Synapse
Energy Economics, Inc.

Indian Point Energy Center
Nuclear Plant Retirement Analysis

TESTIMONY BEFORE THE NEW YORK STATE ASSEMBLY STANDING COMMITTEE ON ENERGY AND THE STANDING COMMITTEE ON CORPORATIONS, AUTHORITIES AND COMMISSIONS

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1. Introduction and Summary

My name is Tim Woolf and I am a Vice President of Synapse Energy Economics, Inc. (Synapse), a research and consulting firm specializing in energy, economic and environmental topics.[1] I have 30 years of experience researching energy issues for consumer advocates, environmental advocates, regulatory commissions, state energy offices, the US Department of Energy and the US Environmental Protection Agency. From 2007 to 2011 I served as a commissioner at the Massachusetts Department of Public Utilities, where I oversaw a dramatic expansion of energy efficiency and renewable resource development in that state.

I would like to thank the New York State Assembly Standing Committee on Energy and the Standing Committee on Corporations, Authorities and Commissioners and Chairmen Kevin Cahill and Jim Brennan for the opportunity to testify today, and for convening this hearing on the important issue of energy alternatives to Indian Point.

This testimony summarizes a report that was prepared by Synapse at the request of the Natural Resources Defense Council, Inc. and Riverkeeper, Inc. The report is titled *Indian Point Energy Center Nuclear Plant Retirement Analysis* and was released on October 17, 2011. I am providing full copies of the Synapse report into the record. This report provides an assessment of the alternative energy resources that are available to replace Indian Point Energy Center Units 2 and 3 if they are permanently retired in 2013 and 2015.

The Synapse report is based upon existing literature regarding electricity resource development in New York. We rely extensively upon the New York Independent System Operator (NYISO) Gold Book, which contains forecasts of peak demand as well as a comprehensive queue of electricity resources that are currently being proposed by power plant developers. We also rely upon independent assessments of energy efficiency and renewable resource opportunities in New York.

In sum, we find that there are likely to be ample existing and new resources available to replace Indian Point if it were to close down permanently in 2013 and 2015; and that neither New York City's nor New York State's electricity reliability would be jeopardized. A replacement scenario focusing on cost-effective demand-side resources, local renewable resources, repowering of existing older inefficient power plants and new efficient generation as necessary would maintain reliability at a low cost to electricity customers.

[1] Additional information about Synapse Energy Economics and my experience is available at www.synapse-energy.com.

2. Existing and Proposed Resources Provide a Capacity Surplus

New York State

Figure 1 presents a summary of the amount of generating capacity in New York State from 2011 through 2021 under two scenarios – one with Indian Point remaining on-line and one with Indian Point retiring in 2013 and 2015.

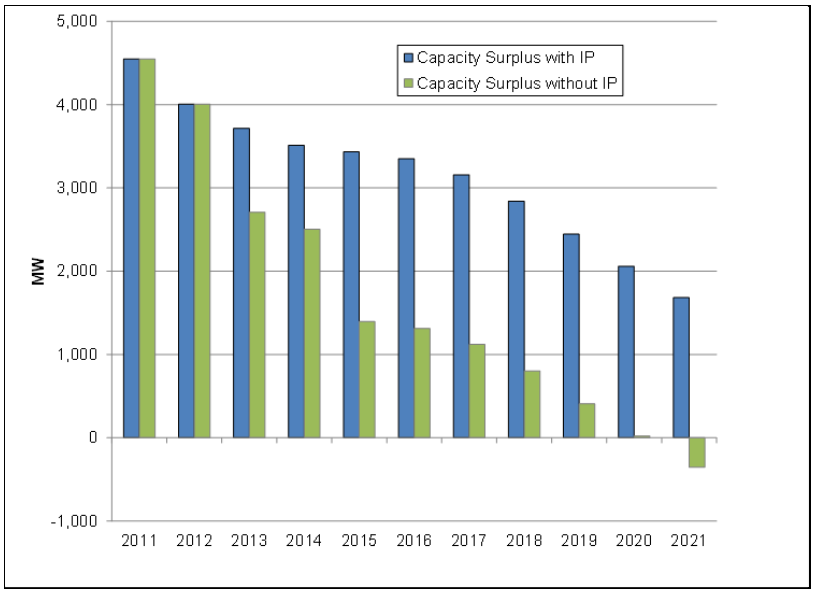
As indicated, there is currently a surplus of capacity in New York State of over 4,000 MW. This surplus is expected to remain through 2021 and beyond.

