UNITED STATES
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

In re:	Docket Nos. 50-247-LR; 50-286-LR
License Renewal Application Submitted by	ASLBP No. 07-858-03-LR-BD01
Entergy Nuclear Indian Point 2, LLC, Entergy Nuclear Indian Point 3, LLC, and Entergy Nuclear Operations, Inc.	DPR-26, DPR-64 January 31, 2011

DECLARATION OF DAVID A. SCHLISSEL

David A. Schlissel hereby declares under penalty of perjury that the following is true and correct:

1. My name is David A. Schlissel. I am the President of Schlissel Technical Consulting. I have served since 1973 as a consultant, expert witness, and attorney on complex management, engineering, and economic issues, primarily in the fields of energy and the environment. I have been retained by regulatory commissions, consumer advocates, publicly-owned utilities, non-utility generators, governmental agencies, and private organizations in more than 35 states to prepare expert analyses on issues related to electric, natural gas, and telephone utilities. I have presented testimony in more than 100 cases before regulatory boards and commissions in 35 states, two federal regulatory agencies, and in state and federal court proceedings.

2. I hold BS and MS degrees in Astronautical Engineering from the Massachusetts Institute of Technology (MIT) and Stanford University, respectively. I also received a Juris Doctor degree from Stanford University School of Law. I also have studied Nuclear Engineering and Project Management at MIT. I am a member of the New York State Bar and the American Nuclear Society. My recent work has involved the evaluation of utility resource planning analyses, the economics of proposed and existing power plants, electric system reliability, and power plant operations and outages. I also have examined the impact of nuclear power plant life extension on plant decommissioning costs. A copy of my CV was submitted to the Board on November 28, 2007 in support of my earlier submissions in this proceeding.

3. I prepared a *Report on the Availability of Replacement Capacity and Energy for Indian Point Units 2 & 3,* dated November 28, 2007 and a second declaration, dated February 27, 2009, which provided additional information on New York's energy markets, energy efficiency, energy conservation, renewable energy, facility repowering, and transmission enhancements, relevant to Chapter 8 of the December 22, 2008 Draft Supplemental

Environmental Impact Statement prepared by NRC in this proceeding. I prepared this updated assessment with the assistance of staff at Synapse Energy Economics, Inc. who worked under my direction and supervision.

4. My November 28, 2007 *Report on the Availability of Replacement Capacity and Energy for Indian Point Units 2 & 3* concluded that:

> "… the capacity and energy provided by Indiana Point Units 2 and 3 can be replaced if the Units are not relicensed. In particular, energy efficiency, renewable resources, the repowering of older generating facilities, transmission upgrades and new natural gas-fired generating facilities represent viable alternatives to the relicensing of Indian Point. Substantial reductions in peak demand and energy requirements will be achieved by 2013 under the state's newly announced "15x15" Clean Energy Plan. Significant amounts of new renewable resources will be available as a result of the state's renewable energy portfolio standard and other initiatives. In addition, thousands of megawatts ("MW") of new generating capacity can be provided by the repowering (i.e. rebuilding) of older generating facilities both along the Hudson River and in the downstate area of the state in New York City and on Long Island. At the same time, transmission system upgrades also can increase the amounts of power that can be provided to the downstate region of the state. Finally, there is the potential for the addition of several thousand megawatts of new generating capacity in the Hudson River Valley and in downstate New York.[1]

5. Developments in the three years since that Report was submitted have confirmed and further supported these conclusions. Since 2000, New York has added over 7,800 MW of new generation, nearly 1,300 MW of new transmission, and nearly 2,400MW of demand response.[2] Eighty percent of the new generation has been added where demand is the greatest in the New York City, Long Island and Hudson Valley region.[3] Substantial transmission capacity has been added, as discussed below, to bring more power to the downstate region from out of state. 2009 also saw a decrease in the generation at fossil fuel-fired power plants and an increase in the generation from renewable resources, as compared to 2008.[4] The total resource capability in the NYCA (New York Control Area) for 2010 has been 43,000 MW (including demand response): greater than the 118% of the 2010 projected schedules of load and installed capacity.[5]

Lowered Energy and Peak Demand Forecasts

6. This Board may take judicial notice of the fact that the United States, including New York State, is experiencing a prolonged recession. This recession has led to lower

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1 *Report on the Availability of Replacement Capacity and Energy for Indian Point Units 2 & 3, a*t p. 18.

2 *NYISO 2010 Summer Outlook, May* 2010, at pp. 10 and 11.

3 Id.

4 Id.

5 Id. at p. 9.

electricity sales and peak loads for an extended period of time and will impact directly the time frame within which the alternatives (e.g., conservation, efficiency, renewables, transmission enhancements, and repowering) would need to be implemented under the "no-action" alternative.

7. Lower electricity sales and peak loads have been experienced in recent years in New York State as a result of the ongoing U.S. economic recession. These reduced energy sales and peak loads will affect the need for the energy and capacity from Indian Point Units 2 and 3. For example, according to NYISO's *2010 Reliability Needs Assessment* ("NYISO 2010 RNA") the actual sales of electricity in the New York State Control Area ("NYCA") declined by 1 percent between 2007 and 2008 and by an additional 4.1 percent between 2008 and 2009.[6] After declining by 5.2 percent between 2006 and 2007, statewide summer peak loads increased by 0.8 percent between 2007 and 2008 before again declining by another 5 percent between 2008 and 2009. Overall, statewide summer peak demand in the NYCA declined by 9 percent between 2006 and 2009. Winter peak demands were essentially flat starting in 2006 before declining by 1.4 percent in the winter of 2008-2009, and another 2.4 percent in the winter of 2009-2010.[7]

8. NYISO reports that electricity sales in Zone J in New York State (New York City) were essentially flat between 2007 and 2008 before declining by approximately 3 percent in 2009.[8] Sales in Zone K (Long Island) were similarly flat between 2007 and 2008 before declining by approximately 2.6 percent between 2008 and 2009.

9. Con Edison confirms that its sales of electricity in Zones I and J in New York State were essentially flat between 2007 and 2008 and declined by 2.8 percent between 2008 and 2009.

10. According to the NYISO, "the effect of the 2009 recent [has been] to reduce the peak demand forecast for 2011 by 1,400 MW, before any energy efficiency adjustments. This also reduced the projections of peak load[s] in subsequent years."[9] For this reason, the NYISO issued a revised 2009 Gold Book forecast that was completed in October 2009. As indicated in Figure 1 below, this revised 2009 Gold Book forecast was significantly lower than the 2009 Gold Book Forecast that had been released earlier in the year. Both the original and the revised 2009 Gold Book forecasts, in turn, were substantially lower than the forecast used in the first Comprehensive Review of Resource Adequacy in 2006.

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6 NYISO *2010 Reliability Needs Assessment (hereinafter "2010 RNA"),September 2010* at p. C-3.

