working Group") as well as members of the public.

Chairman DeCotis called the meeting to order, and asked Board members and Working Group members to introduce themselves. Mr. DeCotis thanked Working Group members and staff from the various agencies for their hard work in developing the Energy Plan. Mr. DeCotis stated that energy planning presents complex and often competing issues including protection of public health, environmental justice concerns, impacts from climate change and energy security. He emphasized that all these needs must be addressed, while also advancing New York's economy and well-being.

Mr. DeCotis advised that there would be no public comments during the meeting, but that Board and Working Group members would be available after the meeting to respond to questions.

Mr. DeCotis stated that the minutes of the Board's second meeting on August 7, 2008 stand approved, unless any Board member raises an exception. Since none were raised, the minutes were approved.

Mr. DeCotis then introduced Tom Congdon, who provided a status report to the Board. Mr. Congdon advised that work is progressing well on the issue briefs, assessments and modeling for the Energy Plan. The Working Group is finding that some of the briefs and assessments have gaps that can't be filled until modeling work is completed. The Working Group is also following a number of other gubernatorial, State agency, and private sector initiatives that could provide additional inputs into the briefs and assessments.

Mr. Congdon stated that the Working Group continues to review incoming stakeholder comments. Since the Board finalized the Scope of the Plan last August, the Working Group has received numerous letters, white papers, and comments from industry groups, businesses, local governments, environmental groups, and concerned residents. The Working Group has also met with additional stakeholders. Mr. Congdon stated that many Working Group members had recently toured GE's Global Research Labs in Niskayuna and saw first-hand some of the technologies under development that will be critical to meeting future energy needs.

Mr. Congdon reminded the Board and the public that interested parties can submit general comments on the Plan at any time, and the Working Group has found that the submissions are helpful, and reflect the challenges inherent in any energy planning process. For

example, some of the comments advocate for new strategies to reduce carbon emissions, such as greater deployment of renewable energy, while others discuss the concerns about the rapid pace of renewable energy development in the State, including siting and cost impacts, and reliability issues.

Mr. Congdon stated that staff from the energy planning agencies would discuss in more detail some of the issues that are under consideration as the Plan is being developed.

- Jeff Cohen, who is Deputy for Policy and Legal Affairs at Department of Public Service, will provide an overview of Reliability and Infrastructure Issues

- Echo Cartwright, the Assistant Secretary for Renewable Energy, will discuss Renewable Energy Development Issues

- Peter Iwanowicz, the Director of the Office of Climate Change at DEC, will give a presentation on Climate Change Issues

- John Williams, who is Director of Energy Analysis at NYSERDA, will provide an overview of the modeling approach for the Plan.

These presentations, which can be found on the State Energy Plan's website at http://www.nysenergyplan.com/publications.html, are summarized below.

Reliability and Infrastructure Needs (Jeff Cohen)

1. Introduction.

Stakeholders from utilities and generators to business interests have stressed the fundamental importance of maintaining the reliability of the State's electric system. Many stakeholders – utilities, environmental groups and others – pointed to the need for new transmission capacity as the key to unlock the State's renewables potential, reduce the State's carbon emissions, and reduce the State's cost of electricity.

2. Reliability of bulk electric system ("bulk" refers to generation and high voltage transmission, typically 115 KV and above, that operate in wholesale markets). Key elements of reliability are adequacy and security. Adequacy means not more than 1 major outage every 10 years. Security means the system will be able to withstand sudden disturbances and/or anticipated loss of system elements, and continue to supply and deliver electricity. Among other rules is the "MOB", or minimum oil

burn, rule. During high demand days, certain units must be burning oil, so that in the event of a major gas supply disruption, these plants would be able to ramp up rapidly to replace the gas fired generation forced off line. Another rule sets reserve margins to accommodate the contingency of a major generator or transmission line unexpectedly going out of service**.**

Applying these and other criteria, the New York Independent System Operator's 2009 Reliability Needs Assessment (NYISO's 2009 RNA), which will be published shortly [it was issued on 1/12/09] finds no statewide bulk system reliability need for new generation or transmission capacity over the 10-year study period beyond what is currently being developed.

The impact of load reductions from implementation of "15 by 15" is the major factor that drives the 2009 RNA results. Significantly, the 2009 RNA models the State achieving just 30% of the 15 by 15 goal**.** Notably, the NYISO's underlying analysis was also done before the recent severe economic downturn.