If the Indian Point units retire in 2013 and 2015, there will continue to be surplus capacity in the state through 2020.

In both of the scenarios in Figure 1 we have only included existing capacity, as it is compared to current forecasts of electricity demand. There will certainly be new capacity added to the electric system during this time period, increasing the amount of surplus capacity indicated in Figure 1.

This surplus of capacity provides the state several years to develop new resources to maintain reliability, if Indian Point is retired.

Figure 1. New Your State Capacity Surplus



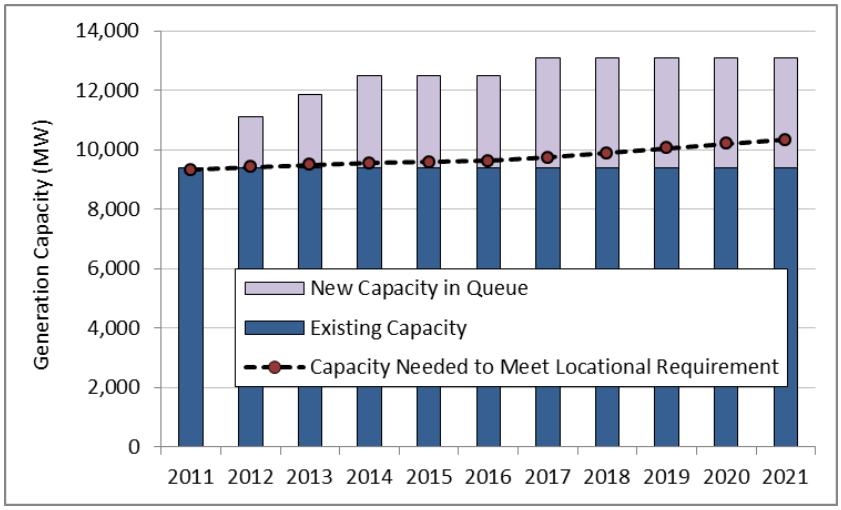
New York City and Long Island

In addition to statewide reliability requirements, the electric utilities and other load-serving entities in New York City and Long Island are subject to locational requirements, due to the constraints on transmission serving those regions. For 2011/2012 New York City and Long Island are required to maintain local generation capacity equal to 81 percent and 101.5 percent of their peak demands, respectively. As with the state as a

whole, these two regions are expected to remain well above these reliability requirements through 2020 or 2021.

Figure 2 presents capacity that could potentially be available through 2021 in Zone J (which is the NYISO zone that is roughly equivalent to New York City), to which the 81 percent locational requirement is applied. Also presented is the amount of capacity that will be required in Zone J in order to meet the 81 percent locational requirement. As indicated, the amount of capacity that could potentially be available is well above the locational requirement, with the potential for 2,000 to 3,000 MW of capacity in excess of the requirement throughout most of the period.

Figure 2. Generation Capacity in New York City Relative to the Locational Requirement



It is important to note that Indian Point is not located within either the New York City or the Long Island reliability regions. Therefore, the retirement of Indian Point will not affect the ability of New York City or Long Island to meet these local reliability requirements.