7 Id.

8 Id. at p. C-4.

9 NYISO *2010 RNA*, September 2010, at p. i.

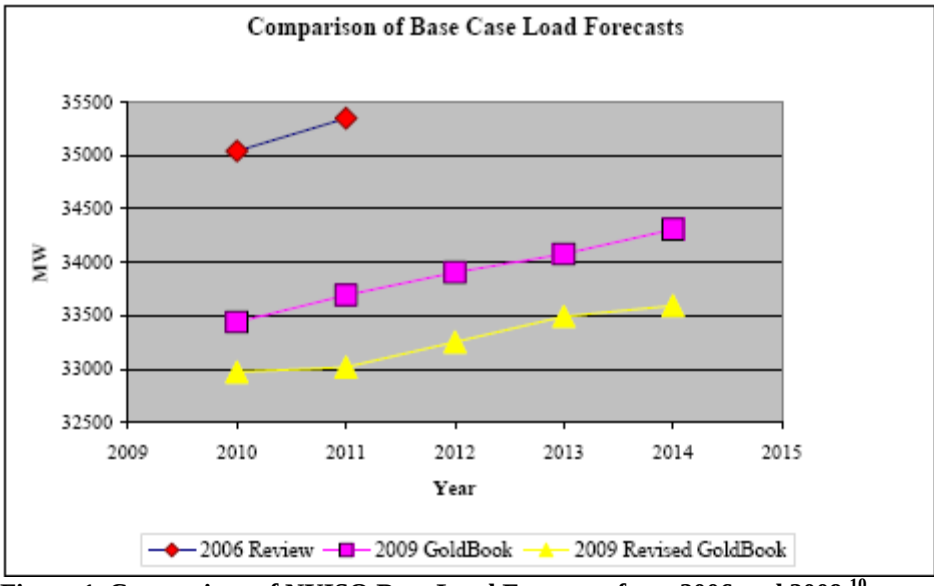

Figure 1. Comparison of NYISO Base Load Forecasts from 2006 and 2009.[10]

11. After looking at projected electric load growth, as well as at existing and proposed generating resources, the NYISO's *2009 Comprehensive Review of Resource Adequacy* found that "the anticipated capacity supply (42,536 MW) will exceed the forecasted peak load (34,309 MW) (this includes the required reserve margin of 18%) for the 2010-2011 Capability Year by 2,051 MW in 2014."[11] According to the NYISO, there were three reasons for this: reductions in peak load due to the recession and to the New York Energy Efficiency Portfolio Standards ("EEPS"), an increase in generation additions, and Special Case Resources ("SCRs") (customer pledges to cut energy usage on demand), and fewer planned retirements.[12]

12. However, in calculating this 2,051 MW capacity surplus in 2014, the NYISO used the original 2009 Gold Book forecast. If the revised 2009 Gold Book forecast is used, instead, as it should be, the anticipated capacity supply of 42,536 MW will exceed the forecasted peak load of 33,594 MW in 2014 by a total of 8,942 MW, or 2,895 MW more than the required 18 percent reserve margin.

13. Moreover, the revised 2009 Gold Book forecast assumes that only a portion of the 15x15 energy efficiency goal will be achieved.[13] A more recent NYISO forecast in its *2010 Reliability Needs Assessment Final* Report, issued in September 2010, shows what the projected impact would be of achieving 100 percent of the "15 by 15" energy efficiency goal by 2015. As a consequence, this 2010 RNA 15x15 forecast projects significantly lower peak demands for New York State.

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10 *NYISO 2009 Comprehensive Review of Resource Adequacy: Covering the New York Control Area for the period 2010 to 2014*. March 10, 2010, at p. A-7.

11 Id. at p. 1.

12 Id.

13 According to the NYISO *2010 RNA*, the Gold Book forecast assumes that approximately 51 percent of the 15x15 goal will be achieved by the end of the planning horizon in 2020. NYISO *2010 RNA*, at p. 9.

14. The annual peak forecasts projected between 2011 and 2020 in the NYISO's 2010 RNA's Base Case and 15x15 forecasts are shown in Figure 2, below:

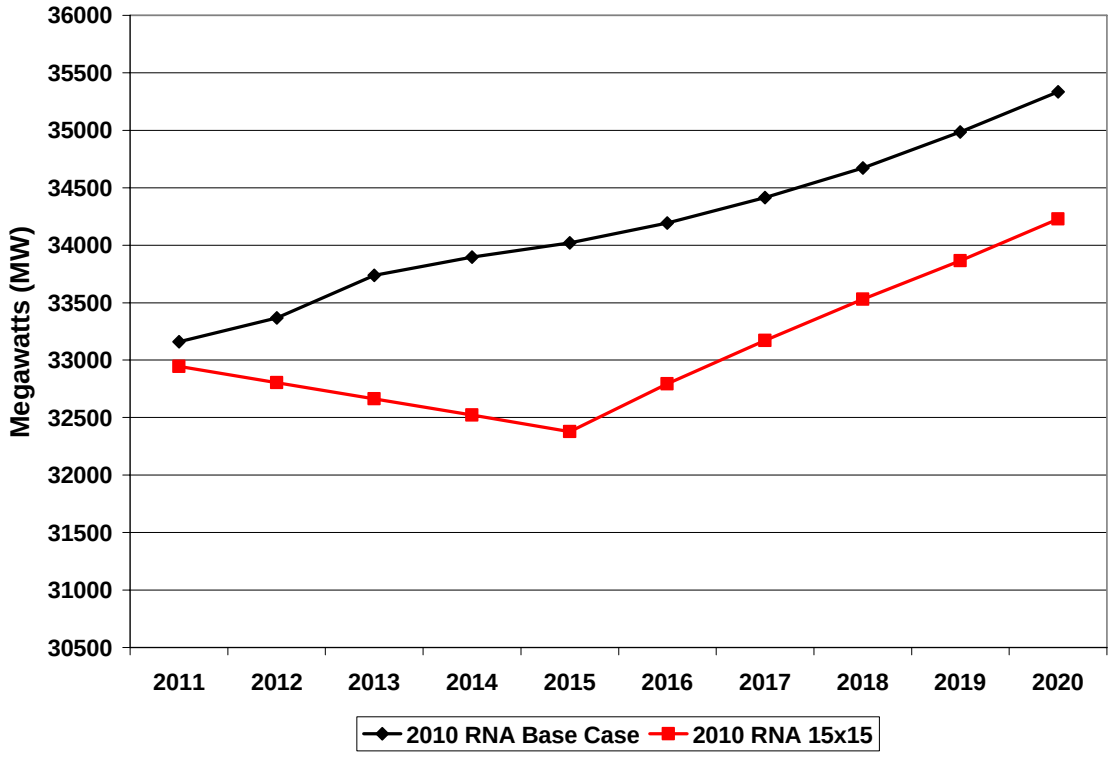

Figure 2. Comparison of NYISO 2010 Reliability Needs Assessment Base Case and 15x15 Load Forecasts.[14]

14. If the RNA's 2010 15x15 forecast is used and its projection of a capacity supply of 43,404 MW in 2014 will exceed the projected 32,251 MW peak load by 10,285 MW, or 5,029 MW more than the required 18 percent reserve margin.