3. Key assumptions underpinning the 2009 RNA.

- Utilities will continue to maintain and upgrade their transmission facilities.
- The natural gas delivery system will be adequate to supply needs of generators, during the winter as well as during the summer.
- We will not see previously unplanned retirements of critical generators triggered by imposition of stricter environmental regulations.

4. Maintaining and upgrading the State's transmission system.

Since 2007 there has been increasing focus on assessing the condition of the utilities' Transmission and Distribution (T & D) systems. The results are major capital expenditure programs underway at National Grid and Con Edison. These programs carry very substantial price tags. Based on plans the companies have submitted, an estimated $10 - 15 billion over the next 5 years will need to be spent just by these two companies on their T&D systems. A substantial portion of that amount will be allocated to transmission. If approved, this could exert upward pressure on retail rates.

5. Capacity of natural gas delivery system.

Can this system meet the demands of the generators on a peak demand winter day after taking care of its core customers? Since 2000, over 5500 MW of gas-fired capacity has been added. The natural gas delivery system was not designed to meet their requirements. But at

least until now we have enjoyed a happy circumstance: gas demand peaked in winter, electric demand in summer. Now, with so much gas-fired generation operating in the winter, there is a concern about the adequacy of the natural gas delivery system to meet peak demand in the winter, including the demand from the generation sector.

Many assumptions go into this analysis – which is by no means finished. Assume the generators cannot burn oil on that peak winter day because they have used up their hours of permitted oil burn under their air permits. Oil burn restrictions have been imposed because the NYC metropolitan area is in violation of certain health-based NAAQs. Assumptions regarding progress on achieving 15 by 15, the availability of incremental renewables capacity, and/or the potential effects of closing Indian Point 2 and 3, all impact the demand for gas for electric generation out into the planning period. Finally, we need to estimate what the demand of core customers will be on that peak day. This issue must be examined under a range of assumptions.

6. Impact of environmental regulations.

Gas generators – to the extent they can burn oil – will generally opt for a permit that will allow them to burn no. 2 for a limited number of hours – as an alternative to spending money on pollution controls. This highlights the significance of the adequacy of natural gas delivery system. New environmental regulations may well accelerate retirements or deratings of plants that now burn no. 6 oil (Port Jefferson, Northport and Barrett) and plants that now burn coal.

7. Planning.

Electric and gas system studies must be fully integrated. We need to avoid the electric system becoming less resilient – less able to withstand supply or price shocks, or extreme weather. Challenges include significantly reduced fuel diversity downstate; reduced dual fuel capability downstate; fewer load-following units system wide; and fewer units to provide voltage support.

8. Need for new transmission capacity.

For over a decade there were few, if any, comprehensive studies of the State's transmission system looking forward. Now many studies are proceeding simultaneously, looking at various issues including economics and deliverability of renewables. Some will have timely results. (Examples: NYISO wind study, 12/08; NYC transportation study, Jan-Feb 2009; Energy East bottled wind, June 2009; transmission owners study (STARS) Phase 1 results, early 2009.)

9. Demonstrations of need.

There are 3 ways to demonstrate need: reliability, economics and/or public policy. Accepting the NYISO's conclusion that there is no statewide bulk system reliability need for the planning period, the need for new transmission must be justified on economic or public policy grounds.

Economics. Saving money on the State's electricity bill, by eliminating transmission constraints that currently prevent cheaper power moving to the downstate area. In-State sources of generation; PJM; hydro from Quebec. NYC transmission planning effort is focusing on this possibility. The STARS study and NYISO's economic planning process will also address this issue.

Public policy. We need to fully develop renewable energy, and make sure the power can be delivered to load centers. For example, by addressing bottled wind generation upstate. We must increase imports of hydro from Quebec. We also need to be mindful of complexity and cost. This suggests the need to rank projects on the basis of overall benefits. Upstate renewables and hydro from Quebec could in theory be justified both on economics and public policy grounds.

10. Outstanding questions regarding transmission.

The transmission system will be called on to do things it was never expected to do before. It will be the vehicle for implementing major public policies.

Issues: Whether it makes economic sense to downstate electric utility customers – those who would directly benefit and therefore who would likely pay – to increase transmission capacity to the downstate area; whether bottled wind generation in the North country or in Western New York is, or could be, a significant problem, and does it make economic sense to invest in transmission to solve it; what must be done to import new Canadian hydro, assuming the price is right, and who will pay for the required transmission upgrades to get it to the load centers.