3. There is a Large Potential for New Resources in the Region

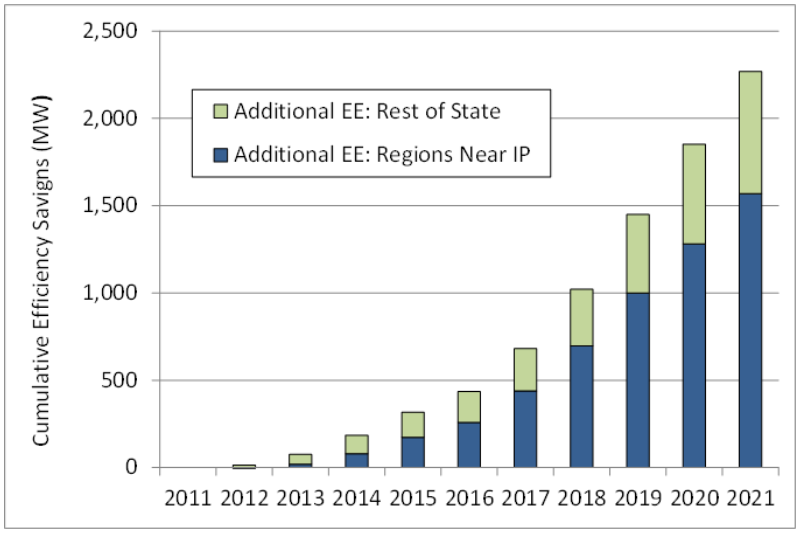
Energy Efficiency and Demand Response

We estimate that over the next decade there is enough energy efficiency in the state to reduce peak demand by over 2,000 MW – above and beyond the efficiency savings currently assumed by NYISO in their load forecasts. As indicated in Figure 3, many of these resources are located in the regions near Indian Point, due to the high customer loads in those regions.

This estimate is based on the assumption that existing efficiency activities in New York would be increased enough to reduce peak demand by roughly 1.5 percent per year from 2015 through 2021. This level of efficiency savings is well within what could be considered reasonably achievable; additional efficiency savings could be obtained with

increased efforts. Energy efficiency savings are, of course, free of carbon pollution and other air and water pollution impacts.

Figure 3. Cumulative Additional Efficiency Savings (MW); By Location



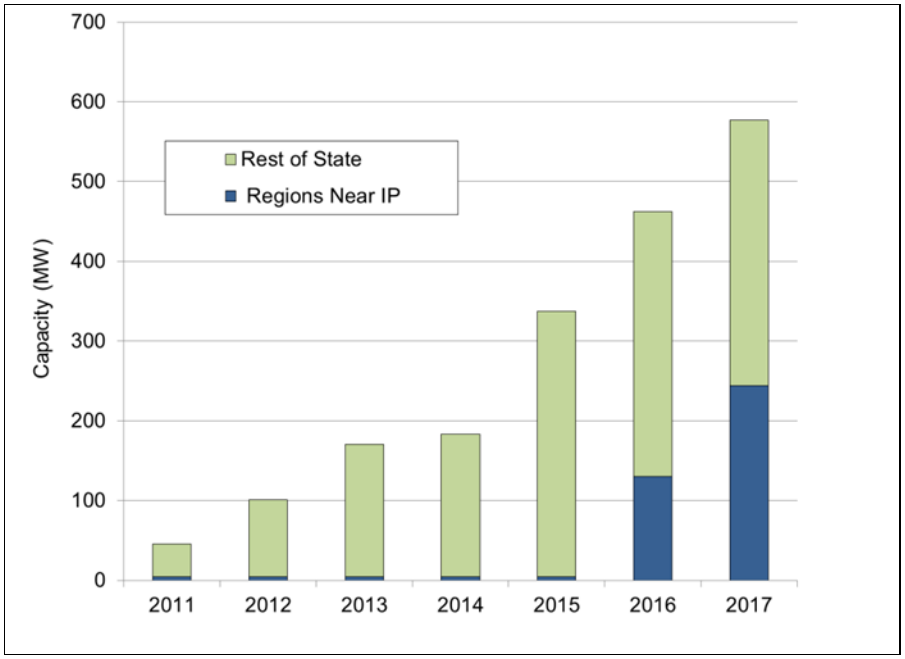
The expansion of demand response (DR) resources in the downstate region could also assist in replacing Indian Point. DR programs provide customers with financial incentives to reduce their load at times of high electrical demand, e.g., by controlling lighting, air conditioning or water heating end-uses.

There are now over 2,000 MW of DR enrolled with the NYISO Special Case Resource program, which were largely responsible for averting a new all-time record for peak load in July 2011. As market rules expand in accordance with FERC mandates designed to ensure fair compensation of DR, there will be an increasingly valuable role for these resources to play in meeting the energy and reliability needs of the state – particularly in New York City and the other regions around Indian Point.