15. In fact, data from the NYISO 2010 RNA shows that under the 2010 15x15 forecast, the New York Control Area would have capacity reserves significantly higher than the 18 percent required reserve. This is shown in Figure 3, below:

[14] The data for Figure 2 is taken from Table 3-1 on p. 12 of NYISO's 2010 RNA.

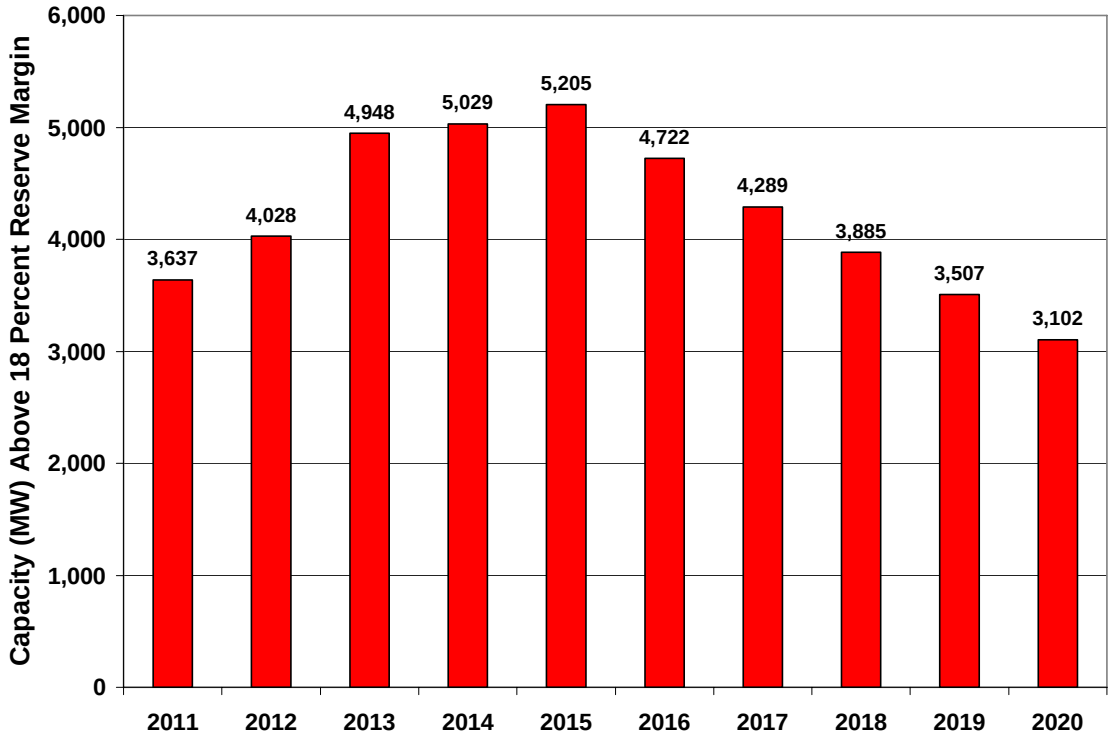

Figure 3. Capacity in Excess of 18 Percent Reserve Margin under NYISO 2010 Reliability Needs Assessment 15x15 Load Forecast.

16. Thus, the reserve margins in the New York Control Area would exceed 18 percent even if the Indian Point Units are not relicensed.

17. Reserve margins in the New York Control Area would exceed 18 percent in each year through 2020 even under the NYISO's 2010 RNA Base Case forecast, as shown in Figure 4 below:

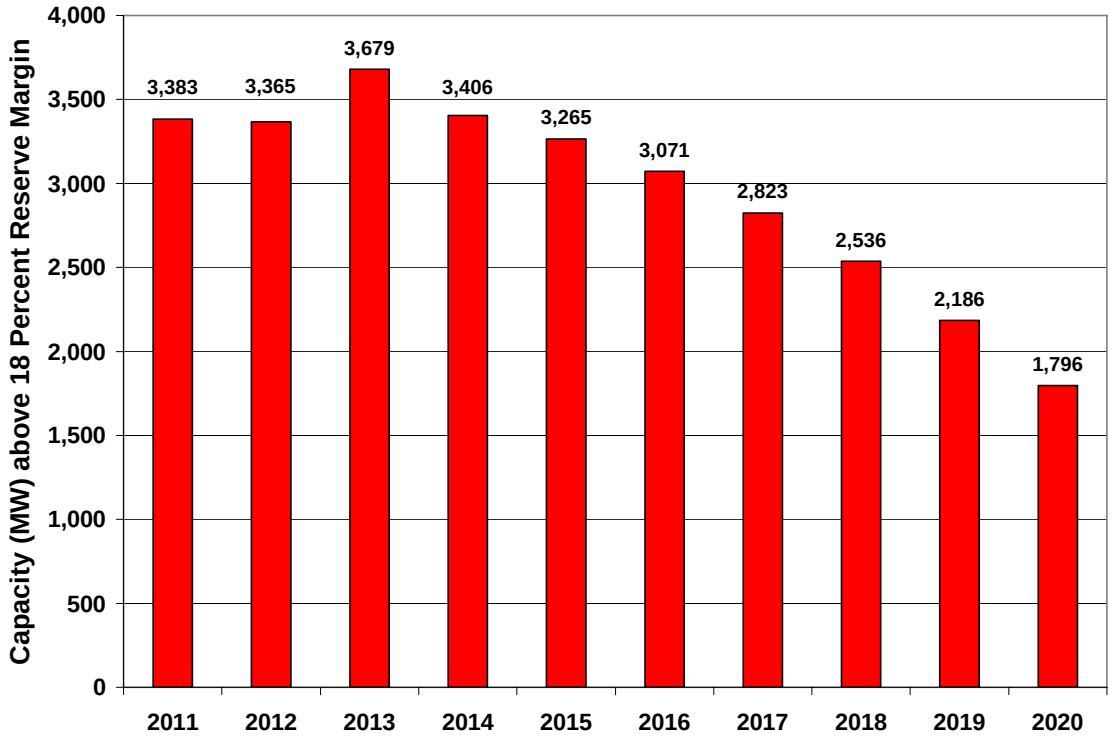

Figure 4. Capacity in Excess of 18 Percent Reserve Margin under NYISO 2010 Reliability Needs Assessment Base Case Load Forecast.

18. As shown in Figure 4, even if the state achieves substantially less than the 15x15 goal, reserve margins would still be significantly higher than 18 percent in each year through 2020. In fact, the reserve margins in the New York Control Area would exceed 18 percent in each year through 2018 even if the Indian Point Units are not relicensed. This would give the state time to accelerate energy efficiency investments (and consequent savings) and to add additional renewable and gas-fired resources, if needed.

