UNITED STATES

NUCLEAR REGULATORY COMMISSION

BEFORE THE 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,	DPR-26, DPR-64
Entergy Nuclear Indian Point 3, LLC, and	
Entergy Nuclear Operations, Inc.	June 29, 2012

PRE-FILED WRITTEN REBUTTAL TESTIMONY OF

DAVID A. SCHLISSEL

REGARDING CONTENTION NYS-37

On behalf of the State of New York ("NYS" or "the State"), the Office of the Attorney General hereby submits the following testimony by David A. Schlissel regarding Contention NYS-37.

Q. What is the purpose of your testimony?

A. The purpose of this testimony is to respond to the testimony of Entergy Witnesses Donald P. Cleary, David Harrison, Jr., and Eugene T. Meehan Regarding Contention NYS-37 (Energy Alternatives).

Q. What documents did you review in preparation for your rebuttal testimony?

A. I read Entergy's Statement of Position concerning Contention NYS-37; the testimony of Entergy witnesses Donald P. Cleary, David Harrison, Jr., and Eugene T. Meehan concerning NYS-37 and exhibits thereto ("Entergy Testimony") and the report prepared for Entergy by NERA Economic Consultants. I have also read NRC Staff's Statement of Position concerning Contention NYS-37 and the testimony of NRC witness Andrew L. Stuyvenberg and exhibits thereto("Staff Testimony").

Q. What are your conclusions?

A. My conclusions are as follows:

1. Entergy’s witnesses on Contention NYS-37 (Energy Alternatives) inappropriately used the widely respected National Energy Modeling System ("NEMS") to model the No Action Alternative. NEMS is traditionally used to model the effect of proposed policy changes or alternatives. I have never seen it used, as Entergy’s witnesses use it here, to model the retirement of one or two specific generating units.

2. There are other production simulation models that are traditionally used in the industry to evaluate the economic and environmental impacts of power plant retirements and the addition of

new generating capacity, energy efficiency and renewable resources. For example, Entergy's 2003 assessment of the potential economic and environmental impacts of an Indian Point Energy Center ("IPEC") retirement used the GE MAPS model.

3. Entergy has not modeled a credible No Action Alternative. It assumes that there would be no market or state response to replace the lost generation from IPEC until 2026 other than through the continued operation of old, dirty and inefficient coal and oil/gas steam units that would otherwise be retired by 2015.

4. The results of Entergy's NEMS modeling of the No Action Alternative do not provide credible evidence that there would only be a small role for additional energy efficiency and conservation under the No Action Alternative.

A. Neither the NEMS Baseline analysis nor Entergy's No Action Alternative modeled New York State's current "15 x 15" energy efficiency plan.

B. NEMS does not model energy efficiency as an

additional resource. Instead, the only way in NEMS to model additional energy efficiency is to reduce the energy forecast – something that Entergy's witnesses did not do either in the Baseline Analysis or the No-Action Alternative. For this reason, it is not possible for NEMS to directly compare the cost of continuing to operate Indian Point against the cost of achieving more energy efficiency. In fact, the NEMS model could not add additional energy efficiency even if it is the lower cost resource.

5. The results of Entergy's NEMS modeling also do not provide credible evidence that additional renewable resources would not play a significant role as replacement energy in a No Action Alternative. In particular, Entergy did not consider the potential for a proposed transmission line to bring additional low cost renewable resources into downstate New York from Canada or that the cost of renewable resources might decrease as a result of economies of scale.

6. Entergy unreasonably assumes in its No Action

Alternative that the following substantial amounts of older, dirtier and less efficient coal and oil and gas steam capacity would continue to operate long past 2015:

- 323 MW of coal capacity in Upstate New York that would otherwise be retired in 2015 or 2017

- 822 MW of oil and gas steam capacity in Upstate New York that would otherwise be retired in 2018

- 25 MW of combustion turbine capacity on Long Island that would otherwise be retired in 2015

- 85 MW of coal capacity in New England that would otherwise be retired in 2016

- 960 MW of oil and natural gas steam capacity in New England that would otherwise be retired in 2015 or 2016

7. Entergy's witnesses misleadingly understate the marginal cost of generating electricity at existing coal and oil and natural gas steam generating units.

8. In Entergy's modeling of the No Action Alternative:

A. No clean and efficient replacement capacity is added in New York State (let alone

downstate New York City/Westchester County) until 2026 and then only a relatively small amount (300 MW in total) is added in the years 2026 through 2040.