Renewable Resources

There are currently roughly 5,500 MW of renewable resources in the NYISO interconnection queue, the majority of which (5,365 MW) are wind projects. Only a portion of the wind capacity is considered to be available for purposes of the NYISO reliability planning. Therefore, the 5,365 MW of wind capacity is roughly equivalent to 1,154 MW of capacity that can be used to meet the state's summer peak reliability requirements. Even if only one-half of this capacity is eventually developed, it would provide roughly 244 MW of renewable resources in the regions near Indian Point, and 333 MW of renewable resources in the rest of the state, as indicated in Figure 4.

Figure 4. Potential Renewable Capacity in the NYISO Queue



In addition to the renewable resources in the NYISO interconnection queue, there is a large potential for solar photovoltaics and additional offshore wind, both of which are highly concentrated in the regions near Indian Point and near the highest electricity loads in New York. Pending legislation in the New York State legislature, if enacted, would establish a program to develop approximately 5,000 MW of solar power capacity in New York State by the year 2025, which could mean as much as 2,500 MW of solar power in the regions near Indian Point. The Long Island–New York City Offshore Wind Collaborative sees the potential for an offshore wind project of up to 350 MW, potentially growing to 700 MW. At least one large offshore wind farm has already been proposed for the Federal waters off NYC. Deepwater Wind has proposed the 1,000 MW Hudson Canyon Wind Farm that would supply power directly into the Gowanus Substation in Brooklyn where it holds a 1,000 MW queue position. The wind farm would be paired with a HVDC transmission network called SMRT Line that would also interconnect into central New Jersey and possibly Long Island. The SMRT Line is currently being evaluated under the NYISO's economic planning process (the CARIS process).

Additional Generation Opportunities

Combined heat and power (CHP) facilities are a highly-efficient, clean, distributed generation resource that could play a key role in replacing Indian Point. These projects can range from as small as 100 kW to as large as 10-20 MW, and are sized according to a building's electrical and heating/cooling needs (or in the case of district energy, the needs of a cluster of buildings). To date, the New York State Energy Research and Development Authority (NYSERDA) incentives have supported a number of high-profile

CHP projects in the region near Indian Point, but the state has only begun to scratch the surface of its CHP potential. The environmental and reliability benefits of this technology are proven and well-established, leading New York City to include a goal to install 800 MW of CHP as part of its PLANYC sustainable energy strategy.

In addition, new efficient, combined-cycle gas-fired power plants with state of the art pollution controls can help meet reliability requirements in the absence of Indian Point. There are currently 4,208 MW of new gas-fired plants in the NYISO interconnection queue, not including the recently completed 550 MW Astoria II facility. The majority of this capacity, 3,908 MW, is located in the regions near Indian Point. Assuming that 50 percent of the remaining gas-fired projects come on line as scheduled, there will be1,954 MW of new natural gas capacity in the regions near Indian Point New York, nearly enough to replace Indian Point all by itself.

Repowering existing gas-fired generation plants is another available option with important environmental benefits for replacing Indian Point energy. Repowering existing gas plants involves replacing or rebuilding the existing plant with a new, more efficient combined cycle gas-fired plant, which can produce more electricity while using gas more efficiently and producing less air and water pollution. There are 230 MW of planned plant repowerings that were once in the NYISO interconnection queue but have been removed. These projects could be revisited should it become clear that Indian Point would retire, and if New York State provided incentives for Con Edison and other utilities to enter into long-term contracts with the developers of repowered generation plants.

Transmission Opportunities

Furthermore, there are currently 8,210 MW of new transmission capacity proposed in the NYISO interconnection queue. Of these projects, 5,010 MW terminate in New York City, and 2,000 MW (West Point Transmission and NY Power Pathway) will terminate in the region where Indian Point is located. It is difficult to predict the likelihood that any one of these projects will be approved and come on-line. Nonetheless, it is safe to conclude that some of these transmission lines are likely to be developed prior to 2020 and would assist in replacing the capacity from Indian Point.