Energy Efficiency

19. My November 2007 Report quantifies the annual reductions in electricity consumption needed per year to achieve the state's "15 by 15" goal, on both a statewide and regional basis.[15] As shown in that Report, the state's "15 by 15" energy efficiency goal, if achieved, would offset a significant portion of the energy and capacity provided by the two Indian Point Units.

20. Subsequent to the submittal of my November 2007 Report, Governor Spitzer's goal of a 15 percent decrease in energy demand from forecasted levels by the year 2015 (more than 27,000 GWh) was formalized by the New York PSC's *Order Establishing Energy Efficiency Portfolio Standard and Approving Programs*, adopted on June 23, 2008. The EEPS Order gives funding to specific energy efficiency programs, and energy savings coming directly from those programs are estimated to be approximately 7,639 GWh in

[15] Schlissel, David. *Report on the Availability of Replacement Capacity and Energy for Indian Point Units 2 & 3*. November 28, 2007, at pp. 5 and 6.

2015,[16] which is slightly less than half of what is needed to replace the Indian Point generating Units.

21. According to a draft energy efficiency potential study done in 2008 by Optimal Energy, which updated an earlier 2003 energy efficiency potential study, New York State's achievable energy efficiency potential through 2015 is 26,000 GWh.[17] Of this 26,000 GWh of achievable potential, Optimal Energy concludes that 38% (9,824 GWh) of the savings can be realized in New York City, 14% (3,603 GWh) in Long Island, and the remaining 48% (12,573 GWh) in the rest of New York State.[18]

    This 26,000 GWh represents a 14% decrease from the 2015 forecast of electricity demand, which is slightly short of the "15 by 15" goal. This estimated efficiency potential only takes into account policies that are currently in effect, however. Optimal Energy also estimates that policies related to improved building codes and appliance standards which have passed but not yet taken effect, or for which implementation is highly likely in the next ten years, can provide additional electricity savings of 11,000 GWh, or an extra 5.7% from forecasted demand.[19] If the same percentages apply to the regional savings values stated above, New York City's (Zone J) total potential would increase to just over 14,000 GWh and Long Island's (Zone K) total potential would increase to more than 5,000 GWh. Along with the additional potential in Zones H and I, if achieved, energy efficiency reductions in New York City and Long Island would more than offset the energy generated each year at Indian Point Units 2 and 3.

22. As quantified by Optimal Energy, there is sufficient energy efficiency potential in the state to meet the state's goal of "15 by 15." New York has a long history of investments in energy savings, first through the implementation of the Systems Benefit Charge program ("SBC"), and now through the EEPS. New York's efforts at energy efficiency to date should indicate that the state can be expected to achieve full implementation of the 2015 goal. Annual energy efficiency savings to date, achieved largely from the SBC program (that was initiated in 1998), already have reached more than 4,000 GWh per year. Savings from EEPS funded programs are expected to be an additional 7,639 GWh in 2015. It is reasonable to expect that some of these savings have and will occur in areas of New York that are served by the Indian Point Units. LIPA and NYPA can be expected to contribute another 3,000 GWh in energy savings by the year 2015 – most, if not all of which will be achieved in those areas of the state that currently rely on Indian Point. Together, all of these energy efficiency savings can offset a significant portion, if not all of, the electric generation that would be generated by Indian Point Units 2 and 3.

23. Furthermore, NYISO Demand Response programs, which enlist electricity customers to conserve power in response to system conditions, are effectively reducing the need for

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16 New York State Energy Plan, *Energy Efficiency Assessment*, December 2009, p. 29.

17 The November 2007 Report references a presentation by Philip Mosenthal of Optimal Energy which states that New York has an energy efficiency potential of 61,506 GWh. This value represents energy efficiency potential between 2003 and 2022.

18 Optimal Energy, Inc. *Achievable Electric Energy Efficiency Potential in New York State*, 2008. As cited in the New York State Energy Plan: *Energy Efficiency Assessment*, December 2009, p. 6.

19 Id. at p. 5.

additional capacity. One of the NYISO Demand Response programs, Special Case Resources, currently has registrations of 2,084 MW, an increase of 761 MW from last year.[20]

Renewable Resources

24. As explained in the *Renewable Energy Assessment* in the 2009 New York State Energy Plan, New York is a leader in developing renewable energy resources, as demonstrated by its commitment to the Renewable Portfolio Standard ("RPS") and subsequently to the "45 by 15" clean energy goal.

> The RPS, adopted in 2004, has been the State's primary policy initiative to promote the development of renewable resources. The 2004 RPS goal aims to increase the amount of electricity delivered to New York consumers that is generated by renewable resources to 25 percent by 2013. In his 2009 State of the State address, Governor Paterson proposed to increase this goal by announcing New York's "45 by 15" clean energy goal. This goal challenges the State to meet 45 percent of its electricity needs by 2015 through increased energy efficiency and renewable energy. The goal calls for a reduction in electricity end-use by 15 percent, primarily through the expansion of energy efficiency activities, while simultaneously meeting 30 percent of the State's electricity supply needs through renewable resources.[21]

25. New York State is already well on its way towards achieving these goals, as shown in Table 1, below, which includes the amounts of electricity generated from in-state renewable resources in each year between 2001 and 2009. These totals only include in-state resources and do not include imported renewable energy, out-of-state renewable energy attributes (Renewable Energy Certificates ("RECs") acquired through green purchasing in the voluntary market), or customer-sited renewable generation, all of which contribute toward meeting the RPS requirements.

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[20] NYISO *Reliability Summary 2009-2018*, pp. 5 - 6.

[21] New York State Energy Plan. *Renewable Energy Assessment*, December 2009, at p. 1.

Table 1. Electricity Generation from New York State Renewable Resources (GWh).[22]

Year	Hydro	Wind	Methane, Refuse, Solar, and Wood	Total Statewide Electricity Requirement	Total Generation from Renewable Resources	% of Total Statewide Electricity Requirement (In-State only)
2001	23,084	21	1,781	155,240	24,886	16.03%
2002	25,048	82	1,726	158,507	26,856	16.94%
2003	24,269	41	1,694	158,013	26,004	16.46%
2004	23,990	116	1,795	160,211	25,901	16.17%
2005	25,783	103	1,886	167,208	27,772	16.61%
2006	27,345	518	1,942	162,237	29,805	18.37%
2007	25,253	873	1,941	167,341	28,067	16.77%
2008	25,711	1,282	2,996	144,619	29,989	20.74%
2009	26,420	2,108	2,888	136,501	31,416	23.02%

26. However, there is significantly more renewable energy that could be used to generate electricity in New York State. For example, as shown in the following table, the 2009 New York State Energy Plan *Renewable Energy Assessment* presents evidence that the technical/practical potential for renewable resources is forecast at more than 141,000 GWh by the year 2018.[23]

Table 4. New York Renewable Energy Technical/Practical Potential Electricity Generation

Resource	In-State GWh Generation (2007)	Projected In-State GWh Generation based on the Achievement of the 25% RPS Goal (2013)[3]	Projected In-State GWh Technical/Practical Potential (2018)	% of Projected GWh Generation (2018)[4]
Hydro[1]	25,253	25,385	31,000	19%
Biomass[2]	1,942	3,616	9,400	5.8%
Wind	873	8,476	48,000	29%
Solar-PV[1]	17	27	53,000	32%
Total	**28,085**	**37,504**	**141,400**	**87%**

Notes: Assumes a rolling 3-year average NYS fossil fuel conversion factor for renewable electricity resources.