B. In Entergy's modeling of the No Action Alternative most of the replacement power for Indian Point is built in New England and not New York State. However, no clean and efficient replacement capacity would be added in New England before 2025 and then only a relatively small amount (110 MW) would be added until 2030.

9. It is more reasonable to expect that the likely market response would be to add some replacement generating capacity before 2026 if IPEC is not relicensed.

10. New York State is currently taking a number of actions to ensure that there would be new generating capacity in downstate New York if IPEC is not relicensed or that there would be additional transmission capability to import new generating capacity (both clean and efficient gas and renewable) into the downstate region. These

actions include the development of a New York Energy Highway.

11. Well over 2,000 MW of clean and efficient new natural gas-fired combined cycle capacity is being proposed for construction in or near New York City and Westchester County.

12. The NEMS modeling of the Baseline Analysis and the No Action Alternative does not reflect either the New York Energy Highway or the over 2,000 MW of clean and efficient generating capacity being proposed for construction in or near New York City and Westchester County.

13. Entergy's witnesses misleadingly overstate the environmental impacts of the No Action Alternative by understating the potential for (a) substantial energy efficiency, (b) renewable energy and (c) clean and efficient generating capacity as alternatives if IPEC is not relicensed.

Q. Entergy's witnesses have testified that they have developed two related "empirical" evaluations to identify the environmental impacts of the generation that would likely replace Indian Point Energy Center ("IPEC") under the No Action

Alternative.[1] Do you agree that they have presented the results of two "empirical" evaluations?

A. No. They present only a single empirical evaluation – based on their NEMS modeling - (and that is seriously flawed as I will explain). The remainder of the Entergy witnesses' testimony on Contention NYS-37 consists of hypothesis and conjecture.

Q. Entergy's witnesses testify that the results of their NEMS modeling show that under the No Action Alternative (1) existing IPEC generation would be replaced primarily by fossil-fueled generation from existing natural gas and coal facilities and (2) conservation and renewables would be unlikely to play significant roles in replacing lost generation from IPEC. Do the results of the NEMS modeling support these claims?

A. No. The NEMS results presented by Entergy's witnesses are misleading and flawed for several reasons. First, NEMS is not the appropriate model to use to determine the economic and environmental impacts of the No Action Alternative. Second, NEMS does not accurately or fully model New York's "15 x 15" energy efficiency plan or the potential for additional energy

[1] Testimony of Entergy Witnesses Donald P. Cleary, David Harrison, Jr., and Eugene T. Meehan Regarding Contention NYS-37 (Energy Alternatives), ENT000479 ("Entergy Testimony") at Answer A49 on page 34.

efficiency above that included in the “15 x 15” plan. Third, the assumption that if Indian Point Units 2 and 3 were retired in 2013 and 2015, respectively, replacement capacity would not be added in downstate New York until sometime in 2026 is completely unrealistic in that it ignores (a) the current plans being developed by New York State to add clean and efficient new natural gas-fired generating capacity in the New York City/Westchester region of the state and (b) the economic incentives that the retirement of IPEC would create for developers of new generating projects in the New York City/Westchester region.

Q. Have you ever seen NEMS used to measure the economic and environmental impacts of retiring one or two generating units, as Entergy's witnesses use it here?

A. No. I have seen NEMS used (a) to evaluate the impact of new or revised national or regional policies or (b) to provide inputs (such as projected future natural gas and coal prices) that have been used in plant retirement studies. However, I have not seen NEMS used to evaluate the potential economic and environmental impacts of retiring one or two specific generating units such as Indian Point Units 2 and 3.

Q. In your experience is the NEMS model the appropriate model to use to evaluate the economic and environmental impacts

of retiring Indian Point Units 2 and 3?

A. No. As Entergy's witnesses have explained, NEMS is used by the Energy Information Administration to perform policy analyses in response to requests from Congress, the White House, the Department of Energy, and other federal agencies.[2] The firm, NERA Economic Consulting, for which Entergy witnesses David Harrison and Eugene Meehan work, and other analysts, also have used NEMS to model potential policy changes in other contexts.[3]

Q. Why is NEMS an inappropriate model to use to evaluate the economic and environmental impacts of retiring IPEC?

A. Although NEMS is a widely used model for policy analysis because it seeks to replicate the entire U.S. and even portions of Canada, it offers only very simplified descriptions of the electric grid and the electric dispatch process in any one state (New York State included). For example, generating units are dispatched in NEMS for only 9 demand points or segments in the year instead of all 8760 hours. Thus, the model does not provide a detailed or accurate picture of the dispatch of generating units in the state. The same is true for the rest of the United States. For this reason, the results of the NEMS analyses presented by Entergy's witnesses may be gross

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[2] Entergy Testimony, Answer A88 at page 72.