Studies that are underway should start providing answers to some of these – and other – questions.

Renewable Energy Development (Echo Cartwright)

The Plan's renewable energy assessment will consider various renewable technologies, including hydropower, solar technologies, wind (both land and off-shore), biomass, biofuels and geothermal. The assessment will provide a foundation to consider future renewables policy in the Plan. The presentation will focus on RPS and deployment challenges.

Why renewable energy? Indigenous resources reduce energy imports; keeps energy expenditures in-State; helps meet environmental and climate change goals, while meeting energy demand; creates economic development opportunities and job growth; provide long-term price stability (fuel is free); and improve grid reliability - peak load/demand offset.

Development driven by Renewal Portfolio Standard. 25 percent electricity from renewable sources by 2013, approved by the PSC in 2004; NYSERDA administers funding collected by the utilities and uses it to provide incentives to developers.

RPS results to date. Contracted projects to date: 1,340 MW of new renewable capacity by the end of 2009; 3.8 million MWh annually, enough to power 635,000 homes. Environmental benefits – the following emissions (equivalent) have been avoided annually: 2,600 tons of nitrogen oxides (NOx), 5,200 tons of sulfur oxides (SOx), and 1.9 million tons of carbon dioxide (CO_2). $742 million in RPS funding to date is projected to leverage $2.1 billion in private investment and over $4 billion in economic spin-off over the next 20 years.

Challenges to deployment. (1) Impacts on consumer energy bills: near-term cost impact vs. need for technology and market development; (2) next generation bio-energy: need for alternative high-value liquid fuels and sustainable crop and land use management; (3) transmission and delivery: moving upstate renewable energy supplies to high demand areas may require investment in transmission and/or greater siting of resources closer to load; (4) limitation: intermittency of wind and solar, lack of storage capacity, siting.

In conclusion, renewable energy assessment is well underway. We need to (1) clearly define policy, economic and environmental trade-offs; (2) understand stakeholder concerns in order to responsibly develop and deploy renewable resources; (3) identify renewable energy potential, bill impacts, and most efficient and effective means of meeting policy goals.

Climate Change and the State Energy Plan (Peter Iwanowicz)

Governor Paterson: "Global warming is the most pressing environmental issue of our time."

A wide range of commenters - business, transmission, clean energy, individuals, trade associations, generation owners, environmentalists - raised the issue of climate change.

What we are hearing and what we are addressing: climate change poses challenges and presents opportunities; there are intersections with other policies and impacts; everything should be considered as part of the solution; the Energy Plan is a major venue for addressing climate change.

Stakeholder thoughts on technology solutions: (1) energy efficiency is cost effective; early adopters reap the benefits; how best to deliver? (2) Renewable energy - need to understand technological limitations, and how to address the complexity of needed transmission upgrade. (3) Low- or no-carbon fuels - how best to reduce the carbon intensity? Other issues: carbon capture and sequestration; materials management; modernization of transmission and distribution; clean, distributed generation and demand side management to cut consumption and emissions at peak times.

Stakeholder thoughts on policy strategy: modernize existing power plants and the transmission and distribution system; transmission system to match need for renewable deployment; the Energy Plan needs to take into account other sectors of the economy (growth and sprawl); the Plan and climate are clearly intertwined; need to assess impacts on rates and bills; the Plan should articulate a goal of an 80% reduction in GHG emissions by 2050.

Challenges before us: meeting the climate challenge; what does it mean for the planning horizon before us?

State Energy Plan Modeling Process (John Williams)

John Williams presented what he described as a "very high level" overview of the modeling processes being conducted in developing the Energy Plan.

NYSERDA hired ICF Resources LLC to model both the electric and natural gas sectors. NYSERDA will also spend $200,000 to develop an Economic Impact Model, which will predict the impact of various policy scenarios on the State's economy.

Electricity Modeling.