[1]Hydro, wind, biomass and solar-PV technical potential was estimated without consideration of cost or market acceptability. The solar-PV 2007 data was estimated based on historical growth rate, and only includes customer-sited, grid-tied electricity generation. All solar-PV data are reported as alternating current (AC) with the exception of LIPA, which is reported as direct current (DC).

[2]Biomass data do not account for customer-sited applications such as ADG. Biomass in-state potential estimate is based on data from the Optimal Energy study, which allocates only some of the total available biomass to electric generation. Waste-to-electricity potential estimates (which account for 6% of the total biomass potential) are included based on the Optimal Energy study, where 50% of the municipal solid waste was considered biogenic based on EIA historical data.

[3]Energy generation in 2013 was estimated to show the expected impact of the 25% RPS, based on the 2004 Cost Study. The 2004 RPS Order anticipated that New York would import 8,269 GWh of hydropower, which is not included as projected in-state GWh generation.

[4]Based on the SEP Policy Reference Case of 163,326 GWh presented in the Energy Demand and Price Forecast document.

Sources: Optimal Energy Inc. (prepared for NYSERDA). *Energy Efficiency and Renewable Energy Resource Development Potential in New York State.* 2003; EIA. *State Energy Data System: New York.* 2009; NYSERDA. *Patterns & Trends – New York State Energy Profiles: 1993 - 2007*. 2009; NYS Renewable Fuels Roadmap preliminary estimates; 2004 Order Supplemental worksheets; DPS, NYSERDA, Sustainable Energy Advantage, LLC, and LaCapra Associates. *New York Renewable Portfolio Standard Cost Study Report II.* 2004; NYSERDA. *Market Characterization Report: Anaerobic Digester Gas-to-Electricity for the Municipal Wastewater Sector in New York*. 2007; DPS and LIPA customer-sited renewable energy data, 2007.

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22 Data from 2001 – 2007 were taken from the New York State Energy Plan: *Renewable Energy Assessment*. December 2009, at p. 7.

23 The technical/practical potential of a renewable resource reflects technical constrains such as energy generation capacity factors and manufacturing base, developable land resources, and limited social constraints, to the "pure" technical potential value to produce a more achievable estimate. New York State Energy Plan: *Renewable Energy Assessment*. December 2009, at p. 7.

27. In fact, the NYISO has already taken steps to allow the grid to accommodate these increasing levels of wind generation. In the 2009 Annual Report, NYISO states that it has implemented a state-of-the-art wind forecasting system, and "became the first grid operator to integrate wind-generated electricity into economic dispatch."[24] It is planning for more wind energy by considering new operating procedures, market rules, storage technologies, and transmission reinforcements that would increase "the amount of wind that could be reliably integrated into the bulk power system and delivered to the load."[25] Indeed, The most recent NYISO wind study concluded that "the addition of up to 8,000 MW of wind generation to the New York power system will have no adverse reliability impact (and) would supply in excess of 10% of the system's energy requirement."[26]

28. New renewable resources continue to be proposed and constructed in New York State. The NYISO Interconnection Queue lists those planned generating units and transmission lines from utilities or merchant generators that have requested interconnection to the electricity grid. (On-site generation is not represented in the Queue.) Figure 5, below, shows the interconnection requests for renewable resources as of July 2, 2010, disaggregated by resource type.

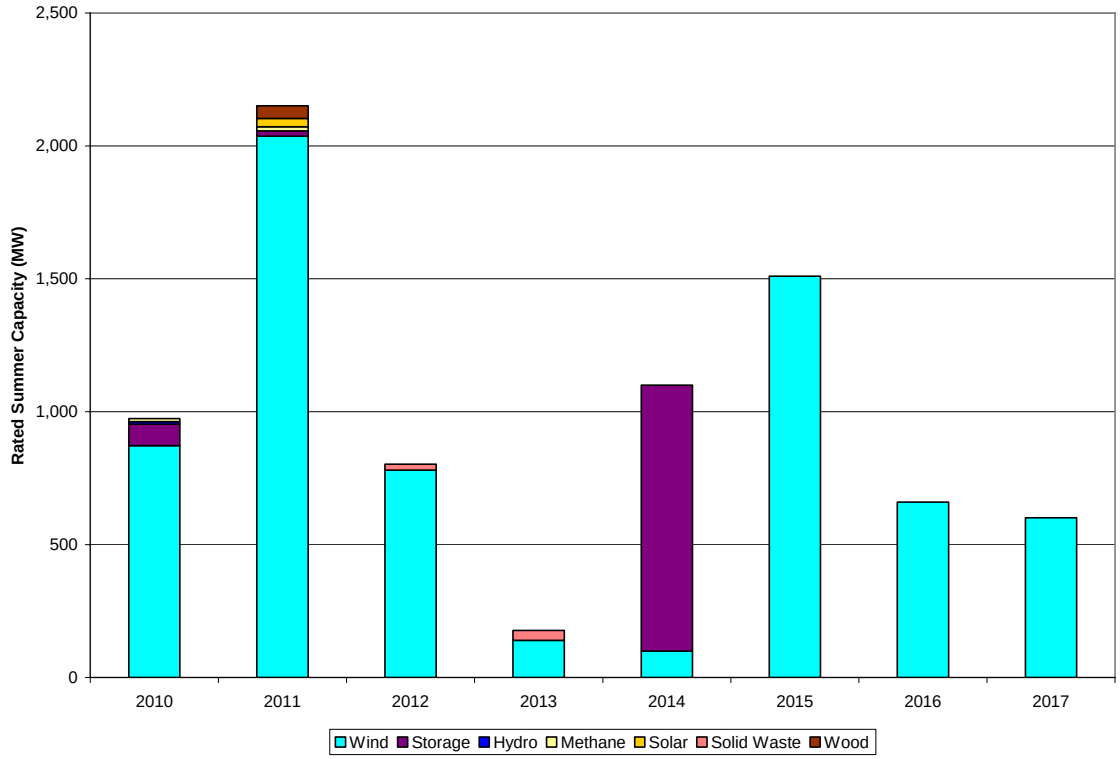

Figure 5. Capacity of Renewable Generating Resources with Pending Interconnection Requests, by Disaggregated by Resource Type (MW).[27]

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24 NYISO. *Energizing the Empire State: 2009 Annual Report*. 2009, p. 6; *see also*: NYISO. *Power Trends 2010, p.* 16.