[3] Id.

distortions of what would actually happen if IPEC is not relicensed.

In addition, NEMS divides the New York State electric grid into only 3 zones with just a single transmission link modeled between each zone. By way of contrast, NYISO divides New York into 11 zones (A through K) with different transmission interchange limits between the zones.

Q. Are there other electric system models that Entergy could and should have used to better evaluate the economic and environmental impacts of the No Action Alternative?

A. Yes. There are a number of electric system models that are routinely used for capacity expansion planning analyses or for examining the economic and environmental impacts of retiring existing generating facilities. These models include GE-MAPS, Strategist, Market Analytics, and PROMOD. These models provide more detailed replications of the existing electric grids and the economic dispatch of existing generating facilities than does NEMS.

Q. Has Entergy previously used any of these models to evaluate the economic and environmental impacts of retiring Indian Point Units 2 and 3?

A. Yes. As noted by Entergy witnesses Harrison and Meehan, Entergy used the GE MAPs model in a 2002-2003 assessment

of the potential economic and environmental impacts of an IPEC shutdown.[4]

Q. What is your opinion of the No Action Alternative that Entergy has modeled with NEMS?

A. The No Action Alternative that Entergy has modeled is not credible in any way. It assumes that there would be no market or state response to replace any of the lost generation from IPEC until 2026 other than through the continued operation of old, dirty and inefficient coal and oil/gas steam units that would otherwise have been retired by 2015.

For this reason, Entergy does not model a reasonable No Action Alternative. Instead, it models what clearly is a 'worst case' alternative in which (a) there is very little or no new energy efficiency, (b) little new renewable energy and (3) no efficient and clean new capacity is added until 2026 or later. Instead, Entergy models a No Action future in which old, dirty and inefficient coal and oil/gas units that would be retired in or around 2015 are operated as baseload facilities for an additional 20 years. This is simply not a credible future.

Q. What have you reviewed to reach your conclusions about the reasonableness of the results of Entergy's NEMS modeling of the Baseline analysis and the No Action Alternative?

[4] Entergy Testimony, Answer A12 at page 9.

A. I reviewed an Excel file provided by Entergy entitled "NERA_Full NEMS Output Including Unused Tables." Entergy represents that this Excel file contains the full NEMS output, including all the output tables that NERA used in its analysis and the output tables that NERA deemed irrelevant and did not use in its analysis.[5]

Q. What is your opinion of the results of Entergy's NEMS modeling that purport to show there would only be a small role for additional energy efficiency and conservation under the No Action Alternative?[6]

A. These results are not credible. First, contrary to what Entergy's witnesses imply, NEMS does not model (nor does it have an easy way to model) New York State's current "15 x 15" energy efficiency goal. Consequently, Entergy's witnesses have not shown that all of the low cost energy efficiency that will be achieved under the "15 x 15" plan already is included in their "Baseline" analysis and, in fact, there may be a significant amount of additional low cost energy efficiency available to replace IPEC beyond that reflected in that Baseline analysis.

At the same time, the NEMS model does not treat energy

[5] Exh. NYS000438

[6] Entergy Testimony, Answer A85 at page 71.

efficiency as an additional resource – that is, the only way to model additional energy efficiency in NEMS is as a reduction to the energy forecast. For this reason, it is not possible in NEMS to directly compare the cost of continuing to operate Indian Point against the cost of adding more energy efficiency. As a result, as Entergy has run it, (that is, without reducing the energy forecast for New York State to reflect either the "15 x 15" goal or the availability of other low cost energy efficiency) the NEMS model could not add additional energy efficiency even if it is the lower cost resource. Instead, the model is limited to reflecting only a very limited amount of price induced conservation.

Q. After reviewing the testimony and report filed by Entergy's witnesses on Contention NYS-37, is it still your opinion that energy efficiency could play a significant role as replacement energy in a No Action Alternative?

A. Yes. It is not a surprise that Entergy's modeling results do not show a major role for additional energy efficiency in the No Action Alternative because (1) NEMS does not model the New York State "15 x 15" energy efficiency goal and (2) it is not possible to add any other low cost energy efficiency in NEMS except by reducing the energy forecast which Entergy's witnesses have not done. For these reasons, I

continue to believe that energy efficiency could play a significant role as replacement energy in a No Action Alternative.