ICF is using its Integrated Planning Model (IPM) to provide quantitative estimates of the impacts on the New York electricity sector related to a variety of potential policy scenarios. The results provided by ICF will provide the quantitative foundation for analysis of a variety of policy scenarios being investigated by the Working Group. The scope of work includes the following:

- Development of modeling input assumptions (with assistance from NYISO, DPS and other State agencies) for use in the Energy Plan analysis;
- Development of a Reference Case (intended to reflect current regulations and market conditions);
- ICF then presents forecasts of energy prices, capacity price, generation mix, generation additions, fuel consumption, emission by pollutant, etc.;
- The modelers then use IPM to analyze various sensitivity scenario and policy scenario runs. Sensitivity scenarios are run with IPM to estimate the impact on the Reference Case of changes in selected input assumptions, e.g., gas price fluctuations, demand growth, changes in regional and national energy and environmental policies;
- Policy scenarios are used to evaluate the impacts of alternative regulatory structures - a national greenhouse gas policy, an expanded RPS (30 by 15), nuclear activities (retirement of plants, new construction), transmission development scenarios, a roll-out of plug-in hybrid electric vehicles, and the like;
- The results from each sensitivity scenario and policy scenario are then compared to the Reference Case results to assess the impacts on price, capacity, etc.

ICF will also feed results from its electric modeling into other forecasting and modeling efforts, including natural gas and macroeconomic modeling.

Natural Gas Modeling

ICF will evaluate the ability of the gas system to simultaneously meet the demands of residential, commercial and industrial customers as well as demands of electric generators and to identify vulnerabilities, weaknesses, and reliability issues that could adversely affect the reliability of the electric system over the planning period from 2009 to 2019. As with the electric modeling, the results provided by ICF will provide the quantitative foundation for analysis of a variety of policy scenarios being investigated.

ICF will use the Multi-Area Production Simulation (MAPS) model to forecast electric generation natural gas demand and the Gas Market Model (GMM) to forecast the other sector national gas demand, and other various forecasts. ICF will then use these forecasts in the GMM and Gas Pipeline Competition Model (GPCM) to develop a more detailed New York State pipeline demand forecast. Using the average monthly forecast from GPCM, ICF will use the Daily Gas Load Model and the Regional Infrastructure Assessment Modeling System to assess peak-day natural gas demand and pipeline capacity for each interstate pipeline in New York State. The goal will be to build "what if" scenarios - e.g., load growth, severe weather, power plant retirements, combination scenarios - to make sure that demand is fully met on a peak day.

Macroeconomic modeling

NYSERDA has budgeted $200,000 to hire a contractor to develop an Economic Impact Model. Possible uses of such a model:

- to inform us of future economic conditions given specific changes in the economy or regulatory action;

- for the Energy Plan, we can apply policy scenario outputs to New York demographic, labor price, production costs, etc. data to produce economic impact;

- we can build "what if" scenarios and track the impact of each scenario on the State's economy generally. For example, how will specific programs or policies impact job growth in New York? How will they impact gross state product?

Comments from Board Members

Commissioner Grannis asked whether there is adequate hydropower available from Quebec, especially in light of the failure of prior projects designed to provide power to New York and other states. Jeff Cohen responded that there is adequate capacity, and Quebec is building out more. Tom Congdon advised that many of the past problems - opposition by native American tribes and the like - have been resolved.

Judith Enck asked why the RPS program does not fund solar thermal systems (using the sun to heat water). Echo Cartwright responded that a recommendation of the Renewable Energy Task Force is to increase funding not only for solar photovoltaic (PV) energy generation, but also for solar thermal projects. Jeffrey Cohen noted that solar thermal projects probably were not

funded because solar thermal does not produce energy, and consequently it is difficult for the PSC to justify using ratepayers' monies to fund this.

Chairman DeCotis asked Echo Cartwright to identify the primary barriers to expanding renewable energy in New York - are they technology, cost, deliverability, availability of land, access to capital, transmission, all of the above? Ms. Cartwright responded that different technologies face different barriers - e.g., transmission is the key issue for wind, while it is cost for solar, and land issues for some biofuels such as corn.

Nancy Reuss asked whether New York is well positioned to obtain stimulus funds if the President-elect's proposals become legislation. Ms. Cartwright responded that the State has well-developed energy efficiency, renewable energy, and net metering programs, which will hopefully attract businesses that haven't looked favorably upon New York in the past. Ms. Cartwright also advised that the Governor's office is working with the Department of Labor on developing a "green collar" workforce of skilled labor to support renewable energy technology companies. Mr. Congdon stated that the Governor's Office has briefed the President-elect's transition team on the State's various energy efficiency and renewable energy programs.