Table 1. Transmission Projects in the NYISO Interconnection Queue

Project Name	Summer Capacity (MW)	Target In-Service Year	Regions Affected
Cross Hudson II	800	2013	New York City
Hudson Transmission	660	2013	New York City
Clay HVDC	2,000	2014	Western NY, New York City
Champlain Wind Link II	600	2014	Western NY State
Champlain Wind Link I	600	2014	Western NY State
New York Wire-Phase 1	550	2014	New York City
West Point Transmission	1,000	2015	Eastern NY State
Transmission Developers NYC	1,000	2015	New York City
NY Power Pathway	1,000	2016	Eastern NY State
Total	8,210		

4. The Costs of Replacing Indian Point are Likely to be Modest

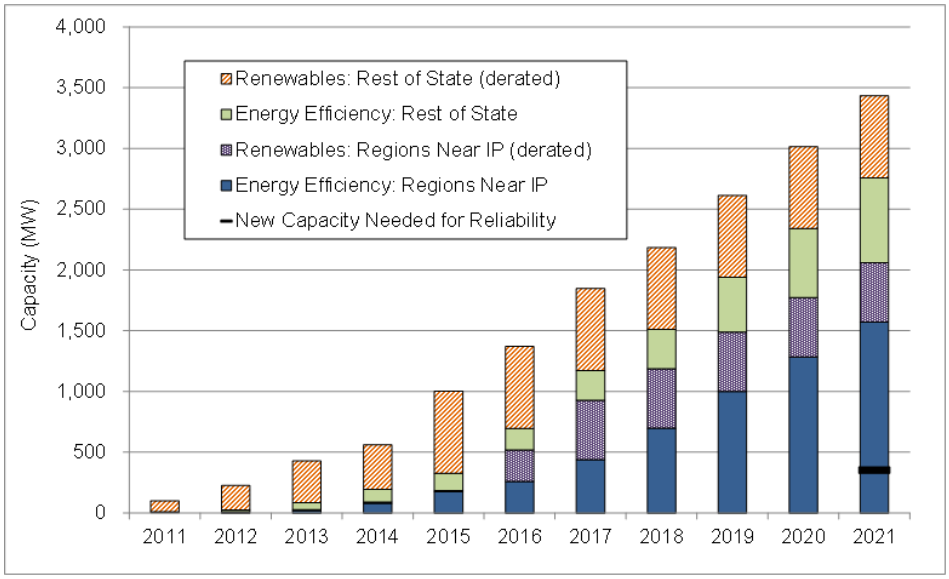
The ultimate cost of replacing Indian Point will depend upon the choices that are made by policymakers in selecting the portfolio of replacement resources.

Other studies of Indian Point replacement options – for example the Charles River Associates study – typically overstate the likely costs of replacing power from Indian Point, by presenting a limited set of replacement options. They typically include a very limited amount of energy efficiency resources as replacement options.

Energy efficiency will help significantly reduce replacement power costs both by reducing the wholesale prices of energy and capacity, and by reducing customer bills. In addition, new renewable resources will help lower the cost of replacement power, to the extent that they are required anyway to comply with the state's renewable portfolio standard.

Figure 6 presents a summary of the energy efficiency and renewable resources that are available to replace Indian Point, based on our analysis above. It demonstrates that there is clearly enough efficiency and renewable resources available to replace Indian Point – if New York policymakers decide to pursue those options.

Figure 6. New Efficiency and Renewable Resources Available to Replace Indian Point



The primary cost impact of retiring Indian Point will be an increase in the wholesale electricity prices in New York State. The percentage increase in electricity customers' bills from replacing Indian Point will be roughly half of the percentage increase in wholesale electricity prices, because wholesale energy represents roughly half of electricity customers' total bills.

We estimate that the impact on customers' retail electricity bills is likely to be on the order of one to three percent under the replacement scenarios discussed in this report. For those customers who participate in energy efficiency programs, this increase in electricity bills would be more than offset by reductions in bills due to energy efficiency savings.

We recommend that the state adopt a "no regrets" approach to replacing Indian Point. In other words, the state should adopt those resources that provide the most value to electricity customers and the state as a whole – regardless of whether Indian Point is retired. This would mean adopting cost-effective energy efficiency and renewable resources that can contribute to a low-cost, sustainable electricity mix over the long-term.

Such a no regrets approach would be consistent with several existing or proposed New York policy initiatives, including the 15 percent by 2015 energy efficiency standard, the 30 percent by 2015 renewable portfolio standard, the promotion of photovoltaics resources, the development of off-shore wind resources, the promotion of cost-effective highly efficient combined heat and power resources, and the repowering of existing gas facilities, particularly those located in the regions near Indian Point.