Q. What is your opinion of the results of Entergy's NEMS modeling that purport to show that additional renewable resources would not play a significant role as replacement energy in a No Action Alternative?

A. These results are not credible. Entergy's hypothetical analysis that purports to show that any additional renewable resources beyond those considered in the State's "30 x 15" plan would be more expensive is incomplete and misleading.[7] First, the NEMS output information provided by Entergy's witnesses does not show conclusively that the amount of renewable energy in either the Baseline Analysis or the No Action Alternative actually meets the New York State "30 x 15" goal.

At the same time, Entergy's modeling of the No Action Alternative ignores the possibility that there will be additional low cost renewable energy above that included in the "30 x 15" goal. For example, Entergy's NEMS modeling ignores the very possibility that its own witnesses cite, that is, that

[7] For example, see the discussion in Entergy's Testimony, answer A68 on pages 53 and 54.

the completion of transmission system upgrades could unlock the capability of bringing large amounts of low cost hydro generated power from Canada into downstate New York.[8] Entergy also ignores the very real possibility that the cost of renewable resources will decrease over time, in part as the result of economies of scale. Instead, all Entergy's witnesses provide are some theoretical graphs that are not empirically tied to actual costs and circumstances in New York State.

Q. Will the new hydro generation capacity and energy from Quebec that Entergy's witnesses discuss be available whether or not IPEC is relicensed?

A. Not necessarily. Entergy provides absolutely no evidence that this additional hydro generation from Canada is included as a resource either in the state's "30 x 15" renewable portfolio plan or in Entergy's NEMS Baseline analysis. Nor do they present any evidence that the delivered price of the additional hydro generated power from Quebec would be more expensive than any of the renewable energy that is included in "30 x 15" plan or the NEMS modeling. Instead, Entergy presents only analytic conjecture and theoretical graphs with no empirical links to New York State.

Q. What units does Entergy assume would not be retired if

[8] See Entergy Testimony, Answer A124 on page 98.

IPEC were not relicensed?

A. Entergy assumes that the following older, dirtier, and less efficient coal and oil/gas steam capacity that would be retired in the Baseline analysis would not be retired in the No Action Alternative:

- 323 MW of coal capacity in Upstate New York that would otherwise be retired in 2015 or 2017
- 822 MW of oil and gas steam capacity in Upstate New York that would otherwise be retired in 2018
- 85 MW of coal capacity in New England that would otherwise be retired in 2016
- 960 MW of oil and natural gas steam capacity in New England that would otherwise be retired in 2015 or 2016[9]

Q. Is there any evidence that the merchant companies that own this capacity will want to keep their plants operating in future years whether or not IPEC is relicensed?

A. No. In fact, coal units in both New York State and New England have reduced their generation or have been shut down as a result of competition from extremely low natural gas prices.

Q. Based on their NEMS modeling, Entergy's witnesses claim that the marginal costs of generation at existing coal and oil and natural gas steam generating units are lower than the

[9] Exh.NYS000438

costs of either (1) generating power at new natural gas fired combined cycle units, (2) additional conservation beyond that included in the state's "15 x 15" energy efficiency plan or (3) additional renewable energy beyond that included in the state's "30 x 15" plan. From this, they argue that new, clean gas-fired generation, additional conservation or additional renewable energy will be more expensive and therefore less competitive in New York's deregulated electricity market. Do you agree?

A. No. Entergy's witnesses present a very misleading comparison in Table 1 on page 58 of their testimony that purports to show the marginal costs of generation technologies "that are generally capable of increasing utilization," which are all fossil fuel power plants and do not include wind, solar, or hydro facilities. The listed marginal costs are too low because Entergy uses the heat rates of efficient new coal and gas fired combined cycle and combustion turbine units to calculate the marginal costs of the existing coal and natural gas steam units that NERA assumes will run more if IPEC is not relicensed. However, these existing units generally are less efficient than new natural gas combined cycle units and the heat rates of these older, less efficient units are more probably above (perhaps significantly above) 10,000 btu/kwh than in the 7-8,000 btu/kwh range assumed by Entergy in the derivation of

the marginal costs in Table 1. Therefore, the marginal costs of existing fossil fuel units are higher per megawatt hour than the figures shown in the table and they would be less competitive than Entergy asserts.