25 NYISO. *Integration of Wind into System Dispatch*, October 2008, p. 5-1.

26 NYISO. *Growing Wind: Final Report of the NYISO 2010 Wind Generation Study*, September 2010, at iv.

27 NYISO Interconnection Queue, July 2, 2010.

29. Thus, there is 7,935 MW (rated summer capacity) of renewable capacity awaiting approval for interconnection with the grid between 2010 and 2017. The majority of the proposed resources are for wind generation with over 2,000 MW of wind requesting to be online in 2011, and another 1,500 MW of wind from the Lake Eerie and LIPA/Con Edison offshore wind projects requesting to come online in 2015. Additional wind projects totaling more than 500 MW have also requested to be interconnected in 2016 and 2017. Historically, a large portion of the requests that enter the Interconnection Queue are not actually constructed. However, even if only 20% of the proposed projects come online, there would still be a 1,587 MW increase in wind generating units by 2017.

30. LIPA, while not bound by the RPS target, said that it will provide approximately 2,000 GWh of renewable energy toward the goal by 2013.[28] The voluntary market, where customers pay a premium to purchase electricity generated from renewable sources, is expected to contribute another 2,000 GWh toward the RPS by 2013.

31. Energy storage projects also could play a significant role in the development of other renewable resources, as they would provide a way to help manage the intermittency of other types of resources. One example of this type of resource that has already begun construction is the Beacon Power flywheel energy storage plant in Stephentown, New York. This project has a capacity of 20 MW and is expected to be the first full-scale flywheel system in the US that provides grid regulation services after it is completed in 2012.[29] As shown in Figure 5, one large storage project has requested to be interconnected with the grid in 2014, with several other smaller projects requesting interconnection in other years.

Transmission System Enhancements and Upgrades

32. Since I submitted my November 2007 Report, developers in New York have been actively licensing and building upgrades and enhancements to the transmission system. One project that was referenced in the November 2007 Report as being "proposed" has actually come online. The three Linden Variable Frequency Transformers began operating at the Linden, New Jersey cogeneration facility on December 8, 2009 and have the capability to convert up to 315 MW of electricity from the New Jersey power system and feed it into New York City. These transformers are helping to stabilize NYC's power grid, increase reliability, and reduce the need for new capacity inside the city.[30]

33. A number of other transmission projects also have been approved or proposed since November 2007. For example, the Hudson Transmission Partners line, mentioned as "proposed" in the November 2007 Report, was approved by the NY PSC on September 8, 2010. This 345 kV line will connect PJM to midtown Manhattan, running between the Bergen Substation in Ridgefield, New Jersey and terminating at Consolidated Edison substations. It is expected to initially provide 320 MW of firm capacity from PJM to New

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28 *Renewable Energy Assessment New York State Energy Plan,* December 2009, at p. 12.

29 NYISO. *Energizing the Empire State: 2009 Annual Report*. 2009, at p. 6.

30 GE Energy Financial Services. *New Jersey and New York City's Electricity Systems Now Talking to Each Other, Thanks to GE's Smart Grid Technology & Smart Capital,* Press Release, December 8, 2009.

York City, with the potential to provide 660 MW of firm capacity if necessary investments are made to upgrade PJM facilities.[31] In the Order approving this line, the NY PSC stated that "the HTP facility will assist in maintaining system reliability in the event that one or both of the Indian Point plants close."[32]

34. Other new transmission proposals to import power into the New York City zone since November 2007 Report include the Cross Hudson Cable and the Champlain-Hudson Power Express (CHPE) line. The Cross Hudson Cable is a 345 kV alternating current line, and will run for 8 miles between the Bergen Switchyard in Ridgefield, New Jersey, owned by PSEG, and the West 49th Street substation in Manhattan, owned by Consolidated Edison. The most recent project updates for the Cross Hudson Cable include a transmission import capability of 700 MW and a projected online date of summer 2013.[33]

35. The CHPE line would connect the US-Canadian border with a converter station that will be built in Yonkers, New York and will supply 1,000 MW of new wind and hydro electricity now being targeted for development in Canada into the New York City zone. Modeling performed by London Economics International, and submitted to the NY PSC, assumes in the Baseline scenario that the CHPE line would operate at a 90% capacity factor and deliver 7,640 GWh of renewable generation into New York annually.[34] The CHPE line is expected to be operational by 2015. The electricity brought into New York from the CHPE line alone would represent almost half of the generation that can be expected from the Indian Point Units in the future.

36. Combined, these new transmission projects would have the capability to import more than two thousand MW of capacity into the New York City zone. When combined with electric generation imported into downstate New York over other transmission projects, a significant amount, if not all, of the capacity and energy from Indian Point Units 2 and 3 could be replaced.

New Gas-Fired Generating Facilities and Plant Repowering Projects

37. New natural gas-fired capacity is under-construction or is being proposed to come online in New York State in near to mid-term. For example, the NYISO 2010 RNA includes two new generating plants in Zone J (New York City) in 2011 that were not included in previous Reliability Needs Assessments – the 513 MW Bayonne Energy Plant and the

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31 State of New York Public Service Commission. *Commission Approves Transmission Line to NYC: Power Line Would Improve Reliability, Increase Supply*, Press Release, September 8, 2010. Available at: http://documents.dps.state.ny.us/public/Common/ViewDoc.aspx?DocRefId={575751AB-6DF9-4C37-92CD-2813A2BD5B7D}

32 New York Public Service Commission. *Order Granting Certificate of Environmental Compatibility and Public Need*, September 15, 2010. p. 44.

33 Cavallo Energy. *Cavallo Cross Hudson Management LLC Accepting Open Season Applications for New Transmission Capacity from New Jersey to New York.*

34 London Economics International, LLC. *Projected Energy Market, Capacity Market and Emissions Impact Analysis of the Champlain-Hudson Power Express Transmission Project for New York*. July 16, 2010, at p. 14.

550 MW Astoria Energy II plant.[35]

38. The Astoria Repowering Project also is being undertaken in Zone J by Astoria Gas Turbine Power LLC, a subsidiary of NRG Energy Inc. The Astoria facility is currently 600 MW, made up of 31 simple-cycle peaking units, and the repowering would covert the peaking facility to intermediate combined-cycle (CC) generating units in two Phases. Phase 1 would replace seven of the peaking turbines with two 260 MW CC units, which are projected to be operational in 2013. Phase 2 would replace the remaining 24 peaking turbines with an additional two CC turbines of 260 MW each. The repowered units will have a combined capacity of 1,040 MW, for a net addition of 440 MW. Upgrading to CC turbines also means that the repowered units will produce more electricity per installed MW of capacity.