Judith Enck asked whether the modeling being done by the Working Group will address negative environmental externalities when weighing energy alternatives, e.g., acidification of Adirondack lakes and fish kills resulting from coal-burning power plants - "dirty energy has health care impacts." Ms. Enck opined that if all the costs associated with fossil fuel energy production were borne by the energy producers, then the cost of producing this type of energy would be substantially higher. Working Group member Dr. Nancy Kim responded that while an issue brief is examining public health impacts from use of various fuels, it is not looking at externalities such the cost of treating illnesses due to pollution. Ms. Enck urged the Board to be transparent about this issue - if the modeling will not address such negative impacts, the Plan should say so explicitly.

In response to Peter Iwanowicz's presentation, in particular a goal of "80 by 50," Chairman DeCotis asked whether in order to meet that goal the State must stop burning all fossil fuels. Mr. Iwanowicz replied that if we continue to burn fossil fuels, we need to capture all the carbon. He also said that if the Plan adopts an 80 by 50 goal, the key will be what we do over the next ten years; if we don't aggressively deal with fossil fuels now, we will have to take vastly

more dramatic steps in the years leading up to 2050. (He noted that one third of the CO2 we are emitting now will remain in the atmosphere in 100 years.)

Commissioner Grannis observed that energy planning and climate change efforts are now very much aligned, much more so than when the Board began its work, especially in light of the Governor's pronouncements and the President-elect's 80 by 50 proposal, and this puts added pressure on the Board to squarely address climate change in the Plan. Judy Lee said the challenge is even greater given the need to keep costs affordable for ratepayers. Chairman DeCotis asked whether Working Group members thought the federal government would develop a program that the states would fit within, or would New York and the other RGGI states be asked to play a key role in developing national policy. Commissioner Grannis stated that ideally RGGI will seamlessly be incorporated into a national program, but New York will need to make sure that we are not preempted from running our own program if it is determined that the federal program is not adequate to meet New York's needs. Mr. Iwanowicz opined that New York and the other RGGI states are in a very strong position - we have a track record on how to develop a cap and trade program and administer a successful auction. Additionally, Lisa Jackson, the likely new EPA administrator, was a key player in developing RGGI while working for the State of New Jersey.

Proposed Schedule Modification

Tom Congdon raised the issue of extending the Schedule contained in the Executive Order that created the Energy Planning Board. The schedule in the EO is as follows:

- Complete a comprehensive Draft State Energy Plan by March 31, 2009
- Hold six public hearings
- Issue a Final State Energy Plan by June 30, 2009.

Mr. Congdon presented several problems with the current schedule: (1) Several parties expressed an interest in commenting on the Plan, but said that their comments would be more productive if they could be in response to work product. The current schedule does not allow for an additional public comment period on any of the Energy Plan inputs until the draft Plan is issued; (2) other key policy initiatives will not be completed in time to be considered in the Plan. Key initiatives the Working Group is following include, but are not limited to: the Biofuels Roadmap that is being developed by the Renewable Energy Task Force; the STARS

Transmission Study; the Commission on State Asset Maximization report; and the Environmental Justice Interagency Task Force Recommendations; (3) the State's economic condition has worsened since we commenced the planning process, and we must take into consideration the severe economic condition of the State; and (4) it is unlikely that all of the modeling and analytic work will be completed in time to fully develop a draft Plan by March 31.

In light of these issues, the Working Group recommended the following modified schedule:

- Issue a preliminary draft document on March 31 that will serve as a foundational document for the Energy Plan. It will provide initial thoughts on findings to date, and will allow parties to consider the direction the Plan is moving in.
- Put the "Foundation Document" out for public comment.
- Issue a Draft Plan on or before July 15, 2009.
- Hold at least 6 public hearings per the EO; accept written comments.
- Issue Final Plan on or before October 15, 2009.

In response to a comment from Commissioner Grannis that hearings in July and August may not be well attended, Mr. Congdon stated that some of the hearings would also be held in September.

Chairman DeCotis advised that since the Working Group was requesting a modification to an EO issued by the Governor, the Governor would have to approve any changes to the schedule. Board members agreed by consensus that such a request should be submitted to the Governor. Mr. DeCotis proposed to draft a letter to the Governor, and circulate the draft letter to Board members for comments.

Review of the requirements Contained in the Executive Order

Chairman DeCotis then reviewed the various requirements in the EO - assessments, deliverables, and the like. Mr. Congdon confirmed that the Working Group was in the process of addressing each required item.

The final item on the agenda was to consider such other business as may come before the Energy Planning Board. Mr. DeCotis asked if there was any other business. There being none, the meeting was adjourned.

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David A. Munro, Secretary to the Board