Q. When would new generation capacity be added under Entergy's No Action Alternative?

A. Figures 1 and 2, below (taken from the outputs for Entergy's NEMS modeling) show the cumulative megawatts of capacity added in New York State and New England under Entergy's Baseline analysis (Figure 1) and the No Action Alternative (Figure 2). Figure 3 then shows how much capacity is added under the No Action Alternative above that which would be added in the Baseline analysis. This represents the capacity added as a result of the retirement of Indian Point Units 2 and 3.

Figure 1: Cumulative Capacity Additions After 2012 in New York State and New England in Entergy's Baseline Analysis

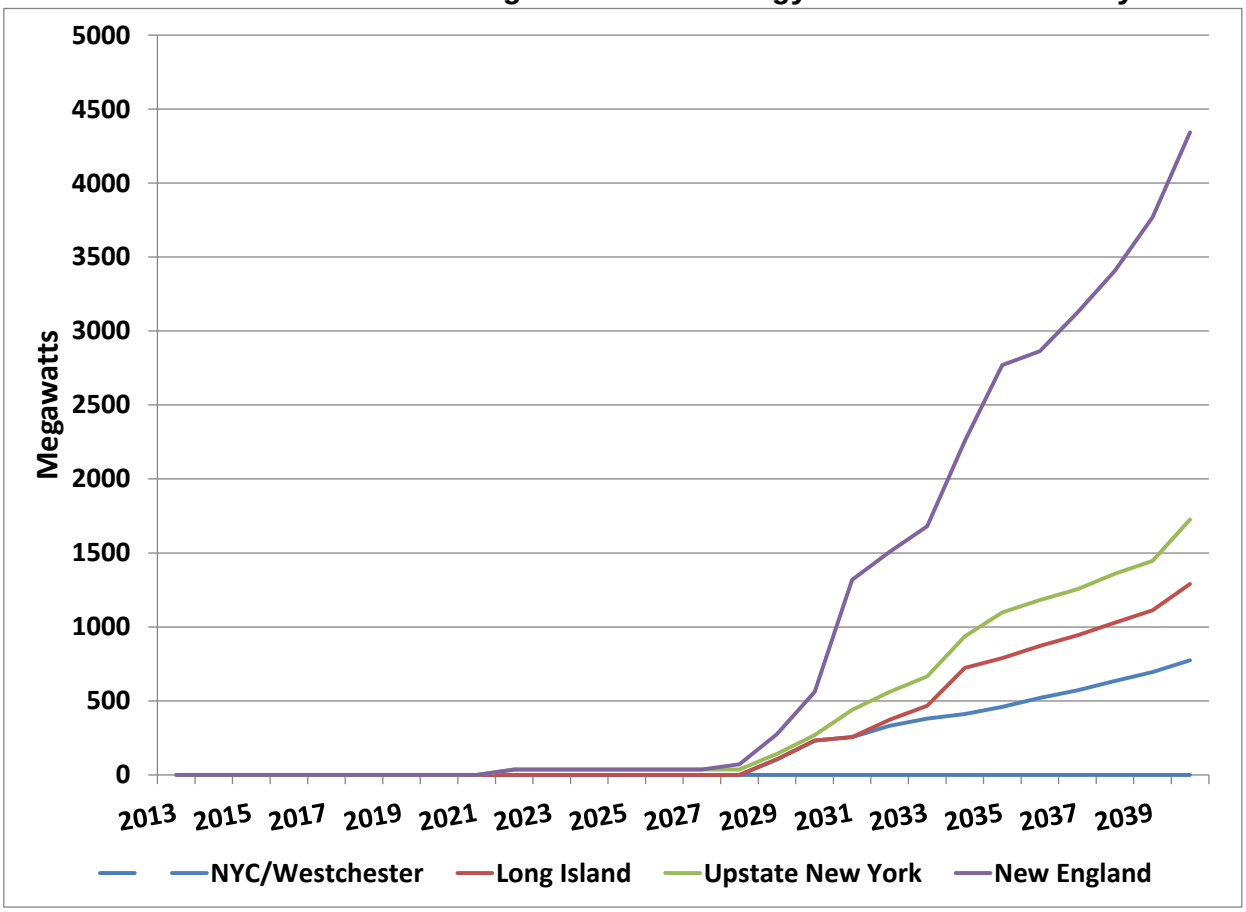


Figure 2: Cumulative Capacity Additions After 2012 in Entergy's No Action Alternative