Astoria Energy has explained that

> …the project will provide greater electric generation capability in megawatts per hour and more available hours per year. Depending on dispatch and contract needs, the new units will be able to operate for more than 7,000 hours per year per turbine, in comparison to just a few hundred hours per year per turbine for the existing units, thus providing a far more reliable electric supply to the grid. The new units will provide more reliable power output in an intermediate operating mode – they can be used both as peaking units and as base loaded units.[36]

In fact, in its most recent "Progress Report to Stakeholders and Interested Parties," dated July 2010, Astoria Energy stated that on July 29, 2010 the New York State Department of Environmental Conservation (NYSDEC) submitted the draft environmental permits to the US EPA for a mandatory review. In addition, Astoria Energy has submitted a Petition for a Certificate of Public Convenience and Necessity (CPCN).[37] NRG is currently awaiting the issues of both its permits and the CPCN. The NYISO *2010 Reliability Needs Assessment* shows a projected online date for these projects of June 2012.[38] Astoria Energy is also currently constructing the Astoria Energy II plant, a new 550 MW unit in Queens, which is expected to go into operation in the summer of 2011.

39. In addition, Astoria City Councilman Peter Vallone is working with US Power Generating Co. on a repowering plan for the 1,280 MW Astoria Generating Station, located in Queens and powered by fuel oil and natural gas. The Company filed for its first permits in January with NYSDEC.[39] At the same time, although TransCanada has chosen to install pollution controls at its Ravenswood Generating Station in Long Island City for

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35 NYISO *2010 Reliability Needs Assessment*, at pp. i and 17.

36 NRG Astoria Gas Turbine Power LLC – Repowering Project. State Environmental Quality Review (SEQR). Scoping Document for Draft Environmental Impact Statement, October 8, 2008, p. 3. *Available at*: http://www.dec.ny.gov/docs/permits_ej_operations_pdf/astoriadftscope.pdf

37 Astoria Repowering Project, *Progress Report to Stakeholders and Interested Parties*, July 2010. *Available at*: http://www nrgenergy.com/news-center/astoria/documents htm

38 NYISO. *2010 Reliability Needs Assessment*, September 2010, at p. 4.

39 Remizowski, Leigh. *$1.5B makeover for NRG Energy power plants means better air for residents*, New York Daily News, April 25, 2010.

the short-term, officials say that the Company is hoping to repower the 2,480 MW plant at some point in the near future.[40] Finally, the opportunities for repowering that I discussed in my November 2007 Report still exist, and the New York Power Authority (NYPA) is investigating additional repowering opportunities at "one or more plants in the city to increase their output while making them cleaner and more efficient."[41]

40. Of the approved or proposed projects that I listed in my November 2007 Report, the Bowline Unit 3 and Arthur Kill projects have been withdrawn. The Empire State Project is listed in the Interconnection Queue with an online date of 2010, and the project website shows the project as under construction with a target online date of September 2010.[42] The Spagnoli Road Energy Center is listed in the Interconnection Queue with an online date of 2013.

Natural Gas Developments

41. The short and long-term outlooks for natural gas use in electricity generation continue to be favorable, supporting new natural gas capacity in New York State as well as the repowering of existing generating capacity with natural gas turbines. For example, the New York State Energy Plan has noted the following:

> Natural gas has become and will continue to be the fuel of choice for new and replacement generation in New York for the next several years due to its economic, operational and environmental advantages. In general, natural gas-fired generation plants have lower capital costs, are cleaner burning, are more energy-efficient, and have a greater degree of operational flexibility than other fossil fueled alternatives.[43]

42. As a result of an existing and expected future supply glut, current and projected prices of natural gas have been significantly reduced. This has led to what many other utilities, such as the Entergy Corporation, and an increasing number of gas and electric industry sources consider a structural change in the natural gas market.

43. For example, in early April of 2009, Entergy Louisiana informed the Louisiana Public Service Commission of its intent to defer (and perhaps cancel) the proposed retirement of an existing gas-fired power plant and its replacement by a new coal-fired unit. Entergy explained that it no longer believed that a new coal plant would provide economic benefits for its customers due to its current expectation that future gas prices would be much lower than previously anticipated:

> Perhaps the largest change that has affected the Project economics is the sharp decline in natural gas prices, both current prices and those forecasted for the longer-term. The prices have declined in large part as a result of a

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40 Id.

41 New York Power Authority. *NYPA to Cease Operations of Queens Power Plant on January 31st*. Press Release. January 29, 2010.

42 See Empire Generating Co, LLC. Project Timeline. Available at: http://www.empiregen.com/images/stories/pdf/Project_Timeline_2.pdf

43 New York State Energy Plan. *Natural Gas Assessment*, December 2009, at p. 9.

structural change in the natural gas market driven largely by the increased production of domestic gas through unconventional technologies. The decline in the long-term price of natural gas has caused a shift in the economics of the Repowering Project, with the Project currently – and for the first time – projected to have a negative value over a wide range of outcomes as compared to a gas-fired (CCGT) resource.[44]

4. Recent Natural Gas Developments

Until very recently, natural gas prices were expected to increase substantially in future years. For the decade prior to 2000, natural gas prices averaged below $3.00/mmBtu (2006$). From 2000 through May 2007, prices increased to an average of about $6.00/mmBtu (2006$). This rise in prices reflected increasing natural gas demand, primarily in the power sector, and increasingly tighter supplies. The upward trend in natural gas prices continued into the summer of 2008 when Henry Hub prices reached a high of $131.32/mmBtu (nominal). The decline in natural gas prices since the summer of 2008 reflects, in part, a reduction in demand resulting from the downturn in the U.S. economy.

* * * *

However, the decline also reflects other factors, which have implications for long-term gas prices. During 2008, there occurred a seismic shift in the North American gas market. "Non-conventional gas" – so called because it involves the extraction of gas sources that previously were non-economic or technically difficult to extract – emerged as an economic source of long-term supply. While the existence of non-conventional natural gas deposits within North America was well established prior to this time, the ability to extract supplies economically in large volumes was not. The recent success of non-conventional gas exploration techniques (e.g., fracturing, horizontal drilling) has altered the supply-side fundamentals such that there now exists an expectation of much greater supplies of economically priced natural gas in the long-run….

* * * *

Of course, it should be noted that it is not possible to predict natural gas prices with any degree of certainty, and [Entergy Louisiana] cannot know whether gas prices may rise again. Rather, based upon the best available information today, it appears that gas prices will not reach previous levels for a sustained period of time because of the newly discovered ability to produce gas through non-traditional recovery methods…[45] [Emphasis added]

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[44] *Report and Recommendation Concerning the Little Gypsy Unit 3 Repowering Project*, submitted by Entergy Louisiana to the Louisiana Public Service Commission, April 1, 2009, at pp. 6-8.

[45] Id, at pp. 17, 18 and 22.