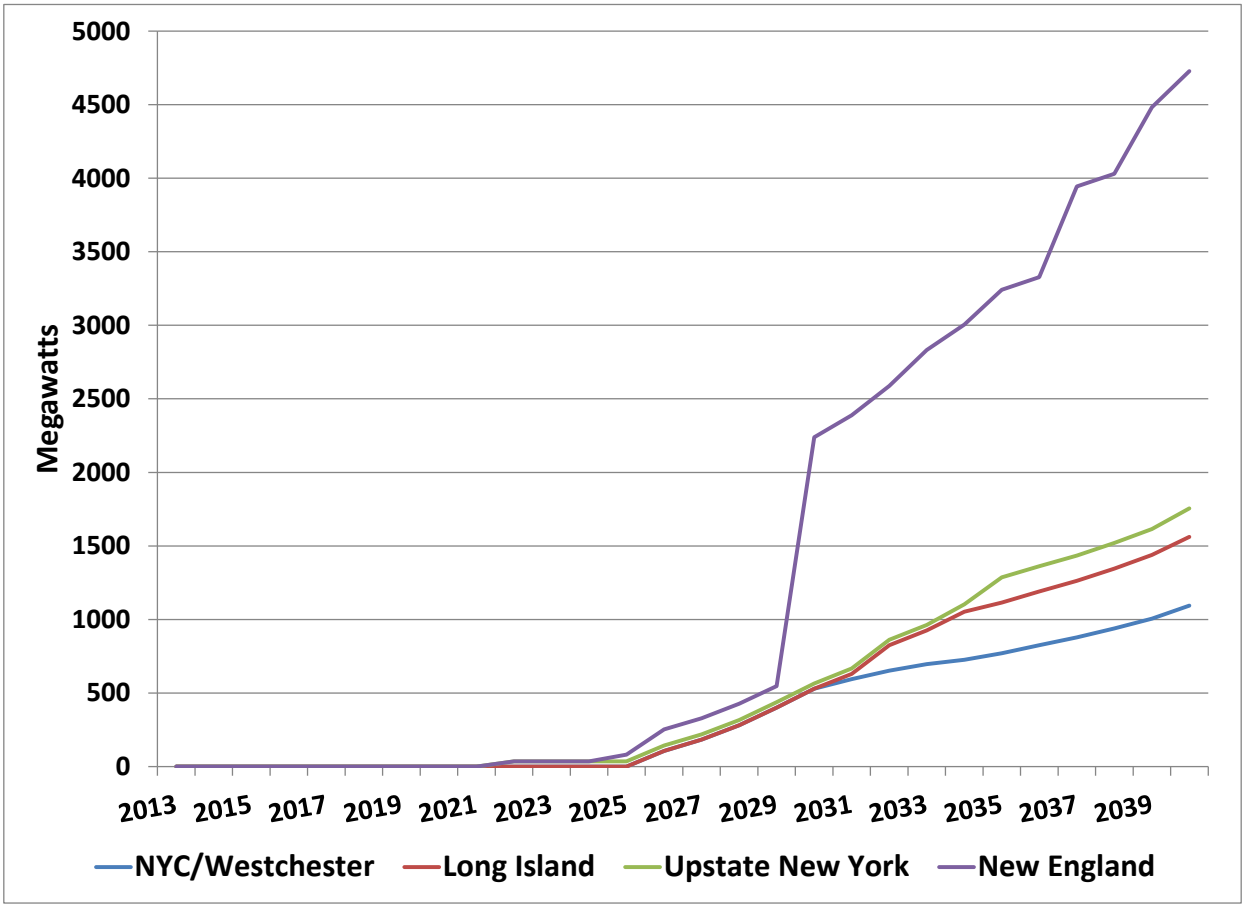
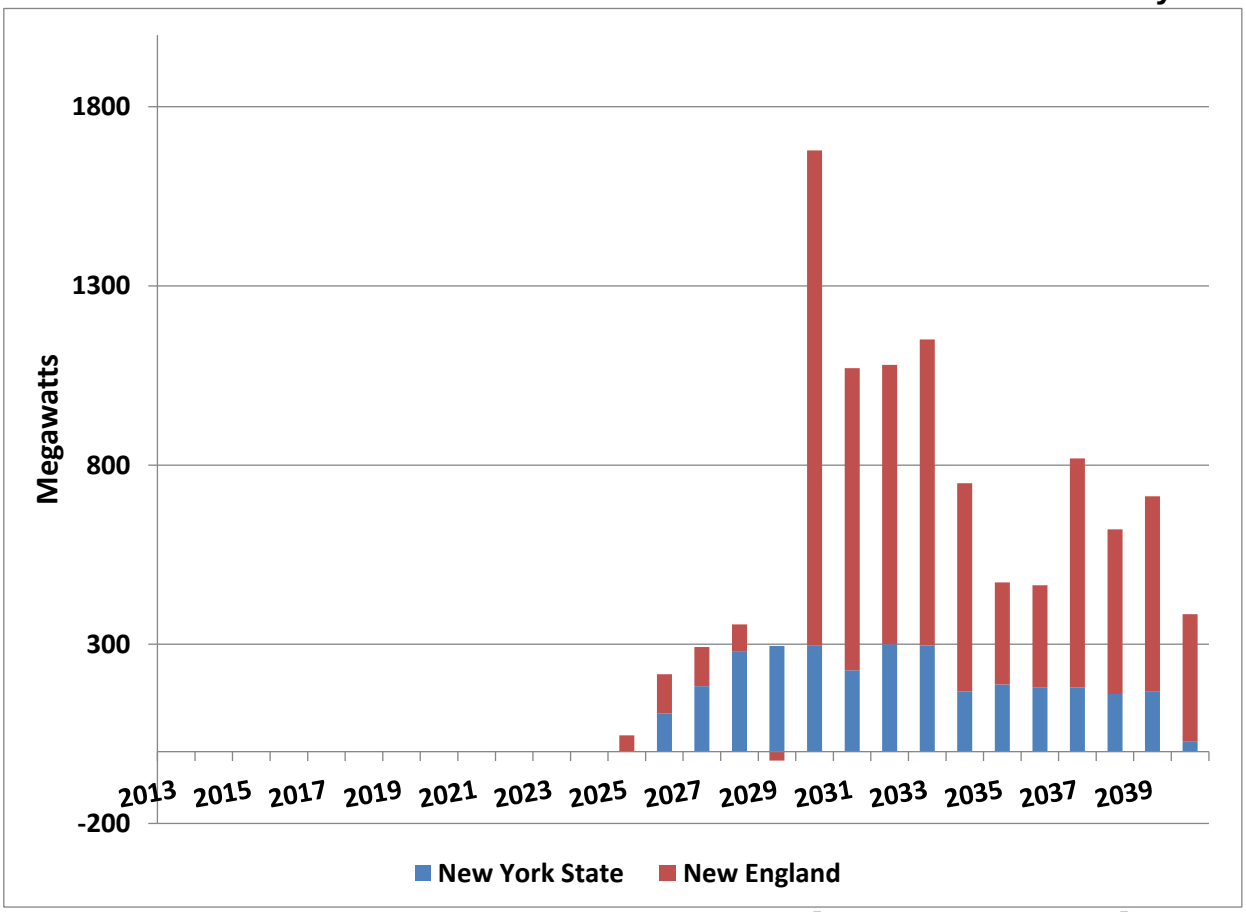


Figure 3: Cumulative Megawatts of Replacement Capacity Added in NEMS No Action Alternative above That Added in Baseline Analysis



Q. What do Figures 1, 2 and 3 reveal about the results of Entergy's NEMS modeling of the No Action Alternative?

A. In Entergy's NEMS modeling of the No Action Alternative:

- No clean and efficient replacement capacity is added in New York State (let alone New York City and/or Westchester) until 2026 and only a relatively small amount (300 MW in total) is added in the years 2026 through 2040.

- No clean and efficient replacement generating capacity would be added in New England until 2025 and then only

> a relative small amount (110 MW) of new capacity would be added between 2025 and 2030.[10]

Although this result is not reflected in Figure 4, remarkably, the results of Entergy's NEMS modeling projects that more new generating capacity would be built in Upstate New York in the Baseline analysis than under the No Action Alternative.

Q. Is it reasonable to expect that any significant portion of the replacement capacity that would be added if IPEC is retired would be built in New England?

A. No. It is more reasonable to expect that replacement generating capacity would either be built (1) in the downstate New York region or (2) in Upstate New York rather than in unspecified locations in New England.

Q. What do you believe would be the likely market response to the retirement of Indian Point Units 2 and 3?

A. It is reasonable to expect that current or new market participants would seek to add new capacity in New York City or Westchester County close to the downstate loads. Given the current and projected low costs of natural gas, and the financial risks faced by new coal plants, I believe that the new generating capacity that would be added would be clean and efficient natural gas combined cycle units. Indeed, new

[10] Exh.NYS000438

efficient natural gas combined cycle units have been added in New York City within the past decade and other proposed combined cycle units were licensed by the state to be built in downstate New York but were unable to obtain needed financing. It is reasonable to expect that IPEC's retirement would facilitate the licensing of new replacement generation projects.