44. Entergy's conclusion that there has been a seismic shift in the domestic natural gas industry was confirmed in early June of 2009 by the release of a report by the American Gas Association and an independent organization of natural gas experts known as the Potential Gas Committee, the authority on gas supplies. This report concluded that the natural gas reserves in the United States are 35 percent higher than previously believed. The new estimates show "an exceptionally strong and optimistic gas supply picture for the nation," according to a summary of the report.[46]

45. A Wall Street Journal Market Watch article titled "U.S. Gas Fields From Bust to Boom" similarly reported that huge new gas fields have been found in Louisiana, Texas, Arkansas and Pennsylvania, and cited one industry-backed study as estimating that the U.S. now has enough natural gas to satisfy nearly 100 years of current natural gas-demand.[47] It further noted that

> Just three years ago, the conventional wisdom was that U.S. natural-gas production was facing permanent decline. U.S. policymakers were resigned to the idea that the country would have to rely more on foreign imports to supply the fuel that heats half of American homes, generates one-fifth of the nation's electricity, and is a key component in plastics, chemicals and fertilizer.
>
> But new technologies and a drilling boom have helped production rise 11% in the past two years. Now there's a glut, which has driven prices down to a six-year low and prompted producers to temporarily cut back drilling and search for new demand.[48]

46. The Interconnection Queue in New York State includes some 4,500 MW of potential natural gas-fired generation. It is unlikely that all of these units will be built. However, if only 25 percent of the proposed capacity in the Queue actually is built, that would be mean the addition of 1,125 MW of new gas-fired capacity in New York State within the next five years.

47. For these reasons, new generating units fueled by natural gas as well as the repowering of existing units would be a viable alternative to a portion of the capacity and energy generation provided by the two Indian Point Units.

Comments on NRC's Final Supplemental Environmental Impact Statement ("FSEIS")

48. I have reviewed Chapter 8 of the December 3, 2010 Final Supplemental Environmental Impact Statement ("FSEIS") prepared by the NRC in this proceeding and NRC's analysis of energy alternatives contained therein.

49. In my opinion the NRC's analysis of energy alternative in the FSEIS fails to accurately represent the current availability of alternatives to the relicensing project because it:

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46 *Estimate Places Natural Gas Reserves 35 percent Higher*, New York Times, June 9, 2009.

47 "*US Gas Companies Go From Bust to Boom"* Available at http://www.ctenergy.org/pdf/WSJ.pdf.

48 Id.

- ignores the impact of the recession on short and long term energy and demand forecasts, and the impacts of reduced energy and load demands on the timing and choice of energy alternatives;
- bases its analysis of natural gas-fired combined-cycle (NGCC) generation on a single study (Levitan 2005) that predates significant structural changes in the natural gas sector, as outlined above, that directly impact the viability of plant repowering, plant retirement and new gas-fired generation in New York State;
- continues to rely primarily on economic data and studies that pre-date the recession and the implementation of aggressive state-wide policies and programs to significantly increase energy efficiency, conservation, and renewables throughout the state, in general, and in the zones currently receiving power from Indian Point, in particular;
- fails to recognize significant new developments since 2007 in New York State's transmission grid system that directly impact and increase New York State's capacity to import electrical power and utilize off-site renewable generation as alternatives to the power supplied by Indian Point;
- does not account for the impact of the federal stimulus (ARRA) and state incentives since 2007 that significantly support the expansion of energy efficiency programs and renewable electricity generation in New York State and which increase the viability and effectiveness of those alternatives;
- unreasonably fails to examine the present reasonable viability of energy conservation and renewable generation as a combined alternative to Indian Point given the current forecasts for New York State's renewable sector and energy efficiency / conservation programs;

50. The NRC's analysis of energy alternatives in the FSEIS furthermore relies on inaccurate information because it states that "as of November 10, 2010 the New York Regional Interconnection ("NYRI") is still seeking the approval of the New York State Public Service Commission (NYPSC)" to build a major transmission project. In fact, on April 21, 2009 the New York State Public Service Commission recognized and approved NYRI's application to formally withdraw its petition for a certificate under Article VII of the Public Service Law.[49] The PSC granted NYRI's withdrawal request, with prejudice, and dismissed the application.

51. A rational analysis of the potential for purchased electrical power alternative to license renewal should account for the recently approved Hudson Transmission Partners line and Linden transmission projects that I have noted above, as both of these projects would increase transmission capacity in the zones currently supplied by Indian Point.

52. The NRC's analysis of energy efficiency as an alternative to relicensing Indian Point is:

[49] NYS PSC Case 06-T-0650, PSC Correspondence (Issued April 21, 2009); *See also* FERC Docket No. OA08-52-003, New York Independent System Operator, Inc., Order on Rehearing, 126 FERC ¶61, 320 (Issued March 31, 2009).

(a) not site specific; (b) methodologically unclear; (c) incomplete; and (d) fails to provide a factual basis for its conclusions for the following reasons;

- NRC staff adopt the finding of Shearon Harris (NUREG-1437, Supplement 33 dated August 2008), which considers utility based conservation as an alternative to license renewal for a 900 MW pressurized water nuclear reactor, located 20 miles outside of Raleigh, North Carolina in a regulated electricity market. The Shearon Harris facility shares little, if any, similarity to the substantially larger, deregulated, Indian Point facilities. The analysis provided in Shearon Harris is based primarily on data from a single 2006 study of North Carolina's energy markets and contains no analysis of New York's energy markets and provides no analysis of utility based conservation programs in New York.
- NRC staff also adopt the findings of Three Mile Island ("TMI") Unit 1 (NUREG-1437, Supplement 37 dated June 2009), which considers Pennsylvania's Alternative Energy Portfolio Standard ("AEPS") as an alternative to license renewal for a 800 MW pressured water reactor. This analysis relies on a single study, conducted in 2004 of Pennsylvania's energy efficiency potential (Pletka). The TMI analysis makes no reference to New York State, Indian Point, or the energy efficiency potential relevant or forecasted to be available in the zones currently receiving power from Indian Point. The TMI analysis also assumes that "because TMI sells power into the PJM interconnection, conservation in other nearby states may also help offset the power produced by TMI." (NUREG-1437, Supplement 37, p. 8-26), an assumption that is not applicable to Indian Point.
- The NRC Indian Point FSEIS is incomplete because it provides no factual support that the analysis contained in NUREG-1437 of North Carolina's regulated program is relevant or substantially similar, to any such program in New York State's deregulated energy market. Likewise, the NRC Indian Point FSEIS analysis of energy conservation/efficiency as an alternative to relicensing is incomplete because it provides no factual support that the energy efficiency programs put in place by the State of Pennsylvania in 2004 are relevant or applicable to the energy efficiency programs already in place, or likely to be in place, and available to replace the power generated by Indian Point. Because the NRC Indian Point FSEIS does not define what energy efficiency and/or energy conservation programs it anticipates will be available to replace the power generated by Indian Point, it is impossible to determine impact, reasonableness, and viability of the NRC's energy efficiency/conservation alternative.
- Likewise, the NRC's conclusion its proposed energy conservation/ energy efficiency alternative will result in "small to moderate socioeconomic impacts, which will not be offset by conservation (8.3.3., p. 8-43)" lacks factual support and/or further analysis. For example, no attempt is made to assess the potential for job creation and/or economic development presented by NRC's energy efficiency alternative, which may vary substantially depending on the specific nature of the efficiency / conservation alternative.

53. Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

Dated: January 31, 2011

Belmont, Massachusetts

David A. Schlissel

David A. Schlissel