Q. What actions is the State of New York currently taking to ensure that there would be new clean and efficient natural gas-fired or renewable generating capacity added in downstate New York or that there would be additional transmission capability to import new generating capacity into the downstate region?

A. The State has taken a number of actions that can be expected to lead to efficient and clean new generation being built in or imported into downstate New York. First, the Power New York Act of 2011 established a process for the siting of electric generating facilities and repowering projects. Second, the State has started the process for developing an Energy Highway plan that will include (1) building new transmission lines or rebuilding and upgrading existing ones; (2) repowering aging power plants to increase their efficiency and making them more environmentally friendly and (3) building new plants including those powered by natural gas and by wind and other

renewable fuels.[11] The State has explained that:

> While taking action to reduce demand through the State's on-going energy efficiency initiatives remains critical to the current and future sustainable energy system, this initiative focuses on supply-side and infrastructure projects that generate and transmit energy.[12]

The specific objectives of the Energy Highway are to:

- Reduce constraints on the flow of electricity into, and within, the downstate area; and expand the diversity of power generation sources supplying downstate
- Assure that long-term reliability of the electric system is maintained in the face of major system uncertainties
- Encourage development of utility-scale renewable generation resources throughout the state
- Increase the efficiency of power generation, particularly in densely populated urban areas.[13]

The current schedule calls for the State's Energy Highway Task Force to develop an action plan sometime in the summer of 2012.

Q. Are clean and efficient new generation facilities being proposed for in or near downstate New York?

A. Yes. A number of new projects representing well over 2,000 MW of clean and efficient generating capacity have been proposed for completion in and near New York City in the years

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[11] New York Energy Highway Request for Information, at page 4, www.nyenergyhighway.com/Content/pdf/EH_RFI/Brochure_2012.pdf

[12] Id.

[13] Id. at page 11.

2014-2017:

- NRG's Berrians GT I, II and III project involving the addition of 580 MW of natural gas-fired capacity in New York City
- The CPV Valley Energy Center in Orange County involving 650 MW of natural gas –fired combined cycle capacity
- US Power Gen's Luyster Creek Energy Project in New York City involving 400 MW of natural gas-fired combined cycle capacity
- The Cricket Valley Energy Center located east of Poughkeepsie, New York which would add 1000 MW of new natural gas-fired combined cycle capacity.

Q. Does Entergy's NEMS Baseline or No Action Alternatives include the New York Energy Highway or any of these proposed facilities?

A. No.

Q. You testified earlier that in Entergy's No Action Alternative, clean new replacement generating capacity would not be added in the New York City/Westchester region until 2026 and in New England until 2025. Does the discussion of the environmental impacts of the No Action Alternative by Entergy's witnesses address the impact of adding this clean new replacement capacity?

A. Not surprisingly, Entergy's witnesses discuss only the environmental impacts of not relicensing IPEC in the years 2016-

2025.[14] This is significant because under Entergy's No Action Alternative only a very small amount of clean and efficient replacement capacity would be added in New York State during this period and a mere 46 MW of clean and efficient replacement capacity would be added in New England. Entergy also adds only a little bit more energy conservation and barely any additional renewable energy. Instead, Entergy assumes that the great bulk of the replacement energy would come from the continued operation of existing inefficient and dirty coal and oil/gas steam units.[15] Consequently, it is no wonder that Entergy concludes that there would be significant environmental impacts as it has excluded all clean sources of replacement energy.

Q. Does this complete your testimony?

A. Yes.

I have reviewed all the exhibits referenced herein. True and accurate copies are attached.

[14] For example, see Entergy Testimony, Table 8 on page 80.

[15] As shown in Entergy Testimony, Table 7 on page 78, 43.1% of the replacement energy would come from coal and 55.9% from existing gas and oil units.

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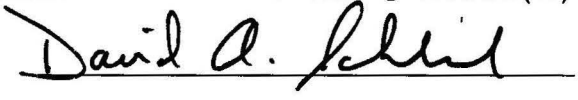
Entergy Nuclear Indian Point 2, LLC,	DPR-26, DPR-64
Entergy Nuclear Indian Point 3, LLC, and	
Entergy Nuclear Operations, Inc.	June 29, 2012

DECLARATION OF David A. Schlissel

I, David Schlissel, do hereby declare under penalty of perjury that my statements in the foregoing testimony and my statement of professional qualifications are true and correct to the best of my knowledge and belief.

Executed in Accord with 10 C.F.R. § 2.304(d)



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